2023 Policies, Procedures, Protocols, Appendices

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Division of Emergency Medical Services

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APPENDICES and REFERENCES
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Policies

Division of Emergency Medical Services

Criteria for Death / Withholding Resuscitation

Policy:

CPR, BLS and ALS treatment are to be withheld only if the patient is obviously dead (see procedure section) or a valid (*properly completed, signed, dated, and unexpired*) **North Carolina Do Not Resuscitate (DNR)** form and/or **Medical Orders for Scope of Treatment (MOST)** form is present (Disposition Policy 5).

EMS personnel shall also honor a valid **POLST (Physician Orders for Life Sustaining Treatment), POST (Physician Orders for Scope of Treatment), MOST and/or DNR** (*properly completed, signed, dated, and unexpired*) from another state or US military form. NCGS Article 23: 90-320.

Purpose:

The purpose of this policy is to:

- Honor those who have obviously expired prior to EMS arrival.
- To honor the terminal wishes of the patient
- To prevent the initiation of unwanted resuscitation

Procedure:

1. If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated: (Must document on chart)

   - Body decomposition
   - Rigor mortis
   - Dependent lividity
   - Blunt force trauma
   - Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction)
   - **Confirmed** extended downtime (> 15 minutes) with Asystole on the ECG in 2 leads (Each lead must be at least 10 seconds in length) - a 12-Lead does not satisfy this req.
   - Meets criteria established in AC 12 Termination of CPR Protocol
   - Meets criteria established in TB 10 Traumatic Arrest Protocol (when applicable)

1. If a bystander or first responder has initiated CPR or automated defibrillation prior to ALS personnel (Paramedic or AEMT) arrival and any of the above criteria (signs of obvious death) are present, the ALS provider may discontinue CPR / resuscitation efforts. All other EMS personnel levels must communicate with medical control prior to discontinuation of the resuscitative efforts unless specifically addressed in AC 12 Termination of CPR Protocol and/ or TB 10 Traumatic Arrest Protocol.

2. 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** (Disposition Policy 3).
   b) Patient care responsibilities are transferred to the destination hospital staff.

Deceased Subjects

Policy:

EMS will handle the disposition of deceased subjects in a uniform, professional, and timely manner.

Purpose:

The purpose of this policy is to:

- Organize and provide for a timely disposition of any deceased subject
- Maintain respect for the deceased and family
- Allow EMS to return to service in a timely manner.

Procedure:

1. Do not remove lines or tubes from unsuccessful cardiac arrests/codes unless directed below.

2. Notify the law enforcement agency with jurisdiction if applicable.

3. If subject was found deceased by EMS, the scene is turned over to law enforcement.

4. If EMS has attempted to resuscitate the patient and then terminated the resuscitative efforts, EMS personnel should contact the primary care provider (medical cases) or medical examiner (traumatic cases or primary care provider unavailable) to provide information about the resuscitative efforts.

   <u>Cases that require notification of the Medical Examiner when death results from:</u>

   Accident
   Homicide
   Violence
   Poisoning
   Suicide
   Occurring in jail, prison, correctional institution, or in LEO custody
   Occurring under suspicious, unusual, or unnatural circumstances
   Sudden unexpected death when in otherwise good health
   No current primary care or specialty physician care

5. Transport arrangements should be made in concert with law enforcement and the family's wishes.

6. If the deceased subject's death is not under the jurisdiction of the medical examiner, any line(s) or tube(s) placed by EMS should be removed prior to transport.

7. Document the situation, name of primary care provider or Medical Examiner contacted, the patient care report form (PCR).

8. Physician Assistants and/or Nurse Practitioners may sign a North Carolina death certificate when specially authorized by their supervising physician.

9. Follow Disposition Policy 9 Organ Procurement Agency Notification

Discontinuation of Prehospital Resuscitation

Policy:

Unsuccessful cardiopulmonary resuscitation (CPR), basic life support (BLS), and other advanced life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital when this policy is followed.

Purpose:

The purpose of this policy is to:

- Allow for discontinuation of prehospital resuscitation after the delivery of adequate and appropriate BLS and/or ALS therapy.

Procedure:

1. Discontinuation of CPR, BLS, and ALS intervention may be implemented **prior to contact with Medical Control if ALL** of the following criteria have been met:

    - Patient must be ≥ 18 years of age
    - High quality CPR administered
    - Airway successfully managed:
        Acceptable airway management techniques include orotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy
        EtCO2 monitoring for airway confirmation utilized if available
    - IV or IO access has been achieved
    - No hypothermia (body temperature ≥ 93.2°F or 32°C)
    - Protocol AC 12 On Scene Resuscitation Termination of CPR or TB 10 Traumatic Arrest utilized as applicable
    - All EMS BLS and ALS personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate

2. If all of the above criteria are not met and discontinuation of prehospital resuscitation is desired, **contact Medical Control**.

3. The **Deceased Subjects Policy** should be followed.

Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS patient care report (PCR).

Disposition (Patient Instructions)

Policy:

This policy applies to all credential levels, including Medical Responders and first responders.

Mentally capable patients maintain the right to refuse care and/or transport. If unsure, contact Medical Control. Medical Control may not order a patient who is capable to be transported but may be able to talk with the patient directly and convince him or her to seek appropriate treatment or transport.

- Patients who are not capable at the time of the EMS encounter and/or present a danger to themselves or others shall be transported to a local emergency department for mental health evaluation, or to an approved alternative destination. Providers should make every effort to transport patients with their consent, regardless of capacity, however transport of incapacitated individuals may occur without their consent as necessary. Contact Law Enforcement for assistance with transporting patients without their consent. Disagreement with the provider does not itself constitute lack of capacity.

All patients refusing service shall be informed of the availability of service and:

- Recommend treatment and transport in a non-confrontational, polite manner,
- Advised to call 911 for emergency service if desired, and
- Advised that the patient(s) accept full responsibility for their actions
- Advised to wait on the arrival of a paramedic prior to refusal so that an ALS assessment may be performed and appropriate patient refusal documentation completed.

For this reason, in general Medical Responders and first responders should NOT cancel incoming EMS units when a patient or patients are present on a scene. (see "Definition of a Patient") If there is no one on scene who meets the definition of a patient, First Responding units may advise such over the radio and then cancel incoming EMS units at the discretion of the highest ranking officer on scene or the scene or incident commander.

- Patients are considered to be capable of refusing care if they do not endorse suicidal or homicidal ideation, are oriented to person, place and time (or to their baseline mental status in a nursing home), and can express understanding of the risks of refusal.
- The use of alcohol or other drugs should not be used solely as a criterion for rendering a person incapable of making a medical decision. Rather, the circumstances of the event should be taken into account. For example, the patient who has used alcohol or other drugs with a potential for head trauma and altered mental status will require transport based on implied consent whereas the substance-using patient in their home with no evidence of trauma who meets the capacity criteria listed above may be capable of making a medical decision.
- Patients treated for hypoglycemia under the altered mental status protocol do not require a refusal form.

Documentation:

- In the PCR narrative, describe the patient encounter, VITAL SIGNS, and advice given. Use the "Refusal of Care" procedure in the call reporting system to document that the patient is alert and oriented to person, place, and time, and that the patient understands given instructions.
- If possible, have the patient sign the AMA form, have a third party witness the signature, and give a copy to the patient. If not possible, document the reason why this was not accomplished (patient refused to wait on paramedic resource, patient refused to sign, etc.)
- Complete the "Refusal of Service" document in the electronic call report.
- Patients should receive the appropriate pre-printed "Patient Instructions" form (see appendix)

EMS personnel shall not discuss cost, system status/unit availability, or any other non-clinical subject in regards to a patient's decision to accept or decline treatment and/or transport.

North Carolina Do Not Resuscitate and MOST Form

Policy:

Any patient presenting to any component of the EMS system with a completed North Carolina ***Do Not Resuscitate*** (DNR) form (yellow form) shall have the form honored and CPR and ALS therapy withheld in the event of cardiac arrest. The **Medical Orders for Scope of Treatment** (MOST) form shall be honored as directed below.

Purpose:

To honor the terminal wishes of the patient and to prevent the initiation of unwanted resuscitation.

Procedure:

1. When confronted with a cardiac arrest patient, the following conditions must be present in order to honor the DNR request and withhold CPR and ALS therapy:

- Original North Carolina DNR form (yellow form - not a copy) – or – DNR box is checked in section A of the MOST form (pink form – not a copy). (NOTE: If in a medical facility, see the "Deceased Persons" procedure for additional guidance regarding other methods of documenting DNR status)
- Form signed by physician, physician's assistant, or nurse practitioner

2. A DNR request may be overridden by the request of the patient, the patient's guardian, or the patient's on-scene physician.

3. When confronted with a seriously ill patient who is not in cardiac arrest and has a MOST form, the

MOST form Section B shall be utilized as follows:

- Full Scope of Treatment box is checked: Use all appropriate measures included in System Protocols to stabilize/resuscitate the patient
- Limited Scope of Treatment box is checked: The maximum airway intervention is non-rebreather mask and airway suctioning. All appropriate IV medications may be utilized. No electrical therapies are to be provided.
- Comfort Measures is checked: The maximum airway intervention is non-rebreather mask and airway suctioning. IV pain medications may be administered. Medical control may be contacted reference appropriate treatment.

4. In the case of a peri-arrest patient with a DNR but not a MOST form, make every effort to contact the patient's Healthcare Power of Attorney (HCPOA) if one exists, and/or the patient's family to clarify the patient's wishes regarding resuscitation. In general the "hierarchy" of decision-making for end-of-life issues, per NC Law (NCGS 90-322), is 1) Healthcare power of attorney; 2) Spouse; 3) A majority of reasonably available Adult Children and Parents; 5) Adult Siblings; 6) Adult Grandchildren; 7) Grandparents; 8) Adult who exhibited special care and concern for the patient

5. If family members are present and ask that resuscitative efforts be withheld in the absence of an advanced directive, determine their relationship to the patient and the patient's history. If the patient has an obvious life-limiting illness (terminal cancer, advanced neurological disease, etc.), resuscitative efforts may be withheld. If there is no obvious life-limiting illness, begin resuscitation based on appropriate protocol(s) and contact medical control for further guidance.

6. Living wills or other documents indicating the patients desire to withhold CPR or other medicare may be honored only in consultation with the patient's family.

Patient Without a Protocol

Policy:

Anyone requesting EMS services will receive a professional evaluation, treatment, and transportation (if needed) in a systematic, orderly fashion regardless of the patient's problem or condition.

Purpose:

- To ensure the provision of appropriate medical care for every patient regardless of the patient's problem or condition.

Procedure:

1. Treatment and medical direction for all patient encounters, which can be triaged into an EMS patient care protocol, is to be initiated by protocol.

2. When confronted with an emergency or situation that does not fit into an existing EMS patient care protocol, the patient should be treated by the **Universal Patient Care Protocol** and a **Medical Control Physician** should be contacted for further instructions.

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Physician on Scene

Policy:

Policy:
The medical direction of pre-hospital 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 North 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 pre-hospital care
- To minimize the liability of the EMS system as well as any on-scene physician

Procedure:

1. When a non-medical-control physician offers assistance to EMS or a patient is being attended to by a physician with whom they do not have an ongoing patient relationship, EMS personnel must provide the On-Scene Physician Form to the physician. All requisite documentation must be verified and should the physician wish to continue providing medical assistance to EMS and the patient, the physician must be approved by on-line medical control as soon as possible with consideration of the clinical situation.

2. When a patient is being attended to by a physician with whom they have an ongoing patient-provider relationship, EMS personnel may follow orders given by the physician if the orders conform to current County EMS guidelines, the physician agrees to the requirements presented on the “On- Scene Physician” form, and if the physician signs the Patient Care Report. Notify medical control at the earliest opportunity.

3. EMS personnel may accept orders from a patient’s physician over the phone with the approval of medical control. The paramedic should obtain the specific order and the physician’s name and phone number for relay to medical control so that medical control can discuss any concerns with the physician directly. For the purposes of this policy, a physician may be considered “on scene” and therefore able to take medico-legal responsibility for the patient (and therefore issue orders) if contact is made with the physician by telephone or other “live” but remote two-way communication method. For the purposes of this policy a physician does not have to be physically present to be considered “on scene.”

4. Orders received from an authorized (as determined by this policy) physician may be followed, even if they conflict with existing local protocols, provided the orders encompass skills and/or medications approved by both the County EMS System Medical Director and the State Medical Board for a provider’s credential level. Under no circumstances shall EMS personnel perform procedures or give medications that are outside their scope of practice and/or credential as per the County EMS System Standards Document (this document) and the North Carolina Medical Board.

Opioid Overdose/Misuse (Optional)

Policy:
Patients who have experienced an opioid overdose/misuse should be offered a variety of options to more appropriately manage their care where available in the community. All care should be provided within the rules and regulations of the state of North Carolina.

Purpose:
- To ensure patients are offered options for treatment of opioid misuse where available.
- Provide harm reduction measures related to opioid misuse.

Procedure:
1. Patients must be over 18 years of age and experienced unintentional overdose or misuse of an opioid medication(s) only. Patients must NOT have experienced cardiac arrest defined as administration of chest compressions by first responders or EMS during the incident.

2. The patient must regain a normal mental status and respiratory effort after the administration of naloxone, NOT have suicidal or homicidal ideations/intentions, and NOT ingested substance(s) for intentional self-harm.

3. Patients who have co-ingested other substances should be treated based on appropriate protocol. Consult Carolina Poison Center at 1-800-222-1222 for advice if needed.

4. Transport to an Emergency Department should be offered to all patients. For patients who decline transport to an Emergency Department, alternative destinations should be offered if available in the community. Options may include assistance with accessing inpatient treatment centers, outpatient facilities, mobile crisis solutions, addiction specialists, and/or other local treatment options.

5. In order to decline transport, the patient must meet the following criteria:
    a) Be 18 years or older
    b) Maintain a GCS of 15 (alert, and oriented to time, place, person, and situation)
    c) Demonstrate decision-making capacity as outlined in Universal Protocol (UP 1) Pearls.

6. If patient declines transport to an Emergency Department, an additional dose of naloxone should be offered by EMS if patient consents to additional treatment. IN administration is preferable to limit the possibility of provider needle stick injury. If patient has no sober and responsible party to monitor them, EMS should offer IM administration of naloxone if patient consents to treatment. If available, a naloxone kit should be left with the patient, family, and/or friends on scene. EMS should provide brief education on how to properly use these kits and refer them to read all package related material and instructions provided by the manufacturer.

7. In addition to naloxone kits, the following items should be offered where possible/available:
    a) Offer to properly dispose of any dirty needles following your agency policy
    b) Provide clean needles/syringes where possible following your agency policy
    c) Refer to a community peer support team if available
    d) Provide literature outlining resources for substance misuse treatment programs in the community

Organ Procurement Agency Notification

Policy:

When cardiopulmonary resuscitation (CPR), basic life support (BLS), and other advanced life support (ALS) interventions are withheld or discontinued on scene, EMS will report the death to the appropriate organ procurement organization servicing the county where death occurred in a timely manner. EMS will share information relevant to the donation process with the appropriate organ procurement organization.

Purpose:

To ensure an organ procurement organization is notified of deaths pronounced in the field by EMS in order to:

- Honor the decedent's registered declaration of eye and/or tissue donation.
- Preserve family's opportunity to support eye and/or tissue donation.
- Service the public health by facilitating eye and tissue donation.

Procedure:

EMS will notify the appropriate organ procurement organization of deaths pronounced outside of the hospital. Potential donors between ages of newborn – 100 years old will be referred.

<u>Essential information to be provided to the organ procurement organization include:</u>

- Caller name, title, and agency contact information
- Patient demographics
- Last seen alive date/time or time of death
- Circumstances of death (notify organ procurement agency even if medical examiner case)
- Medical interventions and medical history
- Next of kin name and contact information
- Who is taking custody of the decedent's body (ex: funeral home, hospital, M.E.)
- EMS **SHOULD NOT** discuss eye or tissue donation with next of kin. Coordinators specializing in family support will attempt to contact appropriate family members about organ donation.
- Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS electronic patient care report (ePCR).

<u>Contact information for Organ Procurement Organizations:</u>

LifeShare to the Carolinas		LifeNet Health	HonorBridge
1 (800) 932-4483		1 (800) 847-7831	1 (800) 252-2672
Anson	Jackson	Currituck	All other NC counties
Buncombe	Lincoln		
Burke	Macon		
Cabarrus	Madison		
Cherokee	Mecklenburg		
Clay	Polk		
Cleveland	Rutherford		
Gaston	Stanly		
Graham	Swain		
Haywood	Transylvania		
Henderson	Union		

EMS Offload/ Facility Transition of Care

Policy:

EMS represents a valuable community asset and timely availability of transport units is paramount to successful system operations. Turn Around Times after transport destination arrival can often decrease availability of units in the community. It is the expectation that medical facilities will accept care in a timely fashion after arrival of EMS and that EMS will transition care to medical facility staff in a timely manner.

Once EMS arrives at a hospital facility, EMS recognizes that the receiving hospital becomes responsible for patient care and receiving the patient for continued care. The Emergency Medical Treatment and Active Labor Act (EMTALA) is a federal law that states once a patient arrives within 250 yards of a hospital's main building(s), the hospital is responsible for care of the patient, and is obligated to perform a medical screening exam. Hospitals are not permitted to delay receiving of a patient(s) due to their EMTALA obligation. If an EMS transport unit arrives on hospital property that has declared diversionary status, the hospital is not relieved of it's EMTALA obligations and must receive the patient.

Purpose:

The purpose of this policy is to:

- Ensure timely transfer of patient care to the receiving medical facility.
- Provide for the transfer of appropriate care information to the receiving facility.
- Ensure adequate number of transport units available to the community is not delayed due to prolonged Turn Around Times at receiving facilities.
- Promote teamwork and collegiality in transferring care of patients between EMS and hospital personnel with the goal of optimal patient care in focus.

Procedure:

1. EMS will provide an oral report to hospital personnel describing patient status, mechanism of injury or illness, vital signs, therapies provided, procedures performed, and response to treatment.
2. Verbal patient report, paper transition of care/ written hand-off report, PCR copy, or ePCR transmission of patient care is provided to hospital personnel at time of transition of care.
   - Demographic information shall be legible and accurate (to the extent known).
   - Summary of care provided.
   - Vital sign summary.
   - Procedures performed summary.
3. Assist in moving patient from EMS manner of conveyance to designated hospital area identified by hospital personnel.
4. Obtain the name and title of the receiving hospital personnel and document in the EMS PCR or ePCR.
5. Attempt to obtain the signature of the receiving hospital personnel and document in the EMS PCR or ePCR.
   - In the event hospital personnel refuse to sign acknowledging receipt of the patient, document the name and title of the hospital personnel and note hospital personnel refused to sign in the narrative portion of the PCR or ePCR or other area designated by agency.

EMS Documentation and Data Quality

Policy:

The complete EMS documentation associated with service delivery and patient care shall be electronically recorded into a Patient Care Report (PCR) within 24 hours of the completion of the EMS event, with an EMS Data Score at/or below the state average.

Definition:

EMS documentation of a Patient Care Report (PCR) is based on the appropriate and complete documentation of the EMS data elements as required and defined within the North Carolina College of Emergency Physician's EMS Standards (www.NCCEP.org). Since each EMS event and/or patient scenario is unique, only the data elements relevant to that EMS event and/or patient scenario should be completed.

The EMS Data Score is calculated on each EMS PCR as it is electronically processed into the North Carolina PreHospital Medical Information System (PreMIS). Data Quality Scores are provided within PreMIS. The best possible score is a 0 (zero) and with each data quality error a point is added to the data quality score.

A complete Patient Care Report (PCR) must contain the following information (as it relates to each EMS event and/or patient):

- Service delivery and crew information regarding the EMS Agency's response
- Dispatch information regarding the dispatch complaint, and EMD card number
- Patient care provided prior to EMS arrival
- Patient assessment as required by each specific complaint based protocol
- Past medical history, medications, allergies, and DNR/MOST status
- Trauma and cardiac arrest information if relevant to the EMS event or patient
- All times related to the event
- All procedures and their associated time
- All medications administered with their associated time
- Disposition and/or transport information
- Communication with medical control
- Appropriate signatures (written and/or electronic)

Purpose:

The purpose of this policy is to:

- Promote timely and complete EMS documentation.
- Promote quality documentation that can be used to evaluate and improve EMS service delivery, personnel performance, and patient care to the county's citizens.
- Promote quality documentation that will decrease EMS legal and risk management liability.
- Provide a means for continuous evaluation to assure policy compliance.

EMS Documentation and Data Quality

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Patient Care Report (PCR) shall be completed within 6 hours or as soon as possible after the time of the patient encounter. **Documentation should be completed prior to leaving the destination facility unless call demand dictates otherwise, in which case documentation must be completed prior to the end of the personnel's shift.**

2. **A copy of the patient care report form SHOULD be provided to the receiving medical facility. If the final PCR is not available at the time the patient is left with the emergency department or other healthcare facility, an interim report such as the PreMIS Preliminary Report Form MUST be provided.**

3. The PCR must be completed in the PreMIS System or electronically submitted to the PreMIS System within 24 hours of the EMS event or patient encounter's completion. The EMS data quality feedback provided at the time of the electronic submission into PreMIS should be reviewed and when possible any identified errors will be corrected within each PCR. Each PCR may be electronically resubmitted to PreMIS as many times as needed.

4. The EMS Data Quality Scores for the EMS System, EMS Agency, and individual EMS personnel will be reviewed regularly within the EMS System Peer Review Committee.

Documentation of Vital Signs

Policy:

Vital signs are a key component in the evaluation of any patient encounter and a complete set of vital signs shall be documented in the patient care report (PCR) for any patient.

Purpose:

To ensure:

- Objective evaluation of every patient's general clinical status
- Documentation of a complete set of vital signs

Procedure:

1. An **initial** complete set of vital signs includes:
   - Pulse rate and Respiratory rate
   - Systolic **AND** diastolic blood pressure (BP). Cap refill may be substituted in children < 3.
   - Pain / severity (when appropriate to patient complaint), and GCS for Injured Patients
2. When no ALS care is provided, palpated BP's are acceptable for **REPEAT** vital signs.
3. Based on patient condition, complaint, and protocol used, vital signs should also include: Pulse Oximetry, Temperature, End Tidal CO2, Breath Sounds, Level of Response.
4. If the patient refuses evaluation, an assessment of capacity and a patient disposition form must also be completed. In addition, providers should record any vital signs that the patient or situation allows (e.g. a respiratory rate may be obtained by observation alone), and include an explanation of the clinical situation and refusal in the PCR narrative.
5. When any components of vital signs were obtained using the cardiac monitor, the data should be exported electronically to the PCR. Where values are inconsistent with manually obtained values, values may be appropriately edited to reflect the manually obtained values.
6. EMT personnel may attend patients who have the four-lead cardiac monitor attached for the purpose of collecting vital signs. However, cardiac rhythm interpretation is only within scope of practice for AEMT and above. Patients who require repeat or continuous 12 lead monitoring should be attended by a Paramedic.
7. Document situations that preclude the evaluation of a complete set of vital signs. Generally, children > 3 years of age should have a BP measured, and cap refill measured for < 3 years of age. For young children, the need for BP measurement should be determined on a case- by-case basis considering the provider's rapport with the child and the child's clinical condition. Blood pressure measurement is not required for all patients, but should be measured if possible, especially in critically ill patients in whom blood pressure measurement may guide treatment decisions.
8. Record the time vital signs were obtained; any abnormal vital sign should be repeated and monitored closely.

Standards Policy: Documentation Policy Section

Documentation of the Patient Care Report (ePCR)

Policy:

1. A clear history of the present illness with chief complaint, onset time, associated complaints, pertinent negatives, mechanism of injury, etc. This should be included in the subjective portion of the ePCR. The section should be sufficient to refresh the clinical situation after it has faded from memory.
2. An appropriate physical assessment that includes all relevant portions of a head-to-toe physical exam. This information should be included in the appropriate assessment section of the PCR.
3. At least two complete sets of vital signs for transported patients and one complete set for non-transported patients (pulse, respirations, auscultated blood pressure and pulse oximetry at minimum). These vital signs should be repeated and documented after drug administration, prior to patient transfer, and as needed during transport. For Children age < 3, blood pressure measurement is not required for all patients, but should be measured if possible, especially in critically ill patients in whom blood pressure measurement may guide treatment decisions.
4. Only approved medical abbreviations may be used- see appendix.
5. The CAD to ePCR interface embedded within the PCR system should be used to populate all ePCR data fields it supplies. When 911 center times were improperly recorded, these may be properly edited.
6. When the cardiac monitor is applied, data will be transferred to the PCR from the device and attached to the electronic record. If transferred automated vital sign values do not correlate with manually obtained values, or are not consistent with the patient's clinical condition, providers should manually check vitals and record manual results.
7. For drug administrations, dosage, route, administration time, and response shall be documented.
8. A complete list of treatments in chronological order. Response to treatments should also be listed.
9. For patients with extremity injury, neurovascular status must be noted before and after immobilization.
10. For patients with spinal motion restriction, document motor function before/after procedure.
11. For IV administration, the catheter size, site, number of attempts, type of fluid, and flowrate.
12. Any requested medical control orders, whether approved or denied, should be documented clearly.
13. Any waste of controlled medications should include the quantity wasted, where wasted, and name of the person who witnessed the waste. EMS supervisors may witness waste process.
14. ALL crew members are responsible for, and should review, the content of the ePCR for accuracy.
15. Once the call is completed, patient care information may not be modified for any reason. Corrections or additions should be in the form of an addendum to the ePCR.
16. For all patients who receive EMS medications or procedures (beyond a saline lock), the ePCR shall be completed as soon as possible. Completing the record includes marking the record "complete" in the ePCR system and uploading the record to the server.
17. All PCRs should be available to the receiving facility within 6 hours. The hospital has access to the electronic ePCR. In cases where EMS is requested for an expedited ePCR, the call report should be competed within an hour where practical. If completion is to be delayed, explain the delay and indicate the means advise the facility when the report is ready.
18. ePCRs should be completed and uploaded before leaving duty, exceptions only upon on-duty supervisory approval.

Documentation with Multiple Providers

Purpose:

The purpose of this policy is to:

- Provide a consistent method for documenting patient care encounters that include multiple providers, particularly when multi-agencies and multiple units are involved.

Policy:

1. All providers involved in the patient care activity are responsible for ensuring accurate and complete patient care documentation. The primary agency dispatched for the call will be responsible for the call completion. The lead provider (listed as “primary attendant”) on the ePCR is ultimately responsible for the report, however ALL providers should read the entire report once all documentation is complete to ensure accuracy.

2. In the situation where all providers are present during the completion of the documentation, the care team may coordinate the recording of their participation and care, and a single provider may document the patient care encounter with review by all care providers.

3. In the situation where all providers are not present during the completion of the documentation (for example, multiple unit response, a District Chief or QRV Medic provided some patient care on-scene but did not accompany the crew to the hospital), the following shall be accomplished:

   a. The primary transport unit will complete a full PCR to include patient name, demographics, narrative, all procedures and care provided by all providers on the call.
   b. If there is any dispute over documentation, the first attempt to reconcile will be accomplished via conversation between the crewmembers and the primary provider.
   c. Corrections will be placed in an addendum. If the dispute cannot be resolved in this manner, the Division of EMS office shall be contacted for mediation with the Medical Director or his designee.

EMS Dispatch Center Time

Policy:

The EMS Dispatch Center Time will be less than 90 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

Definition:

The EMS Dispatch Center Time is defined as the time interval beginning with the time the initial 911 phone call rings at the 911 Communications Center requesting emergency medical services and ending with the dispatch time of the EMS Unit responding to the event.

Purpose:

The purpose of this policy is to:

- Provide the safest and most appropriate level of response to all EMS events within the EMS System.
- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. A public calls into the 911 Communications Center requesting emergency medical assistance will never be required to speak with more than two persons before a formal EMS Unit is dispatched.

2. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.

3. EMS Units will be dispatched hot (with lights and sirens) or cold (no lights and sirens) by the 911 Call Center based on predetermined criteria. If First Responders are dispatched as a component of the EMS response, they should typically be dispatched hot (with lights and sirens).

4. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.

5. EMS Units may, at their discretion, request for a First Responder on Non-First Responder calls in situations where additional resources are required such as manpower, extreme response time of the EMS Unit, need for forcible entry, etc.

EMS Dispatch Center Time

6. EMS Units dispatched with a cold (no lights and sirens) response, will not upgrade to a hot (with lights and sirens) response **UNLESS**:
   - Public Safety personnel on-scene requests a hot (with lights and sirens) response.
   - Communications Center determines that the patient's condition has changed, and requests you to upgrade to a hot (with lights and sirens) response.

7. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF:**
   - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
   - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
   - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
   - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.

8. Any EMS Dispatch Center Time delays resulting in a prolonged EMS Dispatch Center Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Dispatch Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

9. All EMS Dispatch Delays will be reviewed regularly within the EMS System Peer Review Committee.

Drug Assisted Airway

Policy:

Drug Assisted Intubation (DAI) requires an EMS System or Agency to follow these guidelines to ensure that this invasive procedure is performed in a safe and effective manner to benefit the citizens and guest of North Carolina.

Purpose:

The purpose of this policy is to:

- Ensure that the procedure is performed in a safe and effective manner
- Facilitate airway management in appropriate patients

Procedure:

1. In addition to other monitoring devices, Waveform Capnography and Pulse Oximetry are required to perform Drug Assisted Airways and must be monitored throughout the procedure.

2. Two Paramedics or higher-level providers must be present and participate in the airway management of the patient during the procedure.

3. All staff must be trained and signed off by the EMS Medical Director prior to performing Drug Assisted Airways.

4. A printed copy or electronic download from the monitor defibrillator including the pulse oximetry, heart rate, heart rhythm, waveform capnography, and blood pressure must be stored with the patient care report.

5. An EMS Airway Evaluation Form must be completed on all Drug Assisted Airway Attempts.

6. The EMS Airway Evaluation Form must be reviewed and signed by the EMS Medical Director within 14 days of the Drug Assisted Airway attempts.

7. All Drug Assisted Airways must be reviewed by the EMS System or Agency and issues identified addressed through the System Peer Review Committee.

8. A copy of the EMS Airway Evaluation form for each Drug Assisted Airways must be forwarded to the appropriate OEMS Regional Office listed below at the end of each month for state review.

Western Regional Office
3305-4 16th Avenue SE
Conover, NC 28613
Telephone: 828-466-5548
Fax: 828-466-5651

Central Regional Office
2707 Mail Service Center
Raleigh, NC 27699-2707
Telephone: 919-855-4678
Fax: 919-715-0498

Eastern Regional Office
404 Saint Andrews Dr
Greenville, NC 27834
Telephone: 252-355-9026
Fax: 252-355-9063

In addition, the NC EMS Airway Evaluation Form has been revised to a one page document to improve provider compliance and promote receiving/confirming physician acceptance.

Atypical Protocol Utilization and Online Medical Direction

Purpose:

The purpose of this policy is to:

- Give direction for providers who encounter complicated, unusual, and atypical patient encounters.
- Establish an orderly method by which clinical issues can be rapidly addressed.
- This policy does not affect administrative issues related to employee/employer relationships (injuries, supplies, narcotic replacements, etc.)

Definition of a Patient:

A patient is an individual "requesting" or potentially needing medical evaluation or treatment. The patient-provider relationship is established via telephone, radio, or personal contact. It is the provider's responsibility to ensure all potential patients, regardless of the size of the incident, are offered the opportunity for evaluation, treatment, and/or transport. The guidelines for documenting patient encounters are discussed in the Documentation of the Patient Care Report Procedure.

Policy:

1. Clinical encounters requiring use of this protocol may be divided into two types:
   a. those whose clinical situation is covered by existing protocol but who are presenting an operational/administrative challenge (e.g., patient refusals) and require non-medical control guidance, Atypical Protocol Utilization (APU), or
   b. those whose clinical situation is not covered by existing protocol (e.g., modification of drug dosage, termination of resuscitation not covered in current policy) and thus require medical control orders via on-line medical direction (OLM).
2. Patients (b) requiring OLM shall contact medical control via as described below. The provider requesting OLM must be at the scene with the patient.
3. Request OLM from a physician at the most appropriate receiving hospital via radio. Only physicians may provide medical direction. (Other staff, including PA's and nurses, may not provide online medical direction.
4. Document in the electronic patient care report, the name of the individual and MD number (if applicable) providing OLM in the narrative section.

Automatic Notification of the Medical Director

Any incident, which potentially has an adverse or negative impact on the patient or the System, **must be immediately reported to the receiving Physician and the Medical Director, or in his absence, his designee as soon as possible** after the completion of the call. Such notification should be made via phone, text without HIPPA info, or via Pitt Communications Center. Events that require this notification include:

See next page

Atypical Protocol Utilization and Online Medical Direction

Automatic Notification of the Medical Director

Any incident, which potentially has an adverse or negative impact on the patient or the System, **must be immediately reported to the receiving Physician and the Medical Director, or in his absence, his designee** as soon as possible after the completion of the call. Such notification should be made via phone, text without HIPPA info, or via Pitt Communications Center.

These events that require this notification include:

- Cardiac and/or respiratory arrest occurring after administration of ketamine, midazolam (Versed), morphine, or fentanyl.
- Cardiac arrest after administration of an antiarrhythmic agent in a previously stable patient.
- Any attempt (successful or unsuccessful) at needle and/or surgical airways
- Incorrect medication administration with patient complication (wrong dose, etc.)
- Any cardiac and/or respiratory arrest or patient injury related to the use of physical restraints
- System provider operating outside of scope of practice. The scope of practice isdefined not only by State Certification but by the provider's level of approved practice within theSystem.
- Unrecognized misplaced advanced airway device or other complication related to advanced airway management

Other patient care concerns, potential adverse events, follow-up questions, or clinical issues outside of the above seven urgent issues may be communicated without HIPPA information via text or phone call to the Medical Director, EMS Specialist or the Division of EMS Office as soon as practical.

ECU Health Activation

Policy:

This policy is a systematic approach to expedite the care of patients who are experiencing a STEMI, Stroke, or other emergent medical event, and clarifying the serious/critical trauma patient.

Purpose:

The purpose of this policy is to:

- Provide quality patient care and EMS services for victims experiencing serious illness or traumatic event.
- Allow prehospital professionals to make a request for resources to be ready upon arrival at the appropriate destination for a STEMI, Code Stroke or Medical Yellow.
- Provide the destination communication specialist the necessary patient information that he/she (communication specialist) can make the appropriate decision regarding trauma team intervention.
- Remember, EMS does not activate the “Trauma Team” or state trauma “color activations”.

Procedure:

1. EMS will continue to activate a “Code STEMI” (patient must have on going ischemic symptoms, ECG interpretation ***STEMI***, and Paramedic interpretation is STEMI) by notifying the ECU HEALTH Medical Center communication specialist that “this is a confirmed STEMI, activate the Cath Lab. Confirm activate the Cath Lab.” This request should be responded by the communication specialist that they confirm your STEMI request and will activate the Cath Lab system. If you are in doubt, transmit the ECG, transmit as soon as possible and ask the ED physician to review while you are en-route to the hospital.

2. EMS will continue to activate a “Code Stroke” by following the Stroke program guidelines and notify the destination communication specialist that this is a “Code Stroke”. Give the communication specialist a brief patient report, RACE score and Time of Arrival, and confirm: “This is a Code Stroke activation.”

3. EMS desiring to have the destination communication specialist to alert the emergency department of a “Medical Yellow” will need to identify the treatment/conditions that would warrant an activation based on the “EMS Medical Yellow Alert Guidelines” sheet (Appendix K) and verbalize them to the communication specialist.

4. EMS transporting a serious/critical trauma patient would need to supply the destination communication specialist a brief report (age, gender, mechanism, concerning injuries/condition and an ETA) so he/she (communication specialist) can follow their guidelines regarding emergency department/trauma notifications.

Ketamine Program Requirements

Policy:

When administered outside of the AR 3 Airway Drug Assisted Intubation Protocol, an EMS System or Agency must be approved by the State Medical Director and follow the guidelines below when administering Ketamine.

Purpose:

The purpose of this policy is to:·

- Ensure that Ketamine is administered in a safe and effective manner·
- Facilitate use of Ketamine in appropriate patients·
- Establish a reporting mechanism for state review ·

Procedure:

1. The EMS system or Agency must adopt NCCEP protocols unchanged or submit equivalent protocols for review.
2. Letters of support must be obtained from all receiving hospitals where patients will be delivered after administration. These letters must be submitted to the OEMS prior to approval.
3. All personnel must be trained prior to implementation.
4. All administrations must be reviewed through the established PI/QA Medical Oversight process to include hospital outcome feedback. Concerns identified must be reviewed by the Peer Review/QA committee.
5. There are two (2) components of the NCOEMS reporting process:
   a. The EMS system or agency must submit to the OEMS a Ketamine Adverse Outcome Reporting Form and ePCR within 14 days for administrations that result in any of the following;

   1) Cardiac Arrest (pre-hospital or ED)

   2) Unanticipated intubation required after administration (pre-hospital or ED).

*Secure Ketamine Adverse Outcome Report link: https://nc.readyop.com/fs/4ckI/786bb.

The EMS system or agency must submit a quarterly report to the OEMS indicating;

1) The total number of administrations

2) Summary of primary protocol utilizations

3) Summary highlighting the PR/QA of cases that required a Ketamine Reporting Form.

*Secure Ketamine Quarterly Report link: https://nc.readyop.com/fs/4ckG/1544

****IF THE REPORTING LINKS ABOVE DO NOT DIRECT YOU TO AN ACTIVE FORM, PLEASE COPY AND PASTE THE LINK INTO YOUR WEB BROWSER MANUALLY****

Child with Special Health Care Needs

Policy:

Medical technology, changes in the healthcare industry, and increased home health capabilities have created a special population of patients that interface with the EMS system. It is important for EMS to understand and provide quality care to children with special health care needs.

Purpose:

The purpose of this policy is to:

- Provide quality patient care and EMS services to children with special health care needs.
- Understand the need to communicate with the parents and caregivers regarding healthcare needs and devices that EMS may not have experience with.

Procedure:

1. Caregivers who call 911 to report an emergency involving a child with special health care needs may report that the emergency involves may state that the situation involves a special needs child.

2. Responding EMS personnel should ask the caregiver of a special needs child for a copy of the of any information, regarding the any of special needs, ventilator, medications, etc.

3. EMS personnel may choose to contact the child's primary care physician for assistance with specific conditions or devices or for advice regarding appropriate treatment and/or transport of the child in the specific situation.

4. Transportation of the child, if necessary, will be made to the hospital appropriate for the specific condition of the child. In some cases this may involve bypassing the closest facility for a more distant yet more medically appropriate destination.

Infant Abandonment

Policy:

The North Carolina Infant Homicide Prevention Act provides a mechanism for unwanted infants to be taken under temporary custody by a law enforcement officer, social services worker, healthcare provider, or EMS personnel if an infant is presented by the parent within 7 days of birth. Emergency Medical Services will accept and protect infants who are presented to EMS in this manner, until custody of the child can be released to the Department of Social Services.

> *"A law enforcement officer, a department of social services worker, a health care provider as defined in G.S. 90-21.11 at a hospital or local or district health department, or an **emergency medical technician** at a fire station shall, without a court order, take into temporary custody an infant under 7 days of age that is voluntarily delivered to the individual by the infant's parent who does not express an intent to return for the infant. An individual who takes an infant into temporary custody under this subsection shall perform any act necessary to protect the physical health and well-being of the infant and shall immediately notify the department of social services. Any individual who takes an infant into temporary custody under this subsection may inquire as to the parents' identities and as to any relevant medical history, but the parent is not required to provide this information."*

Purpose:

To provide:

- Protection to infants that are placed into the custody of EMS under this law
- Protection to EMS systems and personnel when confronted with this issue

Procedure:

1. Initiate the Pediatric Assessment Procedure.
2. Initiate Newly Born Protocol as appropriate.
3. Initiate other treatment protocols as appropriate.
4. Keep infant warm.
5. Call local Department of Social Services or the county equivalent as soon as infant is stabilized.
6. Transport infant to medical facility as per local protocol.
7. Assure infant is secured in appropriate child restraint device for transport.
8. Document protocols, procedures, and agency notifications in the PCR.

EMS Back in Service Time

Policy:

All EMS Units transporting a patient to a medical facility shall transfer the care of the patient and complete all required operational tasks to be back in service for the next potential EMS event within 30 minutes of arrival to the medical facility, 90% of the time.

Definition:

The EMS Back in Service Time is defined as the time interval beginning with the time the transporting EMS Unit arrives at the medical facility destination and ending with the time the EMS Unit checks back in service and available for the next EMS event.

Purpose:

The purpose of this policy is to:

- Assure that the care of each EMS patient transported to a medical facility is transferred to the medical facility staff in a timely manner.
- Assure that the EMS unit is cleaned, disinfected, restocked, and available for the next EMS event in a timely manner.
- Assure that an interim or complete EMS patient care report (PCR) is completed and left with the receiving medical facility documenting, at a minimum, the evaluation and care provided by EMS for that patient (It is acceptable to leave the PreMIS Preliminary Report or equivalent if the final PCR cannot be completed before leaving the facility).
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Unit's priority upon arrival at the medical facility will be to transfer the care of the patient to medical facility staff as soon as possible.

2. EMS personnel will provide a verbal patient report on to the receiving medical facility staff.

3. EMS personnel will provide an interim (PreMIS Preliminary Report or equivalent) or final Patient Care Report (PCR) to the receiving medical facility staff, prior to leaving the facility, that documents at a minimum the patient's evaluation and care provided by EMS prior to arrival at the medical facility. A complete PCR should be completed as soon as possible but should not cause a delay in the EMS Back in Service Time (6hrs or no later than end of shift which ever come first).

4. The EMS Unit will be cleaned, disinfected, and restocked (if necessary) during the EMS Back in Service Time interval.

5. Any EMS Back in Service Time delay resulting in a prolonged EMS Back in Service Time will be documented in Patient Care Report (PCR) as an "EMS Turn-Around Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

6. All EMS Turn-Around Delays will be reviewed regularly within the EMS System Peer Review Committee.

EMS Wheels Rolling (Turn-Out) Time

Policy:

The EMS Wheels Rolling (Turn-out) Time will be less than 90 seconds, 90% of the time, for all events identified and classified as an emergent or hot (with lights and siren) response.

Definition:

The EMS Wheels Rolling (Turn-out) Time is defined as the time interval beginning with the time the EMS Dispatch Center notifies an EMS Unit to respond to a specific EMS event and ending with the time the EMS Unit is moving en route to the scene of the event.

Purpose:

The purpose of this policy is to:

- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county's citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. In EMS Dispatch Centers where Emergency Medical Dispatch (EMD) has been implemented, EMS Units will be dispatched by EMD certified personnel in accordance with the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.
2. The EMS Unit Wheels Rolling (Turn-out) time will be less than 90 seconds from time of dispatch, 90% of the time. If a unit fails to check en route within 2:59 (mm:ss), the next available EMS unit will be dispatched.
3. Without question, exception, or hesitation, EMS Units will respond as dispatched (hot or cold). This includes both requests to respond on active calls and requests to "move-up" to cover areas of the System that have limited EMS resources available.
4. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF:**
   - The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
   - The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
   - The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
   - Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.
5. Any EMS Wheels Rolling (Turn-out) Time delay resulting in a prolonged EMS Response Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Response Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.
6. All EMS Response Delays will be reviewed regularly within the EMS System Peer Review Committee.

Readiness for Response

Purpose:

To ensure the provision of a safe and well-organized EMS response by:

1. Selection and dispatch of the closest appropriate EMS resource(s)
2. Establishing the minimum amount of rest an EMS provider must have to promote health, safety in vehicle operations, and safety in patient care.

Policy:

1. During the scheduled work shift, all dispatch-eligible EMS system vehicles should remain in service in the CAD system except as detailed below:

a. When a response vehicle is so depleted of medical supplies or is encountering mechanical issues such that it cannot be reasonably expected to respond appropriately, the EMS technician(s) staffing the vehicle should verbalize and seek acknowledgement from the communications center that the vehicle is out of service equipment or out of service vehicle.

b. When the unit is assigned to an incident by the communications center, including any response to which an incident number is assigned, covering the period from notification to the time the ambulance departs the hospital (transports) or leaves the incident scene (non-transports), it is expected that the unit transmit and receive acknowledgement that their unit is in-service, available for dispatch at the time of departure from the hospital or incident scene.

c. When at least one personnel of a 2-man crew are no longer available to staff and safely affect an emergency response, the EMS professional(s) staffing the vehicle should verbalize and seek acknowledgment from the communications center that the vehicle is out of service for calls. This also applies if necessary to respond to an appropriate order to exit service for a specific administrative task.

d. A single responder response using an ambulance may occur as follows. When a single County EMS technician whose credential to practice is unrestricted in the County EMS system is available at a station with a vehicle that is out of service calls and there is a nearby request for EMS, this single technician may add themselves to all other responding resources and proceed to the scene in the vehicle. This unit should at no time cancel any other dispatched resources prior to arriving and gaining situational awareness of what is needed.

e. Whenever a vehicle reaches ¼ capacity of fuel, the vehicle may mark out of service fuel. The EMS technician(s) staffing the vehicle should verbalize and seek acknowledgement from the communications center that the vehicle is out of service, and transmit and receive acknowledgement that their unit is in-service as soon as fueling is complete. The vehicle should be fueled at the closest appropriate site, without delay.

Policy (continued):

SUGGESTED:

1. EMS professionals should work no more than 36 consecutive hours. If the professional has worked 36 consecutive hours, there should be a minimum of 8 hours of rest prior to return to work.

a. Work is defined as any activity that is either required by an employer, generates income, or in a predictable manner interferes with an EMS provider's ability to rest.

b. Rest is defined as non-work activity that occurs in a provider's home or other non-work environment that is conducive to sleep. Attending EMS-related activities such as administrative meetings, education sessions, participating in assessment centers, etc., does not count as rest. Additionally, working at another public safety agency or other off-duty work (e.g. other business or employment) does not qualify as rest.

2. If a provider chooses to work on-duty less than 36 consecutive hours and participate in additional work activities without an 8-hour period of rest, there should be 8 consecutive hours of rest in the 48-hour period prior to return to the next scheduled duty shift.

Ex 1. A provider works a 24-hour shift that ends at 0700. He/She then wishes to work overtime from 0900 to 2100 and then return to the 24-hour shift at 0700 the next day. This could be scheduled, as there is more than an 8-hour period of continuous rest from the conclusion of the overtime shift and beginning of the next shift.
EX 2. A provider works a 24-hour shift that ends at 0700. He/She then wishes to work overtime from 1300 to 0100, and return to the regular shift at 0700. This should NOT be scheduled, as there is no period of continuous 8-hour rest in the 48 hours prior to the latest 0700 shift.

In general, scheduling variances from this suggested policy are at the sole discretion of the employer.
Suggested consecutive work hours for EMS should act as a guide for staffing and excessive work hours should not be encouraged. Employers are responsible for scheduling and the outcomes of excessive consecutive work hours. There are extreme circumstances (such as an invocation of the EMS Emergency Rule) or a declared "State of Emergency," but these should be specific, time-limited exceptions.
The Medical Director and Assistant Medical Director's, along with the Division of EMS will not be responsible for work related, operational scheduling and personnel issues that do not involve patient care.

Non-Paramedic Transport of Patient

Policy:

A Paramedic resource will be dispatched to every request for EMS service.

- For the purposes of this policy, "Paramedic" refers to a County EMS System credentialed Paramedic with no current restrictions on their clinical practice.
- At least one Paramedic will be on-board the ambulance during transport of all patients unless natural disaster or other exceptions as approved by policy or the Medical Director.
- The provider with the highest level of County EMS System Credential on scene shall conduct a detailed physical assessment and subjective interview with the patient to determine his or her chief complaint and level of distress. If this provider determines that the patient is stable and ALL patient care needs can be managed by a provider with a lower level credential, patient care may be transferred to a technician of lower certification for care while in en-route to the hospital. All personnel are encouraged to participate in patient care while on-scene, regardless of who "attends" with the patient while en-route to the hospital.
- The determination of who attends should be based upon the patient's immediate treatment needs and any reasonably anticipated treatment needs while en-route to the hospital. The highest-credentialed provider on scene retains the right to make the decision to personally attend to any patient transported based on his or her impression of the patient's clinical condition or needs.
- The paramedic performing the paramedic assessment must document the findings of that assessment.
- Other documentation may be completed by the transporting provider. As with all documentation, both all providers are responsible for the content of the report.

The care of the following patients **cannot** be transferred to a lower level credential (i.e. to an AEMT or EMT from an EMT-P):

1. Any patient who requires or might reasonably require additional or ongoing medications, procedures and/or monitoring beyond the scope of practice of the lower credentialed provider. This includes any critically ill or unstable patient as advanced airway management may be required in any decompensating patient. EMT and AEMT providers may be credentialed to perform some but not all airway management, and medications associated with airway management are limited to Paramedic scope of practice by the NC Medical Board.

2. Any patient for whom ALL EMS providers on scene do not agree can be safely transported without a Paramedic in attendance in the patient care compartment. Generally, if providers are questioning who should attend the patient, the paramedic should attend the patient.

3. Any patient suffering from chest pain of suspected cardiac origin, cardiac arrhythmia, moderate-to- severe respiratory distress, multiple trauma, or imminent childbirth.

4. Post-ictal seizure patients due to the possibility of a re-occurrence of a seizure.

5. Patients who have been medicated on the scene may only be transferred to a technician of lower credential whose formulary includes the medications that were administered, except that a patient who has received a single dose of pain medication (including opioids) and/or a single dose of anti-emetic as the only medication outside of the receiving technician's formulary may be transferred to a technician of lower credential if it is unlikely that repeat doses of medication will be indicated during transport.

Non-Emergency Transports

Policy:

Non-emergency medical transport agencies that are transporting a patient to or from a medical facility may or may not require the assistance of a registered nurse, paramedic or AEMT. If medical care is required it must be within the technicians scope of practice as delineated by the EMS System's Medical Director.

Purpose:

The purpose of this policy is to:

- To assure patients receive the appropriate level of care.
- Prevent medication errors.

Procedure:

1. Vital signs must be taken on all patients prior to transport.
2. Any patient experiencing the following symptoms must be referred to an ALS unit:

a. Chest pain present

b. Respiratory distress present

c. Altered mental status (if different than baseline)

d. Fall

e. Abdominal Pain with hypotension

f. Headache with abnormal vital signs

g. Abnormal Vital Signs (age adjusted) RR <8, RR >20, HR <50, HR >100, BPs <90, BPs >180, Temp >101.3F, FSBS >400, 02 sat RA <95%

3. The transporting EMT should ensure that all appropriate documentation accompanies the patient.
4. During transport the EMT must follow all County medical policies, procedures and protocols.
5. If the **patient deteriorates**, the transferring facility should be notified via radio or cell phone and an **ALS unit must be** dispatched to rendezvous with the transporting unit.
6. If the ETA of responding ALS unit is greater than the BLS unit ETA to the receiving facility, the BLS unit should continue to transport except in the case of Cardiac Arrest
7. Vital signs (BP, pulse, respiratory rate, O2 saturation) must be taken every 5 minutes and documented.
8. A County supervisor must be contacted if any concerns about a transport exist.

Important:

Any healthcare professional may at any time upgrade to an emergency response by simply contacting "911" if they feel the condition warrants emergency ALS transport, the above are only guidelines. When calling "911", identify yourself as a "Non-emergency unit" requesting an emergency agency to respond

Equipment Failure

Purpose:

To address and minimize the failure of equipment integral to patient care or mechanical failure of a transport vehicle. Each agency shall provide a daily check sheet in order to test biomedical equipment and vehicles to minimize the risk of such failures.

Procedure:

1. As soon as the failure is recognized, contact the appropriate emergency communications center, advise them of the failure, and have the nearest appropriate EMS resource dispatched. This may be a supervisor, an ambulance, or some other resource, depending upon patient need.

2. Based on the condition of the patient, advise the communications center to send the resource either emergency traffic or non-emergency traffic.

3. Closely monitor and treat the patient to the best of your ability with the remaining functional equipment.

4. Except in unusual circumstances, the original attending provider should continue to provide for the patient until arrival at the hospital, regardless of which unit is actually transporting the patient.

5. While it is appropriate to notify supervisory personnel of the failure at the conclusion of patient care activities, care and transport should not be delayed while awaiting the arrival of a supervisor (unless the supervisor is responding as the nearest unit based on #1 above).

6. All equipment associated with the failure shall be gathered and secured for inspection. This includes all cables, electrodes, tubing, masks, or any other equipment associated with the failure. This equipment shall not be utilized in patient care activity until clearance to do so is provided by the County EMS Office or the Medical Director's office. Accessories such as those mentioned above should be left attached to the failed equipment in the manner that they were attached at the time failure was noted.

Emergency Medical Dispatch Response

Purpose:

The purpose of this policy is to:

- Provide quality patient care and EMS service to the citizens of County. Develop a uniform level of response for the EMS System.
- Provide a means for continuous quality improvement feedback.
- Provide for the safest and most appropriate level of response to the patient(s).

Policy:

1. Persons calling for emergency assistance will never be required to speak with more than two persons to request emergency medical assistance.

2. Each EMS unit shall remain in the assigned by Operations/Communications. To avoid dispatch errors, movement outside of this area must be directed by or reported to the communications center.

3. Emergency Medical Units will be dispatched by EMD's in accordance to the standards developed by the Medical Director and the Emergency Medical Dispatch Protocols.

4. Emergency Medical Units will initially respond Lights & Sirens ("hot") to all requests. As more information becomes available, from the telecommunications center or on scene medical responders, the mode of response may downgraded to no Lights & Sirens ("cold"). A No Lights & Sirens (L&S) response is appropriate for alpha and omega level responses as soon as this can be established.

Procedures:

Emergency Medical Units dispatched for cold response will not upgrade to a hot response unless:

1. Public Safety personnel on-scene request a hot response.
2. Telecommunicators determine that the patient's condition has changed, and requests you to upgrade to a L&S "hot" response.

An ambulance may divert from a cold/non-emergency call to a higher priority call and then:

1. The diverting ambulance must notify the telecommunicator of their diversion to the higher priority call.
2. The diverting ambulance ensures that an ambulance is dispatched to the original call.

An ambulance may divert from one emergency call to another emergency call if:

1. The other call is clearly of higher priority (e.g., Echo vs. Charlie) – or --
2. The EMS unit comes upon what appears to be a higher priority call (e.g., enroute to a Charlie call and comes upon an MVC with high potential for trauma alert/one patients)

An ambulance may by-pass what appears to be a lower priority situation and continue to the originally assigned call. The communications center should be notified so that another EMS resource may be assigned to the lower priority situation.

State Poison Center

Policy:

The state poison center should be utilized by the 911 centers and the responding EMS services to obtain assistance with the prehospital triage and treatment of patients who have a potential or actual poisoning.

Purpose:

The purpose of this policy is to:

- Improve the care of patients with poisonings, envenomations, and environmental/biochemical terrorism exposures in the prehospital setting.
- Provide for the most timely and appropriate level of care to the patient, including the decision to transport or treat on the scene.
- Integrate the State Poison Center into the prehospital response for hazardous materials and biochemical terrorism responses

Procedure:

1. The 911 call center will identify and if EMD capable, complete key questions for the Overdose/ Poisoning, Animal Bites/Attacks, or Carbon Monoxide/Inhalation/HazMat emergency medical dispatch complaints and dispatch the appropriate EMS services and/or directly contact the State Poison Center for consultation.
2. If no immediate life threat or need for transport is identified, EMS personnel may conference the patient/caller with the Poison Center Specialist at the **State Poison Center at 800-222-1222**. If possible, dispatch personnel should remain on the line during conference evaluation.
3. The Poison Center Specialist at the State Poison Center will evaluate the exposure and make recommendations regarding the need for on-site treatment and/or hospital transport in a timely manner. If dispatch personnel are not on-line, the Specialist will recontact the 911 center and communicate these recommendations.
4. If the patient is determined to need EMS transport, the poison center Specialist will contact the receiving hospital and provide information regarding the poisoning, including treatment recommendations. EMS may contact medical control for further instructions or to discuss transport options.
5. If the patient is determined not to require EMS transport, personnel will give the phone number of the patient/caller to the Poison Center Specialist. The Specialist will initiate a minimum of one follow-up call to the patient/caller to determine the status of patient.
6. Minimal information that should be obtained from the patient for the state poison center includes:
    - Name and age of patient
    - Time of exposure
    - Signs and symptoms
    - Substance(s) involved
    - Any treatment given
7. Minimal information which should be provided to the state poison center for mass poisonings, including biochemical terrorism and HazMat, includes:
    - Substance(s) involved
    - Signs and symptoms
    - Time of exposure
    - Any treatment given

Air Transport

Indications:

A helicopter may be utilized when **ALL** of the following criteria are present:

1. **Patient meets criteria for transport to a specialized destination center according to the System Destination Plan.**
2. The ground transport time is greater than 45 minutes.
3. The patient is **not** in cardiac arrest.

A helicopter may also be utilized when any of the following is present:

- A situation approved by the medical director or medical control physician – or –
- Mass Casualty Incident (MCI).
- The patient meets burn center criteria.

Air transport should be considered if any of the following criteria apply:

- Multiple casualty incident with red/yellow tag patients
- Multi-trauma or medical patient requiring life-saving treatment not available in prehospital environment (i.e., blood transfusion, invasive procedure, operative intervention)
- Time dependent medical conditions such as acute ST-elevation myocardial infarctions (STEMI) or acute Stroke that could benefit from the resources at a specialty center as per the EMS Systems Stroke and STEMI Plans.

Procedure:

1. The highest certified technician on the crew (usually the Paramedic or AEMT) will determine that a helicopter may be needed for the patient.
2. That technician will request that the 911 center contact a helicopter service for a scene transport. The 911 center will determine which air ambulance is nearest and utilize this resource.
3. A safe landing zone should be established.
4. If the helicopter does not arrive prior to the extrication of the patient, the patient should be immediately placed in the ambulance and transport begun to the nearest trauma center.
5. **Under NO circumstances will transport of a patient be delayed to use a helicopter.**

Safe Transport of Pediatric Patients

Policy:

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

Purpose:

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

Procedure:

1. Drive cautiously at safe speeds observing traffic laws.
2. Tightly secure all monitoring devices and other equipment.
3. Ensure that all pediatric patients less than 40 lbs are restrained with an approved child restraint device secured appropriately to the stretcher or captain's chair.
3. Ensure that all EMS personnel use the available restraint systems during the transport.
4. Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle, whenever possible.
5. Do not allow parents, caregivers, or other passengers to be unrestrained during transport.
6. NEVER attempt to hold or allow the parents or caregivers to hold the patient during transport.
7. For patients with medical conditions that may be aggravated by stress, make every attempt to optimize safety when comforting the child.
8. Do not transport the pediatric patient who is assessed as meeting trauma center criteria in a child seat that was involved in the collision that produced the child's injury.

Transport

Policy:

All individuals served by the EMS system will be evaluated, treated, and furnished transportation (if indicated) in the most timely and appropriate manner for each individual situation.

Purpose:

To provide:

- Rapid emergency EMS transport when needed.
- Appropriate medical stabilization and treatment at the scene when necessary
- Protection of patients, EMS personnel, and citizens from undue risk when possible.

Procedure:

All sick or injured persons requesting transport shall be transported to the closest appropriate emergency department following the system's Medical Destination Plan when applicable.

1. All trauma patients with significant mechanism or history for multiple system trauma will be transported as soon as possible. The scene time should be 10 minutes or less.
2. All acute Stroke and acute ST-Elevation Myocardial Infarction patients will be transported as soon as possible. The scene time should be 10 minutes or less for acute Stroke patients Other Medical patients will be transported in the most efficient manner possible considering the medical condition. Advanced life support therapy should be provided at the scene if it would positively impact patient care. Justification for scene times greater than 20 minutes should be documented.
3. Patients whose conditions are covered by a formal Destination Plan (Pediatric, Post-Resuscitation, STEMI, Stroke, Trauma, etc.) shall be transported in accordance with those specialty algorithms to the appropriate destination. All other patients should be transported per this policy.
4. No patients will be transported in initial response non-transport vehicles unless an MCI.
5. In unusual circumstances, transport in other vehicles may be appropriate when directed by EMS administration.
6. Alternative destinations (deviation from the Destination Plan) may ONLY be authorized by the System Medical Director, Assistant Medical Director or their designee. On-line Medical Control may not authorize any deviation unless in unusual and extreme circumstances.

Protocols

Division of Emergency Medical Services

Adult Asystole / Pulseless Electrical Activity

History
- SAMPLE
- Estimated downtime
- See Reversible Causes below
- DNR, MOST, or Living Will

Signs and Symptoms
- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

Differential
- See Reversible Causes below

Cardiac Arrest Protocol AC 3

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES

Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life

Confirmed known downtime with asystole >15 minutes
(**Confirmed by 2 leads for 10 sec each.**)

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 10

Begin Continuous CPR Compressions
Push (2 – 3.2 inches)
Compress (110 / min)
Change Compressors every 2 minutes (sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6-8 sec (8-10bpm)
Continuous Compressions
Monitor EtCO2
(within 2 min of starting resuscitation)

AED Procedure
if available

Search for Reversible Causes

P
- Consider Chest Decompression Procedure
- Cardiac Monitor

A
- IO / IV Procedure - UP6
- **Epinephrine (1:10,000) 1 mg IO / IV**
  Repeat every 5 minutes (max 3)
- **Isotonic fluid Bolus 500 mL IO / IV**
  May repeat as needed
  Maximum 2 L

Adult Rhythm Appropriate Protocol(s)
as indicated

Consider Early for PEA
- Repeated Saline Boluses for possible hypovolemia
- Dextrose IV/IO
- Glucagon 4mg IV/IO/IM for suspected beta blocker or calcium channel blocker overdose.
- Calcium Chloride 1 g IV/IO for suspected hyperkalemia, hypocalcemia
- Sodium Bicarbonate 50meq IV/ IO for possible overdose, hyperkalemia, renal failure
- Consider Norepinephrine drip
- Atropine 1mg IV ONLY for organized PEA with rate <60.
- Chest Decompression

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

On Scene Resuscitation / Termination of Resuscitation Protocol(s) AC 12
as indicated

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Adult Asystole / Pulseless Electrical Activity

History
- SAMPLE
- Estimated downtime
- See Reversible Causes below
- DNR, MOST, or Living Will

Signs and Symptoms
- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

Differential
- See Reversible Causes below

APPROVED PERSONNEL ONLY

Cardiac Arrest Protocol AC 1

Cardiac Arrest - PEA

Protocol AC 3

Yes

P

Team Focused CPR continued
CPR ongoing > 20 min
$EtCO^2$ > 15
Airway Confirmed
IO/IV established

Reversible Causes considered and treated

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 10

Approved System Providers ONLY

P

- Consider cardiac Ultrasound (US)
- Acquire cardiac view with and upload clip for review
- Must contact On-call medical director to review US

Adult Rhythm Appropriate Protocol(s) ***as indicated***

On Scene Resuscitation / Termination of Resuscitation Protocol(s) AC 12 ***as indicated***

Notify Destination or Contact Medical Control

Notes:
- Apply the US probe before stopping for pulse check/rhythm check
- Pauses should not be longer than 10 seconds

Adult Cardiac Protocol Section

Adult Asystole / Pulseless Electrical Activity

*Mix **4 mg** (4 ml) of **Norepinephrine** in **250 ml D5W or NS** => concentration of 16 mcg/ml*

**Use 60 gtt/mL drip set only

mcg/min	gtt/min (mL/hr	mcg/min	gtt/min (mL/hr	mcg/min	gtt/min (mL/hr
1	4 gtt/min	11	41 gtt/min	21	79 gtt/min
2	8 gtt/min	12	45 gtt/min	22	82 gtt/min
3	11 gtt/min	13	49 gtt/min	23	86 gtt/min
4	15 gtt/min	14	53 gtt/min	24	90 gtt/min
5	19 gtt/min	15	56 gtt/min	25	94 gtt/min
6	23 gtt/min	16	60 gtt/min	26	98 gtt/min
7	26 gtt/min	17	64 gtt/min	27	101 gtt/min
8	30 gtt/min	18	68 gtt/min	28	105 gtt/min
9	34 gtt/min	19	71 gtt/min	29	109 gtt/min
10	38 gtt/min	20	75 gtt/min	30	113 gtt/min

Adverse/Side Effects

Systemic: Ischemic injury due to potent vasoconstrictor action and tissue hypoxia.
Cardiovascular: Bradycardia, probably as a reflex result of a rise in blood pressure, arrhythmias, tachycardia
Nervous: Anxiety, transient headache.
Respiratory: Respiratory difficulty.
Skin and Appendages: Extravasation necrosis at injection site. Gangrene of extremities has been rarely reported.
Overdoses or conventional doses in hypersensitive persons (e.g., hyperthyroid patients) cause severe hypertension with violent headache, photophobia, stabbing retrosternal pain, pallor, intense sweating, and vomiting.

** Mix 1mg of Epinephrine 1:1,000 in a 250mL NS or D5W Bag (60gtt set)

mcg/min	gtt/min (mL/hr)
1	15 gtt/min
2	30 gtt/min
3	45 gtt/min
4	60 gtt/min
5	75 gtt/min
6	90 gtt/min
7	105 gtt/min
8	120 gtt/min
9	135 gtt/min
10	150 gtt/min

Push Dose Option for Epi:

1. Take a 10 ml syringe with 9 ml of normal saline
2. Into this syringe, draw up 1 ml of Epi 10,000**
   **(cardiac amp contains Epinephrine 100 mcg/ml)
3. Now you have 10 mL's of Epinephrine (10 mcg/ml)
   ***Dose: 0.2-1 ml every 1-5 minutes (2-10 mcg)

*May use Epi with Norepinephrine for additional BP support

Pearls

- **Team Focused Approach / Pit-Crew Approach; assigning responders to predetermined tasks. Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: If no advanced airway use continuous compression with ventilations, 1 breath every 6 sec (8-10bpm max). If advanced airway in place, ventilate 1 breath every 6 sec (8-10bpm max), continuous compressions.**
- **Consider BIAD first - to limit interruptions. Do not interrupt compressions to place an advanced airway.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- **IO / IV access and drug delivery is secondary to high-quality chest compressions and early defibrillation**.
- **Defibrillation:**
  Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
  Charge defibrillator during chest compressions, near the end of 2-minute cycle, to decrease peri-shock pause.
  Following defibrillation, provider should immediately restart chest compressions with no pulse check until end of next cycle.
- **End Tidal CO2 (EtCO2)**
  If EtCO2 is < 10 mmHg, improve chest compressions.
  If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  Renal Dialysis / Renal Failure - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  Drowning / Suffocation / Asphyxiation / Hanging / Lightening Strike – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**
  Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival

Success is based on planning and execution. Procedures require space and patient access. Make room to work. Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Bradycardia; Pulse Present

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

Signs and Symptoms
- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

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

Heart Rate < 60 / min and Symptomatic:
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to bradycardia
Typically HR < 50 / min

NO → Exit to Appropriate Protocol(s)

YES

Airway Protocol(s) AR 1, 2, 3 ***if indicated***

Respiratory Distress Protocol AR 4 ***if indicated***

Chest Pain: Cardiac and STEMI Protocol AC 4 ***if indicated***

B Search for Reversible Causes

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

B 12 Lead ECG Procedure

A IO / IV Procedure

P Cardiac Monitor

A **Isotonic Fluid Bolus**
500 mL – 1 L - IV / IO
(Unless Acute CHF)
Maximum 1 L

Suspected Beta-Blocker or Calcium Channel Blocker

Follow Pediatric Toxicology Protocol

P **Atropine 0.5 mg IV / IO**
May repeat every 3 – 5 minutes
Maximum 3 mg

P **Epinephrine Push-dose**
2 – 3 mcg IV / IO
Repeat every 2 – 3 minutes
Titrate to SBP ≥ 90 mmHg (MAP>70)
Or
Epinephrine 1 - 10 mcg/min IV / IO
Titrate to (MAP>70)

P **If No Improvement**
Transcutaneous Pacing Procedure
(Consider earlier in 2nd or 3rd AVB)

P Consider Sedation
Midazolam 2 – 2.5 mg
IV / IO / IM / IN
Maximum 10 mg

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Bradycardia; Pulse Present

Preferred:

** Mix 1mg of Epinephrine 1:1,000 in a 250mL NS or D5W Bag (60gtt set)

mcg/min	gtt/min (mL/hr)	mcg/min	gtt/min (mL/hr)
1	15 gtt/min	6	90 gtt/min
2	30 gtt/min	7	105 gtt/min
3	45 gtt/min	8	120 gtt/min
4	60 gtt/min	9	135 gtt/min
5	75 gtt/min	10	150 gtt/min

Option:

1. Take a 10 ml syringe with 9 ml of normal saline
2. Into this syringe, draw up 1 ml of epinephrine 10,000 (cardiac amp contains Epinephrine 100 mcg/ml)
3. Now you have 10 mL's of Epinephrine (10 mcg/ml)

****Dose: 0.2-1 ml every 1-5 minutes (2-10 mcg)

Pearls

- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- **Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.**
- **Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.**
- **12-Lead ECG:**
  - **12 Lead ECG not necessary to diagnose and treat**
  - **Obtain when patient is stable and/or following rhythm conversion.**
- **Unstable or peri-arrest condition:**
  - **Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**
  - **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Hypoxemia is a common cause of bradycardia. Ensure oxygenation and support respiratory effort.**
- **Atropine:**
  - **Do NOT delay Transcutaneous Pacing to administer Atropine in bradycardia with poor perfusion.**
  - **Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.**
- **Symptomatic bradycardia causing shock or peri-arrest condition: (hypoxic, hypotensive, CP, AMS, syncopy)**
  - **If no IV or IO access immediately available start Transcutaneous Pacing, establish IV / IO access, and then administer atropine and/or push dose epinephrine.**
- **Symptomatic condition:**
  - **Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.**
  - **Symptomatic bradycardia usually occurs at rates < 50 beats per minute. A trial of fluid resuscitation for possible hypovolemic circumstances, dehydration, sepsis, mild blood loss, blunt or penetrating trauma are a few.**
  - **Search for underlying causes such as hypoxia or impending respiratory failure.**
- **Transcutaneous Pacing Procedure (TCP):**
  - **Indicated with unstable or peri-arrest bradycardia or conditions unresponsive to medical therapy.**
  - **If time allows transport to specialty center because transcutaneous pacing is a temporizing measure.**
  - **Transvenous / permanent pacemaker will probably be needed.**
  - **Immediate TCP with high-degree AV block (2d or 3d degree) with no IV / IO access.**
- **Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)**

Cardiac Arrest; Adult

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 10

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES

Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life

Confirmed downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Begin Continuous CPR Compressions
Push (2 – 3.2 inches)
Compress (110 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 sec (8-10bpm)
Continuous Compressions

Monitor EtCO2
(within 2 min of starting resuscitation)

ALS Available

NO → AED Procedure ***if available***

YES → P Cardiac Monitor

AED Procedure ***if available***

NO — Shockable Rhythm — YES → AED Procedure

Cardiac Monitor

NO — Shockable Rhythm — YES

NO → Asystole / PEA
Protocol AC 1
as indicated

Airway
Protocol(s) AR 1, 2, 3

YES → VF / VT
Protocol AC 8
Tachycardia
Protocol AC 6, 7
as indicated

Airway
Protocol(s) AR 1, 2, 3

Continue CPR
2 Minutes

Repeat and reassess

Airway
Protocol(s) AR 1, 2, 3

Termination on Scene
Protocol AC 12
as indicated

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Cardiac Arrest; Adult

Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: If no advanced airway use continuous compression with ventilations, 1 breath every 6 sec (8-10bpm max). If advanced airway in place, ventilate 1 breath every 6 sec (8-10bpm max), continuous compressions.**
- **Consider BIAD first - to limit interruptions. Do not interrupt compressions to place an advanced airway.**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- **Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.**
- **IO / IV access and drug delivery is secondary to high-quality chest compressions and early defibrillation.**
- **IO access (humeral) is first attempt *preferred route*. Follow IV or IO Access Protocol UP 6**
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
  - Charge defibrillator during chest compressions, near the end of 2-minute cycle, to decrease peri-shock pause.
  - Following defibrillation, provider should immediately restart chest compressions with no pulse check until end of next cycle.
- **End Tidal CO2 (EtCO2)**
  - If EtCO2 is < 10 mmHg, improve chest compressions. Goal is ≥ 20 mmHg.
  - If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - **Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure Protocol AM 3 caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - **Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**
  - Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival

Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Suspected Cardiac MI / STEMI: Chest Pain

History
- Age
- Medications (Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- **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 (onset /duration / repetition)

Signs and Symptoms
- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness
- **Time of Onset**

Women:
- More likely to have dyspnea,
- N/V, weakness, back or jaw pain

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

B	**12 Lead ECG Procedure < 10min FMC**
B	**Aspirin 81 mg x 4 PO (chewed)** Or **325 mg PO**
B	**Nitroglycerin 0.3 / 0.4 mg Sublingual** Repeat every 5 minutes x 3 ***if prescribed to patient & BP ≥ 100)***
P	Cardiac Monitor

Acute MI / STEMI
See box to right

YES →

Acute MI / STEMI

STEMI Definition:

- **≥ 1 mm ST Segment elevation in ≥ 2 contiguous leads**
- **≥ 2 mm ST/J point elevation in V2-V3 for men**
- **ECG software diagnoses Acute MI (symptomatic) EMT- AEMT Paramedic - over-read monitor diagnosis**

Transport based on:

STEMI EMS Triage and Destination Plan

- **Immediate Notification of Facility**
- **Immediate Transmission of ECG**

(if capable)

Keep Scene Time to ≤ 10 Minutes

B	*If transporting to Non PCI Center* **Reperfusion Checklist**

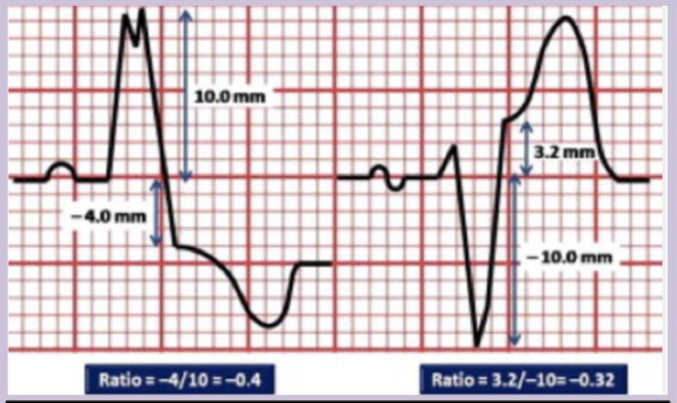
NO ↓

A	IV / IO Procedure
A	**Nitroglycerin 0.3 / 0.4 mg SL** Repeat every 5 minutes as needed
P	**Fentanyl 50 – 100 mcg IV / IO** Repeat 50 mcg every 20 minutes as needed **Maximum 500 mcg** **Or** **Morphine 2 – 4 mg IV / IO** Repeat every 5 minutes as needed **Maximum 10 mg**
	Hypotension / Shock Protocol AM 5 ***if indicated***
	CHF / Pulmonary Edema Protocol AC 5 ***if indicated***

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

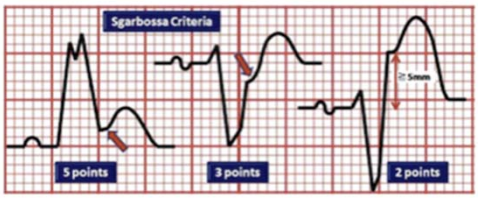
Suspected Cardiac MI and STEMI: Chest Pain



ST/S Ratio

Ratio of ST-segment elevation measured at the J point to the R or S wave, whichever was most prominent

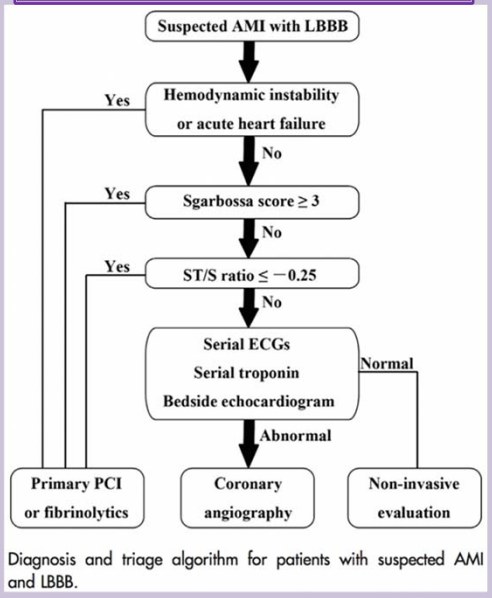
Sgarbossa E et al. Electrocardiographic Diagnosis of Evolving Acute Myocardial Infarction in the Presence of Left Bundle-Branch Block. NEJM 334: 481-7



	ST Segment Elevation ≥ 1 mm Concordant with the QRS Complex	ST segment depression ≥ 1 mm in lead V1-3	ST segment elevation ≥ 5 mm and discordant with the QRS complex
Sensitivity	73%	25%	31%
Specificity	92%	96%	92%
(+) LR	9.13	6.25	3.88
(-) LR	0.29	0.78	0.75

Scarbossa Criteria

- Use on LBBB or paced rhythms.
- Modified Scarbossa criteria more specific, a little less sensitive.
- Scarbossa criteria on bottom with weighting criteria
- *Always assess the patient first. Pt should meet suspected "Cardiac MI or STEMI" signs & symptoms !!*



Diagnosis and triage algorithm for patients with suspected AMI and LBBB.

Pearls

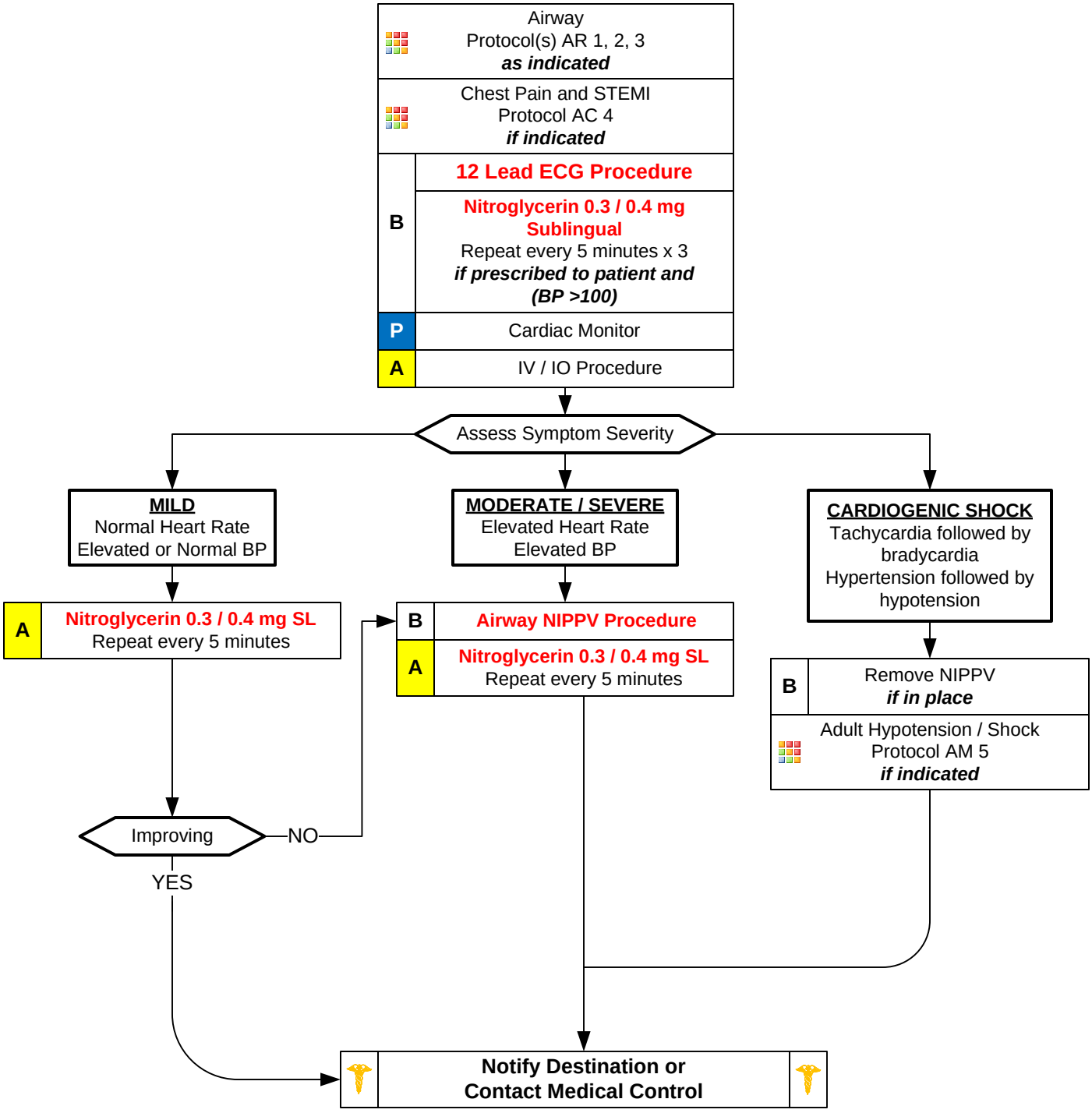
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are the key performance indicators for the EMS Acute Cardiac (STEMI) Care Toolkit**
- **Nitroglycerin:**
  Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.
  Nitroglycerin may cause hypotension during any type myocardial infarction. It is NOT more likely to cause hypotension in an inferior MI and should NOT be avoided or secondary unless already hypotensive.
- **STEMI (ST-Elevation Myocardial Infarction)**
  Positive Reperfusion Checklist should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.
  Consider placing 2 IV sites in the left arm: Many PCI centers use the right radial artery for intervention.
  Consider placing defibrillator pads on patient as a precaution.
  Consider Normal Saline or Lactated Ringers bolus of 250 – 500 mL as pre-cath hydration.
  Scene time goal is < 10 minutes.
  Document and time-stamp facility STEMI notification and make notification as soon as possible.
  Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).
- **Cardiac related symptoms in men and women:**
  Pressure, squeezing, fullness, or pain in the chest.
  Pain or discomfort in one or both arms, the back, neck, jaw, or stomach.
  Shortness of breath ***with or without chest pain***.
  Sweating, nausea, weakness, and/or lightheadedness.
  Women, diabetic patients, and the elderly often experience only weakness, shortness of breath, nausea/vomiting, and back or jaw pain.
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and opioids.
- **EMT may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.**

CHF / Pulmonary Edema

History
- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix, Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Cardiac history --past myocardial infarction

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

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



Adult Cardiac Protocol Section

CHF / Pulmonary Edema

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Diuretics (furosemide) and opioids have NOT been shown to improve the outcomes of EMS patients with pulmonary edema. Even though this historically has been a mainstay of EMS treatment, it is no longer routinely recommended.**
- **Nitroglycerin:**
  Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.
  Nitroglycerin may cause hypotension during any type myocardial infarction. It is NOT more likely to cause hypotension in an inferior MI and should NOT be avoided unless already hypotensive.
- **Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).**
- **Consider myocardial infarction in all these patients. Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.**
- **Cardiac related symptoms in men and women:**
  Pressure, squeezing, fullness, or pain in the chest.
  Pain or discomfort in one or both arms, the back, neck, jaw, or stomach.
  Shortness of breath with or without chest pain.
  Sweating, nausea, weakness, and/or lightheadedness.
  Women, diabetic patients, and the elderly often experience only weakness, shortness of breath, nausea/ vomiting, and back or jaw pain.
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Contraindications to opioids include severe COPD and respiratory distress. Monitor the patient closely.
- Monitor for hypotension after administration of nitroglycerin and opioids.
- Allow the patient to be in their position of comfort to maximize their breathing effort.
- **EMT may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.**

Adult Tachycardia
NARROW (≤ 0.11 sec)

History
- Age
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Recent physical exertion
- Palpitations, irregular heart beat
- **T**ime (onset /duration / repetition)

Signs and Symptoms
- Chest pain, heart failure, dyspnea
- AMS
- Shock, poor perfusion, hypotension
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness

Differential
- Trauma vs. Medical
- Sinus Tachycardia vs. dysrhythmia
- Fever, sepsis, infection (Fever Protocol)
- Pericarditis, pulmonary embolism
- Aortic dissection or aneurysm
- Overdose: Stimulants

Assess tachycardia in context of clinical condition. Identify and **treat underlying cause** of tachycardia; *especially Sinus Tachycardia.*

Unstable / Serious Signs and Symptoms
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES

P — Cardioversion Procedure

Consider Sedation Prior to Cardioversion

Midazolam 2.5-5 mg IV/IO/IN/IM
May repeat as needed
Maximum 10 mg
Or
Fentanyl 100mcg IV/IO/IN/IM

Syncronized
Narrow and Regular: 100J
Narrow and Irregular: 200J
May repeat and increase dose with subsequent cardioversion attempts

NO

B — 12 Lead ECG Procedure

P — Cardiac Monitor

IV or IO Access Protocol UP 6

Regular Rhythm?

YES

P — Attempt Vagal Maneuvers Procedure

Adenosine 6 mg IV / IO
Rapid push with flush

May repeat **12 mg IV / IO**
May repeat **12 mg IV / IO**

NO

P

Diltiazem 0.25 mg/kg IV / IO
Over 2 – 3 minutes
Maximum 25 mg

If No Improvement
Diltiazem 5 – 15 mg/hr IV / IO

If No Improvement in 15 minutes
Diltiazem 0.35 mg/kg IV / IO
Maximum 25 mg

Or
Amiodarone 150 mg
In 100 mL of D5W IV / IO - Infuse over 10 minutes

Or
Metoprolol 5mg IV/IO
Every 5 minutes as required
Maximum 15 mg

Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Adult Tachycardia
NARROW (≤ 0.11 sec)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **12-Lead ECG:**
  - **12 Lead ECG not necessary to diagnose and treat**
  - **Obtain when patient is stable and/or following rhythm conversion.**
- **Unstable condition**
  - **Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**
  - **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- Typical ***sinus tachycardia*** is in the range of 100 to (200 - patient's age) beats per minute.
- **Symptomatic condition**
  - **Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.**
  - **Patients with symptomatic tachycardia with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
  - **HYPOTENSION. Hypoxia, Acutely altered mental status. Signs of shock / poor perfusion.**
  - **Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW):**
  - **DO NOT administer a Calcium Channel Blocker (e.g. Diltiazem) or Beta Blockers.**
  - **Use caution with Adenosine and give only with defibrillator available.**
- **Regular Narrow-Complex Tachycardia:**
  - Vagal maneuvers and adenosine are preferred. Vagal maneuvers may convert 19% to 54 % of SVT.
  - Using passive leg raise with Valsalva is more effective.
  - Adenosine should be pushed rapidly via proximal IV site followed by 20 mL Normal Saline rapid flush.
  - Adenosine should not be used in the post-cardiac transplant patient without **Contact of Medical Control.**
  - Agencies using both calcium channel blockers and beta blockers should choose one primarily. Giving the agents sequentially requires **Contact of Medical Control**. This may lead to profound bradycardia / hypotension.
- **Irregular Narrow-Complex Tachycardia:**
  - Rate control is more important in pre-hospital setting rather than focus on rhythm conversion.
- **Synchronized Cardioversion:**
  - Recommended to treat **UNSTABLE Atrial Fibrillation, Atrial Flutter and SVT**. *(not sinus tachycardia)*
- Monitor for hypotension after administration of Calcium Channel Blockers or Beta Blockers.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Adult Monomorphic Tachycardia

Wide Complex (≥0.12 sec)

History
- Age
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Recent physical exertion
- Palpitations, irregular heart beat
- **T**ime (onset /duration / repetition)

Signs and Symptoms
- Chest pain, heart failure, dyspnea
- AMS
- Shock, poor perfusion, hypotension
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness

Differential
- Trauma vs. Medical
- Sinus Tachycardia vs. dysrrhythmia
- Fever, sepsis, infection (Fever Protocol)
- Pericarditis, pulmonary embolism
- Aortic dissection or aneurysm
- Overdose: Stimulants

Assess tachycardia in context of clinical condition. Identify and treat underlying cause of tachycardia; *especially Sinus Tachycardia with a block.*

Unstable / Serious Signs and Symptoms

Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES

P	
	Cardiac Monitor
	Cardioversion Procedure
	Consider Sedation Prior to Cardioversion **Midazolam 2 – 2.5 mg IV/IO/IN/IM** May repeat as needed **Maximum 10 mg** **Or** **Fentanyl 100mcg IV/IO/IN/IM**
	Wide and Irregular: 200 – 360J • **Monomorphic QRS (Synchronized)** • **Polymorphic QRS (Not-Synchronized)** *May repeat and increase dose with subsequent cardioversion attempts*

NO

B	12 Lead ECG Procedure
P	Cardiac Monitor
	IV or IO Access Protocol UP 6
P	**Consider consultation with medical control**

Regular Rhythm?

YES

P	
	Attempt Vagal Maneuvers Procedure ***Only if regular monomorphic complex***
	Consider **Only if regular monomorphic complex** **Adenosine 6 mg IV / IO** Rapid push with flush May repeat **12 mg IV / IO**

NO

P	
	Amiodarone is a first-line agent for WCT: **Amiodarone 150 mg** **in 100 mL of D5W IV / IO** **Infuse over 10 minutes** Or, if Amiodarone not available: **Lidocaine 1–1.5 mg/kg IV / IO** Max 3mg/kg May repeat if wide complex tachycardia recurs **Amiodarone 450 mg** **in 250 mL of D5W** **1 mg/min (33 mL/hr) IV / IO**
	Monitor and Reassess
	Notify Destination or Contact Medical Control

Monomorphic QRS:

All QRS complexes in a single lead are similar in shape.

Adult Cardiac Protocol Section

Adult Monomorphic Tachycardia

Wide Complex (≥0.12 sec)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **12-Lead ECG:**
  - **12-Lead ECG is not necessary to diagnose and treat arrhythmia. A single lead ECG is often all that is needed. Obtain12-Lead when patient is stable and/ or following a rhythm conversion..**
- **Monomorphic QRS:**
  - **All QRS complexes in a single lead are similar in shape.**
- **Polymorphic QRS:**
  - **QRS complexes in a single lead will change shape from complex to complex.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological or electrical treatment given only when symptomatic, otherwise monitor and reassess.**
- **Unstable condition**
  - **Condition which acutely impairs vital organ function and cardiac arrest may be imminent. If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic condition**
  - **Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.**
  - **Patients with symptomatic tachycardia with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
  - **Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute congestive heart failure.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- **Regular Wide-Complex Tachycardia:**
  - **Unstable condition:**
    - Immediate defibrillation if pulseless and begin CPR.
  - **Stable condition:**
    - Typically VT or SVT with aberrancy. Adenosine may be given if regular and monomorphic and if defibrillator available.
    - Verapamil contraindicated in wide-complex tachycardias.
    - Agencies using Amiodarone, Procainamide and Lidocaine need choose one agent primarily. Giving multiple anti-arrhythmics requires contact of Medical Control.
    - Atrial arrhythmias with WPW should be treated with Amiodarone or Procainamide
- **Irregular Tachycardia:**
  - Wide-complex, irregular tachycardia: Do not administer calcium channel, beta blockers, or adenosine as this may cause paradoxical increase in ventricular rate. This will usually require cardioversion. Contact Medical Control.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Adult Polymorphic Tachycardia
WIDE (≥ 0.12 sec) Torsades de pointes

History
- Age
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Recent physical exertion
- Palpitations, irregular heart beat
- **T**ime (onset /duration / repetition)

Signs and Symptoms
- Chest pain, heart failure, dyspnea
- AMS
- Shock, poor perfusion, hypotension
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness

Differential
- Cardiac arrest
- Sinus Tachycardia vs. dysrhythmia
- Fever, sepsis, infection
- Pericarditis, pulmonary embolism
- Aortic dissection or aneurysm
- Overdose

Assess tachycardia in context of clinical condition
Identify and treat underlying cause of tachycardia

Unstable / Serious Signs and Symptoms
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES → P: Defibrillation Procedure
- **Consider Sedation Prior to Defibrillation**
- **Midazolam 2 – 2.5 mg IV/IO/IN/IM**
  May repeat as needed
  Maximum 10 mg
- **Wide and Irregular: 200 – 360J**
- **Polymorphic QRS (Not-Synchronized)**
- *May repeat and increase dose with subsequent cardioversion attempts*

NO

- B: 12 Lead ECG Procedure
- P: Cardiac Monitor
- IV or IO Access Protocol UP 6

Pulse Present?

YES → P: **Consider consultation with medical control**

NO → Exit to Cardiac Arrest Protocol AC 3

QT Interval < 500 msec

P:
- **Amiodarone 150 mg in 100 mL of D5W IV / IO**
  Infuse over 10 minutes
  May repeat if tachycardia recurs or persists
- **Amiodarone 150 mg in 100 mL of D5W 1 mg/min (66 mL/hr)**
- Or
- **Lidocaine 1 – 1.5 mg/kg IV / IO**
- May repeat if refractory **Lidocaine 0.75 mg/kg IV / IO**
- **Maximum 3 mg/kg**

Monitor and Reassess

QT Interval > 500 msec

P:
- *Consider* **Magnesium 2 g IV / IO**
- May repeat x1
- **Maximum 4 g**

Monitor and Reassess

Notify Destination or Contact Medical Control

Polymorphic QRS:
- **QRS complexes in a single lead will change shape from complex to complex.**

Adult Cardiac Protocol Section

Adult Polymorphic Tachycardia
WIDE (≥ 0.12 sec) Torsades de pointes

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **12-Lead ECG:**
  - **12 Lead ECG not necessary to diagnose and treat**
  - **Obtain when patient is stable and/or following rhythm conversion.**
- **Monomorphic QRS:**
  - **All QRS complexes in a single lead are similar in shape.**
- **Polymorphic QRS:**
  - **QRS complexes in a single lead will change shape from complex to complex.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological or electrical treatment given only when symptomatic, otherwise monitor and reassess.**
- **Unstable condition**
  - **Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**
  - **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic condition**
  - **Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.**
  - **Symptomatic tachycardia usually occurs at rates ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
  - **Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute congestive heart failure.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- **Polymorphic / Irregular Tachycardia:**
  - This situation is usually unstable and immediate defibrillation is warranted.
  - If QT length is known, use for decision-making. Prolonged QT length defined as > 500 msec.
  - QT length < 500 msec:
    - Arrhythmia more likely related to ischemia or infarction and Magnesium not likely helpful.
    - May quickly deteriorate into Ventricular Fibrillation.
    - Even when terminated by defibrillation, may recur, so follow with medication therapy.
  - QT prolongation > 500 msec:
    - Magnesium more likely to be helpful.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Cardiac Arrest Protocol AC 3

Begin Continuous CPR Compressions
Push (2 – 3.2 inches)
Compress (110 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 sec (8-10bpm)
Continuous Compressions

Monitor EtCO2
(within 2 min of starting resuscitation)

AED Procedure
if available

P Defibrillation Procedure

IV / IO Access Protocol UP 6

A *If VF / VT refractory to defibrillation, delay Epinephrine administration until after 2d defibrillation*

Epinephrine (1:10,000) 1 mg IO / IV
Repeat every 5-10 minutes (max 3)

Search for Reversible Causes

(***Limit changes / pulse checks ≤ 10 seconds***)

If Rhythm Refractory
Continue CPR and give Agency specific Anti-arrhythmics and Epinephrine
Continue CPR up to point where you are ready to defibrillate with device charged.
Repeat pattern during resuscitation.

P

Amiodarone 300 mg IV / IO

May repeat if refractory
Amiodarone 150 mg IV / IO

Or
Lidocaine 1.0 – 1.5 mg/kg IV / IO

May repeat if refractory
Lidocaine 0.75 mg/kg IV / IO
Maximum 3 mg/kg

Refractory
Magnesium 2 gm IV / IO

Defibrillation Procedure
If VF / VT refractory after 3 shocks consider changing vector of defibrillation pads or Dual Sequential defibrillation procedure

Notify Destination or Contact Medical Control

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 10

Adult Cardiac Protocol Section

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Pearls

- **Team Focused Approach / Pit-Crew Approach; assigning responders to predetermined tasks. Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: If no advanced airway use continuous compression with ventilations, 1 breath every 6 sec (8-10bpm max). If advanced airway in place, ventilate 1 breath every 6 sec (8-10bpm max), continuous compressions.**
- **Consider BIAD first - to limit interruptions. Do not interrupt compressions to place an advanced airway**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- **Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.**
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation**.
- **IV access is preferred route. Follow IV or IO Access Protocol UP 6.**
- **Defibrillation:**
  Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
  Charge defibrillator during chest compressions, near the end of 2-minute cycle, to decrease peri-shock pause.
  Following defibrillation, provider should immediately restart chest compressions with no pulse check until end of next cycle.
- **End Tidal CO2 (EtCO2)**
  If EtCO2 is < 10 mmHg, improve chest compressions. Goal is ≥ 20 mmHg.
  If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC
- **Special Considerations**
  Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  Renal Dialysis / Renal Failure - Refer to Dialysis / Renal Failure Protocol AM 3 caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Magnesium Sulfate is not routinely recommended during cardiac arrest, but may help with Torsades de points, prolonged QT, low Magnesium States (malnourished / alcoholic), and suspected digitalis toxicity**
- Return of spontaneous circulation: Heart rate should be > 60 when initiating anti-arrhythmic infusions.

Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Post Resuscitation

Return of Spontaneous Circulation

↓

Repeat Primary Assessment

Optimize Ventilation and Oxygenation

- Respiratory Rate 10 / minute
- Maintain SpO2 92 – 98%
- **DO NOT HYPERVENTILATE**

B **ETCO2 ideally 35 – 45 mm Hg**

Airway
Protocol(s) AR 1, 2, 3, 4
as indicated

B 12 Lead ECG Procedure

IV or IO Access Protocol UP 6

P Cardiac Monitor

Monitor Vital Signs / Reassess

Search for reversible causes

↓

Chest Pain and STEMI
Protocol AC 4
if indicated

Hypotension / Shock
Protocol AM 5
as indicated

A **Optimize Systolic BP and Mean Arterial BP**
Systolic BP > 90 mmHg

P Isotonic fluid & (if needed) Norepinephrine to support Mean Arterial BP **(MAP)** > 70 mmHg

Appropriate Arrhythmia
Protocol(s) AC 2, 6, 7
as indicated

Seizure Protocol UP 13
as indicated

Post Intubation BIAD Management
Protocol AR 8

Stablize Patient
Scene Time ≥ 10 min Post ROSC
Prepare for re-arrest

↓

Notify Destination or Contact Medical Control

Transport Destination Decision

Post-resuscitation patient is medically complex.

Consider facility capabilities:

- 24-hour cardiac catheterization laboratory
- Medical ICU service
- Cardiology service
- Neurology service
- Pulmonologyservice
- Targeted Temperature Management

Arrhythmias are common and usually self limiting after ROSC

If Arrhythmia Persists follow Rhythm Appropriate Protocol

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Adult Cardiac Protocol Section

Post Resuscitation

*Mix **4 mg** (4 ml) of **Norepinephrine** in **250 ml D5W or NS** => concentration of 16 mcg/ml*

**Use 60 gtt/mL drip set only

mcg/min	gtt/min (mL/hr	mcg/min	gtt/min (mL/hr	mcg/min	gtt/min (mL/hr
1	4 gtt/min	11	41 gtt/min	21	79 gtt/min
2	8 gtt/min	12	45 gtt/min	22	82 gtt/min
3	11 gtt/min	13	49 gtt/min	23	86 gtt/min
4	15 gtt/min	14	53 gtt/min	24	90 gtt/min
5	19 gtt/min	15	56 gtt/min	25	94 gtt/min
6	23 gtt/min	16	60 gtt/min	26	98 gtt/min
7	26 gtt/min	17	64 gtt/min	27	101 gtt/min
8	30 gtt/min	18	68 gtt/min	28	105 gtt/min
9	34 gtt/min	19	71 gtt/min	29	109 gtt/min
10	38 gtt/min	20	75 gtt/min	30	113 gtt/min

Adverse/Side Effects

Systemic: Ischemic injury due to potent vasoconstrictor action and tissue hypoxia.

Cardiovascular: Bradycardia, probably as a reflex result of a rise in blood pressure, arrhythmias, tachycardia

Nervous: Anxiety, transient headache.

Respiratory: Respiratory difficulty.

Skin and Appendages: Extravasation necrosis at injection site. Gangrene of extremities has been rarely reported.

Overdoses or conventional doses in hypersensitive persons (e.g., hyperthyroid patients) cause severe hypertension with violent headache, photophobia, stabbing retrosternal pain, pallor, intense sweating, and vomiting.

** Mix 1mg of Epinephrine 1:1,000 in a 250mL NS or D5W Bag (60gtt set)

mcg/min	gtt/min (mL/hr)
1	15 gtt/min
2	30 gtt/min
3	45 gtt/min
4	60 gtt/min
5	75 gtt/min
6	90 gtt/min
7	105 gtt/min
8	120 gtt/min
9	135 gtt/min
10	150 gtt/min

Push Dose Option for Epi:

1. Take a 10 ml syringe with 9 ml of normal saline
2. Into this syringe, draw up 1 ml of Epi 10,000**
   **(cardiac amp contains Epinephrine 100 mcg/ml)
3. Now you have 10 mL's of Epinephrine (10 mcg/ml)
   ***Dose: 0.2-1 ml every 1-5 minutes (2-10 mcg)

*May use Epi with Norepinephrine for additional BP support

Adult Cardiac Protocol Section

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Continue to search for potential cause of cardiac arrest during post-resuscitation care.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided.**
- **Titrate FiO_2 to maintain SpO_2 of 92 - 98%.**
- **Head of bed should be maintained at least 10 – 20 degrees of elevation when possible to decrease aspiration risk and promote cerebral venous flow.**
- **Pain/sedation:**
  Patients requiring advanced airways and ventilation commonly experience pain and anxiety. Unrelieved pain can lead to increased catecholamine release, ischemia, immunosuppression, and prolonged hospitalization.
  Ventilated patients cannot communicate pain / anxiety and providers are poor at recognizing pain / anxiety. Vital signs such has tachycardia and / or hypertension can provide clues to inadequate sedation, however they both are not always reliable indicators of patient's lack of adequate sedation.
  Pain must be addressed first, before anxiety. Opioids are typically the first line agents before benzodiazepines. Ketamine is also a reasonable first choice agent.
- **Ventilator / Ventilation strategies:**
  Tailored to individual patient presentations. Medical Control can indicate different strategies above.
  In general ventilation with BVM should cause chest rise. With mechanical ventilation a reasonable tidal volume should be about 6 mL/kg and peak pressures should be < 30 cmH20.
  Continuous pulse oximetry and capnography should be maintained during transport for monitoring.
  Head of bed should be maintained at least 10 – 20 degrees of elevation when possible to decrease aspiration risk.
- **EtCO2 Monitoring:**
  Initial End tidal CO2 may be elevated immediately post-resuscitation, but will usually normalize.
  Goal is 35 – 45 mmHg but avoid hyperventilation to achieve.
- **Titrate fluid resuscitation and vasopressor administration to maintain SBP of 90 – 100 mmHg or Mean Arterial Pressure (MAP) of 70 – 80 mmHg.**
- **STEMI (ST-Elevation Myocardial Infarction)**
  Consider placing 2 IV sites in the left arm: Many PCI centers use the right radial artery for intervention.
  Consider placing defibrillator pads on patient as a precaution.
  Document and time-stamp facility STEMI notification and make notification as soon as possible.
  Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiology / cardiac catheterization, intensive care service, and neurology services.**
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may best be planned in consultation with Medical Control.

Team Focused CPR

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES →
- Decomposition
- Rigor mortis
- Dependent lividity
- Blunt force trauma
- Injury incompatible with life

Confirmed extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO ↓

Begin Continuous CPR Compressions
Push (2 – 3.2 inches)
Compress (110 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 sec (8-10bpm)
Continuous Compressions

Monitor EtCO2
(within 2 min of starting resuscitation)

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 10

First Arriving BLS / ALS Responder
Initiate Compressions Only CPR
Initiate Defibrillation Automated Procedure
if available
Call for additional resources

Second Arriving BLS / ALS Responder
Assume Compressions or
Initiate Defibrillation Automated / Manual Procedure
Place BIAD
DO NOT Interrupt Compressions
Ventilate at 6 to 8 breaths per minute

Third Arriving Responder
BLS or ALS

BLS

Establish Team Leader
(Hierarchy)
Fire Department or Squad Officer
EMT
First Arriving Responder

Rotate with Compressor
To prevent Fatigue and effect high quality compressions
Take direction from Team Leader

Fourth / Subsequent Arriving Responders
Take direction from Team Leader

Continue Cardiac Arrest Protocol AC 3

ALS

A

Establish Team Leader
(Hierarchy)
EMS ALS Personnel
Fire Department or Squad Officer
EMT
First Arriving Responder

Initiate Defibrillation Automated Procedure
Establish IV / IO Protocol UP 6
Administer Appropriate Medications
Establish Airway with BIAD if not in place

P

Initiate Defibrillation Manual Procedure
Continuous Cardiac Monitoring
Establish IV / IO Protocol UP 6
Administer Appropriate Medications
Establish Airway with **BIAD** if not in place

Continue Cardiac Arrest Protocol AC 3

Team Leader
ALS Personnel
Responsible for patient care
Responsible for briefing / counseling family

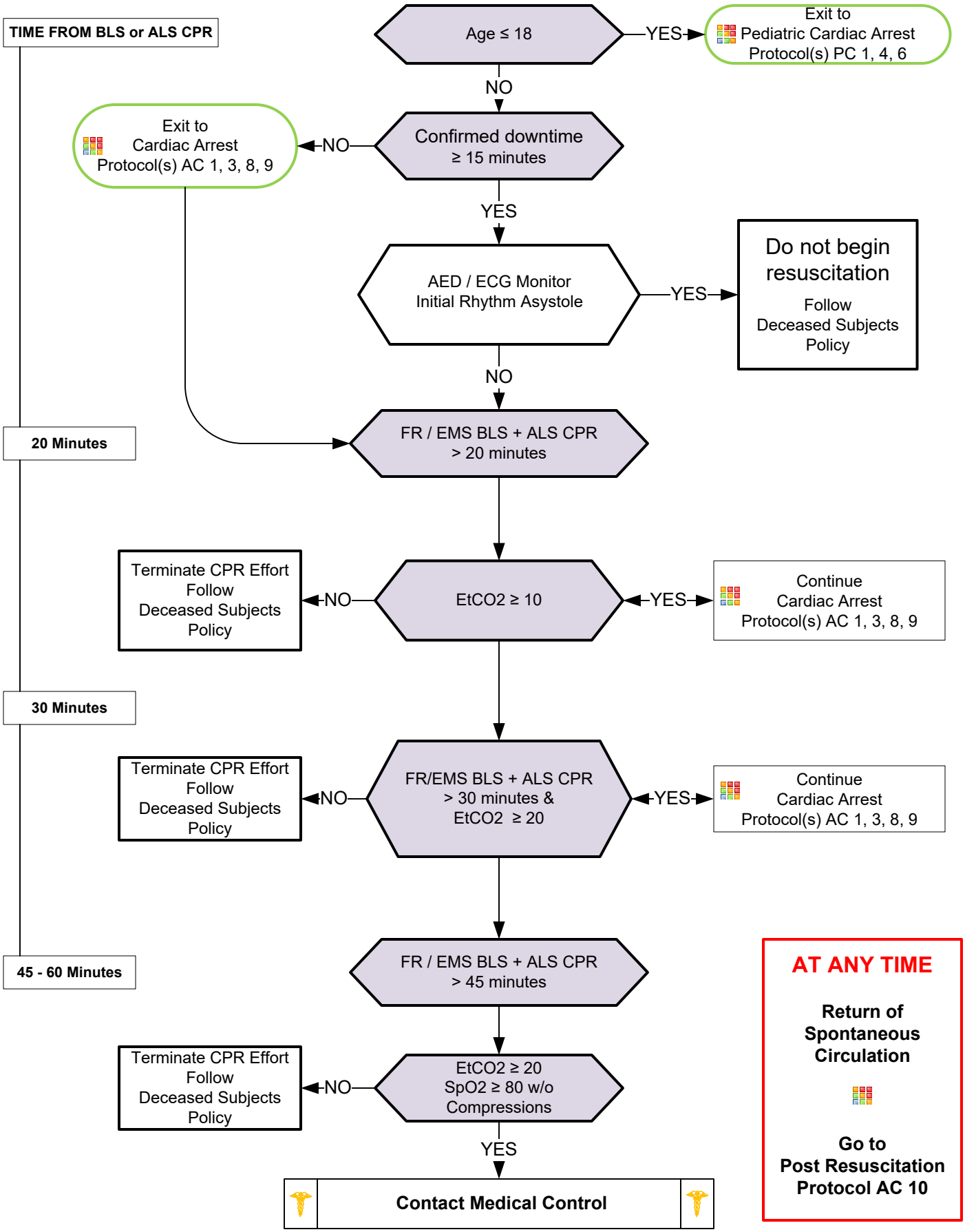
Incident Commander
Fire Department / First Responder Officer
Team Leader until ALS arrival
Manages Scene / Bystanders
Ensures high-quality compressions
Ensures frequent compressor change
Responsible for briefing family prior to ALS arrival

Team Focused CPR

Pearls

- **Team Focused Approach / Pit-Crew Approach; assigning responders to predetermined tasks. Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: If no advanced airway use continuous compression with ventilations, 1 breath every 6 sec (8-10bpm max). If advanced airway in place, ventilate 1 breath every 6 sec (8-10bpm max), continuous compressions.**
- **Consider BIAD first - to limit interruptions. Do not interrupt compressions to place an advanced airway**
- **Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery are secondary to high-quality chest compressions and early defibrillation**.
- **IV access is preferred route. Follow IV or IO Access Protocol UP 6.**
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
  - Charge defibrillator during chest compressions, near the end of 2-minute cycle, to decrease peri-shock pause.
  - Following defibrillation, provider should immediately restart chest compressions with no pulse check until end of next cycle.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

On Scene Resuscitation
Termination of CPR



Adult Cardiac Protocol Section

On Scene Resuscitation / Termination of CPR

Pearls

- **General approach:**
  1. **Determine if a terminal disease is involved?**
  2. **Is there an advanced directive such as a DNR / MOST form?**
  3. **Did the patient express to your historian any desires regarding resuscitation and if so what measures?**
  4. **Remember a living will is not a DNR.**
- **Obtain a history while resuscitation efforts are ongoing. Determine the most legitimate person on scene as your information source such as a spouse, child, or sibling or Durable Health Care Power of Attorney.**
- Basic and Advanced Life Support may use for treatment decisions.

Mechanical Circulatory Support
LVAD, RVAD, and Bi-VAD

History
- SAMPLE
- Bridge to transplant
- Destination therapy
- Estimated downtime
- LVAD, RVAD, Bi-Vad, TAH
- DNR, MOST, or Living Will
- Contact with LVAD coordinator

Signs and Symptoms
- Unconsciousness
- Pulseless
- Apneic
- Poor capillary refill / skin color
- AMS or decreased mental status
- No electrical activity on ECG
- No heart tones on auscultation

Differential
- See Reversible Causes below
- Infection/Sepsis
- Hypovolemia
- Cardiac arrest
- Hemorrhage

Contact VAD coordinator:
- As quickly as possible for troubleshooting and treatment advice, but do not delay emergency treatment
- Follow patient specific emergency plan if present

Rapid assessment
Check for signs of life
Assess for adequate perfusion

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES ▶
Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Unresponsive and Not breathing normally

Responsive or Unresponsive and Breathing normally

Airway Protocol(s) AR 1, 2, 3 ***if indicated***

Respiratory Distress Protocol AR 4 ***if indicated***

Assess LVAD function
Look and listen for alarms
LVAD Alarming?

YES ▶ **Go to Page 2** ◀ YES

NO

Place stethoscope over heart

Humming sound present?

YES ▶ **Go to Page 3** ◀ YES

NO

Airway Protocol(s) AR 1, 2, 3 ***if indicated***

Respiratory Distress Protocol AR 4 ***if indicated***

Assume VAD failure
Initiate age appropriate ventilation rate

Go to Page 2

Assume VAD failure
Initiate age appropriate ventilation rate

Go to Page 2

Adult Cardiac Protocol Section

Mechanical Circulatory Support
LVAD, RVAD, and Bi-VAD

History
- SAMPLE
- Bridge to transplant
- Destination therapy
- Estimated downtime
- LVAD, RVAD, Bi-Vad, TAH
- DNR, MOST, or Living Will
- Contact with LVAD coordinator

Signs and Symptoms
- Unconsciousness
- Pulseless
- Apneic
- Poor capillary refill / skin color
- AMS or decreased mental status
- No electrical activity on ECG
- No heart tones on auscultation

Differential
- See Reversible Causes below
- Infection/Sepsis
- Hypovolemia
- Cardiac arrest
- Hemorrhage

Entering from Page 1
No VAD humming heard and/or
VAD is alarming

Attempt to restart LVAD

Expose VAD control module
Expose VAD power source
Expose VAD driveline

Driveline:
- **Ensure driveline is connected firmly to control module**

Power source (batteries or main power source):
- **Ensure all power connections are firmly connected to control module**

Battery charge:
- **Check by pressing charge indicator**
- **Replace battery(s) if indicated**

LVAD restarted?
Humming sound over heart?

YES → **Go to Page 3**

NO

Spare control module:
- **Attach batteries or main power source to spare control module**
- **Detach driveline and attach to spare control module**

LVAD restarted?
Humming sound over heart?

YES → **Go to Page 3**

NO

Possible driveline cable fracture:
- **Quickly, but gently manipulate cable trying to restore break**
- **If successful, tape driveline in place where functioning restored**

Mechanical Circulatory Support
LVAD, RVAD, and Bi-VAD

Reassess
Patient responsive?

YES

Rhythm analysis

Ventricular Tachycardia?
Ventricular Fibrillation?

YES

Do Not Defibrillate

Access Circulation

- **Cap refill < 2 – 3 sec?**
- **EtCO2 > 20 mmHg?**
- **MAP > 50 mmHg?**

YES

NO

IV / IO Access
Protocol UP 6

A — **Normal Saline Bolus**
500 mL IV / IO
May repeat as needed
Maximum 2 L

NO

Rhythm analysis

Ventricular Tachycardia?
Ventricular Fibrillation?

YES

AED Procedure
if available

P — Defibrillation Procedure

NO

Access Circulation

- **Cap refill < 2 – 3 sec?**
- **EtCO2 > 20 mmHg?**
- **MAP > 50 mmHg?**

YES

- **Contact VAD Coordinator**
- **Transport to VAD Center**
- **Take all spare VAD equipment**

Notify Destination or
Contact Medical Control

NO

Cardiac Arrest Protocol AC 3
as indicated

Team Focused CPR Protocol AC 11
as indicated

IV / IO Access Protocol UP 6

A — **Normal Saline Bolus 500 mL IV / IO**
May repeat as needed
Maximum 2 L

Contact VAD Coordinator

On Scene Resuscitation / Termination of Resuscitation Protocol(s) AC 12
as indicated

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Suspected Opioid Overdose

Administer Naloxone per Overdose / Toxic Ingestion Protocol TE 7

Left Ventricular Assist Device LVAD Unresponsive or AMS

Pearls

- **Recommended exam: Mental status, skin color, capillary refill, peripheral pulses, blood pressure.**
- **Assessment of blood flow and perfusion status:**
  - **Optimal BP attained by manual BP and Doppler.**
  - **Automated BP devices can measure a BP in about 50% of attempts and is not reliable to assess perfusion**
  - **A MAP of ≥ 60 mmHg is adequate for most LVAD patients.**
  - **Skin color, skin temperature, capillary refill**
- **Mechanical Circulatory Support devices:**
  - **LVAD – Left Ventricular Assist Device**
  - **RVAD – Right Ventricular Assist Device**
  - **BiVAD – Biventricular Ventricular Assist Device**
  - **TAH – Total Artificial Heart**
- **Reasons for use:**
  - **Bridge therapy – patients awaiting transplant or anticipated recovery.**
  - **Destination therapy – advanced heart failure, not candidate for transplant, and will live rest of life with device.**
- **Pump type and assessing pulses:**
  - **Pulsatile flow pumps – older units, not commonly in use now, but generate blood flow with a pulsatile flow and patient will have a palpable pulse.**
  - **Continuous flow pumps – majority of pumps now used and create blood flow in a continuous stream, no pulsatile flow, so patient will not have a palpable pulse.**
  - **Most devices are implanted inside the chest and have an internal pump, a driveline connected from the pump to the controller unit, and a power source consisting of batteries and electrical cord for receptacles.**
- **Common complications:**
  - **Disconnection of power supply, either battery disconnect, or electrical cord to receptacle disconnection.**
  - **Driveline failure or disconnection from controller unit.**
  - **Controller failure**
  - **Blood clot formation, acute stroke, and bleeding (mucosal and gastrointestinal most common sites)**
  - **Infection**
- Abnormal heart rhythm:
  - Pseudo-PEA: Normal cardiac electrical activity in a patient who is alert and well perfused with no palpable pulse.
  - Tachyarrhythmias are usually well tolerated.
- End Tidal CO2 (EtCO2)
  - If EtCO2 is < 10 mmHg, improve chest compressions. Goal is ≥ 20 mmHg.
  - If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- Transcutaneous Pacing:
  - Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival

Total Artificial Heart

History
- SAMPLE
- Bridge to transplant
- Destination therapy
- Estimated downtime
- LVAD, RVAD, Bi-Vad, TAH
- DNR, MOST, or Living Will
- Contact with LVAD coordinator

Signs and Symptoms
- Unconsciousness
- Pulseless
- Apneic
- Poor capillary refill / skin color
- AMS or decreased mental status
- No electrical activity on ECG
- No heart tones on auscultation

Differential
- See Reversible Causes below
- Infection/Sepsis
- Hypovolemia
- Cardiac arrest
- Hemorrhage

Rapid assessment
Check for signs of life
Assess for adequate perfusion

Contact transplant coordinator:
- As quickly as possible for troubleshooting and treatment advice, but do not delay emergency treatment
- Follow patient specific emergency plan if present

DO NOT USE ECG MONITOR
- Total Artificial Heart does not generate ECG

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES → Decomposition, Rigor mortis, Dependent lividity, Blunt force trauma
Injury incompatible with life
Extended downtime
Do not begin resuscitation
Follow Deceased Subjects Policy

NO

Pulse Present?

NO → **Go to Page 2**

YES

- Airway Protocol(s) AR 1, 2, 3 ***if indicated***
- Respiratory Distress Protocol AR 4 ***if indicated***
- Altered Mental Status Protocol UP 4 ***if indicated***

→ **Check Blood Pressure**

Systolic BP ≥ 150 mmHg

A — **Nitroglycerin 0.3 / 0.4 mg SL**
Repeat every 5 minutes as needed
Maintain SBP ≥ 90 mmHg

P — May assist patient taking their antihypertensive medication
Maintain SBP ≥ 90 mmHg

Systolic BP < 150 mmHg And ≥ 90 mmHg

DO NOT USE:
- Manual or mechanical chest compressions
- ECG/Defibrillation/Pacing/AED devices
- Vasopressor medications
- Antiarrhythmic medications

Systolic BP < 90 mmHg

IV / IO Access Protocol UP 6

A — **Normal Saline Bolus 500 mL IV / IO**
May repeat as needed
Maximum 1 L

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Total Artificial Heart

Entering from Page 1
No Pulse Present

DO NOT USE ECG MONITOR
- Total Artificial Heart does not generate ECG

Attempt to restart Total Artificial Heart

Expose Total Artificial Heart control module
Expose Total Artificial Heart power source
Expose Total Artificial Heart driveline

Driveline:
- **Ensure it is connected firmly to control module**
- **Ensure lines are not kinked or bent**

Power source:
- **Ensure all connections firmly to control module (batteries or main power source)**

Battery charge:
- **Check by pressing charge indicator**
- **Replace battery(s) if indicated**

Back up Driver
- **Change to back up driver *if available***

Pulse Present? YES → **Go to Page 1**

NO

A **Normal Saline Bolus 500 mL IV / IO**
May repeat as needed

Maximum 1 L

Pulse Present? YES → **Go to Page 1**

NO

Follow Deceased Subjects Policy

Total Artificial Heart

Pearls

- **Recommended exam: Mental status, skin color, capillary refill, peripheral pulses, blood pressure.**
- **Assessment of blood flow and perfusion status:**
  - **Manual and automated BP devices can measure a BP.**
  - **Skin color, skin temperature, capillary refill**
- **ECG and telemetry monitoring:**
  - **The artificial heart does not produre an ECG wave form or tracing.**
  - **Do not use the 12-Lead ECG or ECG monitoring as it will only show asystole.**
- **Total Artificial Heart:**
  - **Different than Ventricular Assist Device (LVAD, RVAD, or Bi-VAD)**
  - **The patient's left and right ventricles are removed and the artificial heart is connected to the right and left atria.**
  - **The patient is totally dependent on the artificial heart for circulatory support – the native heart is removed.**
  - **There are both a right and left side pump, driven by air, and each side driven by a separate driveline.**
  - **The drivelines are not electric, they are driven by air, so kinking can disrupt the pumping action.**
  - **Artificial heart produces a pulsatile wave form so the patient will have a palpable pulse when operational.**
- **Reasons for use:**
  - **Bridge therapy – patients awaiting transplant or anticipated recovery.**
  - **Destination therapy – advanced heart failure, not candidate for transplant, and will live rest of life with device.**
- **Common complications:**
  - **Most common is kinking or bending of the driveline(s) which stops air from moving and stops pumping action.**
  - **Disconnection of power supply, either battery disconnect, or electrical cord to receptacle disconnection.**
  - **Driveline failure or disconnection from controller unit.**
  - **Controller failure**
  - **Blood clot formation, acute stroke, and bleeding (mucosal and gastrointestinal most common sites)**
  - **Infection**
- **Blood pressure:**
  - **Optimal SBP is < 130 mmHg and > 90 mmHg.**
  - **Hypertension puts great strain on the pump and can cause blood to back up into the lungs and cause pulmonary edema and respiratory failure.**
  - **Epinephrine and vasopressors are ineffective, can cause hypertension, and may worsen the patient's condition.**
- Manual or mechanical chest compressions:
  - **Do not use**
- End Tidal CO2 (EtCO2)
  - Helpful in monitoring adequate perfusion status.
- Defibrillation/Cardioversion:
  - Do not use.
- Transcutaneous Pacing:
  - Do not use.

Wearable Cardioverter Defibrillator Vest

History
- SAMPLE
- Known risk for Sudden Cardiac Death
- Risk for life-threatening arrhythmia
- No implanted defibrillator
- Heart failure – cardiomyopathy
- Decreased ejection fraction

Signs and Symptoms
- Chest pain, dyspnea
- Palpitations
- Received shock from vest
- Poor capillary refill / skin color
- AMS or decreased mental status

Differential
- See Reversible Causes below
- Arrhythmia
- Infection/Sepsis
- Hypovolemia
- Cardiac arrest
- Hemorrhage

Conduct standard patient assessment
Primary/Secondary Surveys

Wearable Cardioverter-Defibrillator Vest Alarming?

YES ▶

Device Silent or Single-Tone Gong Alert
Voice: None – silent
Voice: "Treatment given, call your doctor"
See page 2

NO

Device Siren Alert Two-Tone
Voice: "If patient is not responsive, call for help. Start CPR."
See page 2

Device Siren Alert Two-Tone
Voice: "Press response buttons to delay treatment."
"Bystanders, do not interfere."
See page 2

Cardiac Arrest — YES ▶ Cardiac Arrest Protocol AC 3

NO

Condition requires 12-Lead ECG
And/or
Continuous telemetry monitoring

YES ▶
- Airway Protocol(s) AR 1, 2, 3 ***as indicated***
- Chest Pain and STEMI Protocol AC 4 ***if indicated***
- Age Appropriate Protocol(s) ***as indicated***
- IV / IO Protocol UP 6
- **Remove cardioverter-defibrillator vest**
  1. Remove the battery
  2. Remove the vest
  3. Place ECG electrodes
  4. Place pads anterior-lateral or anterior-posterior
- AED Procedure ***if available***
- **P** — Cardioversion - Defibrillation Procedure(s)
- Cardiac Monitor

NO

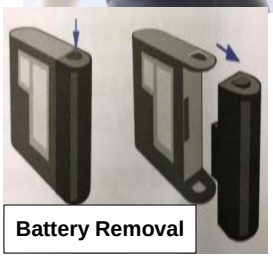
Leave Vest in Place and Operational

Exit to Age Appropriate Protocol(s)

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Wearable Cardioverter Defibrillator Vest



Pearls

- **Recommended exam: Mental status, skin color, capillary refill, peripheral pulses, blood pressure.**
- **Wearable Cardioverter-Defibrillator Vest:**
  - **Device is preparing to delivery a shock to the patient:**
  - **Before device delivers a shock, it tests to see if patient is conscious – voice prompt instructs patient to press the "response" button (see diagram above).**
  - **Only the patient should press the "response" button.**
  - **Once a treatable arrhythmia is detected it takes between 25 and 60 seconds to deliver the shock.**
- **Audible and tactile warning system:**
  - **The device will provide a vibration, a siren tone, and voice prompts to check if the patient is conscious and give them an opportunity to press the "response" button to abort a shock.**
  - **See audible warning system above.**
- **Reasons for use:**
  - **Currently only device on the market is the Zoll LifeVest.**
  - **Worn by patients at risk of sudden cardiac arrest or risk of abnormal and/or lethal arrhythmia.**
- **Blue gel on the patient's skin from the device:**
  - **Electrode pads release a blue get prior to treatment to improve shock conduction and reduce burning.**
  - **Do not remove the gel if the vest is left in place during treatment.**
  - **Remove gel if vest is removed for prehospital care.**
- **Shock to providers:**
  - **Do not touch the patient when the device is instructing you that a shock will be delivered.**
  - **Providers can be shocked by the device during energy delivery if provider is touching the patient.**
- Removing the device for prehospital care:
  - The device should only be removed when ECG monitor and defibrillator is available.
  - Continuous ECG monitoring and electrode pads should be in place when vest is removed.
- Defibrillation/cardioversion with vest in place:
  - Disconnect the device from the vest before you deliver a cardioversion or defibrillation
- Transcutaneous Pacing:
  - May be utilized with vest in place – disconnect the device from the vest before you perform transcutaneous pacing.

Allergic Reaction / Anaphylaxis

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

Signs and Symptoms
- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema
- N/V

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

Assess Symptom Severity / Suspected Exposure to Allergen

MILD
Skin Only

- **Diphenhydramine 25 - 50 mg PO**
- **A** — IV Procedure ***if indicated***
- **A** — **Diphenhydramine 25 - 50 mg PO / IV / IM / IO**
- **B** — Monitor and Reassess Monitor for Worsening Signs and Symptoms

MODERATE
2 + Body Systems

- **Epinephrine 1:1000 IM 0.3 – 0.5 mg *if available***
- **Diphenhydramine 25 - 50 mg PO** *See Pearls*
- **B** — **Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3 ***if indicated***
- **A** — **Epinephrine 1:1000 0.3 – 0.5 mg IM** Repeat every 5 minutes if no improvement

SEVERE
2 + Body Systems + hypotension Or Isolated Hypotension

- **Epinephrine 1:1000 IM 0.3 – 0.5 mg *if available***
- **B** — **Albuterol 2.5 – 5 mg** Nebulizer Repeat as needed x 3 ***if indicated***
- Airway Protocol(s) AR 1 - 4 ***if indicated***
- Hypotension / Shock Protocol AM 5 ***if indicated***

- **A** — **Diphenhydramine 25 - 50 mg IV / IM / IO *if not given PO (See Pearls)***
- IV / IO Protocol UP 6
- **A** — **Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg (DuoNeb)** Repeat as needed x 3 ***if indicated***
- **A** — **Isotonic Fluid Bolus 500 mL IV / IO** Repeat as needed **Maximum 2 Liters**
- **P** — **<u>For refractory/peri-arrest</u>** Anaphylaxis, consider **Epinephrine 1:10,000 0.1mg IV/IO, may repeat to max 0.3mg**
- **Methylprednisolone 125 mg IV / IO**

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Allergic Reaction / Anaphylaxis

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdominal**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**

Epinephrine administration:

Drug of choice and the FIRST drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.)
IM Epinephrine should be administered in priority before or during attempts at IV or IO access.

Diphenhydramine and steroid administration:

Diphenhydramine and steroids have no proven utility in Moderate / Severe anaphylaxis.
Diphenhydramine and steroids should NOT delay repeated Epinephrine administration.
In Moderate and Severe anaphylaxis Diphenhydramine may decrease mental status.
Oral Diphenhydramine should NOT be given to a patient with decreased mental status and / or a hypotensive patient as this may cause nausea and / or vomiting.

Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Contact Medical Control for appropriate dosing.

Symptom Severity Classification:

Mild symptoms:
Flushing, hives, itching, erythema with normal blood pressure and perfusion.

Moderate symptoms:
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.

Severe symptoms:
Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension/poor perfusion or isolated hypotension.

Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.

Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in **-il.**

Hereditary Angioedema involves swelling of the face, lips, airway structures, extremities, and may cause moderate to severe abdominal pain. Some patients are prescribed specific medications to aid in reversal of swelling.
Paramedic may assist or administer this medication per patient / package instructions.

Patients with moderate and severe reactions should receive a 12 lead ECG and should be continually monitored, but this should NOT delay administration of epinephrine.

EMR/ EMT:

The use of Epinephrine IM is limited to the treatment of anaphylaxis and may be given only by autoinjector, unless manual draw-up is approved by the Agency Medical Director and the NC office of EMS.

Administration of diphenhydramine is limited to the oral route only.

EMT administration of beta-agonist is limited to only patients currently prescribed the medication, unless approved by the Agency Medical Director and the NC office of EMS.

Agency Medical Director may require contact of medical control prior to EMT/ EMR administering any medication(s).
The shorter the onset from exposure to symptoms the more severe the reaction.

Diabetic; Adult

History
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms
- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential
- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status

	Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure ***if indicated***
	IV / IO Protocol UP 6
P	Cardiac Monitor
	Altered Mental Status Protocol UP 4 ***if indicated***
	Hypotension / Shock Protocol AM 5 ***if indicated***
	Suspected Stroke Protocol UP 14 ***if indicated***
	Seizure Protocol UP 13 ***if indicated***

A	Blood Glucose ≤ 69 mg / dl and symptomatic No venous access **Glucagon 1 – 2 mg IM** Repeat in 15 minutes if needed

Blood Sugar ≤ 69 mg / dl

	Consider Oral Glucose Solution *if available*
	Consider Oral Solution (Juices / Food)
A	<u>If no improvement</u> **D10W in 250 mL bag - IV / IO** Titrate to patient condition and response May repeat until Blood Glucose ≥ 80 mg/dL

Blood Sugar 70 – 249 mg / dl

	Blood Glucose Analysis Procedure ***if condition changes***

Exit to Appropriate Protocol(s)

Blood Sugar ≥ 250 mg / dl

A	**Isotonic Fluid Bolus** **500 mL IV / IO** May repeat as needed **Then infuse 150 mL / hr**

	Monitor and Reassess Every 5 minutes Until Blood Glucose ≥ 80 mg / dl

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Diabetic; Adult

Pearls

- **Recommended exam: Mental Status, Skin, Respirations and effort, Neuro.**
- **Patients with prolonged hypoglycemia or those who are malnourished may not respond to glucagon.**
- **Do not administer oral glucose to patients that are not able to swallow or protect their airway.**
- **Quality control checks should be maintained per manufacturers recommendation for all glucometers.**
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
  - Blood sugar must be **≥ 80**, patient has ability to eat and availability of food with responders on scene.
  - Patient must have known history of diabetes and not taking any oral diabetic agents.
  - Patient returns to normal mental status and has a normal neurological exam with no new neurological deficits.
  - Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol UP 1.
  - Otherwise contact medical control.
- **Hypoglycemia with Oral Agents:**
  - Patient's taking oral diabetic medications should be encouraged to allow transportation to a medical facility.
  - These patients are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established.
  - Not all oral agents have prolonged action so Contact Medical Control or NC Poison Control Center for advice. for advice.
  - Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Hypoglycemia with Insulin Agents:**
  - Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established.
  - Not all insulin have prolonged action so Contact Medical Control for advice.
  - Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Congestive Heart Failure patients who have Blood Glucose > 250:**
  - Limit fluid boluses unless they have signs of volume depletion, dehydration, poor perfusion, hypotension, and/or shock.
- In extreme circumstances with no IV / IO access and no response to glucagon, D50 can be administered rectally.
  - Contact medical control for advice.

Dialysis / Renal Failure

History
- Peritoneal or Hemodialysis
- Anemia
- Catheter access noted
- Shunt access noted
- Hyperkalemia

Signs and Symptoms
- Hypotension
- Bleeding
- Fever
- Electrolyte imbalance
- Nausea and / or vomiting
- Altered Mental Status
- Seizure
- Arrhythmia

Differential
- Congestive heart failure
- Pericarditis
- Diabetic emergency
- Sepsis
- Cardiac tamponade

Cardiac Arrest → YES

P: **Calcium Gluconate 2 gm IV / IO (Or Calcium Chloride 1 gm IV / IO)**
Sodium Bicarbonate 50 mEq IV / IO

→ Exit to Appropriate Cardiac Protocol(s) ***as indicated***

NO

Shunt / Fistula Bleeding → YES

Apply firm finger tip pressure to bleeding site
Apply dressing but avoid bulky dressing
Dressing must not compress fistula / shunt as this will cause clotting of the shunt

NO

Blood Glucose Analysis Procedure
Diabetic Protocol AM 2 ***as indicated***
B: 12 Lead ECG Procedure
IV / IO Protocol UP 6
P: Cardiac Monitor
CHF / Pulmonary Edema Protocol AC 5 ***as indicated***

Beaufort County EMS see Destination Plan

NO

Systolic Blood Pressure < 90 → YES

A: **Isotonic Fluid Bolus 250 mL**
Repeat as needed
Maximum 1 L
If lungs remain clear

Hypotensive / Shock Protocol AM 5 ***as indicated***

NO

Peaked T Wave QRS ≥ 0.12 sec → YES

P: **Calcium Gluconate 2 gm IV / IO (Or Calcium Chloride 1 gm IV / IO)**
Sodium Bicarbonate 50 mEq IV / IO

NO

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Dialysis / Renal Failure

Pearls

- **Recommended exam: Mental status. Neurological. Lungs. Heart.**
- **Preferably transport to a medical facility capable of providing Dialysis treatment.**
- **Do not take Blood Pressure or start IV in extremity which has a shunt / fistula in place.**
- **Access of shunt indicated in the dead or near-dead patient only with no IV or IO access.**
- **If hemorrhage cannot be controlled with firm, uninterrupted direct pressure, application of tourniquet with uncontrolled dialysis fistula bleeding is indicated.**
- **Hemodialysis:**
  Process which removes waste from the blood stream and occurs about three times each week.
  Some patients do perform hemodialysis at home.
- **Peritoneal dialysis:**
  If patient complains of fever, abdominal pain, and / or back pain, bring the Peritoneal Dialysis fluid bag, which has drained from the abdomen, to the hospital.

Complications of Dialysis Treatment:

Hypotension:
Typically responds to small fluid bolus of 250 mL Normal Saline.
May result in angina, AMS, seizure or arrhythmia.

Filtration and decreased blood levels of some medications like some seizure medications:

Disequilibrium syndrome:
Shift of metabolic waste and electrolytes causing weakness, dizziness, nausea and / or vomiting and seizures.

Equipment malfunction:
Air embolism.
Bleeding.
Electrolyte imbalance
Fever.

- **Fever:**
  Consider sepsis in a dialysis patient with any catheter extending outside the body.
- Always consider Hyperkalemia in all dialysis or renal failure patients.
- Sodium Bicarbonate and Calcium Chloride / Gluconate should not be mixed. Ideally give in separate lines.
- Renal dialysis patients have numerous medical problems typically. Hypertension and cardiac disease are prevalent.

Hypertension

History
- Documented Hypertension
- Related diseases: Diabetes; CVA; Renal Failure; Cardiac Problems
- Medications for Hypertension
- Compliance with Hypertensive Medications
- Erectile Dysfunction medications
- Pregnancy

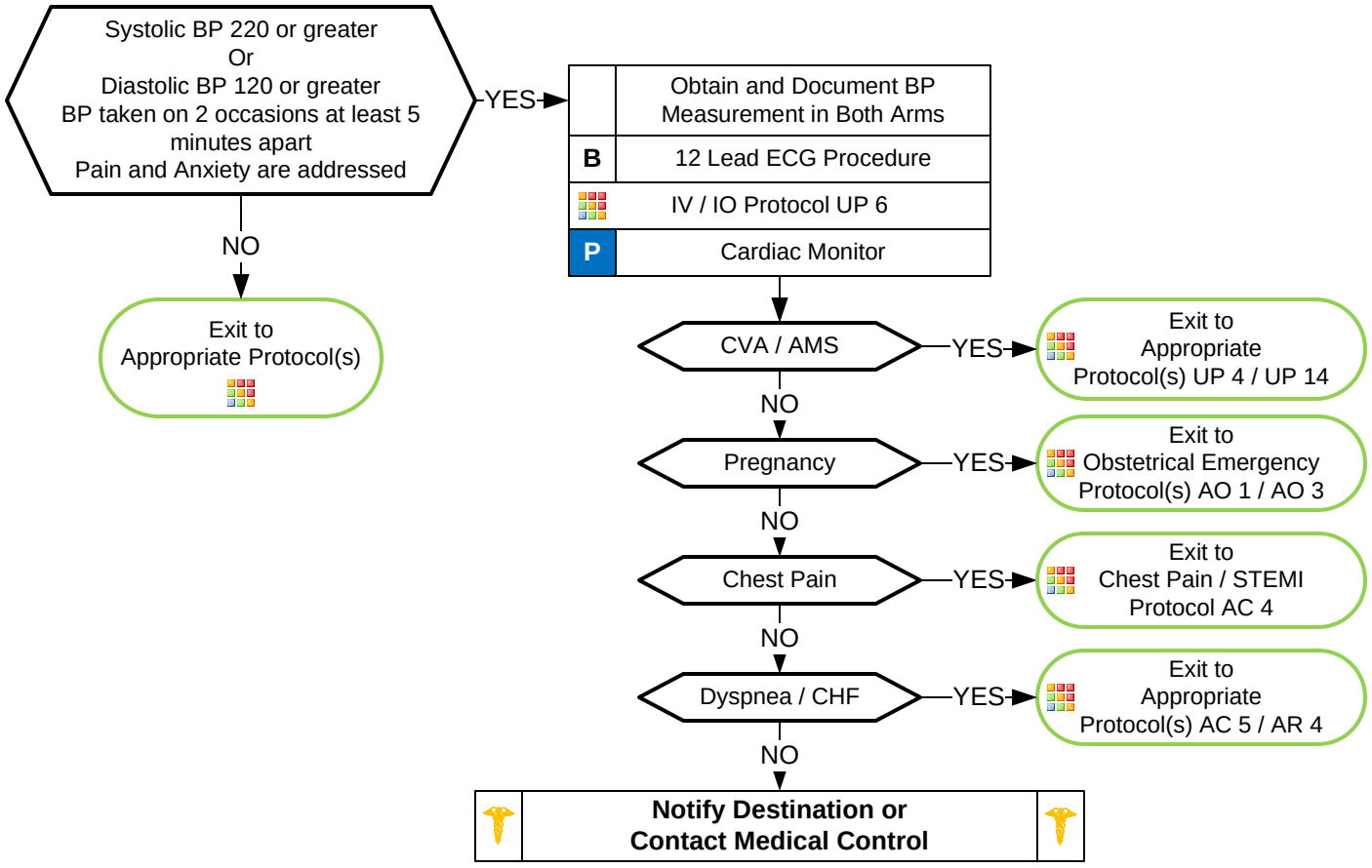
Signs and Symptoms

One of these
- Systolic BP 220 or greater
- Diastolic BP 120 or greater

AND at least one of these
- Headache
- Chest Pain
- Dyspnea
- Altered Mental Status
- Seizure

Differential
- Hypertensive encephalopathy
- Primary CNS Injury
  - Cushing's Response with Bradycardia and Hypertension
- Myocardial Infarction
- Aortic Dissection / Aneurysm
- Pre-eclampsia / Eclampsia

Hypertension is not uncommon especially in an emergency setting. Hypertension is usually transient and in response to stress and / or pain. A hypertensive emergency is based on blood pressure along with symptoms which suggest an organ is suffering damage such as MI, CVA or renal failure. This is very difficult to determine in the pre-hospital setting in most cases. Aggressive treatment of hypertension can result in harm. Most patients, even with significant elevation in blood pressure, need only supportive care. Specific complaints such as chest pain, dyspnea, pulmonary edema or altered mental status should be treated based on specific protocols and consultation with Medical Control.



Adult Medical Protocol Section

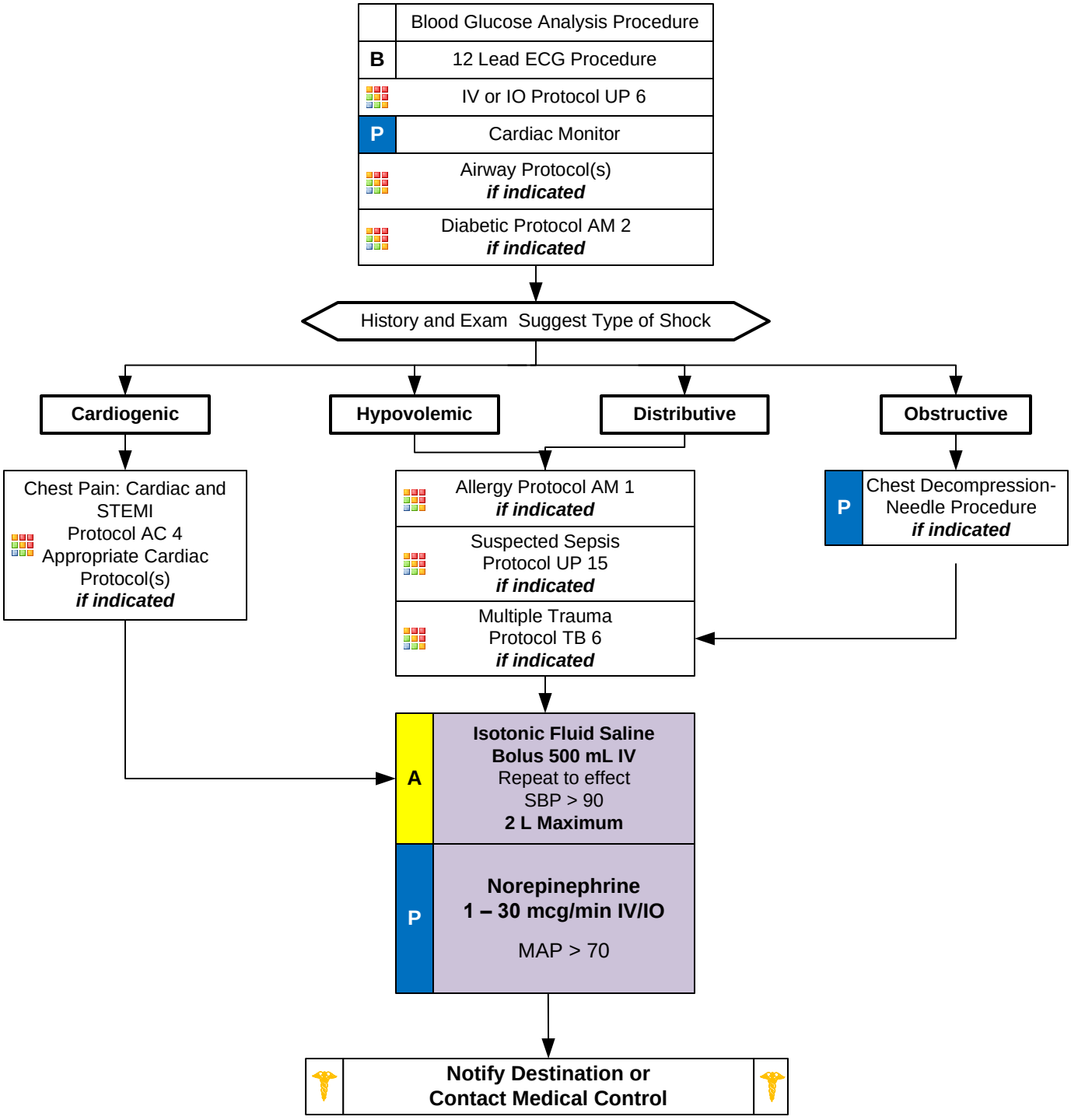
Pearls
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Elevated blood pressure is based on two to three sets of vital signs.
- Symptomatic hypertension is typically revealed through end organ dysfunction to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated at 30 degrees.
- Ensure appropriate size blood pressure cuff utilized for body habitus.

Hypotension / Shock

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

Signs and Symptoms
- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Tarry stools

Differential
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal
- Physiologic (pregnancy)
- Sepsis



Adult Medical Protocol Section

Hypotension / Shock

*Mix **4 mg** (4 ml) of **Norepinephrine** in **250 ml D5W or NS** => concentration of 16 mcg/ml*

**Use 60 gtt/mL drip set only

mcg/min	gtt/min (mL/hr	mcg/min	gtt/min (mL/hr	mcg/min	gtt/min (mL/hr
1	4 gtt/min	11	41 gtt/min	21	79 gtt/min
2	8 gtt/min	12	45 gtt/min	22	82 gtt/min
3	11 gtt/min	13	49 gtt/min	23	86 gtt/min
4	15 gtt/min	14	53 gtt/min	24	90 gtt/min
5	19 gtt/min	15	56 gtt/min	25	94 gtt/min
6	23 gtt/min	16	60 gtt/min	26	98 gtt/min
7	26 gtt/min	17	64 gtt/min	27	101 gtt/min
8	30 gtt/min	18	68 gtt/min	28	105 gtt/min
9	34 gtt/min	19	71 gtt/min	29	109 gtt/min
10	38 gtt/min	20	75 gtt/min	30	113 gtt/min

Adverse/Side Effects

Systemic: Ischemic injury due to potent vasoconstrictor action and tissue hypoxia.
Cardiovascular: Bradycardia, probably as a reflex result of a rise in blood pressure, arrhythmias, tachycardia
Nervous: Anxiety, transient headache.
Respiratory: Respiratory difficulty.
Skin and Appendages: Extravasation necrosis at injection site. Gangrene of extremities has been rarely reported.
Overdoses or conventional doses in hypersensitive persons (e.g., hyperthyroid patients) cause severe hypertension with violent headache, photophobia, stabbing retrosternal pain, pallor, intense sweating, and vomiting.

** Mix 1mg of Epinephrine 1:1,000 in a 250mL NS or D5W Bag (60gtt set)

mcg/min	gtt/min (mL/hr)
1	15 gtt/min
2	30 gtt/min
3	45 gtt/min
4	60 gtt/min
5	75 gtt/min
6	90 gtt/min
7	105 gtt/min
8	120 gtt/min
9	135 gtt/min
10	150 gtt/min

Push Dose Option for Epi:

1. Take a 10 ml syringe with 9 ml of normal saline
2. Into this syringe, draw up 1 ml of Epi 10,000**
   **(cardiac amp contains Epinephrine 100 mcg/ml)
3. Now you have 10 mL's of Epinephrine (10 mcg/ml)
   ***Dose: 0.2-1 ml every 1-5 minutes (2-10 mcg)

*May use Epi with Norepinephrine for additional BP support

Pearls

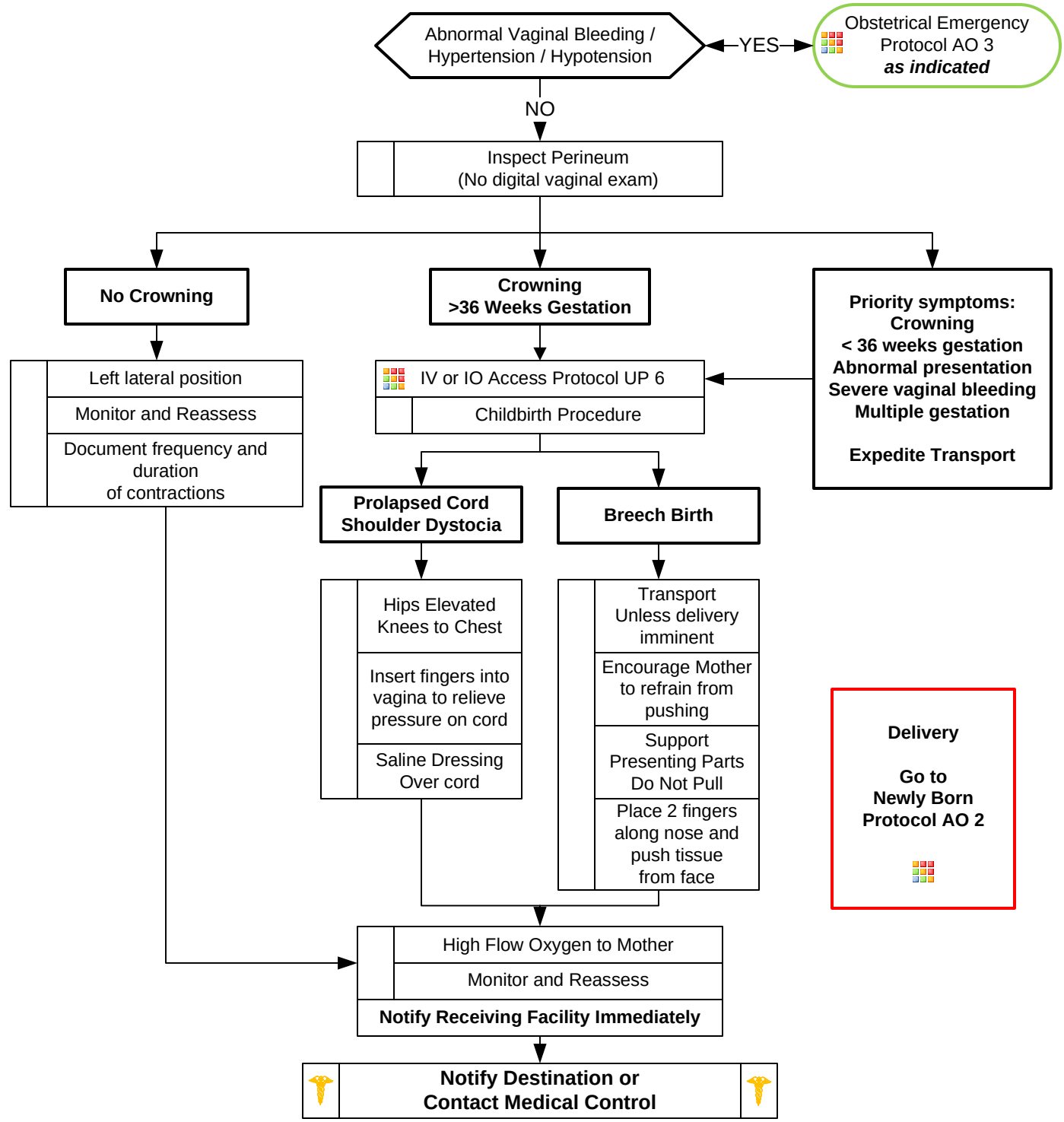
- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Hypotension can be defined as a systolic blood pressure of less than 90 or MAP <70. This is not always reliable and should be interpreted in context and patients typical BP if known.**
- **Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Hypovolemic Shock:**
  Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
  Tranexamic Acid (TXA):
  Agencies utilizing TXA must submit letters from the their receiving trauma centers for approval by the OEMS Medical Director.
  Receiving trauma centers must agree to continue TXA therapy with repeat dosing.
  TXA is NOT indicated and should NOT be administered where trauma occurred > 3 hours prior to EMS arrival. .
- **Cardiogenic Shock:**
  Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventrical / septum / valve / toxins.
- **Distributive Shock:**
  Sepsis / Anaphylactic / Neurogenic Toxins
  Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
- **Obstructive Shock:**
  Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
  Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency or Congenital Adrenal Hyperplasia:**
  Body cannot produce enough steroids (glucocorticoids / mineralocorticoids.)
  May have primary or secondary adrenal disease, congenital adrenal hyperplasia, or more commonly have stopped a steroid like prednisone. Injury or illness may precipitate.
  Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain.
  If suspected Paramedic should give Methylprednisolone 125 mg IM / IV / IO or Dexamethasone 10 mg IM / IV / IO. Use steroid agent specific to your drug list.
  May administer prescribed steroid carried by patient IM / IV / IO. Patient may have Hydrocortisone (Cortef or Solu-Cortef). Dose: < 1y.o. give 25 mg, 1-12 y.o. give 50 mg, and > 12 y.o. give 100 mg or dose specified by patient's physician.

Childbirth/ Labor

History
- Due date
- Time contractions started / how often
- Rupture of membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Medications
- Gravida / Para Status
- High Risk pregnancy

Signs and Symptoms
- Spasmodic pain
- Vaginal discharge or bleeding
- Crowning or urge to push
- Meconium

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



Adult Obstetrical Protocol Section

Childbirth/ Labor

Pearls

- **Recommended Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro**
- **Record APGAR at 1 minute and 5 minutes after birth. Do not delay resuscitation to obtain APGAR.**
- **If neonate requiring resusciation, move quickly to AO 2 Newly Born Protocol**
- **After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.**
- **Tranexamic Acid (TXA):**
  Postpartum hemorrhage: NOT indicated and should NOT be administered where birth occurred > 3 hours prior to EMS arrival.
- **Transport or Delivery?**
  Decision to transport versus remain and deliver is multifactorial and difficult. Generally it is preferable to transport. Factors that will impact decision include: number of previous deliveries; length of previous labors; frequency of contractions; urge to push; and presence of crowning.

Apgar score

	Score 2	Score 1	Score 0
Appearance	Pink	Extremities blue	Pale or blue
Pulse	> 100 bpm	< 100 bpm	No pulse
Grimace	Cries and pulls away	Grimaces or weak cry	No response to stimulation
Activity	Active movement	Arms, legs flexed	No movement
Respiration	Strong cry	Slow, irregular	No breathing

- **Maternal positioning for labor:**
  Supine with head flat or elevated per mother's choice. Maintain flexion of both knees and hips. Elevated buttocks slightly with towel. If delivery not imminent, place mother in the left, lateral recumbent position with right side up about 10 – 20°.
- **Umbilical cord clamping and cutting:**
  Place first clamp about 10 cm from infant's abdomen and second clamp about 5 cm away from first clamp.
- **Multiple Births:**
  Twins occur about 1/90 births. Typically manage the same as single gestation. If imminent delivery call for additional resources, if needed. Most twins deliver at about 34 weeks so lower birth weight and hypothermia are common. Twins may share a placenta so clamp and cut umbilical cord after first delivery. Notify receiving facility immediately.
- Document all times (Contraction onset, contraction duration and frequency, delivery, APGAR 1 and 2, and placenta delivery).
- If maternal seizures occur, refer to the Obstetrical Emergencies Protocol.
- Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.

Newly Born

History
- Due date and gestational age
- Multiple gestation (twins etc.)
- Meconium / Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors such as substance abuse or smoking

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

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

In a non-vigorous infant whose respirations are not improving after warming, drying, and stimulating within 30 seconds, move quickly to Positive Pressure Ventilation with BVM

Breathing or Crying?
Term Gestation?
Good Muscle Tone?

ALL YES →
- **Warm, Dry, and Stimulate infant**
- **Infant with mother if possible *(skin-to-skin)***
- **Maintain normal temperature**
- Bulb suction airway only if needed
- Monitor and Reassess
- **Notify Destination or Contact Medical Control**

ANY NO ↓

- **Warm, Dry and Stimulate**
- **Bulb suction airway if needed**
- ***If not breathing within 30 seconds move quickly to next step: BVM***

Agonal breathing or Apnea?
Or
Heart Rate < 100 / min
Or
Labored breathing/ Persistent cyanosis
If not improving within 30 seconds move quickly to next step

YES →
- Position and clear airway if necessary
- **BVM Ventilations with or without O_2**
- **Ventilation Rate: 40 – 60 breaths/ minute**
- **B** Pulse Oximetry Right Hand
- **P** Cardiac Monitor 3 or 4 – Lead

Heart Rate < 100

YES →
- Check chest movement
- Change airway position
- Change BVM Technique
- **Add O_2 if not already providing**
- Pediatric Airway Protocol(s) AR 5, 6 ***if no improvement***

NO ↓

Heart Rate < 60

YES →
- **Chest Compressions *See Pearls***
- ***Compression 1:2:3 and BVM breath; repeat***
- Pediatric Airway Protocol(s) AR 5, 6
- IV or IO Access Protocol UP 6
- **A** **Epinephrine 1:10,000**
- **0.01 mg /kg IV / IO**
- Every 3 to 5 minutes as needed
- **A** **Normal Saline Bolus**
- **10 mL / kg IV / IO**
- If not responding to epinephrine
- *May repeat x 1*
- Blood Glucose Analysis Procedure
- **A** **<u>Blood Glucose < 40 mg/dL</u>**
- **Administer 2 mL/kg of D10 IV / IO**
- Repeat as needed CBG ≥ 40 mg/dL

NO ↓

- ***Supplemental Oxygen***
- ***(See Pearls for expected SpO_2)***
- Maintain warmth
- Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Obstetrical Protocol Section

Newly Born

Pearls

- **Recommended Exam: Quality of Cry, Muscle tone, Respirations, Heart Rate, Pulse Oximetry, and Gestational Age**
- **Majority of newborns do not require resuscitation, only warming, drying, stimulating, and cord clamping.**
  - **With term gestation, strong cry/ breathing, and good muscle tone, generally will not need resuscitation.**
  - **If no resuscitation needed, skin-to-skin contact with the mother is best way to maintain warmth of infant.**
  - **Maintain warmth of infant following delivery adjuncts; cap/ hat, plastic wrap, thermal mattress, radiant heat.**
  - **Most important vital signs in the newly born are heart rate, respirations, and respiratory effort.**
  - **About 10% of newborns need assistance to help them start breathing after birth.**
  - **About 1% of newborns require intensive resuscitation to restore/ support cardiorespiratory functions.**
- **Airway:**
  - **Positive Pressure Ventilations with BVM is the most important treatment in a newborn with poor respirations and/ or persistent bradycardia (HR < 100 BPM).**
  - **When BVM is needed, ventilation rate is 40 – 60 breaths per minute.**
  - **Adequacy of ventilation/ is measured mainly by increase in heart rate as well as chest rise.**
  - **If heart rate or respirations are not improving after 30 to 60 seconds of resuscitation, place BIAD or endotracheal tube.**
  - **Routine suctioning is no longer recommended, bulb suction only if needed.**
- **Breathing:**
  - **Oxygen is not necessary initially, but if infant is not responding with increased heart rate or adequate breathing, add oxygen to the BVM.**
- **Circulation/ Compressions:**
  - **Heart rate is critical during first few moments of life and is best monitored by 3 or 4 lead ECG, as pulse assessment is difficult in the neonate. Heart Rate is best tool for gauging resuscitation success.**
  - **If heart rate remains < 60 BPM after 30 to 60 seconds of BVM/ resuscitation, begin compressions.**
  - **With BIAD or ETT in place, compressions and ventilation should be coordinated with compression, compression, compression, then ventilation. (3:1 ratio with all events totaling 120 per minute)**
  - **2-thumbs encircling chest and supporting the back is recommended. Limit interruptions of chest compressions.**
- **If infant not responding to BVM, compressions, and/ or epinephrine, consider hypovolemia, pneumothorax, and/ or hypoglycemia (< 40 mg/dL).**
- **Document 1 and 5 minute APGAR in PCR or ePCR. DO NOT delay or interrupt resuscitation to obtain an APGAR score.**
- **Meconium staining:**
  - **Infant born through meconium staining who is NOT vigorous:**
  - **Bulb suction mouth and nose and provide positive pressure ventilation.**
  - **Direct endotracheal suctioning is no longer recommended.**
- **Expected Pulse Oximetry readings following birth:**
  - ***(Accurate only in infant NOT requiring resuscitation)***
  - **1 minute 60 – 65%**
  - **2 minutes 65 – 70%**
  - **3 minutes 70 – 75%**
  - **4 minutes 75 – 80%**
  - **5 minutes 80 – 85%**
  - **10 minutes 85 – 95%**
- Pulse oximetry should be applied to the right upper arm, wrist, or palm.
- Cord clamping:
  - Recommended to delay for 1 minute, unless infant requires resuscitation.
- Maternal sedation or narcotics will sedate infant (Naloxone NO LONGER recommended, use supportive care only).
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline) or **D10 solution at 2 mL/kg IV / IO.**
- **In the NEONATE, D10 is administered at 2 mL/kg.** *(NOT 5 mL/kg in the pediatric patient after the first month of life.)*

Apgar score

	Score 2	Score 1	Score 0
Appearance	Pink	Extremities blue	Pale or blue
Pulse	> 100 bpm	< 100 bpm	No pulse
Grimace	Cries and pulls away	Grimaces or weak cry	No response to stimulation
Activity	Active movement	Arms, legs flexed	No movement
Respiration	Strong cry	Slow, irregular	No breathing

Obstetrical Emergency

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

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

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

Known or Suspected Pregnancy
Missed Period
Vaginal Bleeding
Abdominal Pain

YES

- Left lateral recumbant position
- Blood Glucose Analysis Procedure
- IV / IO Protocol UP 6
- P — Cardiac Monior
- Abdominal Pain Vomiting and Diarrhea Protocol UP 3 **if indicated**
- Diabetic Protocol AM 2 / PM 2 **if indicated**
- Hypotension / Shock Protocol AM 5 / PM 3 **if indicated**

NO

Exit to Appropriate Protocol(s)

Seizure Activity

YES

- P — **Magnesium Sulfate 4 g IV / IO drip over 2-3 minutes per drug infusion label, or Slow IV push if infusion bag unavailable For persistent seizure after 5-10 min, May repeat Magnesium Sulfate 2g**
- P — **MAGNESIUM is the PRIORITY for PREGNANT SEIZURE. IN ADDITION, if patient is seizing upon EMS Arrival, give Midazolam 10mg IM x 1; do not wait to obtain IV or IO access to give Midazolam**

  If patient begins seizing with EMS, give Midazolam 2.5 mg IV/IO/IM/IN in addition to Magnesium
  May repeat every 3 to 5 minutes for continued seizure activity to **Max 20 mg**

NO

- Childbirth / Labor Protocol AO 1 **if indicated**
- Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Obstetric Protocol Section

Obstetrical Emergency

Pearls

- **Recommended Exam: Mental Status, Abdomen, Heart, Lungs, Neuro**
- **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access.**
- **Magnesium Sulfate should be administered as quickly as possible. May cause hypotension and decreased respiratory drive, but typically in doses higher than 6 g.**
- **Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks generally require 4 to 6 hours of fetal monitoring. DO NOT suggest the patient needs an ultrasound.**
- **Ectopic pregnancy:**
  Implantation of fertilized egg outside the uterus, commonly in or on the fallopian tube. As fetus grows, rupture may occur. Vaginal bleeding may or may not be present. Many women with ectopic pregnancy do not know they are pregnant. Usually occurs within 5 to 10 weeks of implantation. Maintain high index of suspicion with women of childbearing age experiencing abdominal pain.
- **Preeclampsia:**
  Occurs in about 6% of pregnancies. Defined by hypertension and protein in the urine. RUQ pain, epigastric pain, N/V, visual disturbances, headache, and hyperreflexia are common symptoms.
  In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
  Risk factors: < 20 years of age, first pregnancy, multigestational pregnancy, gestational diabetes, obesity, personal or family history of gestational hypertension.
- **Eclampsia:**
  Seizures occurring in the context of preeclampsia. Remember, women may not have been diagnosed with preeclampsia.
- Maintain patient in a left lateral position, right side up 10 - 20° to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour.

Adult Airway

Assess Respiratory Rate, Effort, Oxygenation
Is Airway/ Breathing Adequate?

YES → Supplemental oxygen
Goal oxygen saturation ≥ 92%
Exit to
Appropriate Protocol(s)

NO

Basic Maneuvers First
-open airway chin lift/ jaw thrust
-nasal and/ or oral airway(s)
-Bag-valve mask (BVM) +/- PEEP

Spinal Motion Restriction
Procedure/ Protocol TB 8
if indicated

Altered Mental Status Protocol UP 4
if indicated

Respiratory Distress with a
Tracheostomy Tube
Protocol AR 10
if indicated

Capnography Monitoring

- **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube.**
- **EtCO2 monitoring is mandatory following placement of a BIAD once available on scene.**

Protocols AR 1, 2, and 3 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

Airway Obstructed

YES →
- Airway Foreign Body Obstruction Procedure
- A: Direct Laryngoscopy ***Optional***
- P: Airway Cricothyrotomy Surgical Procedure ***if indicated***

NO

Breathing/ Oxygenation
Support needed?

YES →
- Supplemental Oxygen
  BVM
  Maintain
  Oxygen Saturation ≥ 92 %
- B: Consider Airway NIPPV Procedure
- B: Airway BIAD Procedure ***if indicated***
- A: Oral/ Nasotracheal Intubation Procedure ***Optional***
- P: Chest Decompression Procedure ***if indicated***
- P: Consider Airway Drug Assisted Protocol AR 3 ***if available***
- P: Post-intubation/ BIAD Management Protocol AR 8 ***if indicated***

NO →
Monitor / Reassess
Supplemental Oxygen
if indicated

Exit to
appropriate protocol(s)

Failed Airway:

Unable to Ventilate
and Oxygenate ≥ 90% during
or after one (1) or more
unsuccessful intubation
attempts

and/ or
Anatomy inconsistent with
continued attempts

and/ or
Three (3) unsuccessful
attempts by most experienced
Paramedic/ AEMT.

Exit to
Adult Failed Airway Protocol
AR 2

Notify Destination or
Contact Medical Control

Airway Respiratory Protocol Section

Adult Airway

Pearls

- **See Pearls section of protocols AR 2 and 3.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **Ventilation rate should be 10 - 12 per minute to maintain a EtCO2 of 35 – 45 and avoid hyperventilation.**
- **Anticipating the Difficult Airway and Airway Assessment**
  - **Difficult BVM Ventilation (ROMAN): R**adiation treatment/ **R**estriction; **O**bese/ **O**bstruction/ **O**B – 2d and 3d trimesters/ **O**bstructive sleep apnea; **M**ask seal difficulty (hair, secretions, trauma); **A**ge ≥ 55; **N**o teeth.
  - **Difficult Laryngoscopy (LEON): L**ook externally for anatomical problems; **E**valuate 3-3-2 (Mouth opening should equal 3 of patients finger's width, mental area to neck should equal 3 of patient's finger's width, base of chin to thyroid prominence should equal 2 of patients finger's width); **O**bese, obstruction, OB – 2d and 3d trimesters; **N**eck mobility limited.
  - **Difficulty BIAD (RODS): R**adiation treatment/ **R**estriction; **O**bese/ **O**bstruction/ **O**B – 2d and 3d trimesters/ **O**bstructive sleep apnea; **D**istorted or disrupted airway; **S**hort thyromental distance/ **S**mall mandible.
  - **Difficulty Cricothyrotomy / Surgical Airway (SMART): S**urgery scars**; M**ass or hematoma**, A**ccess or anatomical problems**; R**adiation treatment to face, neck, or chest; **T**umor.
- **Complete an Airway Evaluation Form with any BIAD or Intubation procedure where medications are used to facilitate.**
- **Nasotracheal intubation:**
  - **Procedure requires spontaneous breathing and may require considerable time, exposing patient to critical desaturation.**
  - **Contraindicated in combative, anatomically disrupted or distorted airways, increased ICP, severe facial trauma, basal skull fracture, and head injury. Orotracheal route is preferred.**
- **Intubation attempt defined as laryngoscope blade passing the teeth or endotracheal tube passed into the nostril.**
- **If First intubation attempt fails, make an adjustment and try again: (Consider change of provider in addition to equipment).**
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Gastric tube placement should be considered in all intubated patients if available or time allows.
- It is important to secure the endotracheal tube well to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Adult, Failed Airway

Definition of Failed Airway:
Unable to Ventilate and Oxygenate ≥ 90% during
or after one (1) or more unsuccessful intubation attempts

and/ or
Anatomy inconsistent with continued attempts

and/ or
Three (3) unsuccessful attempts by most experienced Paramedic/AEMT.
Each attempt should include change in approach or equipment

NO MORE THAN THREE (3) ATTEMPTS TOTAL

Capnography Monitoring

- **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube.**
- **EtCO2 monitoring is mandatory following placement of a BIAD once available on scene.**

Protocols AR 1, 2, and 3 should be utilized together (even if agency is not using Drug Assisted Airway as they contain useful information for airway management.

Failed Airway

Call for additional resources if available

BVM
Adjunctive Airway NPA/ OPA
Maintains
Oxygen Saturation ≥ 92 %

YES → Continue BVM
Supplemental Oxygen

Exit to
Appropriate Protocol(s)

NO

B	Attempt Airway Blind Insertion Airway Device Procedure
A	Airway Video Laryngoscopy Device Procedure ***if available*** ***Optional***
P	Airway Cricothyrotomy Surgical Procedure
	Supplemental oxygen BVM with Airway Adjuncts Maintain Oxygen Saturation ≥ 92 %
	Post-intubation BIAD Management Protocol AR 8

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Adult, Failed Airway

Pearls

- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **Ventilation rate should be 10 - 12 per minute to maintain a EtCO2 of 35-45 and avoid hyperventilation.**
- **Anticipating the Difficult Airway and Airway Assessment**
  - **Difficult BVM Ventilation (ROMAN): R**adiation treatment/ **R**estriction; **O**bese/ **O**bstruction/ **O**B – 2d and 3d trimesters/ **O**bstructive sleep apnea; **M**ask seal difficulty (hair, secretions, trauma); **A**ge ≥ 55; **N**o teeth.
  - **Difficult Laryngoscopy (LEON): L**ook externally for anatomical problems; **E**valuate 3-3-2 (Mouth opening should equal 3 of patients finger's width, mental area to neck should equal 3 of patient's finger's width, base of chin to thyroid prominence should equal 2 of patients finger's width); **O**bese, obstruction, OB – 2d and 3d trimesters; **N**eck mobility limited.
  - **Difficulty BIAD (RODS): R**adiation treatment/ **R**estriction; **O**bese/ **O**bstruction/ **O**B – 2d and 3d trimesters/ **O**bstructive sleep apnea; **D**istorted or disrupted airway; **S**hort thyromental distance/ **S**mall mandible.
  - **Difficulty Cricothyrotomy / Surgical Airway (SMART): S**urgery scars**; M**ass or hematoma**, A**ccess or anatomical problems**; R**adiation treatment to face, neck, or chest; **T**umor
- **Complete an Airway Evaluation Form with any BIAD or Intubation procedure where medications are used to facilitate.**
- **Nasotracheal intubation:**
  - **Procedure requires spontaneous breathing and may require considerable time, exposing patient to critical desaturation.**
  - **Contraindicated in combative, anatomically disrupted or distorted airways, increased ICP, severe facial trauma, basal skull fracture, and head injury. Orotracheal route is preferred.**
- **Intubation attempt defined as laryngoscope blade passing the teeth or endotracheal tube passed into the nostril.**
- **If First intubation attempt fails, make an adjustment and try again: (Consider change of provider in addition to equipment)**
- AEMT and Paramedics should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Gastric tube placement should be considered in all intubated patients if available or time allows.
- It is important to secure the endotracheal tube well to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves/ transfers.
- **DOPE: D**isplaced tracheostomy tube/ ETT, **O**bstructed tracheostomy tube/ ETT, **P**neumothorax and **E**quipment failure.

Airway, Drug Assisted
(*OPTIONAL*)

Indications for Drug Assisted Airway
Failure to protect the airway
and/or
Unable to oxygenate
and/or
Unable to ventilate
and/or
Impending airway compromise

Capnography Monitoring
- **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube.**
- **EtCO2 monitoring is mandatory following placement of a BIAD once available on scene.**

Protocols AR 1, 2, 3, 5, and 6 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

Preoxygenate 100% O2

IV or IO Access Protocol UP 6
2 points of access

P — Assemble Airway Equipment
Suction equipment
Alternative Airway Device

Hypoxic Or
Hypotensive Or
Dangerously Combative?

YES →

P — **Ketamine 2 mg/kg IV / IO**

No IV or IO Access:
Ketamine 4 mg/kg IM
Maximum 400 mg

Pediatric: *See Pearls*
2 mg/kg IM
Maximum 400 mg

Correct Hypoxia and/ or Hypotension

Age Appropriate Airway Protocol(s) AR 1, 2, 5, 6, ***as indicated***

Hypotension/ Shock Protocol AM 5/ PM 3 ***as indicated***

Hypoxia corrected
Hypotension corrected
Dangerously Combative condition corrected

Patient still requires intubation

YES →

NO

NO ↓

P — **Etomidate 0.3 mg/kg IV / IO**
Or
Ketamine 2 mg/kg IV / IO
May repeat x 1

P — **Succinylcholine 2 mg/kg IV / IO**
Or
Rocuronium 1 mg/kg IV / IO
(if Succinylcholine contraindicated)
May repeat x 1

Intubate trachea

Placement Verified
Continuous Waveform Capnography

Consider Restraints Physical Procedure

P — Consider Gastric Tube Insertion Procedure

Awakening or Moving after intubation

NO → Exit to Appropriate Protocol(s)

YES

Exit to Post-intubation/ BIAD Management Protocol AR 8

Procedure will remove patient's protective airway reflexes and ability to breath.

You must be sure of your ability to intubate before beginning this procedure.

Must have two (2) Paramedics on scene

Red Text
Key performance indicators used to evaluate protocol compliance.

A NCOEMS Airway Evaluation Form must be completed for every patient who receives Drug Assisted Airway.

Airway Respiratory Protocol Section

Airway, Drug Assisted
(*OPTIONAL*)

Pearls

- **Agencies must maintain a separate Performance Improvement Program specific to Drug Assisted Airway.**
- **This procedure requires at least 2 Paramedics. See Pearls section of protocols AR 1 and 2.**
- **For the purposes of this protocol, a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **Ventilation rate:**
  - **30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 10 - 12 per minute.**
  - **Maintain EtCO2 between 35 - 45 and avoid hyperventilation.**
- **Hypoxia and/ or Hypotension:**
  - **Increased risk of cardiac arrest when a sedative with paralytic medications are administered while hypoxic and/ or hypotensive.**
  - **Resuscitation and correction of hypoxia and/ or hypotension are paramount prior to use of these combined agents.**
  - **Ketamine administration allows time for appropriate resuscitation of hypoxia and/or hypotension while managing the airway.**
- **Ketamine for airway intervention and/ or sedation purposes:**
  - **Ketamine may be used in pediatric patients (fit within a Pediatric Medication/ Skill Resuscitation System product, ≤ 15 years of age, or ≤ 49 kg) with DIRECT ONLINE MEDICAL ORDER by the system MEDICAL DIRECTOR or ASSISTANT MEDICAL DIRECTOR only.**
  - **Agencies using Ketamine in the pediatric population must also be using in their adult population.**
- **KETAMINE:**
  - **Ketamine may be used with or without a paralytic agent in conjunction with either an OPA, NPA, BIAD or endotracheal tube. (BIAD is preferred over endotracheal tube until hypoxia and/ or hypotension are corrected).**
  - **Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management. Once hypoxia and hypotension are corrected, use of a sedative and paralytic can proceed if indicated.**
  - **Ketamine may be used in the dangerously combative patient requiring airway management IM. IV/ IO should be established as soon as possible.**
  - **Ketamine may be used for sedation once a BIAD or endotracheal tube are established and confirmed.**
  - **Agencies using Ketamine must follow Standards Policy: Medial Policy Section Ketamine Program Requirements. Medical Policy 2.**
- **Intubation attempt defined as laryngoscope blade passing the teeth or endotracheal tube passed into the nostril.**
- **If First intubation attempt fails, make an adjustment and try again: (Consider change of provider in addition to equipment)**
- **NC EMS Airway Evaluation Form:**
  - **Fully complete and have receiving healthcare provider sign confirming BIAD or endotracheal tube placement.**
  - **Complete online in region specific *ReadyOp* and upload completed form.**
  - **Complete when Ketamine, Etomidate, Succinylcholine and/ or Rocuronium or used to facilitate use of a BIAD and/ or endotracheal intubation.**
- Paramedics/ AEMT should consider using a BIAD if endotracheal intubation is unsuccessful.
- Drug Assisted Airway is not recommended in an urban setting (short transport) when able to maintain oxygen saturation ≥ 90 %.
- **DOPE: D**isplaced tracheostomy tube/ ETT, **O**bstructed tracheostomy tube/ ETT, **P**neumothorax and **E**quipment failure.

Adult COPD/ Asthma Respiratory Distress

History
- Asthma; COPD -- chronic bronchitis, emphysema, congestive heart failure
- Home treatment (oxygen, nebulizer)
- Medications (theophylline, steroids, inhalers)
- Toxic exposure, smoke inhalation

Signs and Symptoms
- Shortness of breath
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing, rhonchi
- Use of accessory muscles
- Fever, cough
- Tachycardia

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

	Adult Airway Protocol(s) ***as indicated***
	Adult Allergic Reaction/ Anaphylaxis Protocol AM 1 ***as indicated***
B	12 Lead ECG Procedure
	IV or IO Access Protocol UP 6
P	Cardiac Monitor

Following Assessment

WHEEZING

B	**Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3

STRIDOR

B	**Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3
A	**Epinephrine Nebulizer 1 mg (1:1000) / 2 mL NS** May repeat x 1

	Adult Airway Protocol(s) ***as indicated***
B	Airway NIPPV Procedure
A	**Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg (DuoNeb)** Repeat as needed x 3 ***if indicated***
A	Consider **Epinephrine 1:1000 0.3 – 0.5 mg IM**
P	**Methylprednisolone 125 mg IV / IO / IM**
P	**Magnesium Sulfate 2g IV / IO** Infuse over 10 – 20 minutes

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Adult COPD/ Asthma Respiratory Distress

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **This protocol includes all patients with respiratory distress, COPD, Asthma, Reactive Airway Disease, or bronchospasm.**
- **Patients may also have wheezing and respiratory distress with viral upper respiratory tract infections and pneumonia.**
- **Pulse oximetry should be monitored continuously and consider End-tidal CO_2 monitoring if available.**
- **Combination nebulizers containing albuterol and ipratropium (DuoNeb):**
  - **Patients may require more than 3 nebulizer treatments, treatments should continue until improvement.**
  - **Following 3 combination nebulizers (DuoNeb), it is preferable to continue albuterol solely with subsequent treatments as there is no proven benefit to continual use of ipratropium.**
- **Epinephrine:**
  - **If allergic reaction or anaphylaxis is suspected, give immediately and repeat until improvement.**
  - **If allergic reaction is not suspected, administer with failure to improve and/ or impending respiratory failure.**
- **Consider Magnesium Sulfate with no improvement and/ or impending respiratory failure. Likely more effective with asthmatic exacerbation and less so with COPD exacerbation.**
- **Non-Invasive Positive Pressure Ventilation (NIPPV: CPAP or Bi-Level/ BiPap):**
  - **May be used with COPD, Asthma, Allergic reactions, and/ or CHF.**
  - **Consider early in treatment course.**
  - **Consider removal if SBP remains < 100 mmHg and not responding to other treatments.**
- In patients using levalbuterol (Xopenex) you may use Albuterol for the first treatment then use the patient's supply for repeat nebulizers or agency's supply.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **EMR/ EMT:**
  - **The use of Epinephrine IM is limited to the treatment of anaphylaxis and may be given only by autoinjector,** unless manual draw-up is approved by the Agency Medical Director and the NC office of EMS.
  - **Administration of diphenhydramine is limited to the oral route only**.
- **EMT administration of beta-agonist is limited to only patients currently prescribed the medication,** unless approved by the Agency Medical Director and the NC office of EMS.
- Agency Medical Director may require contact of medical control prior to EMT/ EMR administering any medication(s).

Pediatric Airway

Assess Respiratory Rate, Effort, Oxygenation
Is Airway / Breathing Adequate?

YES → Supplemental oxygen
Goal oxygen saturation ≥ 90%
Preferably ≥ 94%

Exit to Appropriate Protocol(s)

NO

Basic Maneuvers First
-open airway chin lift / jaw thrust
-nasal or oral airway
-Bag-valve mask (BVM)

Spinal Motion Restriction Procedure / Protocol TB 8 ***if indicated***

Consider AMS Protocol UP 4

Respiratory Distress with a Tracheostomy Tube Protocol AR 10 ***if indicated***

Capnography Monitoring

- **End-tidal (EtCO2) monitoring is mandatory following placement of a BIAD once available on scene.**

Protocols AR 3, 5, and 6 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

Airway Obstructed → YES

- Airway Foreign Body Obstruction Procedure
- **B** Pediatric BIAD

NO

Breathing / Oxygenation Support needed → YES

- Supplemental Oxygen
  BVM
  Maintain
  Oxygen Saturation ≥ 90 %
  Preferably ≥ 94 %
- **B** Airway BIAD Device Procedure ***if indicated***

NO

Monitor /Reassess Supplemental Oxygen ***if indicated***

Exit to Appropriate Protocol(s)

Unable to Ventilate and Oxygenate ≥ 90% during or after one (1) or more unsuccessful airway attempts .
and/or
Anatomy inconsistent with continued attempts.
and/or
Three (3) unsuccessful attempts by most experienced Paramedic/AEMT.

Exit to Pediatric Failed Airway Protocol AR 6

P

- Chest Decompression Procedure ***if indicated***
- Consider Airway Drug Assisted Protocol AR 3 ***if available***
- Post-intubation / BIAD Management Protocol AR 8 ***if indicated***

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Pediatric Airway

Pearls

- **This protocol is for use in patients who FIT within a Pediatric Medication/Skill Resuscitation System Product.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **Ventilation rate:**
  - **30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8 - 10 per minute.**
  - **Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **Ketamine:**
  - **May be used during airway management of patients who FIT within a Pediatric Medication/Skill Resuscitation System product with a DIRECT, ONLINE MEDICAL ORDER, by the system MEDICAL DIRECTOR OR ASSISTANT MEDICAL DIRECTOR ONLY.**
  - **Systems using Ketamine in the pediatric population must also be using in their adult population.**
- **Agencies utilizing Ketamine must submit a local systems plan to State Medical Director detailing how the drug is used in your program.**
  - **Ketamine may be used within this protocol only WITHOUT a paralytic agent in conjunction with either a OP, NP, BIAD or endotracheal tube.**
  - **Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management.**
  - **Ketamine may be used in the dangerously combative patient requiring airway management IM. IV / IO should be established as soon as possible.**
  - **Ketamine may NOT be used for purposes of sedation only – it must be used only during airway management procedures.**
- **Capnography Monitoring (EtCO2):**
  - **Continuous Waveform and Pulse Oximetry are required for BIAD ventilation verification and ongoing patient monitoring (Not validated and may prove impossible in the neonatal population - verification by two (2) other means is recommended in this population.) Capnography verification and monitoring is required for BIAD verification and monitoring once available on scene.**

Pediatric Failed Airway

Definition of Failed Airway:

- Unable to Ventilate and Oxygenate ≥ 90% during or after one (1) or more unsuccessful intubation attempts.

and/ or

- Anatomy inconsistent with continued attempts.

and/ or

- Three (3) unsuccessful attempts by most experienced Paramedic/ AEMT.

Each attempt should include change in approach or equipment

NO MORE THAN THREE (3) ATTEMPTS TOTAL

Call for additional resources if available

Failed Aiway

BVM
Adjunctive Airway NP/ OP
Maintains
Oxygen Saturation ≥ 92%

YES → Continue BVM
Supplemental Oxygen

Exit to
Appropriate
Protocol(s)

NO

A Airway Video Laryngoscopy Device Procedure ***if available*** ***Optional***

B Attempt
Airway Blind Insertion Airway Device Procedure

P Airway Cricothyrotomy Needle Procedure **See Pearls Section**

BIAD / Cricothyrotomy
Successful
Or
Oxygenation / Ventilation
Adequate

YES → Exit to
Post-intubation/
BIAD Management
Protocol AR 8

NO

Capnography Monitoring

- **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube.**
- **EtCO2 monitoring is mandatory following placement of a BIAD once available on scene.**

Protocols AR 3, 5, and 6 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

Supplemental oxygen
BVM with Airway Adjuncts
Maintain Oxygen Saturation ≥ 92%

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Pediatric Failed Airway

Pearls

This protocol is for use in patients who FIT within a Pediatric Medication/ Skill Resuscitation System Product.

- **For the purposes of this protocol, a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **Ventilation rate:**
  - **30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 10 - 12 per minute. Maintain EtCO2 between 35 - 45 and avoid hyperventilation.**
- **Ketamine for airway intervention and/ or sedation purposes:**
  - **Ketamine may be used in pediatric patients (fit within a Pediatric Medication/Skill Resuscitation System product, ≤ 15 years of age, or ≤ 49 kg) with DIRECT ONLINE MEDICAL ORDER by the system MEDICAL DIRECTOR or ASSISTANT MEDICAL DIRECTOR only.**
  - **Agencies using Ketamine in the pediatric population must also be using in their adult population.**
- **KETAMINE:**
  - **Ketamine may be used with or without a paralytic agent in conjunction with either an OPA, NPA, BIAD or endotracheal tube. BIAD is preferred over endotracheal tube until hypoxia and/ or hypotension are corrected.**
  - **Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management. Once hypoxia and hypotension are corrected, use of a sedative and paralytic can proceed if indicated.**
  - **Ketamine may be used in the dangerously combative patient requiring airway management IM. IV/ IO should be established as soon as possible.**
  - **Ketamine may be used for sedation once a BIAD or endotracheal tube are established and confirmed.**
  - **Agencies using Ketamine must follow Standards Policy: Medial Policy Section Ketamine Program Requirements. Medical Policy 2.**
- **Intubation:**
  - **Attempt defined as laryngoscope blade passing the teeth or endotracheal tube passed into the nostril.**
  - **Use of a stylet is recommended in all pediatric intubations.**
  - **Endotracheal tube: Depth = 3 x the diameter of the ETT. Estimated Size = 16 + age (years) / 4. Term newborn = 3. 5 mm.**
  - **If First intubation attempt fails, make an adjustment and try again: (Consider change of provider in addition to equipment)**
- **NC EMS Airway Evaluation Form:**
  - **Fully complete and have receiving healthcare provider sign confirming BIAD or endotracheal tube placement.**
  - **Complete online in region specific *ReadyOp* and upload completed form.**
  - **Complete when Ketamine, Etomidate, Succinylcholine and/ or Rocuronium or used to facilitate use of a BIAD and/ or endotracheal intubation.** Paramedics/ AEMT should consider using a BIAD if endotracheal intubation is unsuccessful.
- Secure the endotracheal tube well and consider c-collar in pediatric patients (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **Airway Cricothyrotomy Percutaneous Needle Procedure:**
  - **Indicated as a lifesaving / last resort procedure in pediatric patients < 10 years of age.**
  - **Very little evidence to support it's use and safety.**
  - **A variety of alternative pediatric airway devices now available make the use of this procedure rare.**
  - **Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director/ Regional EMS Office.**
  - **≥ 10 years: Surgical cricothyrotomy or commercial kits based on agency preference recommended.**
- **DOPE: D**isplaced tracheostomy tube/ ETT, **O**bstructed tracheostomy tube/ ETT, **P**neumothorax and **E**quipment failure.

Pediatric Asthma
Respiratory Distress

History
- Time of onset
- Possibility of foreign body
- Past Medical History
- Medications
- Fever / Illness
- Sick Contacts
- History of trauma
- History / possibility of choking
- Ingestion / OD
- Congenital heart disease

Signs and Symptoms
- Wheezing / Stridor / Crackles / Rales
- Nasal Flaring / Retractions / Grunting
- Increased Heart Rate
- AMS
- Anxiety
- Attentiveness / Distractability
- Cyanosis
- Poor feeding
- JVD / Frothy Sputum
- Hypotension

Differential
- Asthma / Reactive Airway Disease
- Aspiration
- Foreign body
- Upper or lower airway infection
- Congenital heart disease
- OD / Toxic ingestion / CHF
- Anaphylaxis
- Trauma

Pediatric Airway Protocol(s) 3, 5 - 7 ***as indicated***

Pediatric Allergic Reaction/ Anaphylaxis Protocol PM 1 ***as indicated***

B 12 Lead ECG Procedure

IV or IO Access Protocol UP 6 ***if indicated***

P Cardiac Monitor

Following Assessment

WHEEZING / Asthma

B **Albuterol Nebulizer 1.25 - 2.5 mg**
Repeat as needed x 3

STRIDOR / Croup

B **Albuterol Nebulizer 1.25 - 2.5 mg**
Repeat as needed x 3

A **Epinephrine Nebulizer**
1 mg (1:1000) in 2 mL NS
May repeat x 1

Pediatric Airway Protocol(s) 3, 5 - 7 ***as indicated***

A **Albuterol Nebulizer**
1.25 - 2.5 mg
+/- Ipratropium 0.5 mg (DuoNeb)
Repeat as needed x 3
if indicated

Consider
Epinephrine 1:1000
0.01 mg / kg IM
Maximum 0.3 mg

P **Methylprednisolone 2 mg / kg**
IV / IO / IM
Maximum 125 mg

Magnesium Sulfate 40 mg/kg IV / IO
Infuse over 10 – 20 minutes
Maximum 2 gm

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Pediatric Asthma
Respiratory Distress

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **This protocol includes all patients with respiratory distress, Asthma, Reactive Airway Disease, croup, or bronchospasm.**
- **Patients may also have wheezing and respiratory distress with viral upper respiratory tract infections and pneumonia.**
- **Pulse oximetry should be monitored continuously and consider End-tidal CO2 monitoring if available.**
- **Combination nebulizers containing albuterol and ipratropium (DuoNeb):**
  Patients may require more than 3 nebulizer treatments, treatments should continue until improvement.
  Following 3 combination nebulizers (DuoNeb), it is preferable to continue albuterol solely with subsequent treatments as there is no proven benefit to continual use of ipratropium.
- **Epinephrine:**
  If allergic reaction or anaphylaxis is suspected, give immediately and repeat until improvement.
  If allergic reaction is not suspected, administer with no improvement and/ or impending respiratory failure.
- **Consider Magnesium Sulfate with impending respiratory failure and/ or no improvement.**
- **Consider IV access when Pulse oximetry remains ≤ 92 % after first beta-agonist nebulizer treatment.**
- **Do not force a child into a position, allow them to assume position of comfort, typically the tripod position.**
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to beta-agonists. Consider Epinephrine nebulizer if patient < 18 months and not responding to initial beta-agonist treatment.
- Croup typically affects children < 2 years of age. It is viral, possible fever, gradual onset, no drooling is noted.
- Epiglottitis typically affects children > 2 years of age. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, drooling is common. Airway manipulation may worsen the condition.
- In patients using levalbuterol (Xopenex) you may use Albuterol for the first treatment then use the patient's supply for repeat nebulizers or agency's supply.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **EMR/ EMT:**
  The use of Epinephrine IM is limited to the treatment of anaphylaxis and may be given only by autoinjector, unless manual draw-up is approved by the Agency Medical Director and the NC office of EMS.
  Administration of diphenhydramine is limited to the oral route only.
- **EMT administration of beta-agonist is limited to only patients currently prescribed the medication,** unless approved by the Agency Medical Director and the NC office of EMS.
- Agency Medical Director may require contact of medical control prior to EMT/ EMR administering any medication(s).

Post-intubation/ BIAD Management

Capnography Monitoring

- **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube.**
- **EtCO2 monitoring is mandatory following placement of a BIAD once available on scene.**

Protocols AR 1, 2, 3, 5, and 6 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

ETT or Blind Insertion Airway Device Successful

NO → Exit to Appropriate Adult or Pediatric Airway Protocol(s) 1 – 7

YES

Continue Airway Adjuncts
Maintain SpO2 ≥ 92%
Ventilate Age Appropriate breaths/ minute
May require faster rate
See Pearls

B
- Maintain EtCO2 35 – 45
- 12 Lead ECG Procedure ***as indicated***

IV or IO Access Protocol UP 6 (preferably 2 sites)

P
- Cardiac Monitor
- Transport Ventilator Procedure ***If available***

Mechanical Ventilation Adult Protocol AR 11 ***If available***

Awakening or Moving after Intubation / BIAD Placement

Evidence of Anxiety / Agitation

NO → **Propofol** Interfacility Transfer Protocol / Policy ***If available***

See Pearls

YES

P

Ketamine 1.5 – 2.0 mg / kg IV / IO

Fentanyl 50 - 75 mcg IV / IO
Repeat every 5 minutes as needed
Maximum 300 mcg
Pediatric: 1 mcg / kg IV / IO / IN
May repeat **0.5 mcg / kg** every 5 minutes as needed
Maximum 2 mcg / kg

Or

Morphine 4 mg IV / IO
Repeat **2 mg** every 5 minutes as needed
Maximum 10 mg
Pediatric: 0.1 mg / kg IV / IO
May repeat **0.1 mg / kg** every 5 minutes as needed
Maximum single dose 5 mg
Maximum 10 mg

Midazolam 2 - 2.5 mg IV / IO
Repeat every 3 – 5 minutes as needed
Maximum 10 mg
Pediatric: 0.1 – 0.2 mg / kg IV / IO / IN

Consider long term paralytic
Vecuronium 10 mg (0.1 mg/kg) IV / IO
If needed for patient movement.
Not indicated in Pediatrics

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Post-intubation/ BIAD Management

Pearls

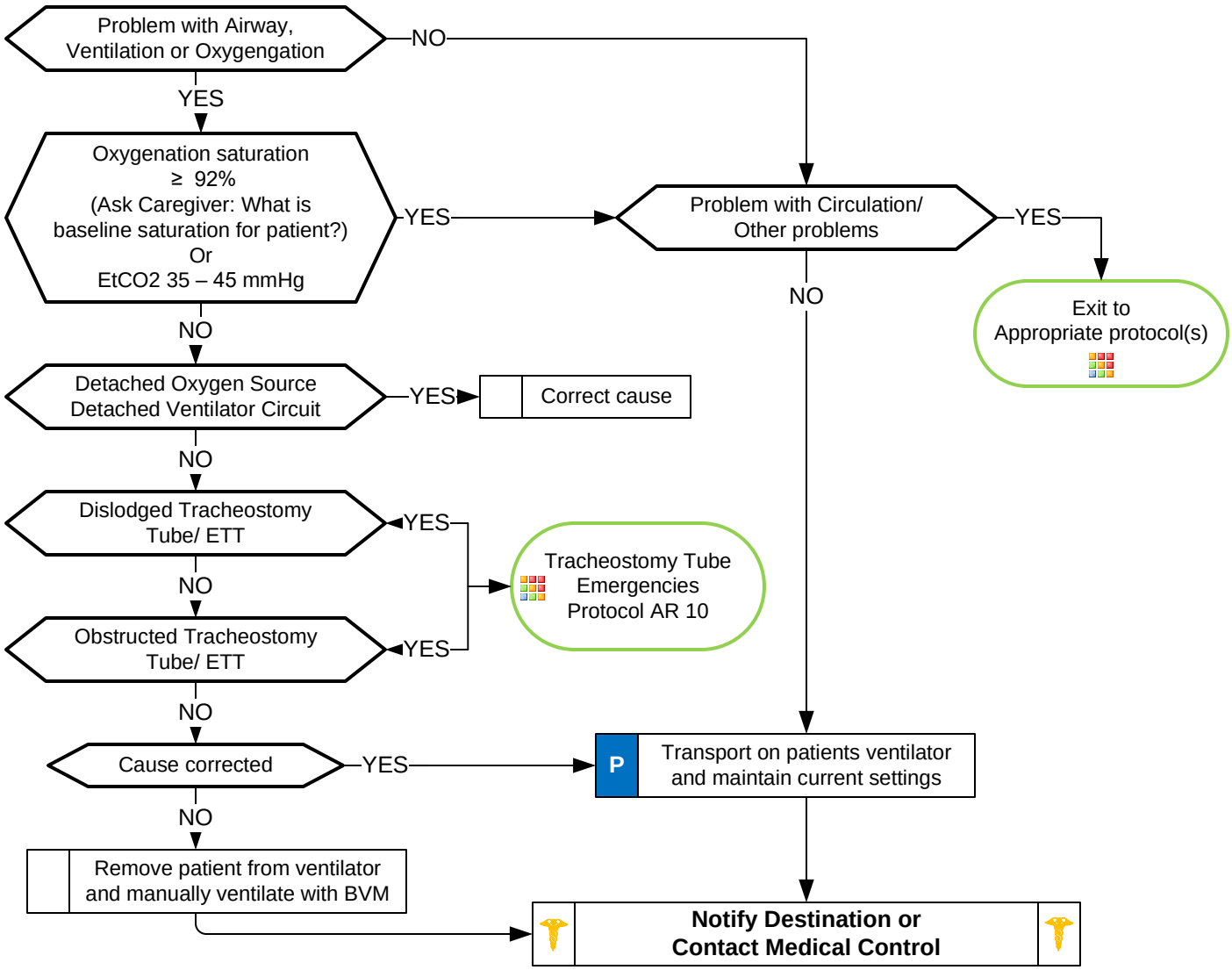
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Patients requiring advanced airways and ventilation commonly experience pain and anxiety.**
- **Unrelieved pain can lead to increased catecholamine release, ischemia, immunosuppression, and prolonged hospitalization.**
- **Ventilated patients cannot communicate pain/ anxiety and providers are poor at recognizing pain/ anxiety.**
- **Vital signs such has tachycardia and/ or hypertension can provide clues to inadequate sedation, however they are not always reliable indicators of a patient's lack of adequate sedation.**
- **Sedation strategy:**
  - **Pain is the primary reason patients experience agitation and must be addressed first.**
  - **Opioids and/ or Ketamine are the first line agents, alone or in combination.**
  - **Benzodiazepines may be utilized if patient is not responding to adequate opioid and/ or Ketamine doses.**
  - **Paralysis is considered a last resort, only when patients are not responding to opioid, Ketamine, or benzodiazepines.**
  - **Patients that have received paralytics may be experiencing pain with no obvious signs or symptoms.**
  - **Consider sedation early after giving paralytics, especially in patients receiving Rocuronium.**
- **Ventilation rate:**
  - **Guidelines: 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 10 – 12 per minute.**
  - **Maintain EtCO2 between 35 - 45 and avoid hyperventilation.**
- **Ventilator/ Ventilation strategies will need to be tailored to individual patient presentations. Medical director can indicate different strategies above.**
- **Propofol:**
  - Use restricted to agencies approved by the OEMS State Medical Director.
  - Agencies must submit a use policy and education plan to the OEMS.
  - Infusion must be supplied and initiated by a medical facility and may be used only during interfacility transfer.
  - Paramedic may titrate infusion to maintain appropriate sedation but cannot initiate or bolus the medication.
- In general, ventilation with BVM should cause chest rise. With mechanical ventilation a reasonable tidal volume should be about 6 - 8 mL/kg and peak pressures should be < 30 cmH_20. Plateau Pressures should be < 30 cmH_20.
- Head of bed should be maintained at least 10 – 20 degrees of elevation when possible, to decrease aspiration risk.
- With abrupt clinical deterioration, if mechanically ventilated, disconnect from ventilator to assess lung compliance.
- **DOPE: D**isplaced tracheostomy tube/ ETT, **O**bstructed tracheostomy tube/ ETT, **P**neumothorax and **E**quipment failure.

Ventilator Emergencies

History
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchopulmonary dysplasia, muscular dystrophy)

Signs and Symptoms
- Transport requiring maintenance of a mechanical ventilator
- Power or equipment failure at residence

Differential
- Disruption of oxygen source
- Dislodged or obstructed tracheostomy tube
- Detached or disrupted ventilator circuit
- Cardiac arrest
- Increased oxygen requirement / demand
- Ventilator failure



Airway Respiratory Protocol Section

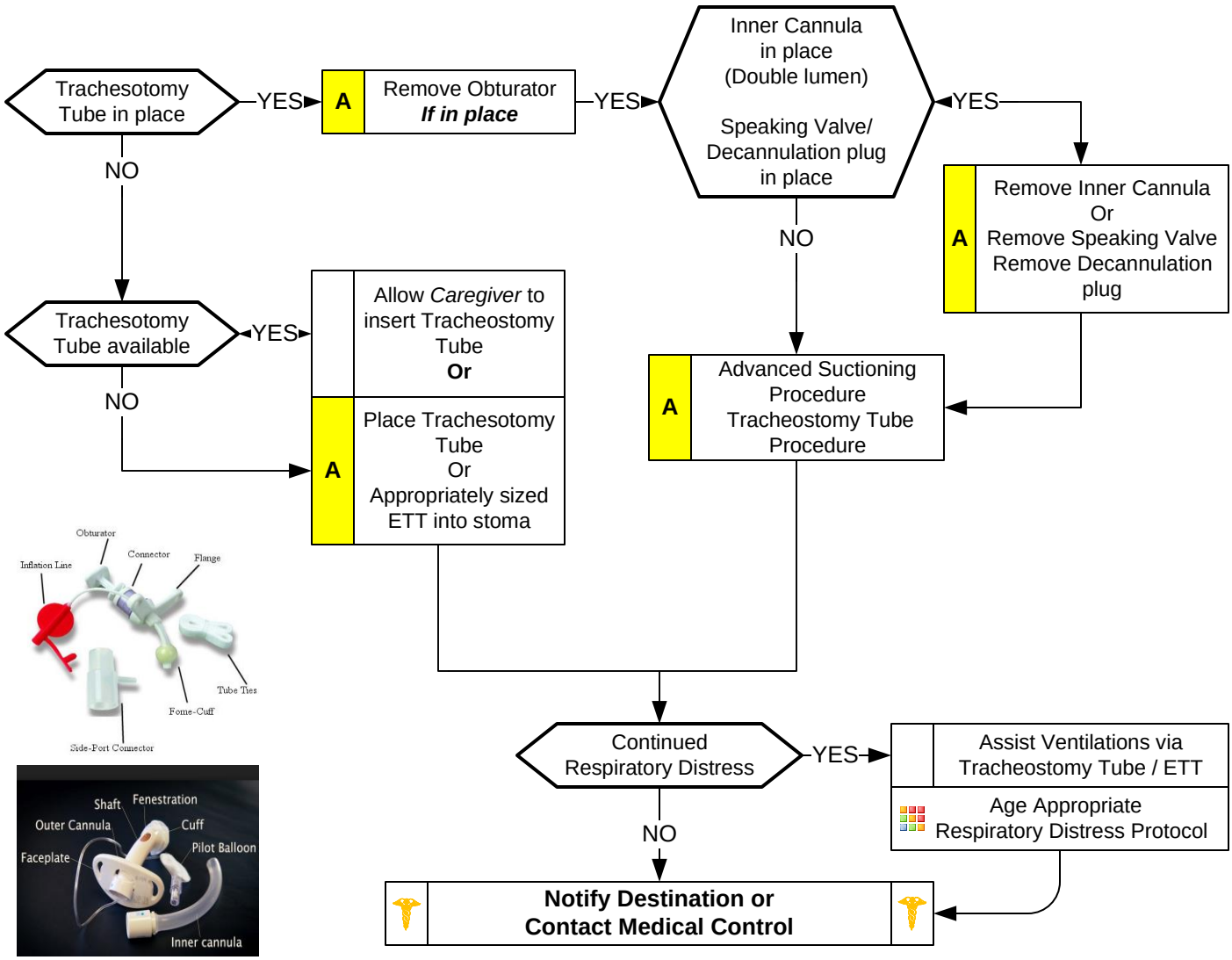
Pearls
- **Always talk to family/ caregivers as they have specific knowledge and skills.**
- **If using the patient's ventilator bring caregiver knowledgeable in ventilator operation during transport.**
- **Take patient's ventilator to hospital even if not functioning properly.**
- Always use patient's equipment if available and functioning properly.
- Continuous pulse oximetry and End Tidal CO_2 monitoring must be utilized during assessment and transport.
- Unable to correct ventilator problem: Remove patient from ventilator and manually ventilate using BVM.
- Typical alarms: Low Pressure/ Apnea: Loose or disconnected circuit, leak in circuit or around tracheostomy site.
  Low Power: Internal battery depleted.
  High Pressure: Plugged/ obstructed airway or circuit.
- **DOPE: D**isplaced tracheostomy tube/ ETT, **O**bstructed tracheostomy tube/ ETT, **P**neumothorax and **E**quipment failure.

Tracheostomy Tube Emergencies

History
- Birth defect (tracheal atresia, tracheomalacia, craniofacial abnormalities)
- Surgical complications (accidental damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchial or pulmonary dysplasia, muscular dystrophy)

Signs and Symptoms
- Nasal flaring
- Chest wall retractions (with or without abnormal breath sounds)
- Attempts to cough
- Copious secretions noted coming out of the tube
- Faint breath sounds on both sides of chest despite significant respiratory effort
- AMS
- Cyanosis

Differential
- Allergic reaction
- Asthma
- Aspiration
- Septicemia
- Foreign body
- Infection
- Congenital heart disease
- Medication or toxin
- Trauma



Airway Respiratory Protocol Section

Pearls
- **Always talk to family/ caregivers as they have specific knowledge and skills.**
- **Important to ask if patient has undergone laryngectomy. This does not allow mouth/ nasal ventilation by covering stoma.**
- Use patients equipment if available and functioning properly.
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down.
- Suction depth: Ask family/ caregiver. No more than 3 to 6 cm typically. Instill 2 – 3 mL of NS before suctioning.
- Do not suction more than 10 seconds each attempt and pre-oxygenate before and between attempts.
- DO NOT force suction catheter. If unable to pass, then tracheostomy tube should be changed.
- Always deflate tracheal tube cuff before removal. Continual pulse oximetry and EtCO2 monitoring if available.
- **DOPE: D**isplaced tracheostomy tube/ ETT, **O**bstructed tracheostomy tube/ ETT, **P**neumothorax and **E**quipment failure.

Mechanical Ventilation; Adult (Optional)

History
- Multiple etiologies leading to need for advanced airway control
- Requires ventilation support
- Height and underlying lung conditions

Signs and Symptoms
- Loss of consciousness or AMS with inability to protect airway
- Difficult oxygenation and/or ventilation
-

Differential
- ROSC
- Trauma
- Stroke
- Seizure
- Shock (see Shock Protocol)
- Toxicological

Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***if indicated***

Post-intubation/BIAD Management Protocol AR 8 ***if indicated***

History of COPD or Asthma?

NO

P

MODE: Volume – Assist Control

FiO_2: 100%

PEEP: 5 cmH_2O

TIDAL VOLUME (V_t): 8 mL/kg
Follow PBW and V_t on page 3

BPM: RESPIRATORY RATE: 18 BPM

FLOW RATE: 60 mL/min *(preset)*

Check Plateau Pressure
Press Manual Breath
P Pressure button
Goal Pressure < 30 cm/H_2O

Decrease Tidal Volume
1 mL/kg increments
Until ≤ 29 **cm/H_2O**
(DO NOT DECREASE < 4 mL/kg)

P

After 10 minutes
Decrease FiO_2 down to 50%
Then adjust PEEP and FiO_2
Goal SpO2 92 – 98%

Step 1: **PEEP =10 FiO_2 =50%**

Step 2: **PEEP =10 FiO_2 =60%**

Step 3: **PEEP =10 FiO_2 =70%**

Step 4: **PEEP =12 FiO_2 =70%**

Step 5: **PEEP =14 FiO_2 =70%**

YES

P

MODE: Volume – Assist Control

FiO_2: 100%

PEEP: 5 cmH_2O

TIDAL VOLUME: 8 mL/kg
Follow PBW and V_t on page 3

BPM: RESPIRATORY RATE: 12 BPM

FLOW RATE: 60 mL/min *(preset)*

I:E Ratio
Increase to 1:4 or 1:5

Check Plateau Pressure
Press Manual Breath
P Pressure button
Goal Pressure < 30 cm/H_2O

Decrease Tidal Volume
1 mL/kg increments
Until ≤ 29 **cm/H_2O**
(DO NOT DECREASE < 4 mL/kg)

P

Check Peak Inspiratory Pressure (PIP)
Goal V_t is 8 mL/kg

ADJUST PIP Alarm Settings
- Up until full exhalation achieved on 8 mL/kg Tidal Volume

Alarming Ventilator and unsure how to troubleshoot

- Immediately disconnect patient and use BVM.
- Once oxygenation and ventilation stabilized, restart ventilator set-up procedure.

Home Ventilator
Inter-facility Transfer with Ventilator

- Set initial parameters to home or facility settings
- Titrate to oxygenation, work of breathing, SpO_2, and $EtCO_2$.
- Use home ventilator if functioning properly.

Notify Destination or Contact Medical Control

Universal Protocol Section

Mechanical Ventilation; Adult (Optional)

Universal Protocol Section

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Mechanical ventilation may be used in any patient ≥ 1 year old.**
- **MODE:**
  - **In all adult patients use Volume – Assist Control.**
  - **This mode requires adequate sedation as it can be uncomfortable in a patient who is awakening.**
- **TIDAL VOLUME:**
  - **Tidal volume is very important in preventing lung injury and calculated by height and predicted body weight, or ideal body weight, and NOT actual body weight.**
  - **Follow Tidal Volume by Height Table on page 3.**
  - **Follow Tidal Volume by Height Table on page 3 when adjusting Peak Inspiratory Pressure alarms to allow full exhalation.**
  - **High Tidal Volumes are well known to cause alveolar damage and lung injury.**
- **FLOW RATE:**
  - **A normal breath (non-mechanical ventilation) has highest flow and volume at the beginning and both decrease as inspiration comes to an end.**
  - **Setting Flow Rate at 60 L/minute allows patient to take full breath without air hunger toward end of inspiration. This is more comfortable for the patient.**
  - **If patient looks like they are trying to take in more volume initially, the Flow Rate can be increased by increments of 5 as needed to improve patient comfort.**
- **FiO_2 and PEEP Adjustments:**
  - **Seems intuitive that when SpO_2 is less than desired the FiO_2 should be increased.**
  - **When FiO_2 is ≥ 50% and SpO_2 remains low, this indicates a shunt, and PEEP must be used in conjunction with FiO_2 to correct the shunt and increase oxygenation.**
  - **Follow PEEP adjustment recommendations on page 1.**
- **$EtCO_2$:**
  - **EtCO_2 and arterial CO_2 do not always correlate well in patients with lung disease or during serious illness or injury.**
  - **Use caution in adjusting respiratory rate to reach a goal of 35 – 45 mmHg. Most intubated patients do not need tight control in this range.**
  - **Patients with suspected head injury do need EtCO2 with a target of 35 – 45 mmHg.**
  - **Allowing patients with COPD and asthma exacerbations to have higher EtCO2 outside the 35 – 45 mmHg range is acceptable. Lower ventilation rates allow more time for exhalation and prevents auto-PEEP and/ or air trapping.**
- **DOPE: D**isplaced tracheostomy tube / ETT, **O**bstructed tracheostomy tube / ETT, **P**neumothorax and **E**quipment failure.

Mechanical Ventilation; Adult (Optional)

TIDAL VOLUME INITIAL SETTINGS By HEIGHT

FEMALE
Height / Predicted body weight / Vt

HEIGHT	PBW	4 ml	5 ml	6 ml	7 ml	8 ml
4' 0" (48)	17.9	72	90	107	125	143
4' 1" (49)	20.2	81	101	121	141	162
4' 2" (50)	22.5	90	113	135	158	180
4' 3" (51)	24.8	99	124	149	174	198
4' 4" (52)	27.1	108	136	163	190	217
4' 5" (53)	29.4	118	147	176	206	235
4' 6" (54)	31.7	127	159	190	222	254
4' 7" (55)	34	136	170	204	238	272
4' 8" (56)	36.3	145	182	218	254	290
4' 9" (57)	38.6	154	193	232	270	309
4' 10" (58)	40.9	164	205	245	286	327
4' 11" (59)	43.2	173	216	259	302	346
5' 0" (60)	45.5	182	228	273	319	364
5' 1" (61)	47.8	191	239	287	335	382
5' 2" (62)	50.1	200	251	301	351	401
5' 3" (63)	52.4	210	262	314	367	419
5' 4" (64)	54.7	219	274	328	383	438
5' 5" (65)	57	228	285	342	399	456
5' 6" (66)	59.3	237	297	356	415	474
5' 7" (67)	61.6	246	308	370	431	493
5' 8" (68)	63.9	256	320	383	447	511
5' 9" (69)	66.2	265	331	397	463	530
5' 10" (70)	68.5	274	343	411	480	548
5' 11" (71)	70.8	283	354	425	496	566
6' 0" (72)	73.1	292	366	439	512	585
6' 1" (73)	75.4	302	377	452	528	603
6' 2" (74)	77.7	311	389	466	544	622
6' 3" (75)	80	320	400	480	560	640
6' 4" (76)	82.3	329	412	494	576	658
6' 5" (77)	84.6	338	423	508	592	677
6' 6" (78)	86.9	348	435	521	608	695
6' 7" (79)	89.2	357	446	535	624	714
6' 8" (80)	91.5	366	458	549	641	732
6' 9" (81)	93.8	375	469	563	657	750
6' 10" (82)	96.1	384	481	577	673	769
6' 11" (83)	98.4	394	492	590	689	787
7' 0" (84)	100.7	403	504	604	705	806

MALE
Height / Predicted body weight / Vt

HEIGHT	PBW	4 ml	5 ml	6 ml	7 ml	8 ml
4' 0" (48)	22.4	90	112	134	157	179
4' 1" (49)	24.7	99	124	148	173	198
4' 2" (50)	27	108	135	162	189	216
4' 3" (51)	29.3	117	147	176	205	234
4' 4" (52)	31.6	126	158	190	221	253
4' 5" (53)	33.9	136	170	203	237	271
4' 6" (54)	36.2	145	181	217	253	290
4' 7" (55)	38.5	154	193	231	270	308
4' 8" (56)	40.8	163	204	245	286	326
4' 9" (57)	43.1	172	216	259	302	345
4' 10" (58)	45.4	182	227	272	318	363
4' 11" (59)	47.7	191	239	286	334	382
5' 0" (60)	50	200	250	300	350	400
5' 1" (61)	52.3	209	262	314	366	418
5' 2" (62)	54.6	218	273	328	382	437
5' 3" (63)	56.9	228	285	341	398	455
5' 4" (64)	59.2	237	296	355	414	474
5' 5" (65)	61.5	246	308	369	431	492
5' 6" (66)	63.8	255	319	383	447	510
5' 7" (67)	66.1	264	331	397	463	529
5' 8" (68)	68.4	274	342	410	479	547
5' 9" (69)	70.7	283	354	424	495	566
5' 10" (70)	73	292	365	438	511	584
5' 11" (71)	75.3	301	377	452	527	602
6' 0" (72)	77.6	310	388	466	543	621
6' 1" (73)	79.9	320	400	479	559	639
6' 2" (74)	82.2	329	411	493	575	658
6' 3" (75)	84.5	338	423	507	592	676
6' 4" (76)	86.8	347	434	521	608	694
6' 5" (77)	89.1	356	446	535	624	713
6' 6" (78)	91.4	366	457	548	640	731
6' 7" (79)	93.7	375	469	562	656	750
6' 8" (80)	96	384	480	576	672	768
6' 9" (81)	98.3	393	492	590	688	786
6' 10" (82)	100.6	402	503	604	704	805
6' 11" (83)	102.9	412	515	617	720	823
7' 0" (84)	105.2	421	526	631	736	842

TROUBLESHOOTING Hypoxia or Deterioration DOPES	
D	Dislodged ETT or cuff leak
O	Obstruction of ETT or circuit
P	Pneumothorax, Pneumonia, Pulmonary embolism or edema, Plug (mucous)
E	Equipment problem
S	Stacked breaths, air trapping, or auto-PEEP

RESPONSE to Hypoxia or Deterioration DOTT	
D	Disconnect ventilator, squeeze chest if auto-PEEP, Decompress if pneumothorax
O	Oxygen 100% FiO2, BVM and check compliance
T	Tube position and function, check EtCO2
T	Tweak ventilator settings or equipment

Pressure Alarm Troubleshooting			Problem Location	Consider
High PIP	+	High Plateau > 30	Alveoli	Compliance problem: Pneumothorax, Pneumonia Pulmonary Edema or Embolism, CHF
High PIP	+	Normal Plateau < 30	Airway problem	Airway, ventilator, or circuit problem: DOPE, Right Main stem intubation, Air trapping or auto-PEEP, Mucous plug, Patient out of synchrony with ventilator

Universal Protocol Section

Pediatric Asystole / PEA

History
- Events leading to arrest
- Estimated downtime
- SAMPLE
- Existence of terminal illness
- Airway obstruction
- Hypothermia
- Suspected abuse

Signs and Symptoms
- Pulseless
- Apneic
- No electrical activity on ECG
- No heart tones on auscultation

Differential
- Respiratory failure
- Foreign body
- Infection (croup, epiglotitis)
- Congenital heart disease
- See Reversible Causes below

Pediatric Pulseless Arrest Protocol

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES →
Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life
Confirmed downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO ↓

Begin Continuous CPR Compressions
Push Hard (1.5 inches Infant / 2 inches in Children)
(≥ 1/3 AP Diameter of Chest)
Push Fast (120 / min)
Change Compressors every 2 minutes
(Limit changes / pulse checks ≤ 5 seconds)
Ventilate 1 breath every 6 seconds (8-10 per min);
Utilize NEWLY BORN protocol if applicable
Monitor EtCO2

AED Procedure
if available

P Cardiac Monitor

IV or IO Access Protocol UP 6

A
Epinephrine 1:10,000
0.01 mg/kg IV / IO Maximum Single Dose 1mg
Or
Epinephrine 1:1000 0.1 mg / kg ETT Maximum 2.5 mg
Repeat every 3 – 5 minutes

Isotonic Fluid Bolus 20 mL/kg IV / IO
May repeat as needed
Maximum 60 mL/kg

Search for Reversible Causes

Blood Glucose Analysis Procedure
if applicable

↓

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Pediatric Cardiac Protocol Section

Pediatric Asystole / PEA

Preferred:

** Mix 1mg of Epinephrine 1:1,000 in a 250mL NS or D5W Bag (60gtt set)

mcg/min	gtt/min (mL/hr)		mcg/min	gtt/min (mL/hr)
1	15 gtt/min		6	90 gtt/min
2	30 gtt/min		7	105 gtt/min
3	45 gtt/min		8	120 gtt/min
4	60 gtt/min		9	135 gtt/min
5	75 gtt/min		10	150 gtt/min

Option:
1. Take a 10 ml syringe with 9 ml of normal saline
2. Into this syringe, draw up 1 ml of epinephrine 10,000 (cardiac amp contains Epinephrine 100 mcg/ml)
3. Now you have 10 mL's of Epinephrine (10 mcg/ml)
   ****Dose: 0.2-1 ml every 1-5 minutes (2-10 mcg)

Pearls

Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks.
Refer to optional protocol AC 11.
Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches.

- **Majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.**
- **When advanced airway not in place perform 15 compressions with 2 ventilations.**
- **Use length-based or weight-based pediatric resuscitation system for medication, equipment, cardioversion, and defibrillation guidance. Pediatric paddles should be used in children < 10 kg.**
- **DO NOT HYPERVENTILATE:**
  If advanced airway in place ventilate:
  Age < 1 year: 1 breath every 2 seconds with continuous, uninterrupted compressions.
  Age ≥ 1 year: 1 breath every 3 seconds with continuous, uninterrupted compressions.
- **Airway is a more important intervention in pediatric arrests. This should be accomplished quickly with BVM or BIAD.**
- **Patient survival is often dependent on proper ventilation and oxygenation / airway Interventions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **High-Quality CPR:**
  Make sure chest compressions are being delivered at 120 / min.
  Make sure chest compressions are adequate depth for age and body habitus.
  Make sure you allow full chest recoil with each compression to provide maximum perfusion.
  Minimize all interruptions in chest compressions to < 10 seconds.
  Use AED or apply ECG monitor / defibrillator as soon as available.
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO2 (EtCO2)**
  If EtCO2 is < 10 mmHg, improve chest compressions. Goal is ≥ 20 mmHg.
  If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **IV / IO access and drug delivery are secondary to high-quality chest compressions and early defibrillation**.
- **IV access is preferred route. Follow IV or IO Access Protocol UP 6.**
- **Special Considerations**
  Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  Renal Dialysis / Renal Failure - Refer to Dialysis / Renal Failure Protocol AM 3 caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  Opioid Overdose - If suspected, administer Naloxone per Overdose / Toxic Ingestion Protocol UP 7 while ensuring airway, oxygenation, ventilations, and high-quality chest compressions.
  Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.

Pediatric Bradycardia With a Pulse

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

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

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

Bradycardia
Typically HR < 60/min
Hypotension / AMS / Poor Perfusion / Shock

Pediatric Airway Protocol(s) AR 5, 6
as indicated

Identify underlying cause
Search for reversible causes

P — Cardiac Monitor

IV or IO Protocol UP 6

Heart Rate < 60/min
Persists despite oxygenation and ventilation

YES → Exit to Pediatric Cardiac Arrest Protocol(s) PC 1, 4, 7

NO

Identify underlying cause
Search for reversible causes

Blood Glucose Analysis Procedure

IV or IO Protocol UP 6

A — **Isotonic Fluid Bolus**
20 ml / kg IV / IO
Repeat as needed x 3
Maximum 60 mL / kg

P — **Epinephrine1:10,000**
0.01 mg/kg IV / IO Maximum Single Dose 1mg
Or
Epinephrine 1:1000 0.1 mg / kg ETT Maximum 2.5 mg
Repeat every 5 minutes

P — **Atropine 0.02 mg / kg IV / IO**
May repeat x 1
Minimum single dose 0.1 mg
Maximum single dose 0.5 mg

P — **If no improvement**
Consider
Transcutaneous Pacing Procedure

Notify Destination or Contact Medical Control

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia
Hypoglycemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Suspected Beta-Blocker or Calcium Channel Blocker

Follow Pediatric Toxicology Protocol

Pediatric Cardiac Protocol Section

Pediatric Bradycardia With Poor Perfusion

Preferred:

** Mix 1mg of Epinephrine 1:1,000 in a 250mL NS or D5W Bag (60gtt set)

mcg/min	gtt/min (mL/hr)	mcg/min	gtt/min (mL/hr)
1	15 gtt/min	6	90 gtt/min
2	30 gtt/min	7	105 gtt/min
3	45 gtt/min	8	120 gtt/min
4	60 gtt/min	9	135 gtt/min
5	75 gtt/min	10	150 gtt/min

Option:
1. Take a 10 ml syringe with 9 ml of normal saline
2. Into this syringe, draw up 1 ml of epinephrine 10,000 (cardiac amp contains Epinephrine 100 mcg/ml)
3. Now you have 10 mL's of Epinephrine (10 mcg/ml)
   ****Dose: 0.2-1 ml every 1-5 minutes (2-10 mcg)

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Bradycardia is often associated with hypoxia so insure patent airway, breathing, and circulation as needed.**
- **Begin CPR immediately with persistent bradycardia and poor perfusion despite adequate oxygenation and ventilation.**
- **Use length-based or weight-based pediatric resuscitation system for medication, equipment, cardioversion, and defibrillation guidance. Pediatric paddles should be used in children < 10 kg.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.**
- **Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.**
- **12-Lead ECG:**
  12 Lead ECG not necessary to diagnose and treat
  Obtain when patient is stable and/or following rhythm conversion.
- **Unstable condition**
  Condition which acutely impairs vital organ function and cardiac arrest may be imminent.
  If at any point patient becomes unstable move to unstable arm in algorithm
- **Epinephrine is first drug choice for persistent, symptomatic bradycardia.**
- **Atropine:**
  Second choice, unless there is evidence of increased vagal tone or a primary AV conduction block, then give atropine first.
  Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.
- **Symptomatic bradycardia causing shock or peri-arrest condition:**
  If no IV or IO access immediately available, start Transcutaneous Pacing, establish IV / IO access, and then administer epinephrine.
  Epinephrine should be administered followed Atropine if no response.
- **Symptomatic condition**
  Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.
  Symptomatic bradycardia usually occurs at rates < 50 beats per minute.
  Search for underlying causes such as hypoxia or impending respiratory failure.
- **Serious Signs / Symptoms:**
  Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.
- **Transcutaneous Pacing Procedure (TCP)**
  Indicated with unstable bradycardia unresponsive to medical therapy.
  If time allows transport to specialty center because transcutaneous pacing is a temporizing measure.
  Transvenous / permanent pacemaker will probably be needed.
  Immediate TCP with high-degree AV block (2d or 3d degree) with no IV / IO access.
- Most maternal medications pass through breast milk to the infant so maintain high-index of suspicion for OD-toxins.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia. Many other agents a child ingests can cause bradycardia, often is a single dose.

Pediatric Pulmonary Edema / CHF

History
- Congenital Heart Disease
- Chronic Lung Disease
- Congestive heart failure
- Past medical history

Signs/Symptoms
- Infant: Respiratory distress, poor feeding, lethargy, weight gain, +/- cyanosis
- Child/Adolescent: Respiratory distress, bilateral rales, apprehension, orthopnea, jugular vein distention (rare), pink, frothy sputum, peripheral edema, diaphoresis, chest pain
- Hypotension, shock

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

History / Signs / Symptoms consistent with respiratory distress with crackles / rales / known CHF

→ Airway Patent, Ventilations adequate, Oxygenation adequate

NO → Pediatric Airway Protocol(s) 5, 6, 7 ***as indicated***

YES

Allergic Reaction Anaphylaxis

YES → Pediatric Allergic Reaction Anaphylaxis Protocol PM 1

NO

	Pulse Oximetry Monitoring
B	12 Lead ECG Procedure
	EtCO2 Monitoring
	IV or IO Protocol UP 6 ***if indicated***
P	Cardiac Monitor

Position child with head of bed in up-position (25-40°)
Flexing hips with support under knees so that they are bent 90°

Transport to a Pediatric Specialty Center ***if available***

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pearls
- **Recommended exam: Mental status, Respiratory, Cardiac, Skin, Neuro**
- **Contact Medical Control early in the care of the pediatric cardiac patient.**
- **Most children with CHF have a congenital heart defect, obtain a precise past medical history.**
- **Congenital heart disease varies by age:**
  - < 1 month: Tetralogy of Fallot, Transposition of the great arteries, Coarctation of the aorta.
  - 2 – 6 months: Ventricular septal defects (VSD), Atrioseptal defects (ASD).
  - Any age: Myocarditis, Pericarditis, SVT, heart blocks.
- **Treatment of Congestive Heart Failure / Pulmonary edema may vary depending on the underlying cause and may include the following with consultation by Medical Control:**
  - **Morphine Sulfate: 0.1 mg/kg IV / IO. Max single dose 5mg/dose**
  - **Fentanyl: 1 mcg/kg IV / IO. Max single dose 50 mcg.**
  - **Nitroglycerin: Dose determined after consultation of Medical Control.**
  - **Lasix 1 mg/kg IV / IO.**
  - **Agency specific vasopressor.**
- Do not assume all wheezing is pulmonary, especially in a cardiac child: avoid albuterol unless strong history of recurrent wheezing secondary to pulmonary etiology (discuss with Medical Control)

Pediatric Cardiac Arrest

History
- Time of arrest
- Medical history
- Medications
- Possibility of foreign body
- Hypothermia

Signs and Symptoms
- Unresponsive
- Cardiac arrest

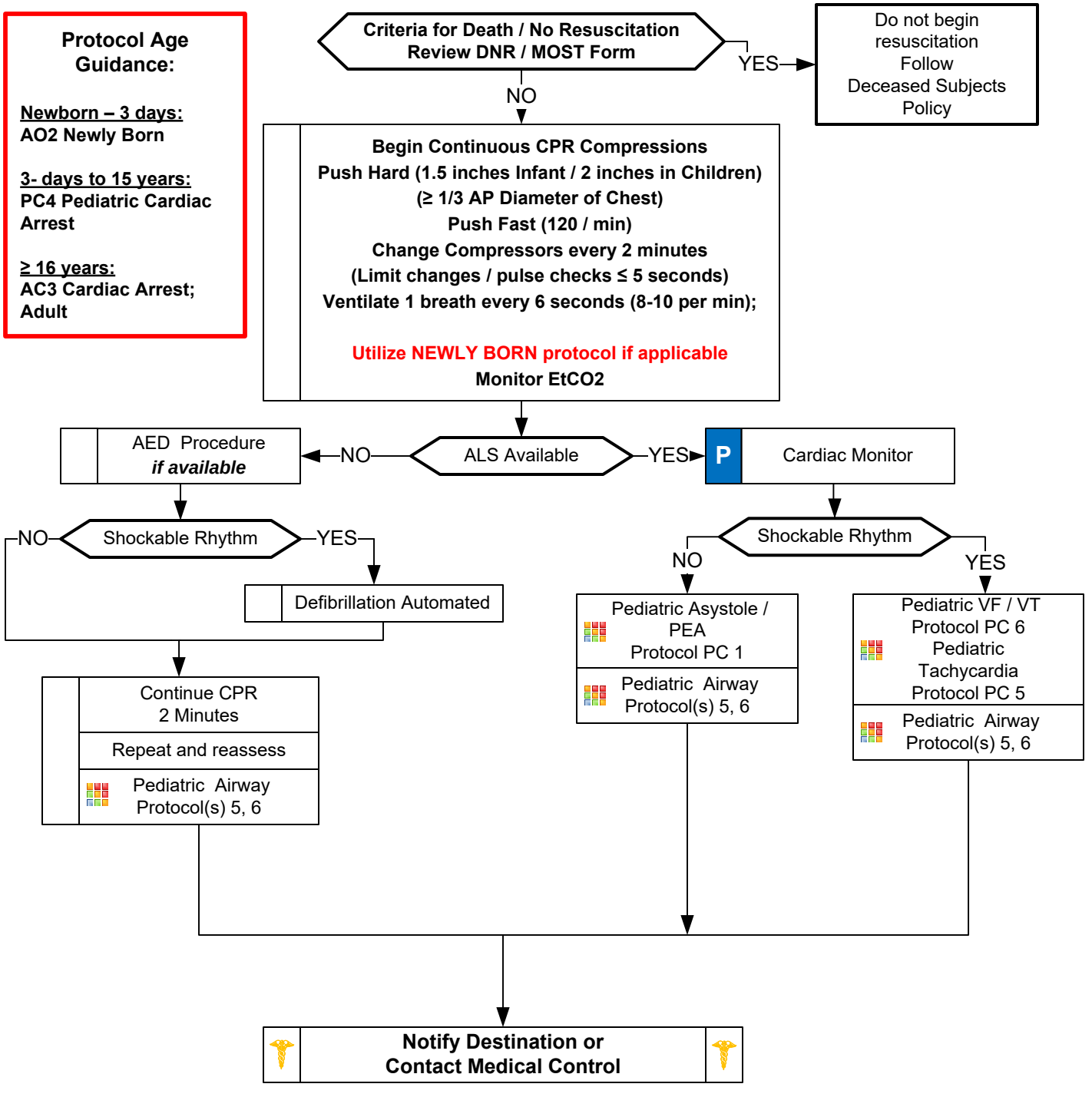
Differential
- Respiratory failure: Foreign body, Secretions, Infection (croup, epiglotitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (Glucose, K)
- Acidosis

Protocol Age Guidance:

Newborn – 3 days:
AO2 Newly Born

3- days to 15 years:
PC4 Pediatric Cardiac Arrest

≥ 16 years:
AC3 Cardiac Arrest; Adult



Pediatric Cardiac Arrest

Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches.**
- **Majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.**
- **When advanced airway not in place perform 15 compressions with 2 ventilations.**
- **Use length-based or weight-based pediatric resuscitation system for medication, equipment, cardioversion, and defibrillation guidance. Pediatric paddles should be used in children < 10 kg.**
- **DO NOT HYPERVENTILATE:**
  If advanced airway in place ventilate:
  Age < 1 year: 1 breath every 2 seconds with continuous, uninterrupted compressions.
  Age ≥ 1 year: 1 breath every 3 seconds with continuous, uninterrupted compressions.
- **Patient survival is often dependent on proper ventilation and oxygenation / airway Interventions.**
- **Do not interrupt compressions to place airway. BIAD first to limit interruptions.**
- **High-Quality CPR:**
  Make sure chest compressions are being delivered at 120 / min.
  Make sure chest compressions are adequate depth for age and body habitus.
  Make sure you allow full chest recoil with each compression to provide maximum perfusion.
  Minimize all interruptions in chest compressions to < 10 seconds.
  Use AED or apply ECG monitor / defibrillator as soon as available.
- **Defibrillation:**
  First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks at Maximum 10 J/kg or adult dose
  Charge defibrillator during chest compressions, near the end of 2-minute cycle, to decrease peri-shock pause.
  Following defibrillation, provider should immediately restart chest compressions with no pulse check until end of next cycle.
- **End Tidal CO2 (EtCO2)**
  If EtCO2 is < 10 mmHg, improve chest compressions. Goal is ≥ 20 mmHg.
  If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **IV / IO access and drug delivery are secondary to high-quality chest compressions and early defibrillation**.
- **Follow IV or IO Access Protocol UP 6.**
- **Special Considerations**
  Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  Renal Dialysis / Renal Failure - Refer to Dialysis / Renal Failure Protocol AM 3 caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  Opioid Overdose - If suspected, administer Naloxone per Overdose / Toxic Ingestion Protocol UP 7 while ensuring airway, oxygenation, ventilations, and high-quality chest compressions.
  Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.

Pediatric Tachycardia
Narrow Complex (≤ 0.09 sec)

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

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

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

- **Assess tachycardia in context of clinical condition**
- **Identify and treat underlying cause of tachycardia (especially sinus tachycardia)**

Unstable / Serious Signs and Symptoms
AMS, shock, hypotension
HR Typically > 180 Child
HR Typically > 220 Infant

YES →

P	
	Cardiac Monitor
	Cardioversion Procedure
	0.5 – 1 J / kg Repeat and increase to **2 J / Kg** May increase to **4 J / Kg** Or adult maximum
	Consider sedation Do NOT delay cardioversion **Midazolam 0.1 – 0.2 mg / kg IV / IO / IN** May repeat if needed **Maximum Single Dose 2 mg** **Maximum Total Dose 5 mg**

NO ↓

B	12 Lead ECG Procedure
P	Cardiac Monitor
	IV or IO Access Protocol UP 6

Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.

Regular Rhythm? NO → **Contact Medical Control**

YES ↓

Probable Sinus Tachycardia

Identify and Treat Underlying Cause

Exit to Age Appropriate Protocol(s)

Probable SVT

P	
	Vagal Maneuvers
	Adenosine 0.1 mg / kg IV / IO **Maximum 6 mg** May repeat **Adenosine 0.2 mg / kg IV / IO** **Maximum 12 mg**

Notify Destination or Contact Medical Control

AT ANY TIME

Pulseless

Go to Pediatric Pulseless Arrest Protocol

Pediatric Cardiac Protocol Section

Pediatric Tachycardia
Narrow Complex (≤ 0.09 sec)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Monomorphic QRS:**
  All QRS complexes in a single lead are similar in shape.
- **Polymorphic QRS:**
  QRS complexes in a single lead will change from complex to complex.
- **Use length-based or weight-based pediatric resuscitation system for medication, equipment, cardioversion, and defibrillation guidance. Pediatric paddles should be used in children < 10 kg.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological or electrical treatment given only when symptomatic, otherwise monitor and reassess.**
- **12-Lead ECG:**
  12-Lead ECG not necessary to diagnose and treat.
  Obtain when patient is stable and/or following rhythm conversion.
  When administering adenosine, obtaining a continuous 12-Lead can be helpful to physicians.
- **Unstable condition:**
  Condition which acutely impairs vital organ function and cardiac arrest may be imminent.
  If at any point patient becomes unstable move to unstable arm in algorithm
  If IV or IO access is in place, may administer adenosine and repeat, prior to synchronized cardioversion.
- **Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.**
- **Serious Signs and Symptoms:**
  Respiratory distress / failure.
  Signs of shock / poor perfusion with or without hypotension.
  AMS
  Sudden collapse with rapid, weak pulse
- **Narrow Complex Tachycardia (≤ 0.09 seconds):**
  Sinus tachycardia: P waves present. Variable R-R waves. Infants usually < 220 beats / minute. Children usually < 180 beats / minute.
  SVT: > 90 % of children with SVT will have a narrow QRS (≤0.09 seconds.) P waves absent or abnormal. R-R waves not variable. Usually abrupt onset. Infants usually > 220 beats / minute. Children usually > 180 beats / minute.
  Atrial Flutter / Fibrillation
- **Vagal Maneuvers:**
  Breath holding. Blowing a glove into a balloon. Have child blow out “birthday candles” or through an obstructed straw. Infants: May put a bag of ice water over the upper half of the face careful not to occlude the airway.
- Separating the child from the caregiver may worsen the child's clinical condition.
- Monitor for respiratory depression and hypotension associated if Diazepam, Lorazepam, or Midazolam is used.
- Continuous pulse oximetry is required for all SVT Patients if available.

Pediatric Tachycardia
Wide Complex (> 0.09 sec)

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

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

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

Assess tachycardia in context of clinical condition
Identify and treat underlying cause of tachycardia

Unstable / Serious Signs and Symptoms
AMS, shock, hypotension
HR Typically > 180 Child
HR Typically > 220 Infant

YES →

P	
	Cardiac Monitor
	Cardioversion Procedure
	0.5 – 1 J / kg Repeat and increase to **2 J / Kg** May increase to **4 J / Kg** Or adult maximum
	Consider sedation Do NOT delay cardioversion **Midazolam 0.1 – 0.2 mg / kg IV / IO / IN** May repeat if needed **Maximum Single Dose 2 mg** **Maximum Total Dose 5 mg**

NO

B	12 Lead ECG Procedure
P	Cardiac Monitor
	IV or IO Access Protocol UP 6

Single lead ECG able to diagnose and treat arrhythmia

12 Lead ECG not necessary to diagnose and treat, but preferred when patient is stable.

Regular Rhythm? — NO → **Contact Medical Control**

YES

Probable Ventricular Tachycardia

P	
	If QRS Regular and Monomorphic **Adenosine 0.1 mg / kg IV / IO** **Maximum 6 mg** May repeat **Adenosine 0.2 mg / kg IV / IO** **Maximum 12 mg**
	Expert consultation recommended for further medication management and/ or cardioversion procedure

Notify Destination or Contact Medical Control

AT ANY TIME

Pulseless

Go to Pediatric Pulseless Arrest Protocol

Pediatric Cardiac Protocol Section

Pediatric Tachycardia
Wide Complex (> 0.09 sec)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Neuro**
- **Monomorphic QRS:**
  All QRS complexes in a single lead are similar in shape.
- **Polymorphic QRS:**
  QRS complexes in a single lead will change from complex to complex.
- **Use length-based or weight-based pediatric resuscitation system for medication, equipment, cardioversion, and defibrillation guidance. Pediatric paddles should be used in children < 10 kg.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological or electrical treatment given only when symptomatic, otherwise monitor and reassess.**
- **12-Lead ECG:**
  12-Lead ECG is not necessary to diagnose and treat arrhythmia. A single lead ECG is often all that is needed.
  Obtain 12-Lead when patient is stable and/ or following a rhythm conversion.
  When administering adenosine, obtaining a continuous 12-Lead can be helpful later to physicians.
- **Unstable condition:**
  Condition which acutely impairs vital organ function and cardiac arrest may be imminent.
  If at any point patient becomes unstable move to unstable arm in algorithm
- **Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.**
- **Serious Signs and Symptoms:**
  Respiratory distress/ failure.
  Signs of shock/ poor perfusion with or without hypotension.
  AMS
  Sudden collapse with rapid, weak pulse
- **Serious Signs and Symptoms:**
  Respiratory distress/ failure.
  Signs of shock/ poor perfusion with or without hypotension.
  AMS
  Sudden collapse with rapid, weak pulse
- **Wide Complex Tachycardia (≥ 0.09 seconds):**
  SVT with aberrancy.
  VT: Uncommon in children. Rates may vary from near normal to > 200/ minute.
  Most children with VT have underlying heart disease / cardiac surgery/ long QT syndrome/ cardiomyopathy.
  Amiodarone 5 mg / kg over 20 – 60 minutes or Procainamide 15 mg / kg over 30 – 60 minutes IV / IO are recommended agents. They should not be administered together. Consultation with Medical Control is advised when these agents are considered.
- **Torsade's de Pointes/ Polymorphic (multiple shaped) Tachycardia:**
  Rate is typically 150 to 250 beats/ minute.
  Associated with long QT syndrome, hypomagnesaemia, hypokalemia, many cardiac drugs.
  May quickly deteriorate to VT.
  Separating the child from the caregiver may worsen the child's clinical condition.
- Monitor for respiratory depression and hypotension associated if Diazepam, Lorazepam, or Midazolam is used.
- Continuous pulse oximetry is required for all SVT patients if available.

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

History
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Airway obstruction
- Hypothermia

Signs and Symptoms
- Unresponsive
- Cardiac Arrest

Differential
- Respiratory failure / Airway obstruction
- Hyper / hypokalemia, Hypovolemia
- Hypothermia, Hypoglycemia, Acidosis
- Tension pneumothorax, Tamponade
- Toxin or medication
- Thrombosis: Coronary / Pulmonary Embolism
- Congenital heart disease

Pediatric Pulseless Arrest Protocol PC 4

P Defibrillation Manual Procedure - 2 J / Kg

Automated Defibrillation Procedure, ***if monitor not available***

Begin Continuous CPR Compressions
Push Hard (≥ 1/3 AP Diameter of Chest) (1.5 inches Infant / 2 inches in Children)
Push Fast (120 / min)
Change Compressors every 2 minutes (*Limit changes / pulse checks ≤ 5 seconds*)
Ventilation 1 breath every 6 seconds (8-10 bpm), monitor EtCO2
Utilize NEWLY BORN protocol (AO 2) - *if applicable*

A IO / IV Protocol UP 6

Epinephrine1:10,000
0.01 mg/kg IV / IO Maximum single dose 1mg
Repeat 3-5 minutes
Or, if no IO / IV access
Epinephrine 1:1000 0.1 mg / kg ETT Maximum 2.5 mg

P Defibrillation Manual Procedure - **4 J / Kg**

Automated Defibrillation Procedure, ***if monitor not available***
Resume Continuous CPR Compressions
Push Hard, Push Fast (120 / min)
Rhythm check/compressor change every 2 minutes, Limit pauses ≤ 5 seconds)
Ventilate 1 breath every 6 seconds (8-10 per min), Monitor EtCO2

P **Amiodarone 5 mg/kg IV / IO, Maximum initial dose 300 mg**
Repeat every 5 minutes
Maximum repeat dose 150 mg, Maximum total dose 15 mg/kg

P **Defibrillate 10 J/kg**
Subsequent shocks at rhythm checks (if VF/VT persists) 10 J/kg max.
Change pads/vector for subsequent shocks.

Automated Defibrillation Procedure, ***if monitor not available***
Resume Continuous CPR Compressions

P **If Rhythm Refractory to defibrillation**
Continue CPR and give Anti-arrhythmic(s) / Epinephrine during compressions.
Pre-charge the monitor prior to rhythm checks and minimize pre-shock pause.
Repeat pattern during resuscitation.

Lidocaine 1 mg/kg IV / IO, Maximum 100 mg
Repeat 0.5 mg/kg, Maximum 3 mg/kg total

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

P
Persistant VF/VT
Or
Torsades de Points

Magnesium Sulfate
40 mg/kg IV / IO over 1 – 2 minutes
May repeat every 5 minutes
Maximum 2 g

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia
Hypoglycemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Pediatric Cardiac Protocol Section

Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Pearls

- Recommended Exam: Mental Status
- Beginning compressions first is recommended in pediatric patients during CPR. However, the majority of pediatric
- arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations and early
- attention to airway management and oxygenation.

- Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation
- when indicated. Compress ≥ 1/3 anterior-posterior diameter of chest, in infants 1.5 inches and in children 2 inches.
- Consider early IO placement if available and / or difficult IV access anticipated.
- DO NOT HYPERVENTILATE: Ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.

- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.

High-Quality CPR:

- Make sure chest compressions are being delivered at 120 / min, using a metronome device if available.
- Make sure chest compressions are adequate depth for age and body habitus.
- Make sure you allow full chest recoil with each compression to provide maximum perfusion.
- Minimize all interruptions in chest compressions to < 5 seconds.
- Do not hyperventilate, ventilate every 6 seconds only (8-10 ventilations per minute).

Defibrillation:

- First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks 10 J/kg

End Tidal CO2 (EtCO2)

- If EtCO2 is < 10 mmHg, improve chest compressions.
- If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)

Antiarrhythmic agents:

- **Adenosine: First dose: 0.1 mg / kg (Maximum 6 mg) Second dose: 0.2 mg / kg (Maximum 12 mg)**
- **Amiodarone 5 mg / kg IV / IO (single dose Maximum 300 mg). May repeat x 2 to a Maximum of 15 mg / kg.**
- **Lidocaine 1 mg / kg IV / IO.**
- **Lidocaine Infusion 20 – 50 mcg / kg / min. If infusion is initiate > 15 minutes from first bolus, repeat 1 mg / kg bolus.**
- **Magnesium Sulfate 40 mg / kg IV / IO over 10 – 20 minutes. In Torsades de pointes give over 1 – 2 minutes. Max 2 g.**
- **Procainamide 15 mg / kg IV / IO over 30 – 60 minutes. Monitor for increased QRS and increased QT.**

- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Utilize Pit-Crew Approach assigning responders to predetermined tasks. Refer to TEAM FOCUSED CPR protocol.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If unable to obtain IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT **(Maximum 2.5 mg)**

Pediatric Post Resuscitation

History
- Respiratory arrest
- Cardiac arrest

Signs/Symptoms
- Return of pulse

Differential
- Continue to address specific differentials associated with the original dysrhythmia

Transport Destination Decision

Post-resuscitation patient is medically complex.

Consider facility capabilities:
- Pediatric ICU service
- Pediatric Cardiology service
- Pediatric Neurology service
- Targeted Temperature Management

Pediatric Airway Protocol(s) AR 5 - 7 ***as needed***

Monitor Vital Signs / Reassess

Blood Glucose Analysis Procedure

Optimize Ventilation and Oxygenation
- Maintain SpO2 ≥ 92 – 98%
  Preferably SpO2 ≥ 94%
- Advanced airway if indicated
- Age Appropriate Respiratory Rate

DO NOT HYPERVENTILATE

ETCO2 ideally 35 – 45 mm Hg

B 12 Lead ECG Procedure

IV or IO Protocol UP 6

P Cardiac Monitor

Pediatric Diabetic Protocol PM 2 ***if indicated***

Pediatric Hypotension / Shock Protocol PM 3 ***if indicated***

Pediatric Bradycardia Protocol PC 2 ***if indicated***

Pediatric Tachycardia Protocol PC 5, 6 ***as indicated***

Hypotension Age Based

0 – 31 Days
< 60 mmHg

1 Month to 1 Year
< 70 mmHg

> than 1 Year
< 70 + (2 x age) mmHg

Antiarrhythmic Medication Given During Arrest

YES

P Continue Antiarrhythmic drip if the drip was started during the arrest.
(ex. If Amiodarone assisted in breaking VF/VT, continue the drip)

Refer to Appropriate Pediatric Arrhythmia Protocol if the arrythmia persists while patient has a pulse

Continue **Amiodarone, Lidocaine, or Magnesium drips if these drips were started while the patient was in cardiac arrest (and now the patient has ROSC).**

NO

Arrhythmias are common and usually self limiting after ROSC

If Arrhythmia Persists follow Rhythm Appropriate Protocol

Post-intubation / BIAD Management Protocol AR 8

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Post Resuscitation

Pearls

- **Recommended Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro**
- **Goals of care are to preserve neurologic function, prevent secondary organ damage, treat the underlying cause of illness, and optimize prehospital care. Frequent reassessment is necessary.**
- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided. Titrate FiO_2 to maintain SpO_2 of 92 - 98%.**
- **Use length-based or weight-based pediatric resuscitation system for medication, equipment, cardioversion, and defibrillation guidance.**
- **Pain/sedation:**
  - **Patients requiring advanced airways and ventilation commonly experience pain and anxiety.**
  - **Unrelieved pain can lead to increased catecholamine release, ischemia, immunosuppression, and prolonged hospitalization.**
  - **Ventilated patients cannot communicate pain / anxiety and providers are poor at recognizing pain / anxiety.**
  - **Vital signs such has tachycardia and / or hypertension can provide clues to inadequate sedation, however they both are not always reliable indicators of patient's lack of adequate sedation.**
  - **Pain must be addressed first, before anxiety. Opioids are typically the first line agents before benzodiazepines. Ketamine is also a reasonable first choice agent.**
- **Ventilation strategies:**
  - **Tailored to individual patient presentations. Medical Control can indicate different strategies above.**
  - **In general ventilation with BVM should cause chest rise.**
  - **Continuous pulse oximetry and capnography should be maintained during transport for monitoring.**
  - **Head of bed should be maintained at least 10 – 20 degrees of elevation when possible to decrease aspiration risk.**
- **EtCO2 Monitoring:**
  - **Initial End tidal CO2 may be elevated immediately post-resuscitation, but will usually normalize.**
  - **Goal is 35 – 45 mmHg but DO NOT hyperventilation to achieve.**
  - **EtCO2 should be continually monitored with advanced airway in place.**
- **Administer resuscitation fluids and vasopressor agents to maintain SBP at targets listed on page 1. This table represents minimal SBP targets. (Use the age/wgt base Pediatric Dosing table or length based tape (LBT).**
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiology / cardiac catheterization, intensive care service, and neurology services.**
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may best be planned in consultation with Medical Control.

Pediatric Allergic Reaction

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

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

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

Assess Symptom Severity

MILD
Skin Only

Diphenhydramine
1 mg / kg mg PO

A
IV Procedure
If indicated

Diphenhydramine
1 mg / kg IV / IM / IO / PO

B
Monitor and Reassess
Monitor for Worsening
Signs and Symptoms

MODERATE
2+ Body Systems

Epinephrine 1:1000 IM
≥ 30 kg 0.3 – 0.5 mg IM
< 30 kg 0.15 mg IM
if available

Diphenhydramine
1 mg / kg PO
See Pearls

B
Albuterol Nebulizer
2.5 – 5 mg
Repeat as needed x 3
if indicated

A
Epinephrine 1:1000 IM
≥ 30 kg 0.3 – 0.5 mg IM
< 30 kg 0.15 mg IM
Repeat every 5 minutes
if no improvement

A
Diphenhydramine
1 mg / kg IV / IM / IO
if not given PO (See Pearls)

IV / IO Procedure

Albuterol Nebulizer
2.5 – 5 mg
+/- Ipratropium 0.5 mg
Repeat as needed x 3
if indicated

P
No improvement with IM Epinephrine
Epinephrine IV / IO
see Pediatric Dosing Table or
length based tape (LBT).

Methylprednisolone
2 mg/kg IV
Maximum 125 mg

SEVERE
2 + Body Systems + hypotension
Or Isolated Hypotension

Epinephrine 1:1000 IM
≥ 30 kg 0.3 – 0.5 mg IM
< 30 kg 0.15 mg IM
if available

B
Albuterol Nebulizer
2.5 – 5 mg
Repeat as needed x 3
if indicated

Airway Pediatric Protocol(s)
if indicated

Pediatric Hypotension / Shock
Protocol PM 3
if indicated

Notify Destination or
Contact Medical Control

Pediatric Medical Protocol Section

Pediatric Allergic Reaction

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs**
- **Anaphylaxis is an acute and potentially lethal multisystem allergic reaction.**
- **<u>Epinephrine administration:</u>**
  - **Drug of choice and the FIRST drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.)**
  - **IM Epinephrine should be administered in priority before or during attempts at IV or IO access.**
  - **Diphenhydramine and steroids have no proven utility in Moderate / Severe anaphylaxis and may be given only After Epinephrine. Diphenhydramine and steroids should NOT delay repeated Epinephrine administration.**
  - **In Moderate and Severe anaphylaxis Diphenhydramine may decrease mental status. Oral Diphenhydramine should NOT be given to a patient with decreased mental status and / or a hypotensive patient as this may cause nausea and / or vomiting.**
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Contact Medical Control for appropriate dosing.**
- **<u>Symptom Severity Classification:</u>**
  - **Mild symptoms:**
    - **Flushing, hives, itching, erythema with normal blood pressure and perfusion.**
  - **Moderate symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.**
  - **Severe symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension and poor perfusion.**
- **Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.**
- **Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.**
- **Fluids and Medication titrated to maintain a SBP >70 + (age in years x 2) mmHg.**
- **EMR / EMT may administer Epinephrine IM and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMR / EMT administering any medication.
- **EMR may administer diphenhydramine by oral route only and may administer from EMS supply**. Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.** Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.
- **Patients with moderate and severe reactions should receive a 12 lead ECG and should be continually monitored, but this should NOT delay administration of epinephrine.**
- The shorter the onset from exposure to symptoms the more severe the reaction.

Pediatric Diabetic

History
- Past medical history
- Medications
- Recent blood glucose check
- Last meal

Signs and Symptoms
- Altered mental status
- Combative / irritable
- Diaphoresis
- Seizures
- Abdominal pain
- Nausea / vomiting
- Weakness
- Dehydration
- Deep / rapid breathing

Differential
- Alcohol / drug use
- Toxic ingestion
- Trauma; head injury
- Seizure
- CVA
- Altered baseline mental status.

	Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure ***if indicated***
A	IV / IO Procedure
P	Cardiac Monitor
	Altered Mental Status Protocol UP 4 ***if indicated***
	Hypotension / Shock Protocol AM 5 ***if indicated***
	Seizure Protocol UP 13 ***if indicated***

A — ***Blood glucose ≤ 69 mg/dl Symptomatic with NO IV / IO Access:*** Awake, alert and able to tolerate oral agent: Give **oral glucose solution**. If unable to tolerate oral: **Glucagon 0.1 mg/kg IM (Maximum 1 mg)** Repeat every 15 minutes as needed to keep Blood glucose > 60 mg / dl.

Blood Sugar ≤ 69 mg / dl

Oral Glucose ½ to 1 Tube If age appropriate

Consider Oral Solution (Juices / Food)

A — Dextrose Infusion
Use D10W in 250mL titrate to condition and effect

≤ 50 kg (110lbs)
D10W 5 mL/kg IV / IO
Repeat as needed

> 50kg (110lbs)
D10W 5 mL/kg IV / IO
Max 25 g per dose
Repeat as needed until BG > 69

Blood Sugar 70 – 249 mg / dl

Blood Glucose Analysis Procedure ***if condition changes***

Exit to Appropriate Protocol(s)

Blood Sugar ≥ 250 mg / dl

A — **Isotonic Fluid Bolus 10 - 20 mL/kg IV / IO**

Maximum 20 mL/kg

Monitor and Reassess Every 5 minutes Until Blood Glucose ≥ 80 mg / dl

Notify Destination or Contact Medical Control

Pediatric Medical Protocol Section

Pediatric Diabetic

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients with prolonged hypoglycemia my not respond to glucagon.**
- **Do not administer oral glucose to patients that are not able to swallow or protect their airway.**
- **Quality control checks should be maintained per manufacturers recommendation for all glucometers.**
- **D10 / D25 Preparation:**
  D10: Remove 10 mL of D50 from a D50 vial. Add 40 mL of NS with the 10 mL of D50 – total volume 50 mL.
  D10: Alternative, Discard 40 mL from the D50 vial and draw up 40 mL of NS – total volume 50 mL.

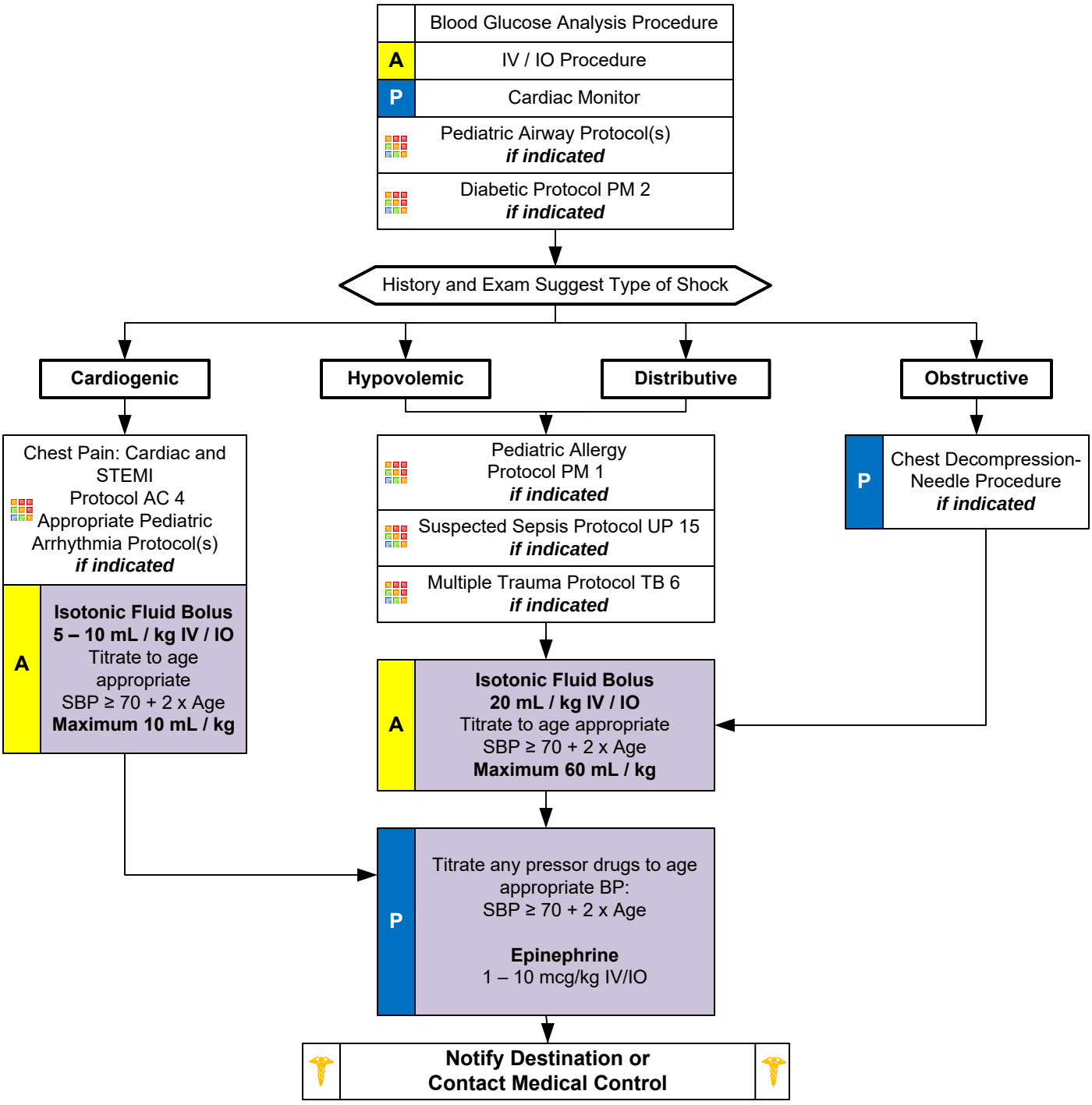
- In extreme circumstances with no IV and no response to glucagon Dextrose 50 % can be administered rectally. Contact medical control for advice.
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
  Adult caregiver must be present with pediatric patient.
  Blood sugar must be ≥ 80, patient has ability to eat and availability of food with responders on scene.
  Patient must have known history of diabetes and not taking any oral diabetic agents.
  Patient returns to normal mental status and has a normal neurological exam with no new neurological deficits.
  Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol UP-1.
  Otherwise contact medical control.
- **Hypoglycemia with Oral Agents:**
  Patients taking oral diabetic medications should be strongly encouraged to allow transportation to a medical facility. They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established. Not all oral agents have prolonged action so Contact Medical Control for advice. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Hypoglycemia with Insulin Agents:**
  Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established. Not all insulins have prolonged action so Contact Medical Control for advice. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.

Pediatric Hypotension / Shock

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

Signs and Symptoms
- Restlessness, confusion, weakness
- Dizziness
- Tachycardia
- Hypotension (Late sign)
- Pale, cool, clammy skin
- Delayed capillary refill
- Dark-tarry stools

Differential
- Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Neurogenic
  - Anaphylactic
- Trauma
- Infection
- Dehydration
- Congenital heart disease
- Medication or Toxin



Hypotension / Shock

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: 70 + 2 x age in years.**
- **Consider all possible causes of shock and treat per appropriate protocol. Majority of decompensation in pediatrics is airway related.**
- **Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.**
- **Shock may be present with a normal blood pressure initially.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.**
- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Hypovolemic Shock:**
  Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
- **Cardiogenic Shock:**
  Heart failure: MI, Cardiomyopathy, Myocardial contusion, Ruptured ventrical / septum / valve / toxins.
- **Distributive Shock:**
  Septic
  Anaphylactic
  Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
  Toxic
- **Obstructive Shock:**
  Pericardial tamponade. Pulmonary embolus. Tension pneumothorax.
  Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency or Congenital Adrenal Hyperplasia:**
  Body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary or secondary adrenal disease, congenital adrenal hyperplasia, or more commonly have stopped a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. **If suspected Paramedic should give Methylprednisolone 125 mg IM / IV / IO or Dexamethasone 10 mg IM / IV / IO. Use steroid agent specific to your drug list. May administer prescribed steroid carried by patient IM / IV / IO. Patient may have Hydrocortisone (Cortef or Solu-Cortef). Dose: < 1y.o. give 25 mg, 1-12 y.o. give 50 mg, and > 12 y.o. give 100 mg or dose specified by patient's physician.**

Suspected Viral Hemorrhagic Fever
Ebola

EMS Dispatch Center

1. Use Emerging Infectious Disease (EID) Surveillance Tool with the following chief complaints:
   - **Typical Flu-Like Symptoms**
     and/or
   - **Unexpected Bleeding**
     (not trauma or isolated nose bleed related)

2. Use EID Card (or equivalent) with the following protocols (or equivalent)
   - EMD 6 Breathing Problem
   - EMD 10 Chest Pain
   - EMD 18 Headache
   - EMD 21 Hemorrhage (medical)
   - EMD 26 Sick Person

3. Ask the following:
   - In the past 21 days have you been to Africa or been exposed to someone who has?
   - If YES:
   - Do you have a fever?

Evolving Protocol:
Protocol subject to change at any time dependent on changing outbreak locations.

Monitor for protocol updates.

Viral Hemorrhagic Fevers:
Ebola is one of many.

YES → **DO NOT DISPATCH FIRST RESPONDERS**

Dispatch EMS Unit only
Discretely notify EMS Supervisor or command staff

NO

EMS

Do not rely solely on EMD personnel to identify a potential viral hemorrhagic fever patient – constrained by time and caller information

Obtain a travel history / exposure history and assess for clinical signs and symptoms

EMS Immediate Concern

1. Traveler from area with known VHF (Ebola) with or without symptoms
2. Traveler from a Country, with active Ebola outbreak, within past 21 days

AND

Fever, Headache	Joint and Muscle aches	Weakness, Fatigue
Vomiting and/or Diarrhea	Abdominal Pain	Anorexia
Bleeding		

NO → Exit to Appropriate Protocol(s)

YES

EMS
Personal Protective Equipment ↔ Refer to page 2
Place surgical mask on patient
Use Non-rebreather mask if Oxygen Needed
Donning and Doffing Guidelines

NO Routine
Aerosol Generating Procedures ↔ Avoid aerosol generating procedures unless medically necessary
NIPPV / Nebulizer therapy / Intubation / BIAD / Suctioning

No Routine
IV or IO Lines ↔ Avoid routine IV or IO access unless medically necessary
If IV / IO necessary:
Stop vehicle to lessen exposure risk

EMS Personnel / Equipment / Transport Unit Requires Decontamination ↔ Refer to Page 3

Notify Destination as soon and as discretely as possible
DO NOT ENTER facility with patient until instructed
Follow entry directions from hospital staff

Special Circumstances Section

Suspected Viral Hemorrhagic Fever
Ebola

PARTICULAR ATTENTION MUST BE PAID TO PROTECTING MUCOUS MEMBRANES OF THE EYES, NOSE, and MOUTH FROM SPLASHES OF INFECTIOUS MATERIAL OR SELF INOCULATION FROM SOILED PPE / GLOVES.
THERE SHOULD BE NO EXPOSED SKIN

DONNING PPE: BEFORE you enter the patient area.

Recommended PPE

PAPR: A PAPR with a full face shield, helmet, or headpiece. Any reusable helmet or headpiece must be covered with a single-use (disposable) hood that extends to the shoulders and fully covers the neck and is compatible with the selected PAPR.

N95 Respirator: Single-use (disposable) N95 respirator in combination with single-use (disposable) surgical hood extending to shoulders and single-use (disposable) full face shield. If N95 respirators are used instead of PAPRs, careful observation is required to ensure healthcare workers are not inadvertently touching their faces under the face shield during patient care.

Single-use (disposable) fluid-resistant or impermeable gown that extends to at least mid-calf or coverall without integrated hood. Coveralls with or without integrated socks are acceptable.

Single-use (disposable) nitrile examination gloves with extended cuffs. Two pairs of gloves should be worn. At a minimum, outer gloves should have extended cuffs.

Single-use (disposable), fluid-resistant or impermeable boot covers that extend to at least mid-calf or single-use (disposable) shoe covers. Boot and shoe covers should allow for ease of movement and not present a slip hazard to the worker.

Single-use (disposable) fluid-resistant or impermeable shoe covers are acceptable only if they will be used in combination with a coverall with integrated socks.

Single-use (disposable), fluid-resistant or impermeable apron that covers the torso to the level of the mid-calf should be used if Ebola patients have vomiting or diarrhea. An apron provides additional protection against exposure of the front of the body to body fluids or excrement. If a PAPR will be worn, consider selecting an apron that ties behind the neck to facilitate easier removal during the doffing procedure

DOFFING PPE: OUTSIDE OF PPE IS CONTAMINATED! DO NOT TOUCH

1) PPE must be carefully removed without contaminating one's eyes, mucous membranes, or clothing with potentially infectious materials.

Use great care while doffing your PPE so as not to contaminate yourself (e.g. Do not remove your N-95 facemask or eye protection BEFORE you remove your gown). There should be a dedicated monitor to observe donning and doffing of PPE. It is very easy for personnel to contaminate themselves when doffing. A dedicated monitor should observe doffing to insure it is done correctly. Follow CDC guidance on doffing.

2) PPE must be double bagged and placed into a regulated medical waste container and disposed of in an appropriate location.
3) Appropriate PPE must be worn while decontaminating / disinfecting EMS equipment or unit.
3) Re-useable PPE should be cleaned and disinfected according to the manufacturer's reprocessing instructions.

Hand Hygiene should be performed by washing with soap and water with hand friction for a minimum of 20 seconds. Alcohol-based hand rubs may be used if soap and water are not available.

EVEN IF AN ALCOHOL-BASED HAND RUB IS USED, WASH HANDS WITH SOAP AND WATER AS SOON AS FEASIBLE.

THE USE OF GLOVES IS NOT A SUBSTITUTE FOR HAND WASHING WITH SOAP & WATER

For any provider exposure or contamination contact occupational health.

If the patient is being transported via stretcher then a disposable sheet can be placed over them.

Special Circumstances Section

Pearls

- **Transmission to another individual is the greatest after a patient develops fever. Once there is fever, the viral load in the bodily fluids appears to be very high and thus a heightened level of PPE is required.**
- **Patient contact precautions are the most important consideration.**
- **Incubation period 2-21 days**
- **Ebola must be taken seriously; however using your training, protocols, procedures and proper Personal Protective Equipment (PPE), patients can be cared for safely.**
- When an infection does occur in humans, the virus can be spread in several ways to others. The virus is spread through direct contact (through broken skin or mucous membranes) with a sick person's blood or body fluids (urine, saliva, feces, vomit, and semen) objects (such as needles) that have been contaminated with infected body fluids.
- Limit the use of needles and other sharps as much as possible. All needles and sharps should be handled with extreme care and disposed in puncture-proof, sealed containers. Safety devices must be employed immediately after use.
- **Ebola Information: For a complete review of Ebola go to:**
  http://www.cdc.gov/vhf/ebola/index.html
  https://www.cdc.gov/vhf/ebola/clinicians/emergency-services/ems-systems.html

Suspected Viral Hemorrhagic Fever
Ebola

EMS Personal
Requires Decontamination

If EMS personnel are exposured to blood, bodily fluids, secretions, or excretions from a patient with suspected or confirmed Ebola should immediately:

1) Stop working and wash the affected skin surfaces with soap and water.
2) Mucous membranes (e.g., conjunctiva) should be irrigated with a large amount of water or eyewash solution;

EMS Equipment / Transport Unit
Requires Decontamination

1) EMS personnel performing decontamination / disinfection should wear recommended PPE
   When performing Decontamination EMS Personnel MUST wear appropriate PPE, which includes:
   - •Gloves (Double glove)
   - •Fluid resistant (impervious) Tyvek Like Full length (Coveralls)
   - •Eye protection (Goggles)
   - •N-95 face mask
   - •Fluid resistant (impervious)-Head covers
   - •Fluid resistant (impervious)-Shoe / Boot covers
2) Face protection (N-95 facemask with goggles) should be worn since tasks such as liquid waste disposal can generate splashes.
3) Patient-care surfaces (including stretchers, railings, medical equipment control panels, and adjacent flooring, walls and work surfaces) are likely to become contaminated and should be decontaminated and disinfected after transport.
4) A blood spill or spill of other body fluid or substance (e.g., feces or vomit) should be managed through removal of bulk spill matter, cleaning the site, and then disinfecting the site. For large spills, a chemical disinfectant with sufficient potency is needed to overcome the tendency of proteins in blood and other body substances to neutralize the disinfectant's active ingredient. An EPA-registered hospital disinfectant with label claims for viruses that share some technical similarities to Ebola (such as, norovirus, rotavirus, adenovirus, poliovirus) and instructions for cleaning and decontaminating surfaces or objects soiled with blood or body fluids should be used according to those instructions.
   (Alternatively, a 1:10 dilution of household bleach (final working concentration of 500 parts per million or 0.5% hypochlorite solution) that is prepared fresh daily (i.e., within 12 hours) can be used to treat the spill before covering with absorbent material and wiping up. After the bulk waste is wiped up, the surface should be disinfected as described in the section above).
5) Contaminated reusable patient care equipment should be placed in biohazard bags (double-bagged) and labeled for decontamination and disinfection.
6) Reusable equipment should be cleaned and disinfected according to manufacturer's instructions by appropriately trained personnel wearing correct PPE.
7) Avoid contamination of reusable porous surfaces that cannot be made single use. Use only a mattress and pillow with plastic or other covering that fluids cannot get through.
8) To reduce exposure, all potentially contaminated textiles (cloth products) should be discarded. This includes non-fluid-impermeable pillows or mattresses. They should be considered regulated medical waste and placed in biohazard red bags. They must be double-bagged prior to being placed into regulated medical waste containers.

Pearls

- **Ebola Information:** **For a complete review of Ebola EMS Vehicle Disinfection go to:**
  https://www.cdc.gov/vhf/ebola/clinicians/emergency-services/ems-systems.html

Suspected Viral Hemorrhagic Fever
Ebola

Special Circumstances Section

Decedent Known or suspected carrier of HVF / Ebola Requires Transportation

Only personnel trained in handling infected human remains, and wearing full PPE, should touch, or move any Ebola-infected remains.
Handling human remains should be kept to a minimum.

Donning / Doffing PPE

PPE should be in place **BEFORE** contact with the body

1) Prior to contact with body, postmortem care personnel must wear PPE consisting of: surgical scrub suit, surgical cap, impervious Tyvex-Coveralls, eye protection (e.g., face shield, goggles), facemask, shoe covers, and double surgical gloves.

2) Additional PPE (leg coverings,) might be required in certain situations (e.g., copious amounts of blood, vomit, feces, or other body fluids that can contaminate the environment).

PPE should be removed immediately after and discarded as regulated medical waste.

1) Use caution when removing PPE as to avoid contaminating the wearer.

2) Hand hygiene (washing your hands thoroughly with soap and water or an alcohol based hand rub) should be performed immediately following the removal of PPE. If hands are visibly soiled, use soap and water.

Preparation of Body Prior to Transport

1) At the site of death, the body should be wrapped in a plastic shroud. Wrapping of the body should be done in a way that prevents contamination of the outside of the shroud.
2) Change your gown or gloves if they become heavily contaminated with blood or body fluids.
3) Leave any intravenous lines or endotracheal tubes that may be present in place.
4) Avoid washing or cleaning the body.
5) After wrapping, the body should be immediately placed in a leak-proof plastic bag not less than 150 µm thick and zippered closed The bagged body should then be placed in another leak-proof plastic bag not less than 150 µm thick and zippered closed before being transported to the morgue.

Surface Decontamination

1) Prior to transport to the morgue, perform surface decontamination of the corpse-containing body bags by removing visible soil on outer bag surfaces with EPA-registered disinfectants which can kill a wide range of viruses.
2) Follow the product's label instructions. Once the visible soil has been removed, reapply the disinfectant to the entire bag surface and allow to air dry.
3) Following the removal of the body, the patient room should be cleaned and disinfected.
4) Reusable equipment should be cleaned and disinfected according to standard procedures.

Transportation of VHV / Ebola Remains

PPE is required for individuals driving or riding in a vehicle carrying human remains. DO NOT handle the remains of a suspected / confirmed case of Ebola The remains must be safely contained in a body bag where the outer surface of the body bag has been disinfected prior to the transport.

Pearls

- **Ebola Information:** **For a complete review of Handling Remains of Ebola Infected Patients go to:**
  http://www.cdc.gov/vhf/ebola/hcp/guidance-safe-handling-human-remains-ebola-patients-us-hospitals-mortuaries.html

High Consequence Pathogens
(Respiratory Diseases, SARS, MERS-CoV, COVID-19)

EMD Dispatch Center Screening

1. All calls requiring response from EMS system:
Ask: Do you have FEVER AND/OR RESPIRATORY SYMPTOMS?
(cough, breathing difficulty, or other respiratory symptoms?)

EMD Systems:
PDS – Card 36 Pandemic Flu
APCO – COVID-19 Pandemic Vital Points Card
PowerPhone – Pandemic Influenza Card

Evolving Protocol:
Protocol subject to change at any time dependent on changing outbreak locations.

Monitor for protocol updates.

EMD Screen Positive

Notify All Responding Agencies:
- Positive screening (agency specific code)
- First Responder Response:
  Follow local system guidance

EMD Screen Negative

First Responders and EMS Screening
Do not rely solely on EMD personnel to identify a potential exposure patient:
- EMD may be constrained by time and caller information.
- **First arriving provider (FR or EMS):**
  If call nature allows, send 1 provider only into scene to complete a quick screen.
  Stand at a distance of ≥ 6 feet and perform screening question.
  Patients with Fever and/or Cough *(or other respiratory symptoms are at risk of Influenza and/or COVID-19).*
  Chills, muscle aches, sore throat, or sudden loss of taste or smell.
  If patient screens **positive:**
  Place facemask or covering over patient's mouth and nose and provider dons appropriate PPE based on clinical situation.
- First Responders should stage and limit number of providers entering scene only necessary for care to limit potential exposures and use of PPE.
- Request additional resources as needed. See Page 4.

Negative FR or EMS Screening

Exit to Appropriate Protocol(s)

Positive FR or EMS Screening

EMS PPE

Patient:
- Use non-rebreather mask if oxygen needed
- If unable to tolerate mask, have patient cover mouth and nose when coughing

Providers utilize:
- **Follow PPE precautions listed below:**
- Exam gloves and eye protection
- Facemask minimum
- **Aerosol generating procedure:**
- Respirator (N95, PAPR, or equivalent)
- Goggles, gown (disposable gown, coveralls, or equivalent)
- Create negative pressure in care compartment (See Pearls)

Personnel in ambulance cab utilize:
- Facemask for driver and passenger

PPE Supply Chain Disruptions:
- Prioritize respirators (N95 or equivalent) to aerosol-generating procedures until supply chain restored.
- Prioritize gowns to aerosol-generating procedures.
- It is reasonable for providers to wear a facemask during their duty-shift and change only when soiled or damaged. Adjust use based on supply chain.

EMS General Treatment Considerations

Aerosol generating procedures:
NIPPV / Nebulizer therapy / Intubation / BIAD / Suctioning / CPR
Use all PPE devices and strategies listed above
- **Notify receiving facility of infection control requirements prior to arrival.**

Exit to Appropriate Protocol(s)

Special Circumstances Section

High Consequence Pathogens

(Respiratory Diseases, SARS, MERS-CoV, COVID-19)

Special Circumstances Section

Pearls

- **First Responders: Because community spread is now present, every patient contact should be considered to have potential for infection with COVID-19. Limit number of FR when caring for patients to limit exposures and PPE use.**
- **Place facemask on any patient complaining of respiratory problems with or without a fever.**
- **Dispatch Screening:**
  - **If caller interrogation results in positive screen first responders are assigned based on local agency direction.**
  - **This screening process will result in many False Positive screens in order to be very sensitive.**
- **First Responder and EMS Screening:**
  - **Limit distance initially to ≥ 6 feet and conduct a quick screening using the EMD specific question. If this results in a positive screen, immediately place a facemask on the source patient and all providers don appropriate PPE and limit provider number to that which necessary for patient care.**
- **Close Contact and Duration Definition:**
  - **Healthcare provider exposure is defined as being within 6 feet for ≥ 15 minutes in a patient with suspected illness.**
  - **Unprotected (no or incorrect PPE) with direct contact with body fluids, including respiratory generated body fluids.**
- **Transport:**
  - **Occupants in cab of vehicle all should wear facemasks. Riders should be discouraged in order to limit PPE use.**
  - **Limit number of providers in vehicle required to provide patient care in order to limit exposures.**
  - **Ensure use of correct PPE for crew and passengers when aerosol-producing procedures utilized.**
- **Recommend facemask and gloves with every patient contact. It is reasonable to wear eye protection on every patient contact.**
- **Reasonable to wear simple/surgical mask during entire duty-shift when not able to maintain social distance of ≥ 6 feet among fellow providers when not engaged in patient care.**
- **Negative Pressure in care compartment:**
  - **Door or window available to separate driver's and care compartment space:**
    - **Close door/window between driver's and care compartment and operate rear exhaust fan on full.**
  - **No door or window available to separate driver's and care compartment space:**
    - **Open outside air vent in driver's compartment and set rear exhaust fan to full.**
  - **Set vehicle ventilation system to non-recirculating to bring in maximum outside air.**
  - **Use recirculating HEPA ventilation system if equipped.**
- **Airborne precautions:**
  - Standard PPE with fit-tested N95 mask (or PAPR respirator) and utilization of a gown or coveralls, change of gloves after every patient contact, and strict hand washing precautions. This level is utilized with Aspergillus, SARS/MERS/COVID-19, Tuberculosis, Measles (rubeola) Chickenpox (varicella-zoster), Smallpox, Influenza, disseminated herpes zoster, or Adenovirus/Rhinovirus.
- **Contact precautions:**
  - Standard PPE with utilization of a gown or coveralls, change of gloves after every patient contact, and strict hand washing precautions. This level is utilized with GI complaints, blood or body fluids, C diff, scabies, wound and skin infections, MRSA. Clostridium difficile (C diff) is not inactivated by alcohol-based cleaners and washing with soap and water is indicated.
- **Droplet precautions:**
  - Standard PPE plus a standard surgical mask for providers who accompany patients in the treatment compartment and a surgical mask or NRB O2 mask for the patient. This level is utilized when Influenza, Meningitis, Mumps, Streptococcal pharyngitis, Pertussis, Adenovirus, Rhinovirus, and undiagnosed rashes.
- **All-hazards precautions:**
  - Standard PPE plus airborne precautions plus contact precautions. This level is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS, MERS-CoV, COVID-19).
- **COVID-19 (Novel Coronavirus): For most current criteria to guide evaluations of patients under investigation:** https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

High Consequence Pathogens
(Respiratory Diseases, SARS, MERS-CoV, COVID-19)

Decontamination Recommendations

EMS Personnel Requires Decontamination

Driver:

- Should wear full PPE as described when caring for patient.
- Remove all PPE, except respiratory (N95, PAPR, or equivalent) and perform hand hygiene prior to entering cab to prevent contamination of driver's compartment. **Cab occupants only need to wear facemasks if respirator not already used.**

Wash hands:

- Thoroughly after transferring patient care and/or cleaning ambulance

Maintain records:

- All prehospital providers exposed to patient at the scene and during ambulance transport (self-monitoring for symptoms for 14 days is recommended, even if wearing appropriate PPE).
  This does not mean the providers can no longer work.
- List all prehospital provider names (students, observers, supervisors, first response etc.) in the Patient Care Report.

EMS Equipment / Transport Unit Requires Decontamination

Safely clean vehicles used for transport:

- Follow standard operating procedures for the containment and disposal of regulated medical waste.
- Follow standard operating procedures for containing and reprocessing used linen.

Wear appropriate PPE when:

- Removing soiled linen from the vehicle. Avoid shaking the linen.
- Clean and disinfect the vehicle in accordance with agency standard operating procedures.
- Personnel performing the cleaning should wear a disposable gown and gloves (a respirator should not be needed) during the clean-up process; the PPE should be discarded after use.
- All surfaces that may have come in contact with the patient or materials contaminated during patient care (e.g., stretcher, rails, control panels, floors, walls, work surfaces) should be thoroughly cleaned and disinfected using an **EPA-registered disinfectant** appropriate for SARS, MERS-CoV, or coronavirus in healthcare settings in accordance with manufacturer's recommendations. **Keep doors open to patient care compartment while cleaning to allow air exchanges.**

EMS Provider Exposure Risk and Monitoring Recommendations

Close Contact
Less than 6 feet for ≥ 15 minutes
Source patient **NOT WEARING A MASK**

PPE Utilized	Exposure Risk	Monitoring	Work Restrictions
NONE	HIGH	Self-monitor Supervision	**If symptomatic:** Fever and Respiratory symptoms (cough, difficulty breathing or other respiratory symptoms) ***THEN*** **Exclude from work:** • At least 72 hours after fever resolution with no use of fever reducing medications. AND • At least 10 days since symptom onset.
No facemask N95 or PAPR	HIGH		
No Eye Protection	MEDIUM		
No Gown/ Coveralls or Gloves	LOW		
All recommended PPE Except facemask instead of N95 or PAPR	LOW		

Close Contact
Less than 6 feet for ≥ 15 minutes
Source patient **WEARING A MASK**

PPE Utilized	Exposure Risk	Monitoring	Work Restrictions
NONE	MEDIUM	Self-monitor Supervision	**If symptomatic:** Fever and Respiratory symptoms (cough, difficulty breathing or other respiratory symptoms) ***THEN*** **Exclude from work:** • At least 72 hours after fever resolution with no use of fever reducing medications. AND • At least 10 days since symptom onset.
No facemask N95 or PAPR	MEDIUM		
No Eye Protection	LOW		
No Gown/ Coveralls or Gloves	LOW		
All recommended PPE Except facemask instead of N95 or PAPR	LOW		

Placing a simple/surgical mask on the patient within 15 minutes of contact decreases exposure risk.

Return to Work Practice and Work Restrictions (if excluded from work OR exposure to suspected or known COVID-19 patient):

- Prior to duty shift, measure temperature and assess for illness symptoms either by provider, infection control officer, or occupational or public health.
- Self-monitoring with oversight by agency's infection control officer, occupation or public health department per agency policy.
- Wear mask at all times and restrict care of immunocompromised patients (Cancer, Transplant, Steroid use) until all symptoms have resolved or 14 days after onset of illness, whichever is longest.
- Social distance: Employee should maintain 6 feet of separation as work duties permit in the workspace.
- Remove from work if employee becomes symptomatic.

- https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-for-ems.html
- https://www.cdc.gov/coronavirus/2019-ncov/healthcare-facilities/hcp-return-work.html
- https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2-covid-19

High Consequence Pathogens
(Respiratory Diseases, SARS, MERS-CoV, COVID-19)

First Responder Guidance

COVID-19 Declared Pandemic with both State and Federal Emergencies Declared

- Many systems are heavily dependent on First Responder agencies to supplement critical prehospital medical care services.
- Community spread is now evident both in NC and in the US.
- Every patient, regardless of medical or injury complaint, is at risk of COVID-19 and all should undergo routine screening questions.
- While EMD is a first step, all providers must screen every patient contact and don appropriate PPE based on clinical situation and COVID-19 screening.
- The citizens we serve continue to have a variety of illness and injury unrelated to COVID-19.
- Limiting PPE use:

  First Responders should consider staging with all incidents and sending 1 provider (or more dependent on situation) into the scene to assess for fever and respiratory complaints.

  Request staged resources as needed only to provide necessary medical care.

  Where patients do not require immediate intervention, first responders may stay in contact with patient, but remain beyond 6 feet until EMS providers arrive to begin assessment and further care.

  Consider calling patient on mobile phones to maintain contact and provide reassurance and explain current situation.

PPE Crisis or Alternative Srategies

N95 Respirators

- Use only for aerosol generating procedures (Nebulizer, NIPPV, Suctioning, BVM, BIAD, Intubation).
- Use facemasks in all other scenarios.
- Use respirators (N95 or equivalent) beyond the manufacturing expiration date when not soiled, ripped, torn, or otherwise damaged. Securing straps should also be in good repair and operational:
  Visually inspect straps, nose bridge/foam, and mask in general.
  Perform seal check: https://www.youtube.com/watch?v=pGXiUyAoEd8
- Models tested by CDC and are believed to function properly beyond expiration date:

  3M: 1860, 1860s, 1870, 8210, 9010, 8000
  Gerson 1730
  Medline/Alpha Protech NON27501
  Moldex: 1512, 2201
- Minimize providers caring for patient to the extent possible to conserve.
- Use Self-Contained Breathing Apparatus (SCBA) if needed.
- Re-use respiratory (N95 or equivalent) masks and place in paper bag between use. Do not touch inside of mask. Wash hands thoroughly before removing mask.
- When to discard a respirator (N95 or equivalent):

  After using during an aerosol producing procedure.
  Contamination with blood, body fluids or secretions, following close contact with known COVID-19 patient.

Gowns:

- Use only for aerosol generating procedures (Nebulizer, NIPPV, Suctioning, BVM, BIAD, Intubation).
- Use only for close patient contact, lifting, moving, or transferring where provider contacts patients body.
- May use removable and washable coveralls.

https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/index.html

Mass Vaccination/Immunization Medication Distribution

History

- Follow local public health department criteria for specific immunization or medication administered.
- Patient receiving medication or vaccination must be without evidence of active infection.
- AEMT and Paramedic providers may participate
- EMT may participate when DHHS/NCMB allows special provision during local or state emergency.

Situation

- Local implementation of this protocol must be done as a component of the EMS system's local public health department community immunization or medication distribution program.
- May initiate protocol when a community has limited public health department resources or when local or state health emergency is declared.

A

Review immunization/vaccination or medication guide provided by the local public health department:

- Patient selection criteria per local public health department (may vary)
- Vaccine/immunization or medication indications
- Vaccine/immunization or medication contraindications
- Vaccine/immunization or medication distribution procedure

B

- EMT may provide vaccinations when DHHS/NCMB allows special provision during local or state emergency.

Confirm patient eligibility for the vaccination or medication including:

- Age
- Medical history
- Contraindications
- Allergies

Eligibility confirmed?

YES

NO

Do not administer:

- Refer to local public health department providers/ officials for further care and instructions.

A

Administer vaccination or medication:

- Dose dependent on local public health department
- Route dependent on local public health department (PO, IN, IM, IV, SQ)

B

Administer Over-the-Counter medication and/or vaccination *(if applicable)*:

- Undergo specific "just-in-time" training
- Dose dependent on local public health department
- Route dependent on local public health department (PO, IN, IM). SQ when specified by NCOEMS.
- Complete required local public health department documentation
- Provide post immunization or medication written instructions and monitoring

Allergic Reaction or Complications

- Exit to age appropriate Protocol(s)
- Notify appropriate local public health department provider/ official

Special Circumstances Section

Pearls

- **Purpose:**
  Provide protocol driven process for EMS providers to assist with public health immunization or medication distribution initiatives.
- **Documentation of the immunization or medication:**
  Complete using local public health department approved record system.
  Creation of an EMS patient care report is not required and is not required to submit to NCOEMS.
  Must create a log of all patient contacts associated with the immunization or mediation distribution program maintained by the EMS system.
  If local public health department is maintaining a log of all patients, EMS may use the public health log and keep copies in the EMS system.
- Injection site:
  Most common injection site for subcutaneous is tissue of an upper arm; follow procedure USP-4 otherwise.
  Injection volume is limited to 1 - 2 mL per site unless specific guidance is given per local public health department.
  Most common sites for intramuscular injections are upper arm, buttocks, and thighs, follow procedure USP-4.
  Injection volume is limited to 1 mL in the upper arm, unless specific guidance is given per local public health department; follow procedure USP-4 otherwise.
  Injection volume is limited to 2 mL (1 mL in pediatrics) in buttocks an thighs, unless specific guidance is given per local public health department; follow procedure USP-4 otherwise.

Scene Rehabilitation: General

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

Remove:
PPE
Body Armor
Chemical Suits
SCBA
Turnout Gear
Other equipment as indicated

Initial Process
1. Personnel logged into General Rehabilitation Section
2. VS Assessed / Recorded (If HR > 110 then obtain Temp)
   Carbon Monoxide monitoring if indicated
3. Personnel assessed for signs / symptoms
4. Remove PPE, Body Armor, Haz-Mat Suits, Turnout Gear,
   Other equipment as indicated

Significant Injury
Cardiac Complaint: Signs / Symptoms
Respiratory Complaint: Serious Signs / Symptoms
Respiratory Rate < 8 or > 40
Systolic Blood Pressure ≤ 80

YES → Exit to Scene Rehabilitation Responder Protocol

NO

Heat or Cold stress

YES → **HEAT STRESS**

Active Cooling Measures
Forearm immersion, cool shirts, cool mist fans etc.
Rest 10 – 20 Minutes

Rehydration Techniques
12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Cooling Measures
Firefighters should consume 8 ounces of fluid between SCBA change-out

YES → **COLD STRESS**

Active Warming Measures
Dry responder, place in warm area
Hot packs to axilla and / or groin
Rest 10 – 20 minutes

Rehydration Techniques
12 – 32 oz Oral Fluid over 20 minutes
Oral Rehydration may occur along with Active Warming Measures
Firefighters should consume 8 ounces of fluid between SCBA change-out

NO

Reassess responder after 20 Minutes in General Rehabilitation Section
Reassess VS

HR ≥ 110 → YES → Temp ≥ 100.6 → YES → Responder Cannot Wear Protective Gear
Extend Rehabilitation Time Until VS Improve

NO

Temp ≥ 100.6 → YES → HR ≥ 110 → YES → Extend Rehabilitation Time Until VS Improve

NO

Discharge Responder from General Rehabilitation Section

Reports for Reassignment

VITAL SIGN CAVEATS

Blood Pressure:
Prone to inaccuracy on scenes. Must be interpreted in context.

Firefighters have elevated blood pressure due to physical exertion and is not typically pathologic.

Firefighters with Systolic BP ≥ 160 or Diastolic BP ≥ 100 may need extended rehabilitation. However this does not necessarily prevent them from returning to duty.

Temperature:
Firefighters may have increased temperature during rehabilitation.

Special Operations Section

Scene Rehabilitation: General

Pearls

- **Rehabilitation officer has full authority in deciding when responders may return to duty and may adjust rest / rehabilitation time frames depending on existing conditions.**
- **Rehabilitation goals:**
  - **Relief from climatic conditions.**
  - **Rest, recovery, and hydration prior to incident, during, and following incident.**
  - **Active and / or passive cooling or warming as needed for incident type and climate conditions.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- **General indications for rehabilitation:**
  - 20-minute rehabilitation following use of a second 30-minute SCBA, 45-minute SCBA or single 60-minute SCBA cylinder.
  - 20-minute rehabilitation following 40 minutes of intense work without SCBA.
- **General work-rest cycles:**
  - 10-minute self-rehabilitation following use of one 30-minute SCBA cylinder or performing 20 minutes of intense work without SCBA.
- **Serious signs / symptoms:**
  - Chest pain, dizziness, dyspnea, weakness, nausea, or headache.
  - Symptoms of heat stress (cramps) or cold stress.
  - Changes in gait, speech, or behavior.
  - Altered Mental Status.
  - Abnormal Vital Signs per agency SOP or Policy / Procedure.
- **Rehabilitation Section:**
  - Integral function within the Incident Management System.
  - Establish section such that it provides shelter / shade, privacy and freedom from smoke or other hazards
  - Large enough to accommodate expected number of personnel.
  - Separate area to remove PPE.
  - Accessible to EMS transport units and water supply.
  - Away from media agencies and spectators / bystanders.

Scene Rehabilitation: Responder

Remove:
PPE
Body Armor
Chemical Suits
SCBA
Turnout Gear
Other equipment as indicated

Continue:
Heat and Cold Stress treatment techniques from General Rehab Section

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

NFPA Age Predicted 85 % Maximum Heart Rate	
20 - 25	170
26 - 30	165
31 - 35	160
36 - 40	155
41 - 45	152
46 - 50	148
51 -55	140
55 - 60	136
61 - 65	132

Initial Process
1. Personnel logged into Responder Rehabilitation Section
2. VS Assessed and Recorded / Orthostatic Vital Signs
3. Pulse oximetry and SPCO (if available)
4. Personnel assessed for signs / symptoms

Use in conjunction with General Rehabilitation Protocol

20 Minute Rest Period

Pulse Rate > 85 % NFPA Age Predicted Maximum — YES → **A**

NO

Systolic BP ≥ 160
Or
Diastolic BP ≥ 100 — YES

NO

Respirations < 8 or > 40 — YES

NO

Pulse oximetry < 90 %
SPCO > 10 % — YES

NO

Temperature ≥ 100.6 — YES

NO

Discharge Responder from General Rehabilitation Section

Reports for Reassignment

A

Normal Saline Bolus
500 mL IV / IO
Maximum 2 L
Titrate to HR ≤ 100
An
SBP ≥ 100 mmHg

No improvement after 30 minutes of additional rehabilitation

Mandatory Rest Period
Rehydration is Most Important
Re-evaluate in 10 minutes

Notify Destination or Contact Medical Control

Special Operations Section

Pearls

- **Rehabilitation officer has full authority in deciding when responders may return to duty.**
- **Utilized when responder is not appropriate for General Rehabilitation Protocol.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- Rehabilitation Section is an integral function within the Incident Management System.
- Establish section such that it provides shelter, privacy and freedom from smoke or other hazards.

Blast Injury / Incident

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

Signs and Symptoms
- Hearing loss (TM rupture)
- Ocular burns/vision changes
- Multiple trauma/penetrating trauma
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing
- Pneumo/hemothorax
- Traumatic amputation (tourniquet)

Differential
- Thermal / Chemical / Electrical Burn Injury
  - Superficial
    - (1st Degree) red – painful (Don't include in TBSA)
  - Partial Thickness
    - (2nd Degree) blistering
  - Full Thickness
    - (3rd Degree) painless/charred or leathery skin
- Radiation injury

Nature of Device: Agent / Amount. Industrial Explosion. Terrorist Incident. Improvised Explosive Device.
Method of Delivery: Incendiary / Explosive
Nature of Environment: Open / Closed.
Distance from Device: Intervening protective barrier. Other environmental hazards,
Evaluate for: Blunt Trauma / Crush Injury / Compartment Syndrome / Traumatic Brain Injury / Concussion / Tympanic Membrane Rupture / Abdominal hemorrhage or Evisceration, Blast Lung Injury and Penetrating Trauma.

Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute

Accidental / Intentional Explosions (See Pearls)

- Triage Protocol UP 2 ***as indicated***
- Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***as indicated***
- Multiple Trauma Protocol TB 6 ***if indicated***
- IV / IO Protocol UP 6 ***if indicated***
- P — Cardiac Monitor ***if indicated***
- Thermal Burn Protocol TB 9 / Chemical and Electrical Burn Protocol TB 2 ***if indicated***
- Crush Injury Protocol TB 3 ***if indicated***
- Radiation Incident Protocol TB 7 ***if indicated***
- Decontamination Procedure ***if indicated***
- Pain Control Protocol UP 11 ***if indicated***

Blast Lung Injury — YES → Age Appropriate Airway Protocol(s) AR 4, 7 ***as indicated***

NO

Rapid Transport to appropriate destination using **Trauma and Burn: EMS Triage and Destination Plan**

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Blast Injury / Incident

Pearls

- **Types of Blast Injury:**
  - Primary Blast Injury: From pressure wave.
  - Secondary Blast Injury: Impaled objects. Debris which becomes missiles / shrapnel.
  - Tertiary Blast Injury: Patient falling or being thrown / pinned by debris.
  - Most Common Cause of Death: Secondary Blast Injuries.
- **Triage of Blast Injury patients:**
  - Blast Injury Patients with Burn Injuries Must be Triaged using the Thermal / Chemical / Electrical Burn Destination Guidelines for Critical / Serious / Minor Trauma and Burns
  - Patients may be hard of hearing due to tympanic membrane rupture.
- **Care of Blast Injury Patients:**
  - Patients may suffer multi-system injuries including blunt and penetrating trauma, shrapnel, barotrauma, burns, and toxic chemical exposure.
  - Consider airway burns which should prompt early and aggressive airway management.
  - Cover open chest wounds with semi-occlusive dressing.
  - Use Lactated Ringers (if available) for all Critical or Serious Burns.
  - Minimize IV fluids resuscitation in patients with no sign of shock or poor perfusion.
- **Blast Lung Injury:**
  - Blast Lung Injury is characterized by respiratory difficulty and hypoxia. Can occur (rarely) in patients without external thoracic trauma. More likely in enclosed space or in close proximity to explosion.
  - Symptoms: Dyspnea, hemoptysis, cough, chest pain, wheezing and hemodynamic instability.
  - Signs: Apnea, tachypnea, hypopnea, hypoxia, cyanosis and diminished breath sounds.
  - Air embolism should be considered and patient transported in left-lateral decubitus position.
  - Blast Lung Injury patients may require early intubation but positive pressure ventilation may exacerbate the injury, avoid hyperventilation.
  - Air transport may worsen lung injury as well and close observation is mandated. Tension pneumothorax may occur requiring chest decompression. Be judicious with fluids as volume overload may worsen lung injury.
- **Accidental Explosions or Intentional Explosions:**
  - **All explosions or blasts should be considered intentional until determined otherwise.**
  - Attempt to determine source of the blast to include any potential threat for aerosolization of hazardous materials.
  - Evaluate scene safety to include the source of the blast that may continue to spill explosive liquids or gases.
  - Consider structural collapse / Environmental hazards / Fire.
  - Conditions that led to the initial explosion may be returning and lead to a second explosion.
  - Greatest concern is potential threat for a secondary device.
  - Patients who can, typically will attempt to move as far away from the explosive source as they safely can.
  - Evaluate surroundings for suspicious items; unattended back packs or packages, or unattended vehicles.
  - **If patient is unconscious or there is(are) fatality(fatalities) and you are evaluating patient(s) for signs of life:**
    - **Before moving note if there are wires coming from the patient(s), or it appears the patient(s) is(are) lying on a package/pack, or bulky item, do not move the patient(s), quickly back away and immediately notify a law enforcement officer.**
  - If there are no indications the patient is connected to a triggering mechanism for a secondary device, expeditiously remove the patient(s) from the scene and begin transport to the hospital.
  - Protect the airway and cervical spine, however, beyond the primary survey, care and a more detailed assessment should be deferred until the patient is in the ambulance.
  - If there are signs the patient was carrying the source of the blast, notify law enforcement immediately and most likely, a law enforcement officer will accompany your patient to the hospital.

Chemical and Electrical Burn

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

Signs and Symptoms
- Burns, pain, swelling
- Ocular burns/vision changes
- Loss of consciousness
- Hypotension/shock
- Compartment syndrome
- Airway compromise/distress could be indicated by hoarseness/ wheezing
- Electrical may be misleading with small contact/external burn and major internal injury – burn/trauma center recommended

Differential
- Thermal / Chemical / Electrical Burn Injury
  - Superficial
    - (1st Degree) red – painful
    - (Don't include in TBSA)
  - Partial Thickness
    - (2nd Degree) blistering
  - Full Thickness
    - (3rd Degree) painless/charred or leathery skin
- Radiation injury
- Blast injury

Assure Chemical Source is NOT Hazardous to Responders.
Assure Electrical Source is NO longer in contact with patient before touching patient.

Assess Burn / Concomitant Injury Severity

Partial or Full Thickness Burn
< 5% TBSA 2nd/3rd Degree
No inhalation injury, Not Intubated, Normotensive
GCS 14 or Greater
Minor Burn

Partial or Full Thickness Burn
5-15% TBSA 2nd/3rd Degree
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
(When reasonably accessible, transport to a Burn Center)
Serious Burn

Partial or Full Thickness Burn
>15% TBSA 2nd/3rd Degree
Burns with Multiple Trauma
Burns with definitive airway compromise
(When reasonably accessible, transport to a Burn Center)
Critical Burn

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7
if indicated

Thermal Burn Protocol TB 9

Pain Control Protocol UP 11
if indicated

Identify Contact Points

Eye Involvement
Irrigate Involved Eye(s) with Normal Saline for 30 minutes
Continue irrigation during transport

Chemical Exposure / Burn
Flush Contact Area with Normal Saline for 15 minutes
Continue irrigation during transport

Decontamination Procedure
if indicated

Age Appropriate Cardiac Protocol(s)
if indicated

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Chemical and Electrical Burn

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow and Red In burn severity do not apply to Triage systems.**
- **Refer to Rule of Nines.**
- **Transport and Destination:**
  In general, chemical and electrical burns should be transported to a burn center.
  Burn center should be initial destination choice unless EMS system access is limited by time and/or distance.
  When EMS transport to burn center is limited, transport to and stabilization at local center is appropriate.
- **Chemical Burns:**
  Refer to Decontamination Procedure.
  With dry powders/substances, gently brush or wipe off prior to irrigation. Do not aerosolize by brushing too vigorously.
  Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation and use tap water. Other water sources may be used based on availability.
  Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
  Flush contact area for minimum of 15 minutes and continue until arrival at receiving facility.
  Hydrofluoric acid burns:
  Monitor ECG for peaked T waves which can be sign of hypocalcemia.
  Eye involvement:
  Irrigation is recommended for a minimum of 30 minutes and continue until arrival at receiving facility.
- **Electrical Burns:**
  Remember the extent of the obvious external burn from an electrical source does not always reflect more extensive internal damage not seen. Small external injury may have large internal injury.
  Do not refer to as entry and exit sites or wounds.
  DO NOT contact patient until you are certain the source of the electrical shock is disconnected.
  Attempt to locate contact points (generally there will be two or more.) A point where the patient contacted the source and a point(s) where the patient is grounded.
  Sites will generally be full thickness (3rd).
  Cardiac Monitor: Anticipate ventricular or atrial irregularity including VT, VF, atrial fibrillation and / or heart blocks.
  Attempt to identify the nature of the electrical source (AC / DC), the amount of voltage and the amperage the patient may have been exposed to during the electrical shock.
  Lightning strike:
  Lightning strike victims are amenable to airway, breathing, cardiac compressions as well as early defibrillation.
  Use concept of reverse triage with multiple casualties. Resuscitate lightning strikes as the priority.
  Lightning strike victims found alive do not often deteriorate quickly.

Crush Syndrome Trauma

History
- Entrapped and crushed under heavy load > 30 minutes
- Extremity / body crushed
- Building collapse, trench collapse, industrial accident, pinned under heavy equipment

Signs and Symptoms
- Hypotension
- Hypothermia
- Abnormal ECG findings
- Pain
- Anxiety

Differential
- Entrapment without crush syndrome
- Vascular injury with perfusion deficit
- Compartment syndrome
- Altered mental status

Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***

B 12 Lead ECG Procedure

IV or IO Access Protocol UP 6

P Cardiac Monitor

Multiple Trauma Protocol TB 6 ***if indicated***

Thermal Burn Protocol TB 9
Chemical and Electrical Burn Protocol TB 2 ***if indicated***

Pain Control Protocol UP 11 ***as indicated***

Age Specific Blood Pressure indicating possible shock

Age 0 – 28 days: SBP < 60
Ages ≥ 1 month: SBP < 70
Age 1 – 9: SBP < 70 + (2*x* Age)

Ages 10 – 64: SBP < 90
Ages ≥ 65: SBP < 100

All ages:
Shock Index HR > SBP

P Consider
Midazolam 0.5 – 2 mg IV / IO
Midazolam 1 – 2 mg IN
Maximum 5 mg
Pediatric: 0.1 – 0.2 mg / kg
IV / IO / IN
Pediatric Maximum 2 mg
Over 2 – 3 minutes as needed

Entrapped < 2 hours

A **Normal Saline Infusion**
1 Liter per hour IV / IO
Pediatric:
3 x maintenance fluid rate

Entrapped > 2 hours

A **Decrease Normal Saline Infusion**
500 mL per hour IV / IO
Pediatric:
Maintenance fluid rate

Abnormal ECG
Peaked T Waves
QRS ≥ 0.12 seconds
QT ≥ 0.46 seconds
Loss of P wave
Or
Hemodynamically Unstable
Or
Asystole / PEA / VF / VT

P

Calcium Gluconate 2 g IV / IO
Or
(Calcium Chloride 1 g IV / IO)
Pediatric: 20 mg / kg IV / IO
Over 2- 3 minutes

Albuterol Nebulizer
2.5 – 5 mg
May repeat x 3

Sodium Bicarbonate
50 mEq IV / IO
Pediatric: 1 mEq / kg IV / IO

Exit to Age Appropriate Cardiac Arrest Protocol AC 3 / PC 4 Arrhythmia Protocol(s) ***if indicated***

Rapid Transport to appropriate destination using Trauma and Burn: EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Crush Syndrome Trauma

Pearls

- **Recommended exam: Mental Status, Musculoskeletal, Neuro**
- **Scene safety is of paramount importance as typical scenes may pose hazards to rescuers. Call for appropriate resources.**
- **Crush Injury is a localized crush injury with systemic signs and symptoms causing muscle breakdown and release of potentially toxic muscle cell components and electrolytes into the circulation.**
- **Crush syndrome typically manifests after 1 – 4 hours of crush injury.**
- **Fluid resuscitation strategy:**
  If possible, administer IV / IO fluids prior to release of crushed body part, especially with crush > 1 hour.
  If access to patient and initiation of IV / IO fluids occurs after 2 hours, give 2 liters of IV fluids in adults and 20 mL/kg of IV fluids in pediatrics, and then begin > 2 hour dosing regimen.
- **If not able to perform IV / IO fluid resuscitation immediately, place tourniquet on crushed limb until IV / IO fluids can be initiated (even if tourniquet is not being used for hemorrhage control).**

- **Pediatric IV Fluid maintenance rate:**
  4 mL for the first 10 kg of weight +
  2 mL for the second 10 kg of weight +
  1 mL for every additional kg in weight after 20 kg

Example: 28 kg pediatric	
First 10 kg:	4 mL/kg/hr = 40 mL/hr
Second 10 kg:	2 mL/kg/hr = 20 mL/hr
Final 8 Kg:	1 mL/kg//hr = 8 mL/hr
	Total: 68 mL/hr rate

- **Consider all possible causes of shock and treat per appropriate protocol.**
- **Majority of decompensation in pediatrics is airway or respiratory related.**
- **Decreasing heart rate and hypotension occur late in children and are signs of impending cardiac arrest.**
- **Shock may be present with a normal blood pressure initially or even elevated.**
- **Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only sign.**
- **Patients may become hypothermic even in warm environments. Maintain warmth.**
- Hyperkalemia from crush syndrome can produce ECG changes described in protocol, but may also be a bizarre, wide complex rhythm. Wide complex rhythms should also be treated using the VF/ Pulseless VT Protocol if indicated (AC 9 VF Pulseless VT Protocol and/ or PC 7 Pediatric VF Pulseless VT Protocol).

Extremity Trauma

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

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

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

Wound care
Control Hemorrhage with Direct Pressure
Splinting as indicated

Consider
Topical Hemostatic Agent / Dressing
if available

Wound Care - Tourniquet Procedure
if indicated

A IV / IO Procedure
if indicated

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7
if indicated

Multiple Trauma Protocol TB 6
if indicated

Age Appropriate Hypotension / Shock
Protocol AM 5 / PM 3
if indicated

Pain Protocol UP 11
if indicated

Crush Syndrome Protocol TB 3
as indicated

Amputation and / or Open Fracture

YES → Clean amputated part, Wrap part in sterile dressing soaked in normal saline and place in air tight container.

Place container on ice if available.

NO

Monitor and Reassess

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Pearls
- **Recommended Exam: Mental Status, Extremity, Neuro**
- 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.
- Multiple casualty incident: Tourniquet Procedure may be considered first instead of direct pressure.

Head Trauma

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

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

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

	Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***if indicated***
	Obtain and Record GCS
	Supplemental oxygen Maintain SpO2 ≥ 90% Preferably ≥ 94% Prevent Oxygen desaturation events < 90%
	Blood Glucose Analysis Procedure
B	Maintain EtCO2 35 – 45 mmHg
A	IV / IO Procedure ***if indicated***
P	Cardiac Monitor
	Altered Mental Status Protocol UP 4 ***if indicated***
	Multiple Trauma Protocol TB 6 ***if indicated***
	Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***
	Seizure Protocol UP 13 ***if indicated***
	Spinal Motion Restriction Procedure / Protocol TB 8 ***if indicated***
	Pain Control Protocol UP 11 ***if indicated***
	Monitor and Reassess

DO NOT ROUTINELY HYPERVENTILATE

Evidence of Brain Herniation:
Unilateral or Bilateral Dilation of Pupils / Posturing

Hyperventilate to maintain EtCO2 30 – 35 mmHg
See Pearls

Rapid Transport to appropriate destination using
Trauma and Burn: EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Head Trauma

Eye Opening Response	Verbal Response	Motor Response
4 = Spontaneous	5 = Oriented	6 = Obeys commands
3 = To verbal stimuli	4 = Confused	5 = Localizes pain
2 = To pain	3 = Inappropriate words	4 = Withdraws from pain
1 = None	2 = Incoherent	3 = Flexion to pain or decorticate
	1 = None	2 = Extension to pain or decerebrate
		1 = None

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **GCS is a key performance measure used in the EMS Acute Trauma Care Toolkit.**
- **A single episode of hypoxia and / or hypotension can significantly increase morbidity and mortality with head injury.**
- **Hyperventilation in head injury:**
  - **Hyperventilation lowers CO_2 and causes vasoconstriction leading to increased intracranial pressure (ICP) and should not be done routinely.**
  - **Use in patient with evidence of herniation (blown pupil, decorticate / decerebrate posturing, bradycardia, decreasing GCS).**
  - **If hyperventilation is needed, ventilate at 14 – 18 / minute to maintain $EtCO_2$ between 30 - 35 mmHg.**
  - **Short term option only used for severe head injury typically GCS ≤ 8 or unresponsive.**
- **Do not place in Trendelenburg position as this may increase ICP and worsen blood pressure.**
- **Poorly fitted cervical collars may also increase ICP when applied too tightly.**
- **In areas with short transport times, Drug Assisted Airway protocol is not recommended for patients who are spontaneously breathing and who have oxygen saturations of ≥ 90% with supplemental oxygen including BIAD / BVM.**
- **Hypotension:**
  - Limit IV fluids unless patient is hypotensive.
  - Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
  - Usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
  - Fluid resuscitation should be titrated to maintain at least a systolic BP of > 70 + 2 x the age in years.
  - **Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: 70 + 2 x age in years.**
- An important item to monitor and document is a change in the level of consciousness by serial examination.
- Consider Restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Concussions:**
  - Traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache.
  - Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.
  - **EMS Providers should not make return-to-play decisions when evaluating an athlete with suspected concussion. This is outside the scope of practice.**

Multiple Trauma

History
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints/ protective equipment
- Past medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential (Life threatening)
- Uncontrolled hemorrhage
- Airway obstruction/ deformity
- Chest:
- Tension pneumothorax
  Flail chest/ Open chest wound
  Pericardial tamponade/ Hemothorax
- Head Trauma Protocol TB 5
- Intra-abdominal bleeding
- Pelvis/ Femur/ Extremity fracture
- Spine fracture/ Cord injury
- Hypothermia

Age Appropriate
Airway Protocol(s) AR 1 - 7
as indicated

P — Chest Decompression Procedure WTP 1
if indicated

Control External Hemorrhage
Procedure(s) WTP 4, 5, 7
Consider Pelvic Binding
Splint Fractures Procedure WTP 3

IV or IO Access Protocol UP 6

Spinal Motion Restriction Procedure WTP 2
Spinal Motion Restriction Protocol TB 8
if indicated

Obtain and Record GCS

VS / Perfusion Abnormal / Shock?

YES → Age Appropriate Hypotension/ Shock
Protocol AM 5/ PM 3
if indicated

P — **TXA 1 - 2 g over 10 minutes IV / IO**
Peds: (Per local trauma guidelines) over 10 minutes IV / IO
Maximum 1 gm
if indicated

P — **Blood Products**
if indicated

NO

Head Injury Protocol TB 5
if indicated

Altered Mental Status
Protocol UP 4
if indicated

Pain Control Protocol UP 11
if indicated

Extremity Trauma Protocol TB 4
if indicated

Crush Syndrome Protocol TB 3
if indicated

Repeat Assessment Adult Procedure

Monitor and Reassess

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan
Limit Scene Time ≤ 15 minutes
Provide Early Notification

Notify Destination or Contact Medical Control

TXA/ Blood Product Indicators:
V/S parameters
for blunt or penetrating trauma:

Adult:
- **SBP ≤ 70 mmHg**
  or
- **SBP ≤ 90 mmHg + HR ≥ 110**

- **Age ≥ 65**
  SBP < 100 mmHg + HR > 100

Peds:
- **SBP < {70 + 2(Age)}**

Trauma and Burn Protocol Section

Multiple Trauma

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
- **Scene time should not be delayed for procedures and all should be performed during rapid transport of unstable patients.**
- **Ask all patients if they are taking any anticoagulants and report during facility transition of care.**
- **Airway:**
  - **BVM and BIAD are acceptable for airway management to maintain SpO_2 of 92 – 98%.**
  - **Endotracheal intubation, if performed, should be completed during transport and should not delay scene time.**
- **Breathing:**
  - **Consider Chest Decompression with signs of shock and/ or injury to torso with evidence of tension pneumothorax.**
- **Circulation:**
  - **Control external hemorrhage and prevent hypothermia by keeping patient warm.**
  - **IV or IO access should be established during rapid transport of unstable patients.**
- **Head Injury with multiple trauma (Refer to Head Trauma Protocol TB 5):**
  - **Higher SBP targets are needed to maintain cerebral perfusion pressure.**
  - **Single episodes of Hypotension and/ or hypoxia are associated with worse outcomes in head injured patients.**
  - **Adult SBP target is ≥ 100 mmHg.**
  - **Pediatric SPB target is ≥ 70 + 2(Age) mmHg.**
- **Trauma Triad of Death:**
  - **Metabolic acidosis/ Coagulopathy/ Hypothermia**
  - **Address by appropriate resuscitation measures and keeping patient warm, regardless of ambient temperature, which helps to treat metabolic acidosis, coagulopathy, and hypothermia.**
- **Tranexamic Acid (TXA):**
  - **Agencies utilizing TXA must submit letters from the their receiving trauma centers for approval by the OEMS Medical Director.**
  - **Receiving trauma centers must agree to continue TXA therapy with repeat dosing.**
  - **TXA is NOT indicated and should NOT be administered where trauma occurred > 3 hours prior to EMS arrival.**
- **Trauma in Pregnancy:**
  - Providing optimal care for the mother = optimal care for the fetus.
  - After 20 weeks gestation (fundus at or above umbilicus) transport patient on left side with 10 – 20° of elevation.
- **Geriatric Trauma:**
  - **Age ≥ 65: SBP < 110 mmHg or HR > SBP may indicate shock.**
  - Evaluate with a high index of suspicion, occult injuries difficult to recognize and with unexpected patient decompensation.
  - Risk of death with trauma increases after age 55.
  - Low impact mechanisms, such as ground level falls might result in severe injury especially in age over 65.
- See Regional Trauma Guidelines when declaring Trauma Activation.
- Maintain high-index of suspicion for domestic violence or abuse, pediatric non-accidental trauma, or geriatric abuse.
- **Refer to your Regional Trauma Guidelines when declaring Trauma Activation.**
- Severe bleeding from an extremity, not rapidly controlled with direct pressure, needs application of a tourniquet.
- Maintain high-index of suspicion for domestic violence or abuse, pediatric non-accidental trauma, or geriatric abuse.

Radiation Incident

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

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential
- Superficial (1st Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute

Assess Burn / Concomitant Injury Severity

Minor Burn	Serious Burn	Critical Burn
Partial / Full Thickness **< 5% TBSA 2nd/3rd Degree Burn** No inhalation injury, Not Intubated, Normotensive GCS 14 or Greater	**Partial or Full Thickness Burn** **5-15% TBSA 2nd/3rd Degree Burn** Suspected inhalation injury or requiring intubation for airway stabilization Hypotension or GCS 13 or Less *(When reasonably accessible, transport to a Burn Center)*	**Partial or Full Thickness Burn** **>15% TBSA 2nd/3rd Degree Burn** Burns with Multiple Trauma Burns with definitive airway compromise *(When reasonably accessible, transport to a Burn Center)*

- Age Appropriate Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7 ***if indicated***
- Eye Involvement: Irrigate Involved Eye(s) with Normal Saline for 15 – 30 minutes, May repeat as needed
- Flush Contact Area with Normal Saline for 15 minutes
- Decontamination Procedure ***if indicated***
- Age Appropriate Cardiac Protocol(s) ***as indicated***
- Thermal Burn Protocol TB 9 ***if indicated***
- **Rapid Transport** to appropriate destination using **Trauma and Burn: EMS Triage and Destination Plan**
- **Notify Destination or Contact Medical Control**

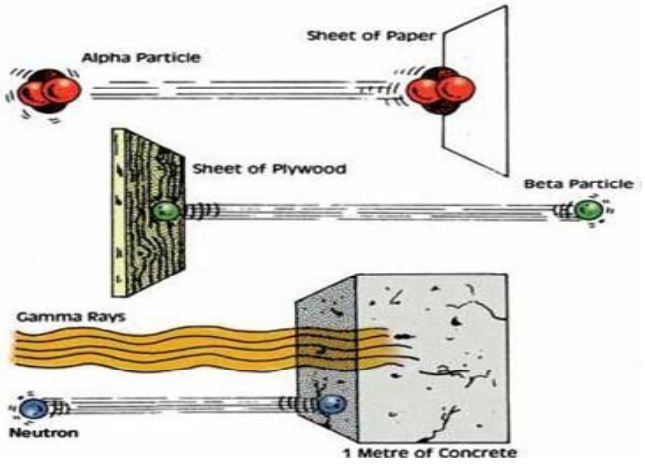
Collateral Injury: Most all injuries immediately seen will be a result of collateral injury, such as heat from the blast, trauma from concussion, treat collateral injury based on typical care for the type of injury displayed.·

Qualify: Determine exposure type; external irradiation, external contamination with radioactive material, internal contamination with radioactive material.·

Quantify: Determine exposure (generally measured in Grays/Gy). *Information may be available from those on site who have monitoring equipment, do not delay transport to acquire this information.*

Trauma and Burn Protocol Section

Radiation Incident



Time Phases of Radiation Injury
(Exposure Dose vs Clinical Outcome)

Exposure Dose (Gy)	Prodrome Severity	Manifest Illness - Symptom Severity			Prognosis
		Hematologic	Gastrointestinal	Neurologic	
0.5 to 1.0	+	+	0	0	Survival almost certain
1.0 to 2.0	+/++	+	0	0	Survival >90 percent
2.0 to 3.5	++	++	0	0	Probable survival
3.5 to 5.5	+++	+++	+	0	Death in 50% at 3.5 to 6 wks
5.5 to 7.5	+++	+++	++	0	Death probable in 2-3 wks
7.5 to 10	+++	+++	+++	0*	Death probable in 1-2.5 wks
10 to 20	+++	+++	+++	+++	Death certain in 5-12 days
> 20	+++	+++	+++	+++**	Death certain in 2-5 days

Abbreviations: Gy: dose in Grey;
0: no effects; +: mild; ++: moderate; +++: severe or marked

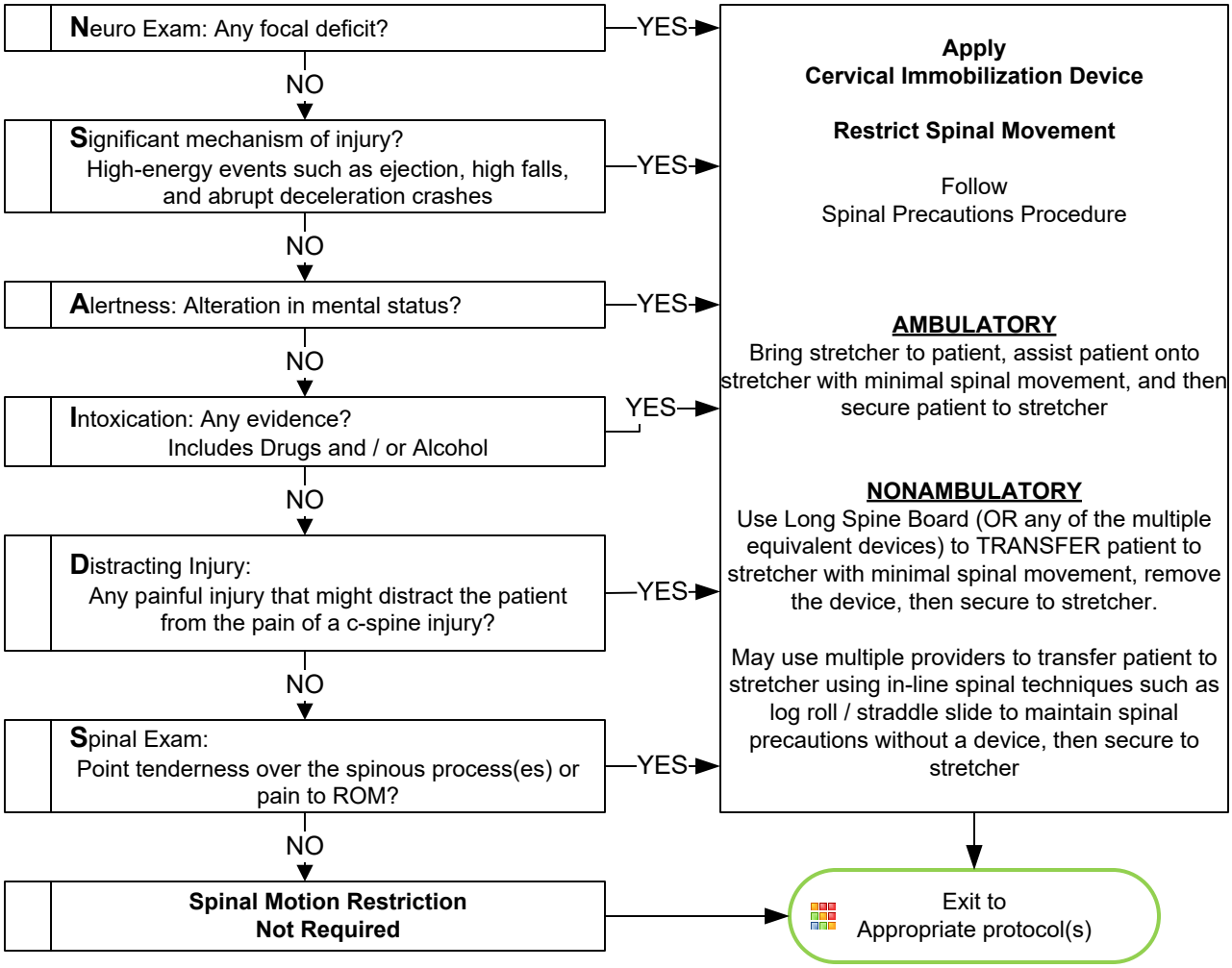
* Hypotension
** Also cardiovascular collapse, fever, shock

Modified from : Waselenko, JK, MacVittie, TJ, Blakely, WF, et al. Medical management of the acute radiation syndrome: Recommendations of the strategic national stockpile radiation working group. Ann Int Med 2004; 140:1039.

Pearls

- Dealing with a patient with a radiation exposure can be a frightening experience. Do not ignore the ABC's, a dead but decontaminated patient is not a good outcome. Refer to the Decontamination Procedure for more information.
- Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- **Three methods of exposure:**
  - External irradiation
  - External contamination
  - Internal contamination
- **Two classes of radiation:**
  - Ionizing radiation (greater energy) is the most dangerous and is generally in one of three states: Alpha Particles, Beta Particles and Gamma Rays.
  - Non-ionizing (lower energy) examples include microwaves, radios, lasers and visible light.
- Radiation burns with early presentation are unlikely, it is more likely this is a combination event with either thermal or chemical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been exposed to a significant source, (> 250 rem).
- Patients experiencing radiation poisoning are not contagious. Cross contamination is only a threat with external and internal contamination.
- Typical ionizing radiation sources in the civilian setting include soil density probes used with roadway builders and medical uses such as x-ray sources as well as radiation therapy. Sources used in the production of nuclear energy and spent fuel are rarely exposure threats as is military sources used in weaponry. Nevertheless, these sources are generally highly radioactive and in the unlikely event they are the source, consequences could be significant and the patient's outcome could be grave.
- **The three primary methods of protection from radiation sources:**
  - Limiting time of exposure
  - Distance from
  - Shielding from the source
- Dirty bombs ingredients generally include previously used radioactive material and combined with a conventional explosive device to spread and distribute the contaminated material.
- Refer to Decontamination Procedure / WMD / Nerve Agent Protocol for dirty contamination events.
- If there is a time lag between the time of exposure and the encounter with EMS, key clinical symptom evaluation includes: Nausea/ Vomiting, hypothermia/hyperthermia, diarrhea, neurological/cognitive deficits, headache and hypotension.
- This event may require an activation of the National Radiation Injury Treatment Network, RITN. UNC Hospitals, Wake Forest-Baptist and Duke are the NC hospitals, with burns managed at UNC and Wake Forest.

Selective Spinal Motion Restriction



Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients meeting all the above criteria do not require spinal motion restriction. However, patients who fail one or more criteria above require spinal motion restriction, but does NOT require use of the long spine board for immobilization.**
- **Long spine boards are NOT considered standard of care in most cases of potential spinal injury. Spinal motion restriction with cervical collar and securing patient to cot, while padding all void areas is appropriate.**
- **True spinal immobilization is not possible. Spine protection and spinal motion restriction do not equal long spine board.**
- **Spinal motion restriction is always utilized in at-risk patients. These include cervical collar, securing to stretcher, minimizing movement / transfers and maintenance of in-line spine stabilization during any necessary movement / transfers. This includes the elderly or others with body or spine habitus preventing them from lying flat.**
- **Consider spinal motion restriction in patients with arthritis, cancer, dialysis, underlying spine or bone disease.**
- Range of motion (ROM) is tested by touching chin to chest (look down), extending neck (look up), and turning head from side to side (shoulder to shoulder) without posterior cervical mid-line pain. ROM should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted.
- **EMR may participate in spinal motion restriction** per Agency Medical Director
- **Immobilization on a long spine board is not necessary where:**
  - **Penetrating trauma to the head, neck or torso with no signs / symptoms of spinal injury.**
- **Concerning mechanisms that may result in spinal column injury:**
  - **Fall from ≥ 3 feet and/or ≥ 5 stairs or steps**
  - **MVC ≥ 30 mph, rollover, and/or ejection**
  - **Motorcycle, bicycle, other mobile device, or pedestrian-vehicle crash**
  - **Diving or axial load to spine**
  - **Electric shock**

Thermal Burn

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

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/ distress could be indicated by hoarseness/ wheezing

Differential
- Thermal / Chemical / Electrical Burn Injury
  - Superficial
    - (1st Degree) red – painful (Don't include in TBSA)
  - Partial Thickness
    - (2nd Degree) blistering
  - Full Thickness
    - (3rd Degree) painless/charred or leathery skin
- Radiation injury
- Blast injury

Assess Burn/ Concomitant Injury Severity

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated, Normotensive
GCS 14 or Greater
Minor Burn

5-15% TBSA 2nd/3rd Degree Burn
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
(When reasonably accessible, transport to a Burn Center)
Serious Burn

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
(When reasonably accessible, transport to a Burn Center)
Critical Burn

- Airway Protocol(s) AR 1, 2, 3, 5, 6 ***as indicated***
- Multiple Trauma Protocol TB 6 ***if indicated***
- Remove Rings, Bracelets, Constricting Items
- Dry Clean Sheet or Dressings
- IV or IO Access Protocol UP 6
  Consider 2 IV sites if ≥ 15 % TBSA

TBSA estimate at ≥ 20%

NO → **A** **Lactated Ringers or Normal Saline**
0.25 mL/kg *X* (TBSA%)/hr

YES → **A** **Lactated Ringers or Normal Saline**
Age: ≤ 5 = 125 mL/hr
Age: 6–14 = 250 mL/hr
Age: ≥ 15 = 500 mL/hr

- Pain Control Protocol UP 11 ***if indicated***
- Carbon Monoxide/ Cyanide Protocol TE 2 ***if indicated***
- Monitor and Reassess
- **Rapid Transport** to appropriate destination using Trauma and Burn: EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

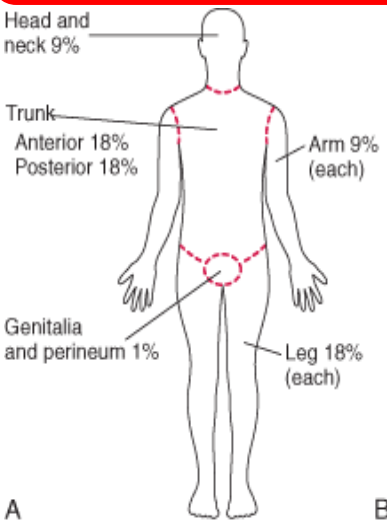
Formula example:
70 kg patient with 15% TBSA

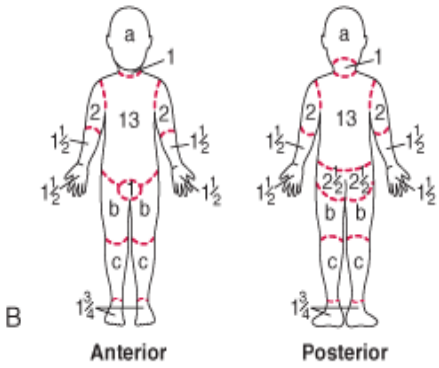
0.25 *x* 70 kg = 17.5
17.5 *x* 15 = 263 mL/hr

1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.

Trauma and Burn Protocol Section

Thermal Burn





Relative percentage of body surface area (% BSA) affected by growth

	Age				
Body Part	0 yr	1 yr	5 yr	10 yr	15 yr
a = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b = 1/2 of 1 thigh	2 3/4	3 1/4	4	4 1/4	4 1/2
c = 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4

Rule of Nines

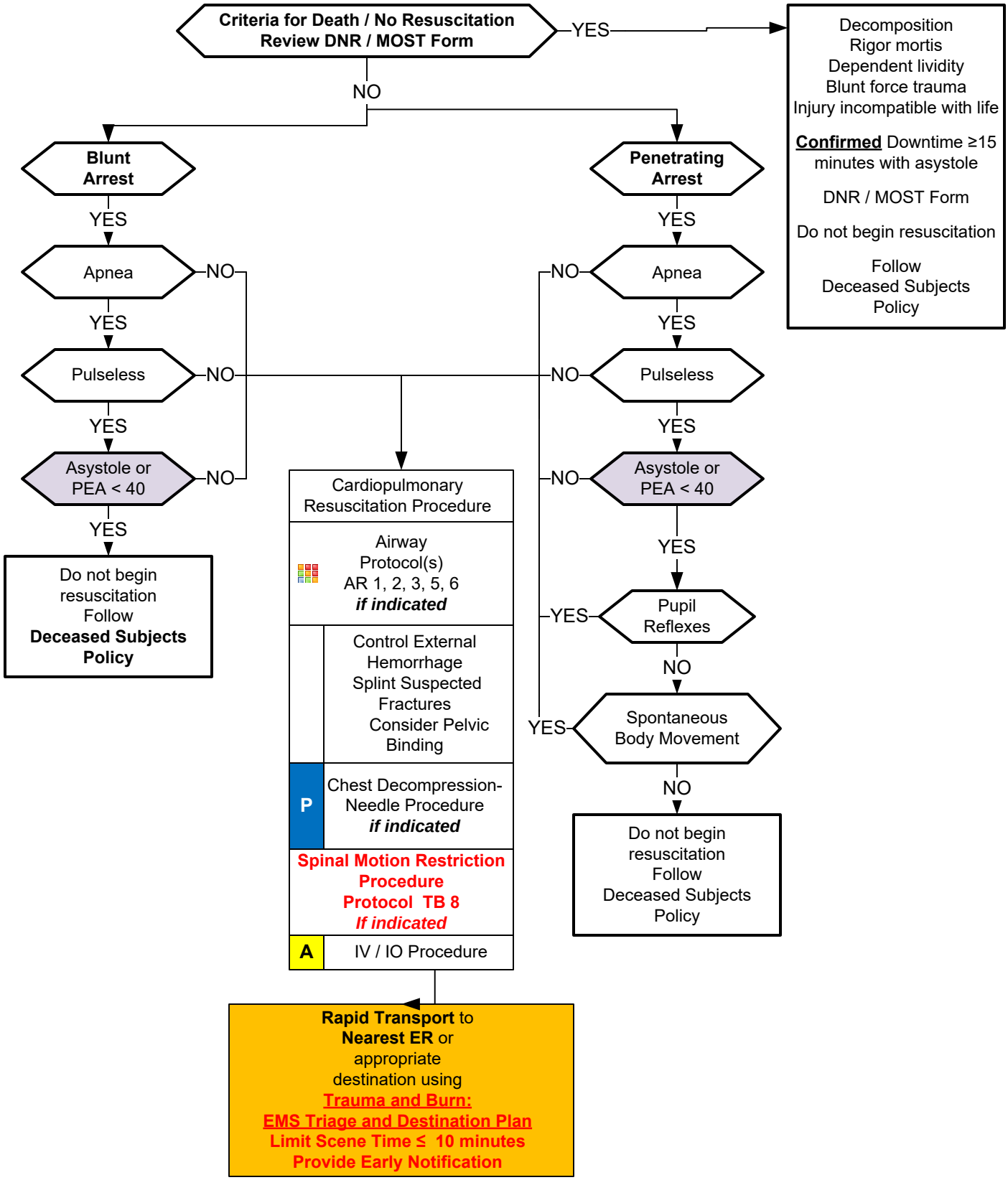
- Rarely find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1st degree burn(superficial) from those of partial (2nd) or full (3rd) thickness burns.
- **For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial (2nd) and Full Thickness (3rd) burns.** Report the observation of other superficial (1st degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4th 5th and 6th degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial and full thickness burn at least at the level of emergent and primary care. For our work, all are included in Full Thickness burns

Estimate spotty areas of burn by using the size of the patient's palm as 1 %

Pearls

- **Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- **Green, Yellow, and Red In burn severity do not apply to the Start/ JumpStart Triage System.**
- **Airway considerations:**
  - **For systems performing RSI, Rocuronium is preferred agent (succinylcholine can be used in the first 24-hours)**
  - **Singed nasal hairs, facial burns, and/ or carbonaceous sputum are NOT absolute indications for intubation in a burn patient.**
  - **Utilizing non-rebreather face mask as well as NIPPV procedure are acceptable as tolerated.**
- **Critical or Serious Burns:**
  - **> 5-15% total body surface area (TBSA) 2nd or 3rd degree burns**
  - **3rd (full thickness) degree burns > 5% TBSA for any age group**
  - **Circumferential burns of extremities**
  - **Electrical or lightning injuries**
  - **Suspicion of abuse or neglect**
  - **Inhalation injury**
  - **Chemical burns**
  - **Burns of face, hands, perineum, or feet**
  - **Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.**
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- 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 burn, must maintain normal body temperature.
- Evaluate the possibility of geriatric abuse with burn injuries in the elderly.
- Do not administer IM pain injections to a burn patient. IM dosing is variable in burn patients and may result in over or under dose.

Traumatic Arrest



Traumatic Arrest

Pearls

- **Confirmed downtime is not a last known well time but a specific known time downtime or witnessed.**
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Withholding resuscitative efforts with blunt and penetrating trauma victims who meet criteria is appropriate.**
- **If transport time to Trauma Center is < 15 minutes use of ECG monitor may delay resuscitation.**
- **Rhythm determination is more helpful in rural settings or where transport to nearest facility is > 15 minutes. Omit from algorithm where appropriate.**
- **Organized rhythms for the purposes of this protocol include Ventricular Tachycardia, Ventricular Fibrillation and PEA.**
- **Wide, bizarre rhythms such as Idioventricular and severely brachycardic rhythms < 40 BPM are not organized rhythms.**
- **First arriving EMS personnel should make the assessment concerning agonal respirations, pulselessness, asystole or PEA < 40, pupillary reflexes and spontaneous body movements.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.**
- **DO NOT HYPERVENTILATE: Place advanced airway (BIAD) with continuous compressions to ventilations are 8 – 10 breaths per minute.**
- **ALS procedures should optimally be performed during rapid transport.**
- **Time considerations:**

  From the time cardiac arrest is identified, if CPR is performed ≥ 15 minutes with no ROSC consider termination of resuscitation.

  From the time cardiac arrest is identified, if transport time to closest Trauma Center is > 15 minutes consider termination of resuscitation.
- Lightning strike, drowning or in situations causing hypothermia resuscitation should be initiated.
- Where multiple lightning strike victims are found used Reverse Triage: Begin CPR where apneic / pulseless
- Agencies utilizing Targeted Temperature Management Protocol should **not** cool the trauma patient, but rather make every effort to maintain warmth.

Bites and Envenomations

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

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

Differential
- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk

Call for help/ additional resources
Stage until scene safe

Contact
Carolinas Poison Control
1-800-222-1222
Or
Agency Specific Number

- General Wound Care Procedure
- Immobilize Injury
- Remove any constricting clothing/ bands/ jewelry
- IV or IO Access Protocol UP 6 ***if indicated***
- Age Appropriate Trauma Protocol(s) TB 4, 5, 6 ***if indicated***
- Age Appropriate Allergic Reaction/ Anaphylaxis Protocol AM 1/ PM 1 ***if indicated***
- Age Appropriate Hypotension/ Shock Protocol AM 5 / PM 3 ***if indicated***
- Pain Control Protocol UP 11 ***if indicated***
- Extremity Trauma Protocol TB 4 ***if indicated***

Identification of Animal

Spider Bite/ Bee or Wasp Sting
Venomous

- Keep bite at level of heart ***if able***
- Apply Ice Packs

P

<u>Muscle Spasm</u>
Midazolam 2 – 2.5 mg IV / IO
Over 2 to 3 minutes
Midazolam IN See Page 2
Maximum 10 mg
Pediatrics:
Midazolam 0.1 – 0.2 mg / kg
IV / IO / IM / IN
Over 2 to 3 minutes
Maximum 5 mg IM

Snake Bite
Venomous

- Keep bite at level of heart ***if able***
- Remove any constricting clothing/ bands
- **DO NOT apply ICE**
- Mark Margin of Swelling / Redness and Time

Mammal Bite

Transport
- NO → Contact and Document contact with Animal Control Officer
- YES

Monitor and Reassess

Notify Destination or Contact Medical Control

Toxin-Environmental Protocol Section

Bites and Envenomations

Pearls

- **Recommended Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neuro exam if systemic effects are noted**
- **Immunocompromised patients are at an increased risk for infection: diabetes, chemotherapy, transplant patients.**
- **Consider contacting the North Carolina Poison Control Center for guidance (1-800-222-1222).**
- **Do not put responders in danger attempting to capture an animal or insect for identification purposes.**
- **Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.**
- **Human bites:**
  Human bites have higher infection rates than animal bites due to normal mouth bacteria.
  Hand and foot bites have highest rates of infection.
- **Dog/ Cat/ Carnivore bites:**
  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).
- **Snake bites:**
  Poisonous snakes in this area are generally of the pit viper family: rattlesnake and copperhead.
  Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
  Amount of envenomation is variable, generally worse with larger snakes and early in spring.
  Snake bites are treated based on signs and symptoms and progression.
  It is not important to attempt to identify the type of snake and attempts may endanger providers.
  Do not bring a snake to the facility for identification as accidental bites to providers may occur.
- **Spider bites:**
  Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly).
  Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).
- **Animal bite(s) in subjects declining transport to a medical facility for evaluation:**
  NCGS 130A-196 requires that all animal bites be reported to the local health department even if the bite is by the owner's animal, and even if accidental.
  Reporting requirements can be satisfied by reporting to local animal control official.

Carbon Monoxide/ Cyanide

History
- Smoke inhalation
- Ingestion of cyanide
- Eating large quantity of fruit pits
- Industrial exposure
- Trauma
- Reason: Suicide, criminal, accidental
- Past Medical History
- Time/ Duration of exposure

Signs and Symptoms
- AMS
- Malaise, weakness, flu like illness
- Dyspnea
- GI Symptoms; N/V; cramping
- Dizziness
- Seizures
- Syncope
- Reddened skin
- Chest pain

Differential
- Diabetic related
- Infection
- MI
- Anaphylaxis
- Renal failure/ dialysis problem
- Head injury/ trauma
- Co-ingestant or exposures

	Immediately Remove from Exposure
	Appropriate Airway Protocol(s) 1 - 7 ***as indicated***
	High Flow Oxygen
	Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure
	IV or IO Access Protocol UP 6
P	Cardiac Monitor/ CO Monitor
	Altered Mental Status Protocol UP 4 ***if indicated***
	Age Appropriate Diabetic Protocol AM 2/ PM 2 ***if indicated***
	Age Appropriate Multiple Trauma Protocol TB 6 Head Injury TB 5 ***if indicated***
	Age Appropriate Hypotension/ Shock Protocol AM 5/ PM 3 ***if indicated***

Contact
Carolinas Poison Control
1-800-222-1222
Or
Agency Specific Number

High Suspicion of Cyanide

YES → P **Hydroxocobalamin 70 mg / kg IV / IO**
Maximum 5 g
If available

NO

	Continue Care Continue High Flow Oxygen
	Monitor and Reasses

Notify Destination or Contact Medical Control

Pearls
- **Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- **Scene safety is priority.**
- Consider CO and Cyanide with any product of combustion.
- Normal environmental CO level does not exclude CO poisoning.
- Symptoms present with lower CO levels in pregnancy, children, and the elderly.
- Continue high flow oxygen regardless of pulse ox readings.

Drowning

History
- Submersion in water regardless of depth
- Possible history of trauma
- Slammed into shore wave break
- Duration of submersion/ immersion
- Temperature of water or possibility of hypothermia

Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Foaming/ Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor
- Apnea

Differential
- Trauma
- Pre-existing medical problem
  - Hypoglycemia
  - Cardiac Dysrhythmia
- Pressure injury (SCUBA diving)
  - Barotrauma
  - Decompression sickness
- Post-immersion syndrome

Awake and Alert

- Supplemental Oxygen ***as tolerated***
- Spinal Motions Restriction Procedure/ Protocol TB 8 ***if indicated***
- Remove wet clothing Dry/ Warm Patient
- Monitor and Reassess
- **Encourage transport and evaluation even if asymptomatic or with minimal symptoms** *Asymptomatic drowning patients (refusing transport) should be instructed to seek medical care/call 911 if they develop any symptoms within 6 hours*
- IV or IO Access Protocol UP 6 ***if indicated***
- P Cardiac Monitor ***as indicated***

Awake but with AMS

- **5 Breaths via BVM**/ mouth-to-mouth ***as tolerated***
- Supplemental Oxygen ***as tolerated***
- Age Appropriate Airway Protocol(s) 1 - 7 ***as indicated***
- Spinal Motion Restriction Procedure/ Protocol TB 8 ***if indicated***
- Altered Mental Status Protocol UP 4 ***as indicated***
- Remove wet clothing Dry/ Warm Patient
- IV or IO Access Protocol UP 6
- P Cardiac Monitor

Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***

Notify Destination or Contact Medical Control

Unresponsive

- **5 Breaths via BVM**/ mouth-to-mouth ***as tolerated***

Pulse
- YES → Age Appropriate Airway Protocol(s) 1 - 7 ***as indicated***
- NO → Exit to Age Appropriate Cardiac Arrest Protocol(s) AC 3/ PC 4

Airway Protocol(s) AR 1 - 7
Spinal Motion Restriction Protocol TB 8 ***as indicated***

Dive Accident / Barotrauma
Divers Alert Network
1-919-684-9111
Or
Agency specific hyperbaric information

Toxic-Environmental Protocol Section

Pearls
- **Recommended Exam: Respiratory, Mental status, Trauma Survey, Skin, Neuro**
- **Drowning is the process of experiencing respiratory impairment (any respiratory symptom) from submersion/ immersion in a liquid.**
- **Begin with BVM ventilations, if patient does not tolerate, then apply appropriate mode of supplemental oxygen.**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **When feasible, only appropriately trained and certified rescuers should remove patients from areas of danger.**
- **Regardless of water temperature – resuscitate all patients with known submersion time of ≤ 25 minutes.**
- **Regardless of water temperature – If submersion time ≥ 1 hour consider moving to recovery phase instead of rescue.**
- **Foam is usually present in airway and may be copious, DO NOT waste time attempting to suction. Ventilate with BVM through foam (suction water and vomit only when present.)**
- **Cardiac arrest in drowning is caused by hypoxia, airway and ventilation are equally important to high-quality CPR.**
- **Encourage transport of all symptomatic patients (cough, foam, dyspnea, abnormal lung sounds, hypoxia) due to potential worsening over the next 6 hours.**
- Predicting prognosis in prehospital setting is difficult and does not correlate with mental status. Unless obvious death, transport.
- Hypothermia is often associated with drowning and submersion injuries even with warm ambient conditions.
- Drowning patient typically has <1 – 3 mL/kg of water in lungs (does not require suction) Primary treatment is reversal of hypoxia.
- Spinal motion restriction is usually unnecessary. When indicated it should not interrupt ventilation, oxygenation and/ or CPR.

Hyperthermia

History
- Age, very young and old
- Exposure to increased temperatures and / or humidity
- Past medical history / Medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

Signs and Symptoms
- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

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

Temperature Measurement Procedure
if available

Temperature Measurement should NOT delay treatment of hyperthermia

- Remove from heat source to cool environment
- Cooling measures
- Remove tight clothing
- Blood Glucose Analysis Procedure
- Age Appropriate Diabetic Protocol AM 2/ PM 2 ***as indicated***

Heat Stroke

Classic Heat Stroke
- Not common type
- Hot and Dry
- Altered Mental Status

Exertional Heat Stroke
- **Most common type**
- Wet with prior sweating
- Altered Mental Status

Assess Symptom Severity

HEAT CRAMPS
Normal to elevated body temperature
Warm, moist skin
Weakness, Muscle cramping

- PO Fluids as tolerated
- Monitor and Reassess

HEAT EXHAUSTION
Elevated body temperature
Cool, moist skin
Weakness, Anxious, Tachypnea

HEAT STROKE
Fever, usually > 104°F (40°C)
Hot, dry skin
Hypotension, AMS / Coma

- Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***
- Altered Mental Status Protocol UP 4 ***as indicated***
- Active cooling measures Target Temp < 102.5° F (39°C)
- **B** 12 Lead ECG Procedure
- IV or IO Access Protocol UP 6
- **P** Cardiac Monitor
- **A** **Normal Saline Bolus**
  500 mL IV / IO
  Repeat to effect SBP > 90
  Maximum 2 L
  PED: Bolus 20 mL/kg IV / IO
  Repeat to effect Age appropriate
  SBP ≥ 70 + 2 *x* Age
  Maximum 60 mL/kg
- Age Appropriate Hypotension/ Shock Protocol AM 5/ PM 3 ***as indicated***
- Monitor and Reassess

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

Hyperthermia

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro**
- **Extremes of age are more prone to heat emergencies (i.e. very young and very old).**
- **Temperature measurement:**
  - **Obtain and document patient temperature if able.**
  - **Many thermometers and routes of measurement are available.**
  - **Order of preference for route of measurement: Rectal > oral > temporal > axillary.**
- Heat illness is predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Intense shivering may occur as patient is cooled.
- **Heat Cramps:**
  - Consists of benign muscle cramping secondary to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion:**
  - Consists of dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting.
  - Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke:**
  - Consists of dehydration, tachycardia, hypotension, temperature ≥ 104°F (40°C), and an altered mental status.
  - Sweating generally disappears as body temperature rises above 104°F (40°C).
  - The young and elderly are more prone to be dry with no sweating.
  - **Exertional Heat Stroke:**
  - **In exertional heat stroke (athletes, hard labor), the patient may have sweated profusely and be wet on exam.**
  - **Rapid cooling takes precedence over transport as early cooling decreases morbidity and mortality.**
  - **If available, immerse in an ice water bath for 5 – 10 minutes. Monitor rectal temperature and remove patient when temperature reaches 102.5°F (39°C). Your goal is to decrease rectal temperature below 104°F (40°C) with target of 102.5°F (39°C) within 15 minutes. Stirring the water aids in cooling.**
  - **Nearly 66% of all exertional heat strokes occur in high school athletes during the month of August.**
  - **In NC, it is mandatory that all high school field houses have a dunk tank and available ice and water.**
  - **Other methods include cold wet towels below and above the body or spraying cold water over body continuously.**
- **Neuroleptic Malignant Syndrome (NMS):**
  - Neuroleptic Malignant Syndrome is a hyperthermic emergency which is not related to heat exposure.
  - It occurs after taking neuroleptic antipsychotic medications.
  - This is a rare but often lethal syndrome characterized by muscular rigidity, AMS, tachycardia and hyperthermia.
  - **Drugs Associated with Neuroleptic Malignant Syndrome:**
  - Prochlorperazine (Compazine), promethazine (Phenergan), clozapine (Clozaril), and risperidone (Risperdal) metoclopramide (Reglan), amoxapine (Ascendin), and lithium.
  - **Management of NMS:**
  - Supportive care with attention to hypotension and volume depletion.
  - Use benzodiazepines such as diazepam or midazolam for seizures and/ or muscular rigidity.

Hypothermia/ Frostbite

History
- Age, very young and old
- Exposure to decreased temperatures but may occur in normal temperatures
- Past medical history / Medications
- Drug use: Alcohol, barbituates
- Infections/ Sepsis
- Length of exposure/ Wetness/ Wind chill

Signs and Symptoms
- Altered mental status/ coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

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

Temperature Measurement Procedure ***if available***

Temperature Measurement should NOT delay treatment of hypothermia

Remove wet clothing
Dry/ Warm Patient

Passive warming measures

Blood Glucose Analysis Procedure

Age Appropriate
Diabetic Protocol AM 2/ PM 2
as indicated

Hypothermia / Frost Bite

Localized Cold Injury

Systemic Hypothermia

Awake with / without AMS

Unresponsive

Pulse

YES

NO

Exit to
Age Appropriate
Cardiac Protocol(s)
See Pearls

General Wound Care

DO NOT Rub Skin to warm
DO NOT Massage
Skin to warm

DO NOT allow refreezing

Age Appropriate
Airway Protocol(s) AR 1 - 7
as indicated

Altered Mental Status
Protocol UP 4
as indicated

Active warming measures

B 12 Lead ECG Procedure

IV or IO Access Protocol UP 6

A
Normal Saline Bolus
500 mL IV / IO
Repeat to titrate SBP > 90 mmHg
Maximum 2 L
Pediatric: 20 mL / kg IV / IO
Repeat to titrate Age Appropriate
SBP ≥ 70 + 2 x Age
Maximum 60 mL / kg

P Cardiac Monitor

Age Appropriate
Hypotension/ Shock
Protocol AM 5/ PM 3
Multiple Trauma Protocol TB 6
as indicated

Monitor and Reassess

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

Hypothermia/ Frostbite

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro**
- **NO PATIENT IS DEAD UNTIL WARM AND DEAD (Body temperature ≥ 93.2° F, 32° C.)**
- **Temperature measurement:**
  - **Obtain and document patient temperature if able.**
  - **Many thermometers and routes of measurement are available.**
  - **Order of preference for route of measurement: Rectal > oral > temporal > axillary.**
  - **Many thermometers do not register temperature below 93.2° F.**
- **Hypothermia categories:**
  - Mild 90 – 95° F (32 – 35° C)
  - Moderate 82 – 90° F (28 – 32° C)
  - Severe < 82° F (< 28° C)
- **Mechanisms of hypothermia:**
  - Radiation: Heat loss to surrounding objects via infrared energy (60% of most heat loss.)
  - Convection: Direct transfer of heat to the surrounding air.
  - Conduction: Direct transfer of heat to direct contact with cooler objects (important in submersion.)
  - Evaporation: Vaporization of water from sweat or other body water losses.
- Contributing factors of hypothermia: Extremes of age, malnutrition, alcohol or other drug use.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- **CPR:**
  - **Severe hypothermia may cause cardiac instability and rough handling of the patient theoretically can cause ventricular fibrillation. This has not been demonstrated or confirmed by current evidence. Intubation and CPR techniques should not be with-held due to this concern.**
  - **Intubation can cause ventricular fibrillation, so it should be done gently by the most experienced provider(s).**
  - **Below 86°F (30° C) antiarrhythmics may not work and if given, should be given at increased time intervals. Contact medical control for direction. Epinephrine can be administered.**
  - **Below 86° F (30°C) pacing should not utilized.**
  - **Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control.**
  - **If the patient is below 86° F (30° C) then defibrillate 1 time if defibrillation is required. Deferring further attempts until more warming occurs is controversial. Contact medical control for direction.**
  - **Hypothermia may produce severe bradycardia so take at least 60 seconds to palpate a pulse.**
- **Active Warming:**
  - Remove from cold environment and into warm environment protected from wind and wet conditions.
  - Remove wet clothing and provide warm blankets/ warming blankets.
  - Hot packs can be activated and placed in the armpit and groin area if available. Care should be taken not to place the packs directly against the patient's skin.

Marine Envenomation/ Injury

History
- Type of bite/ sting
- Identification of organism
- Previous reaction to marine organism
- Immunocompromised
- Household pet

Signs and Symptoms
- Intense localized pain
- Increased oral secretions
- Nausea/ vomiting
- Abdominal cramping
- Allergic reaction / anaphylaxis

Differential
- Jellyfish sting
- Sea Urchin sting
- Sting ray barb
- Coral sting
- Swimmers itch
- Cone Shell sting
- Fish bite
- Lion Fish sting

Call for help/ additional resources
Stage until scene safe

Contact
Carolinas Poison Control
1-800-222-1222
Or
Agency Specific Number

- General Wound Care Procedure
- IV or IO Access Protocol UP 6 ***if indicated***
- (P) Cardiac Monitor ***if indicated***
- Drowning Protocol TE 3 ***if indicated***
- Age Appropriate Allergy/ Anaphylaxis Protocol AM 1/ PM 1 ***if indicated***
- Age Appropriate Hypotension/ Shock Protocol AM 5/ PM 3 ***if indicated***
- Pain Control Protocol UP 11 ***if indicated***

Identification of Sea Creature

Jelly Fish
Anemone
Man-O-War

- Immobilize injury
- Lift away tentacles
  Do Not brush or rub
- Immerse in Hot Water
  110 – 114°F (43 - 46°C)
  if available
- Apply Vinegar Rinse
  If available
  Otherwise wash with clean seawater
  DO NOT
  use fresh water or ice

Sting Ray
Lion Fish
Urchin / Starfish

- Immobilize injury
- Remove Barb or Spine
  If large Barb in thorax or abdomen stabilize object
- Immerse in Hot Water
  110 – 114°F (43 - 46°C)
  if available

Large Organism

- Immobilize injury
- Multiple Trauma Protocol TB 6 ***if indicated***
- Extremity Trauma Protocol TB 4 ***if indicated***

Monitor and Reassess

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

Marine Envenomation/ Injury

Pearls

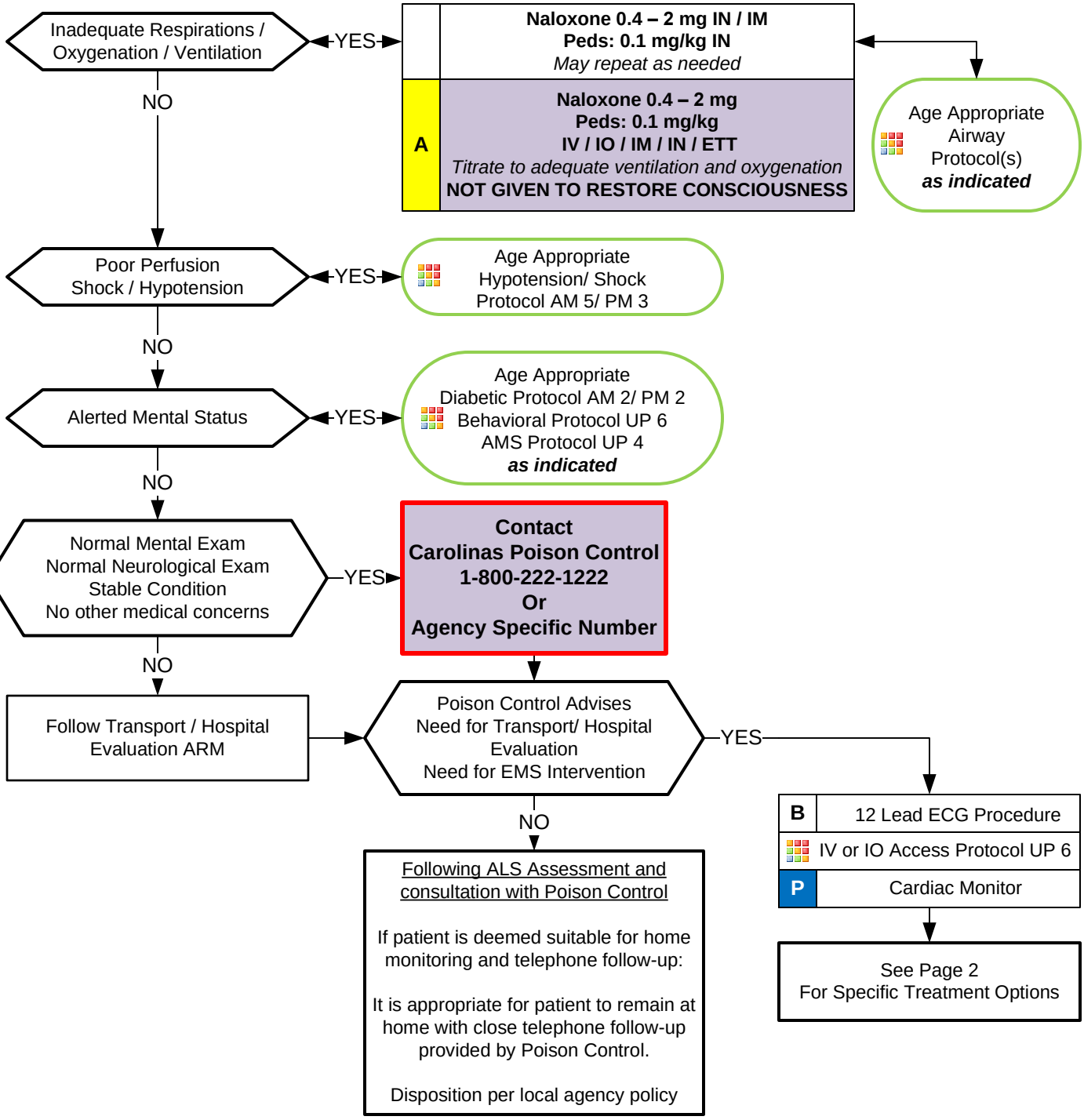
- **Ensure your safety: Avoid the organism or fragments of the organism as they may impart further sting or injury.**
- **Priority is removal of the patient from the water to prevent drowning.**
- **Coral:**
  - Coral is covered by various living organisms which are easily dislodged from the structure.
  - Victim may swim into coral causing small cuts and abrasions and the coral may enter into cuts, causing little if any symptoms initially, but later causing inflammation, pain and/ or infection.
  - The next 24 – 48 hours may reveal an inflammatory reaction with swelling, redness, itching, tenderness, and ulceration.
  - Treatment is flushing with large amounts of fresh water or soapy water then repeating.
- **Jelly Fish/ Anemone/ Man-O-War:**
  - Wash the area with fresh seawater to remove tentacles and nematocysts.
  - Do not apply fresh water or ice as this will cause nematocysts firing as well.
  - Recent evidence does not demonstrate a clear choice of any solution that neutralizes nematocysts.
  - Vinegar (immersion for 30 seconds), 50:50 mixture of Baking Soda and Seawater, and even meat tenderizer may have similar effects.
  - Immersion in warm water for 20 minutes, 110 – 114°F (43 - 46°C), is effective in pain control.
  - Shaving cream may be useful in removing the tentacles and nematocysts with a sharp edge (card).
  - Stimulation of the nematocysts by pressure or rubbing cause the nematocyst to fire even if detached from the jellyfish.
  - Lift away tentacles as scrapping or rubbing will cause nematocysts firing.
  - Typically symptoms are immediate stinging sensation on contact, intensity increases over 10 minutes.
  - Redness and itching usually occur.
  - Papules, vesicles and pustules may be noted and ulcers may form on the skin.
  - Increased oral secretions and gastrointestinal cramping, nausea, pain, or vomiting may occur.
  - Muscle spasm, respiratory, and cardiovascular collapse may follow.
- **Lionfish:**
  - In North Carolina this would typically occur in a residence/ business as lionfish are often kept as pets in saltwater aquariums.
  - Remove any obvious protruding spines and irrigate area with copious amounts of saline.
  - The venom is heat labile so immersion in hot water, 110 – 114°F for 30 to 90 minutes is the treatment of choice but do not delay transport if indicated.
- **Stingrays:**
  - Typical injury is swimmer stepping on ray and muscular tail drives 1 – 4 barbs into victim.
  - Venom released when barb is broken.
  - Typical symptoms are immediate pain which increases over 1 – 2 hours.
  - Bleeding may be profuse due to deep puncture wound.
  - Nausea, vomiting, diarrhea, muscle cramping, and increased urination and salivation may occur.
  - Seizures, hypotension, and respiratory or cardiovascular collapse may occur.
  - Irrigate wound with saline. Extract the spine or barb unless in the abdomen or thorax, Contact Medical Control for advice.
  - Immersion in hot water, if available, for 30 to 90 minutes but do not delay transport.
- Patients can suffer cardiovascular collapse from both the venom and/ or anaphylaxis even in seemingly minor envenomation.
- Sea creature stings and bites impart moderate to severe pain.
- Arrest the envenomation by inactivation of the venom as appropriate.
- Ensure good wound care, immobilization and pain control.

Overdose/ Toxic Ingestion

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

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

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



Overdose/ Toxic Ingestion

Acetaminophen
Tylenol®
APAP Containing Product

YES → **B**

If Time of Ingestion ≤ 1 Hour
Activated Charcoal 1 gm/kg PO
Maximum 50 gm
If available

NO

Aspirin
Salicylate Containing Product

YES → **B**

If Time of Ingestion ≤ 1 Hour
Activated Charcoal 1 gm/kg PO
Maximum 50 gm
If available

NO

Beta Blocker or
Calcium Channel Blocker

YES → **B**

If Time of Ingestion ≤ 1 Hour
Activated Charcoal 1 gm/kg PO
Maximum 50 gm
If available

A

Glucagon 2 – 4 mg IV / IO / IM
Peds: 0.1 mg/kg IV / IO / IM
May repeat in 15 minutes as needed

P

Calcium Gluconate 2 g IV / IO
Or
(Calcium Chloride 1 g IV / IO)
Pediatric: 20 mg / kg IV / IO
Over 2- 3 minutes

Consider
Cardiac External Pacing Procedure for Severe Cases

Age Appropriate Hypotension/ Shock
Protocol AM 5/ PM 3
if indicated

NO

Cyanide/
Carbon Monoxide

YES → Exit to
Carbon Monoxide/ Cyanide
Protocol TE 2

NO

Organophosphate
WMD/ Nerve Agent Exposure

YES → Exit to
WMD/ Nerve Agent
Protocol TE 8

NO

Tricyclic
Antidepressant

YES → **B**

If Time of Ingestion ≤ 1 Hour
Activated Charcoal 1 gm/kg PO
Maximum 50 gm
if available

P

QRS ≥ 0.12 sec or Peds: 0.09 sec
Sodium Bicarbonate
50 mEq IV / IO
Peds: 1 mEq/kg IV / IO
Repeat in 10 minutes as needed

Sodium Bicarbonate Infusion

Symptomatic Care
as needed

Monitor and Reassess

Notify Destination or
Contact Medical Control

Toxin-Environmental Protocol Section

Overdose/ Toxic Ingestion

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Opioids and opiates may require higher doses of Naloxone to improve respiration, in certain circumstances up to 10 mg.**
- **Time of Ingestion:**
  1. **Most important aspect is the TIME OF INGESTION, the substance(s), amount ingested, and any co-ingestants.**
  2. **Every effort should be made to elicit this information before leaving the scene.**
- **Charcoal Administration:**
  The American Academy of Clinical Toxicology DOES NOT recommend the routine use of charcoal in poisonings.
  1. **Consider Charcoal within the FIRST HOUR after ingestion. If a potentially life threatening substance is ingested or extended release agent(s) are involved and ≥ one hour from ingestion, Contact Medical Control or NC Poison Control Center for direction.**
  2. **If NG would be necessary to administer Charcoal, then DO NOT administer unless known to be adsorbed, airway secured by intubation, and ingestion is less than ONE HOUR confirmed and potentially lethal.**
  3. **Charcoal in general, should only be given to a patient who is alert and awake such that they can self-administer the medication.**
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying hiding other medications or has any weapons.**
- **Pediatric:**
  Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and > 10 years > 90 mmHg.
  Pediatric IV Fluid maintenance rate:
  4 mL for the first 10 kg of weight +
  2 mL for the second 10 kg of weight +
  1 mL for every additional kg in weight after 20 kg

Example: 34 kg pediatric	
First 10 kg:	4 mL/kg/hr = 40 mL/hr
Second 10 kg:	2 mL/kg/hr = 20 mL/hr
Final 14 Kg:	1 mL/kg//hr = 14 mL/hr
	Total: 74 mL/hr rate

- **Bring bottles, contents, emesis to ED.**
- **S.L.U.D.G.E: Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis.**
- **D.U.M.B.B.E.L.S: Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation.**
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/ vomiting. If not detected and treated, causes irreversible liver failure.
- **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.
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
- **EMR and EMT may administer naloxone by IN / IM route only and may administer from EMS supply. Agency medical director may require Contact of Medical Control prior to administration and may restrict locally.**
- **When appropriate contact the North Carolina Poison Control Center for guidance, reference Policy 18.**
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.

WMD-Nerve Agent Protocol

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

Signs and Symptoms
- **S**alivation
- **L**acrimation
- **U**rination; increased, loss of control
- **D**efecation / Diarrhea
- **G**I Upset; Abdominal pain / cramping
- **E**mesis
- **M**uscle Twitching
- Seizure Activity
- Respiratory Arrest

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

Call for help/ additional resources
Stage until scene safe

Obtain history of exposure
Observe for specific toxidromes
Initiate triage and/or decontamination as indicated.

Contact
Carolinas Poison Control
1-800-222-1222
Or
Agency Specific Number

Symptom Severity

Asymptomatic

Monitor and Reassess
Every 15 minutes for symptoms
Initiate Treatment per Appropriate Arm

Minor Symptoms:
Respiratory Distress + SLUDGEM

IV or IO Access Protocol UP 6

Nerve Agent Kit IM
2 Doses Rapidly
if available

Major Symptoms:
Altered Mental Status, Seizures, Respiratory Distress, Respiratory Arrest

IV or IO Access Protocol UP 6

Nerve Agent Kit IM
3 Doses Rapidly
if available

P

Atropine 2 mg IV / IO / IM
Pediatric: See Pearls
IV / IO / IM
Repeat every 3 to 5 minutes until symptoms resolve

Pralidoxime (2PAM)
600 mg IV / IO / IM
Pediatric: 15 – 25 mg / kg
IV / IO / IM
Over 30 minutes

Seizure Protocol UP 13

CDC/ ASPR
CHEMPACK Program
NC -57 EMS containers
-43 locations

Almost all citizens within 50 miles of CHEMPACK
See Page 2 and Pearls

Multiple Patients — YES

Consider
Activation and deployment of CHEMPACK
CHEMPACK ACTIVATION:
(insert local number)

Healthcare Coalition Activation
(insert local number)

NO

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

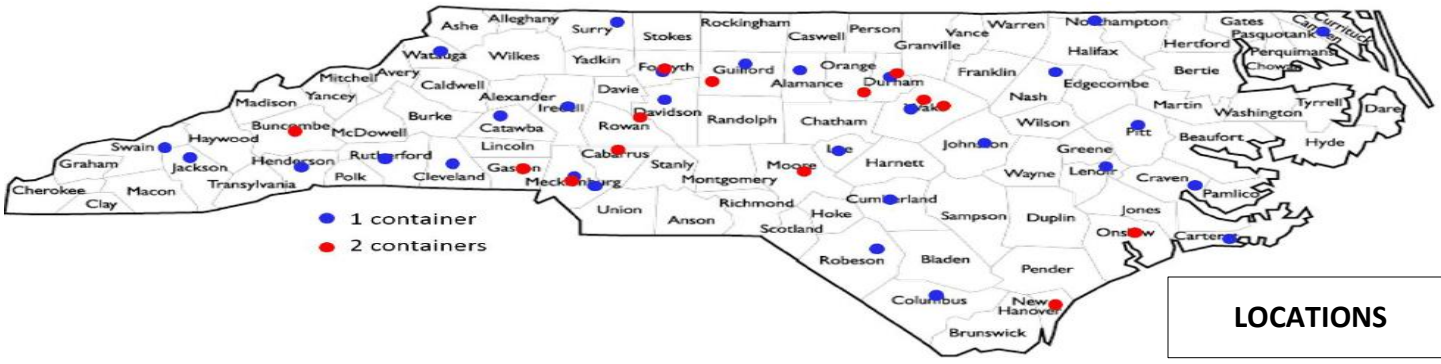
WMD-Nerve Agent Protocol

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Gastrointestinal, Neuro**
- **Follow local HAZMAT protocols for decontamination and use of personal protective equipment.**
- **Adult/ Pediatric Atropine Dosing Guides:**
  - **Confirmed 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 atropines (if available).**
  - **Usual pediatric doses: 0.5 mg ≤ 40 pounds (18 kg), 1 mg dose if patient weighs between 40 to 90 pounds (18 to 40 kg), and 2 mg dose ≥ 90 pounds (≥ 40 kg).**
- **Each Nerve Agent Kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine.**
- **Seizure Activity: Any benzodiazepine by any route is acceptable.**
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure they do not have exposure to other agent(s) (e.g., narcotics, vesicants, etc.)
- The main symptom that the atropine addresses is excessive secretions, so atropine should be given until secretions improve/ dry.
- EMS personnel, public safety officers and EMR/ EMT may carry, self-administer, or administer atropine/ pralidoxime to others by protocol. Agency medical director may require Contact of Medical Control prior to administration.
- **CHEMPACK Program:**
  - For multiple patients, call for **CHEMPACK** deployment per local emergency management and healthca**re coalition plans.**
  - **1 EMS CHEMPACK supports 454 patients.**
  - Medication in CHEMPACK may be used regardless of expiration date.

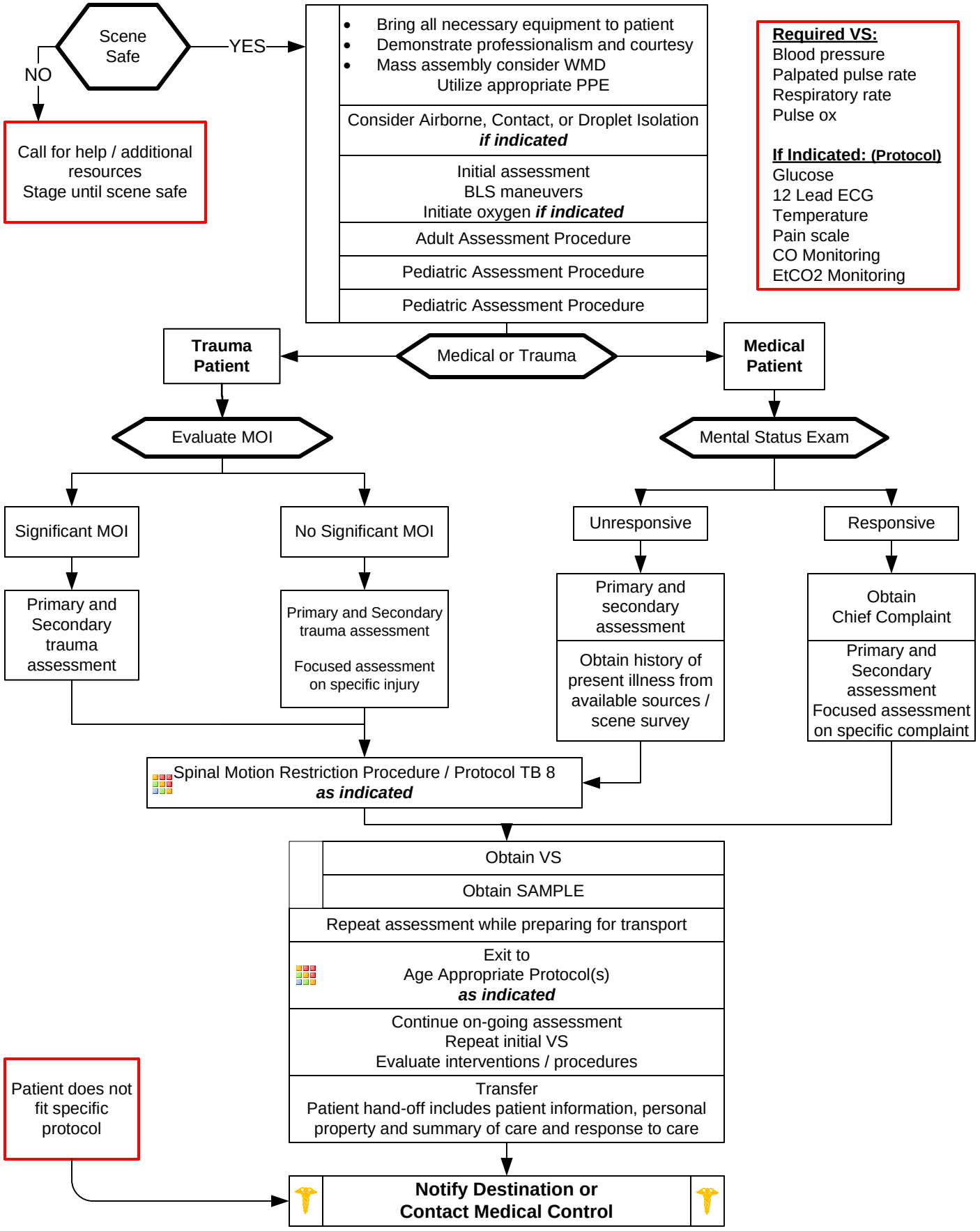
EMS Type CHEMPACK Container
454 Person Treatment Capacity

Product	Cases	Units per case	Total Units
Mark 1 Auto-injector	5	240	1,200
-OR			
ATNAA Auto-injector	6	200	1,200
-OR-			
Atropen 2mg Auto-injector	9	136	1,224
Pralidoxime 300mg Auto-injector	5	240	1,200
-AND-			
Diazepam 10mg Auto-injector	2	300	600
Seizalam (Midazolam) 5mg/ml vial 10ml	1	100	100
Atropen 0.5mg Auto-injector	1	225	225
Atropen 1mg Auto-injector	1	225	225
Atropine Sulfate 0.4mg/ml vial 20ml	1	100	100
Pralidoxime 1gm inj. 20ml	1	276	276
Sterile Water 20ml vials	1	150	150



LOCATIONS

Universal Patient Care



Universal Protocol Section

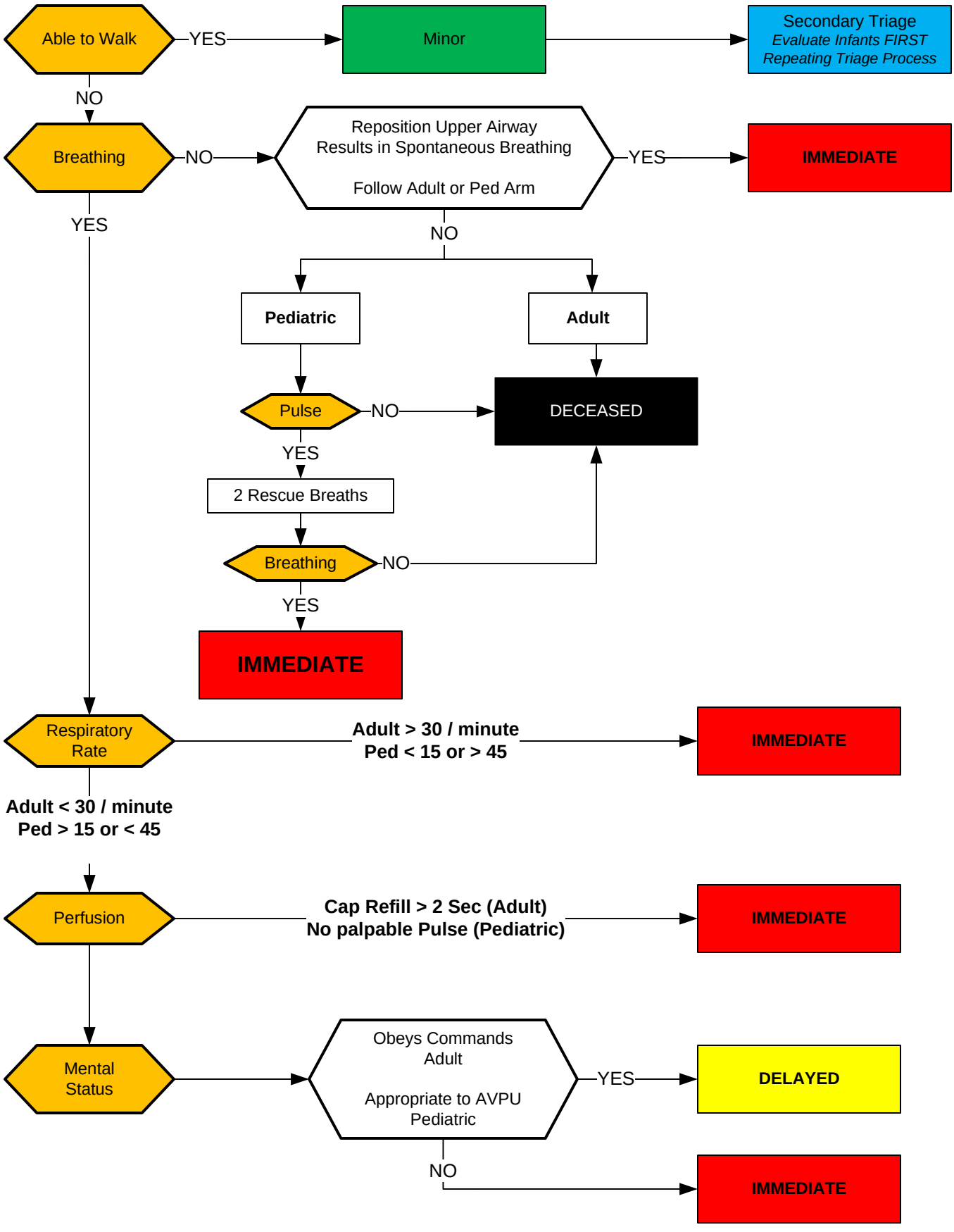
Universal Patient Care

- **Pearls**
- **Recommended Exam: Minimal exam if not noted on the specific protocol is vital signs, mental status with GCS, and location of injury or complaint.**
- **Any patient contact which does not result in an EMS transport must have a completed disposition form.**
- **Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.**
- **2 complete vital sign acquisitions should occur at a minimum with a patient encounter.**
- **Patient Refusal**

  Patient refusal is a high risk situation. Encourage patient to accept transport to medical facility.
  Encourage patient to allow an assessment, including vital signs. Documentation of the event is very important including a mental status assessment describing the patient's capacity to refuse care.
  Guide to Assessing capacity:
  C:***Patient should be able to communicate a clear choice:*** This should remain stable over time. Inability to communicate a choice or an inability to express the choice consistently demonstrates incapacity.
  R: ***Relevant information is understood:*** Patient should be able to display a factual understanding of the illness, the options and risks and benefits.
  A: ***Appreciation of the situation:*** Ability to communicate an understanding of the facts of the situation. They should be able to recognize the significance of the outcome potentially from their decision.
  M: ***Manipulation of information in a rational manner:*** Demonstrate a rational process to come to a decision. Should be able to describe the logic they are using to come to the decision, though you may not agree with decision.
- **Pediatric Patient General Considerations:**

  A pediatric patient is defined by fitting a Length-based Resuscitation Tape, Age ≤ 15, weight ≤ 49 kg.
  Special needs children may require continued use of Pediatric based protocols regardless of age and weight.
  Initial assessment should utilize the Pediatric Assessment Triangle which encompasses Appearance, Work of Breathing and Circulation to skin.
  The order of assessment may require alteration dependent on the developmental state of the pediatric patient.
  Generally the child or infant should not be separated from the caregiver unless absolutely necessary during assessment and treatment.
- Timing of transport should be based on patient's clinical condition and the transport policy.
- Never hesitate to contact Medical Control for patient who refuses transport.
- Blood Pressure is defined as a Systolic / Diastolic reading. A palpated Systolic reading may be necessary at times.
- SAMPLE: Signs / Symptoms; Allergies; Medications; PMH; Last oral intake; Events leading to illness / injury

Triage



Universal Protocol Section

Triage

Pearls

- .**When approaching a multiple casualty incident where resources are limited:**
  Triage decisions must be made rapidly with less time to gather information
  Emphasis shifts from ensuring the best possible outcome for an individual patient to ensuring the best possible outcome for the greatest number of patients.
- **Scene Size Up:**
  1. Conduct a scene size up. Assure well being of responders. Determine or ensure scene safety before entering. If there are several patients with the same complaints consider HazMat, WMC or CO poisoning.
  2. Take Triage system kit.
  3. Determine number of patients. Communicate the number of patients and nature of the incident and establish incident command.
  4. **Direct incoming resources. Identify ingress and egress path. Establish a staging area. Assign a medical officer, triage officer, transportation officer, and staging officer as personal become available.**
- **Triage is a continual process and is a continuous process in each section as resources allow.**
- **Step 1: Global sorting:**
  Call out to those involved in the incident to walk to a designated area and assess group last.
  For those who cannot walk, have them wave/ indicate a purposeful movement and assess them second.
  Those involved who are not moving, or have an obvious life threat, assess first.
- **Step 2: Individual assessments:**
  Control major hemorrhage.
  Open airway and if child, give 2 rescue breaths.
  Perform Needle Chest Decompression Procedure if indicated.
  Administer injector antidotes if indicated.
- **Assess the first patient you encounter using the three objective criteria which can be remembered by RPM.**
  R: Respiratory *(Respiratory rates are difficult to measure quickly, use work of breathing and respiratory distress)*
  P: Perfusion *(Capillary refill can be altered by many factors including skin temperature – use age appropriate heart rates)*
  M: Mental Status *(Motor component of GCS score is important indicator – ability to follow commands)*
- If your patient falls into the RED TAG category, stop, place RED TAG and move on to next patient. Attempt only to correct airway problems, treat uncontrolled bleeding, or administer an antidote before moving to next patient.
- **Treatment:**
  Once casualties are triaged, a focus on treatment can begin. You may need to move patients to treatment areas.
  RED TAGs are moved/ treated first, followed by YELLOW TAGs. BLACK TAGs should remain in place.
  You may also indicate deceased patients by pulling their shirt/ clothing over their head.
  As more help arrives, then the triage/ treatment process may proceed simultaneously.
- **Lightning strike (Reverse Triage):**
  Lightning strike victims are amenable to airway, breathing, cardiac compressions as well as early defibrillation.
  Use concept of reverse triage with multiple casualties. Resuscitate lightning strikes as the priority.
  Lightning strike victims found alive do not often deteriorate quickly.
- **SMART triage tag system is utilized in NC.**

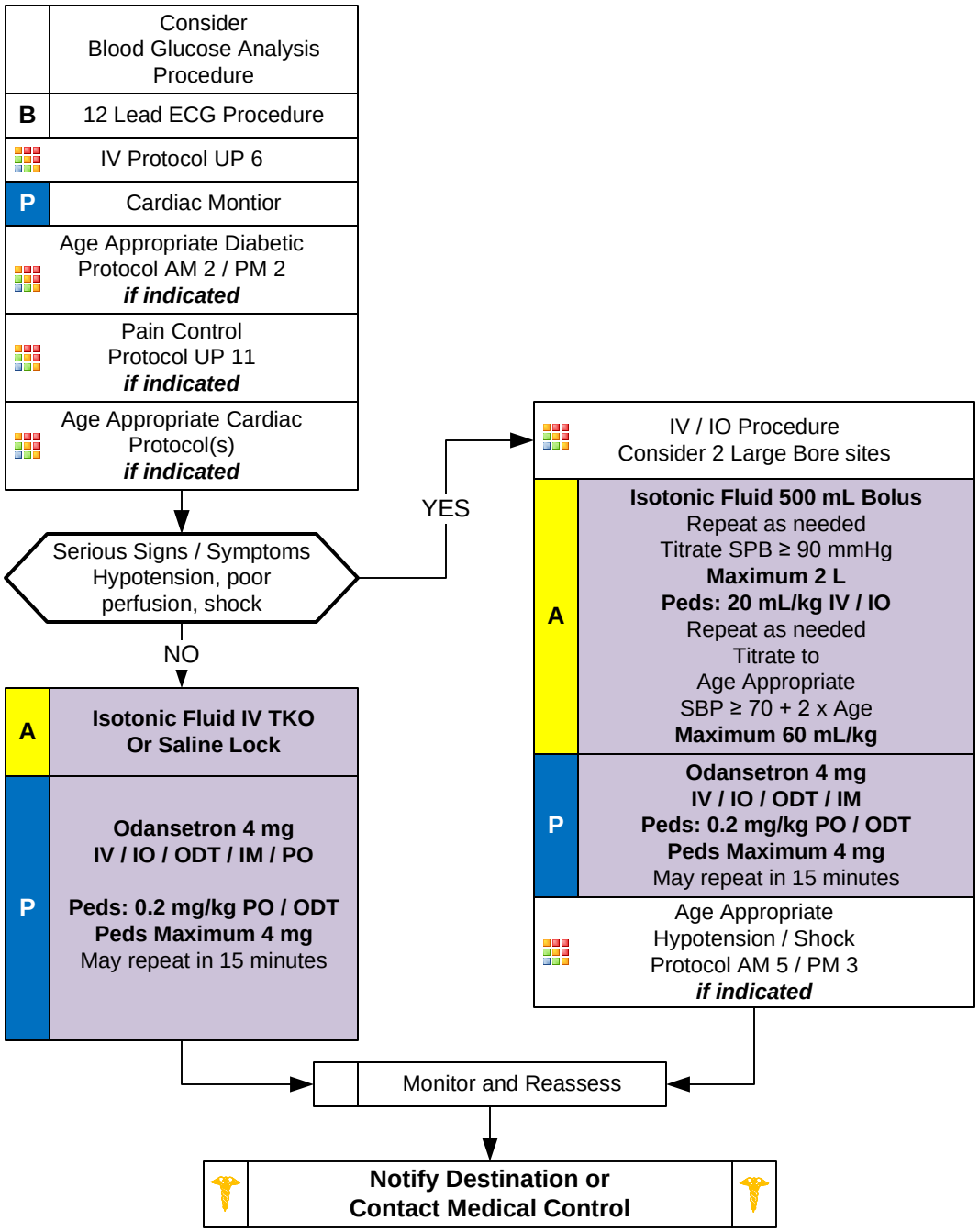
Abdominal Pain
Vomiting and Diarrhea

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

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

Associated symptoms:
Fever, headache, blurred vision, weakness, malaise, myalgias, cough, headache, dysuria, mental status changes, rash

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



Universal Protocol Section

Abdominal Pain
Vomiting and Diarrhea

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Abdominal/ back pain in women of childbearing age should be treated as pregnancy related until proven otherwise.**
- **The diagnosis of abdominal aneurysm should be considered with abdominal pain, with or without back and/ or lower extremity pain or diminished pulses, especially in patients over 50 and/ or patients with shock/ poor perfusion. Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients > 35, diabetics and/ or women, especially with upper abdominal complaints.**
- **Heart Rate: Tachycardia is one of the first clinical signs of dehydration and volume depletion and typically increases as dehydration becomes more severe.**
- **Nausea without vomiting should be treated like vomiting. Patient will benefit from symptom control with antiemetic even if not actively vomiting.**
- Isolated vomiting in children is common but can be a sign of more serious pathology. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with vomiting.
- Vomiting and diarrhea are common symptoms, but can be the symptoms of uncommon and serious pathology such as stroke, CO poisoning, acute MI, new onset diabetes, diabetic ketoacidosis (DKA), and organophosphate poisoning. Maintain a high index of suspicion for serious pathology.

Altered Mental Status

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

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

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

	Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***if indicated***
	Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure
	IV / IO Protocol UP 6
	Age Appropriate Diabetic Protocol(s) AM 2 / PM 2 ***if indicated***

Signs of shock / Poor perfusion Traumatic Injury — YES → Exit to Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3, Multiple Trauma Protocol TB 6, Head Injury Protocol TB 5

NO

Signs of OD / Toxicology — YES → Exit to Overdose / Toxic Exposure Protocol TE 7

NO

Signs of CVA Or Seizure — YES → Exit to Suspected Stroke Protocol UP 14, Seizure Protocol UP 13

NO

Signs of Hypo / Hyperthermia — YES → Exit to Hypothermia Protocol TE 5, Hyperthermia Protocol TE 4

NO

Arrhythmia / STEMI / CP — YES → Exit to Age Appropriate Appropriate Cardiac Protocol(s)

NO

Fever / Sepsis — YES → Exit to Fever Protocol UP 10, Suspected Sepsis Protocol UP 15

NO → **Notify Destination or Contact Medical Control**

Universal Protocol Section

Altered Mental Status

Universal Protocol Section

Pearls

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

AMS may present as a sign of an environmental toxin or Haz-Mat exposure, protect personal safety.

General:

- **The patient with AMS poses one of the most significant challenges.**
- **A careful assessment of the patient, the scene, and the circumstances should be undertaken. Assume the patient has a life threatening cause of their AMS until proven otherwise.**
- **Pay careful attention to the head exam for signs of bruising or other injury. Information found at the scene must be communicated to the receiving facility.**
- **Patients not able to communicate with you coherently require a complete secondary survey (head-to- toe) exam to assess for trauma, infection, or signs of maltreatment/ abuse, or neglect.**
- **Acute Stroke should be considered in all patients with acute AMS when < 24 hours from onset.**

Substance misuse:

- Patients ingesting substances can pose a great challenge.
- DO NOT assume recreational drug use and/ or alcohol are the sole reasons for AMS.
- Misuse of alcohol/ recreational drugs may lead to hypoglycemia or occult trauma.
- More serious underlying medical and trauma conditions may be the cause.

Behavioral health:

- The behavioral health patient may present a great challenge in forming a differential.
- DO NOT assume AMS is the result solely of an underlying psychiatric etiology.
- Often an underlying medical or trauma condition precipitates a deterioration of a patients underlying disease.

Spinal Motion Restriction/ Trauma:

- Only utilize spinal immobilization if the situation warrants.
- The patient with AMS may worsen with increased agitation when immobilized.

It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon

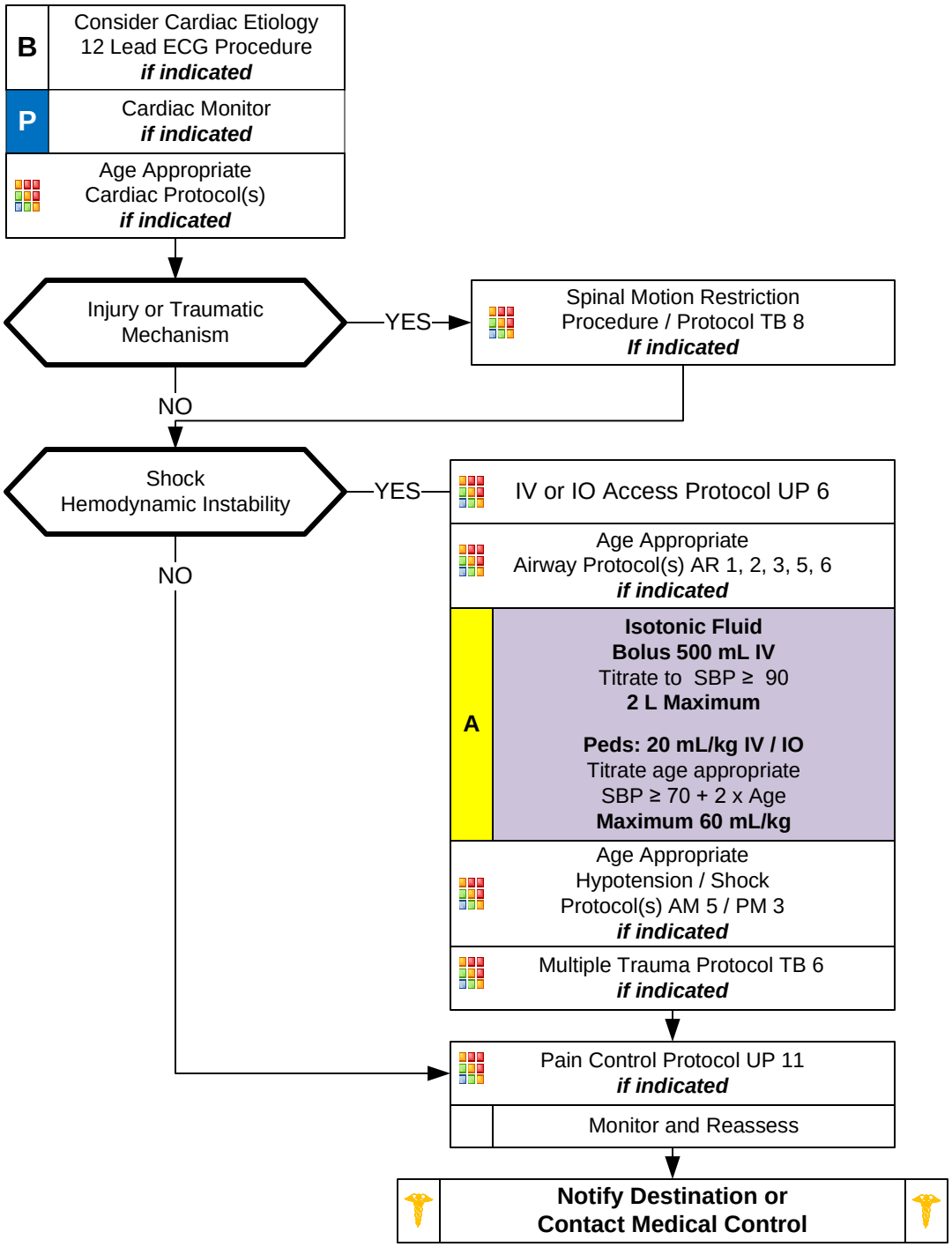
Consider Restraints if necessary for patient's and/ or personnel's protection per USP 5 Restraints: Physical procedure.

Back Pain

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

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

Differential
- Muscle spasm / strain
- Herniated disc with nerve compression
- Sciatica
- Spine fracture
- Kidney stone
- Pyelonephritis
- Aneurysm
- Pneumonia
- Spinal Epidural Abscess
- Metastatic Cancer
- AAA



Universal Protocol Section

Back Pain

Pearls

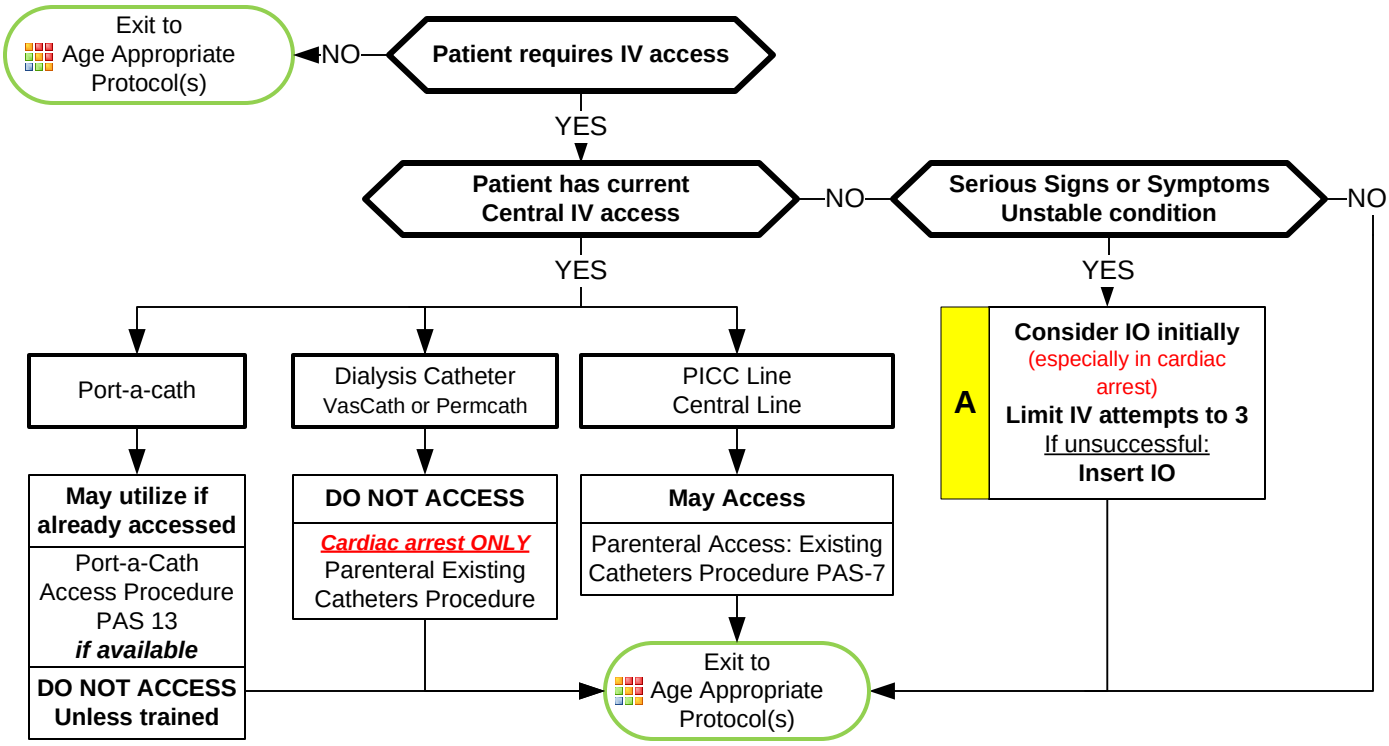
- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Neuro, Lower extremity perfusion, Back**
- **Back pain is one of the most common complaints in medicine and effects more than 90 % of adults at some point in their life. Back pain is also common in the pediatric population. Most often it is a benign process but in some circumstances can be life or limb threatening.**
- **Consider pregnancy or ectopic pregnancy with abdominal or back pain in women of childbearing age.**
- **Consider abdominal aortic aneurysm with abdominal pain especially in patients over 50 and/or patients with shock/ poor perfusion. Patients may have abdominal pain and / or lower extremity pain with diminished pulses, . Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients > 35, diabetics and / or women especially with upper abdominal complaints.**
- **Red Flags which may signal more serious process associated with back pain:**
  - Age > 50 or < 18
  - Neurological deficit (leg weakness, urinary retention, or bowel incontinence)
  - IV Drug use
  - Fever
  - History of cancer, either current or remote
  - Night time pain in pediatric patients
- **Cauda equina syndrome is where the terminal nerves of spinal cord are being compressed (Symptoms include):**
  - Saddle anesthesia(numbness between the genitalia and rectum)
  - Recent onset of bladder and bowel dysfunction. (Urine retention and bowel incontinence)
  - Severe or progressive neurological deficit in the lower extremity.
  - Motor weakness of thigh muscles or foot drop
- **Back pain associated with infection:**
  - Fever / chills.
  - IV Drug user (consider spinal infection)
  - Recent bacterial infection like pneumonia.
  - Immune suppression such as HIV or patients on chronic steroids like prednisone.
  - Meningitis.
- **Spinal motion restriction in patients with underlying spinal deformity should be maintained in their functional position.**
- Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.

IV or IO Access

History
- Chronic medical conditions requiring recurrent need for IV access for medication, hydration, or blood sampling.
- Medical condition requiring administration of IV medications at home.
- End-stage renal disease requiring hemodialysis.
- Chronic medical condition requiring IV nutrition.

Signs and Symptoms
- Fever
- Bleeding
- Hypotension
- Redness, swelling, and/or pain at IV catheter site
- Shortness of breath
- Chest pain
- IV catheter patency

Differential
- Infection or sepsis
- Infection of catheter
- Clotted IV catheter
- Air embolism
- Pneumothorax
- Overdose of home medication
- Shock



Universal Protocol Section

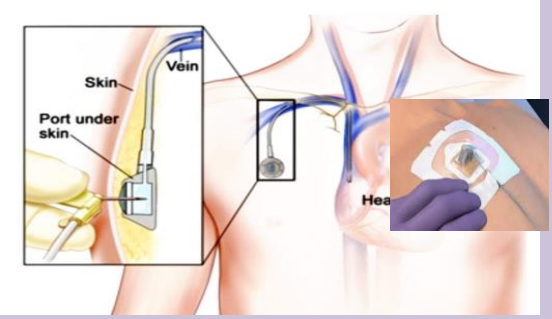
Pearls
- **Frequent encounter of patients with IV access devices and confusion as to which device can be accessed and used by EMS providers.**
- **If unclear about device use, always ask "Is this device used for dialysis?"**
- **When accessing central catheter, always ensure sterility of catheter connection point by cleaning port with alcohol, or similar disinfectant, 2 – 3 times prior to access.**
- **Central line catheters placed for administration of chemotherapy, medications, electrolytes, antibiotics, and blood are available to EMS providers for access and administration of fluids, medications, antibiotics, and blood products.**
- **Central line catheters placed for hemodialysis are NOT available for access by EMS providers unless the patient is in cardiac arrest.**
- Long term IV access is frequently needed for a variety of indications:
  - Medication administration such as antibiotics, pain relief, or chemotherapy
  - Administration of IV nutrition or feeding
  - Need for multiple IV line access or recurrent blood sampling
  - Poor vasculature requiring repeated attempts at IV access
  - End-stage renal disease requiring hemodialysis
- Common complications of central access devices:
  - Infection
  - Damage to vasculature
  - Air embolism
  - Loss of patency due to clogging or clotting
  - Pneumothorax

IV or IO Access

Types of IV catheters:

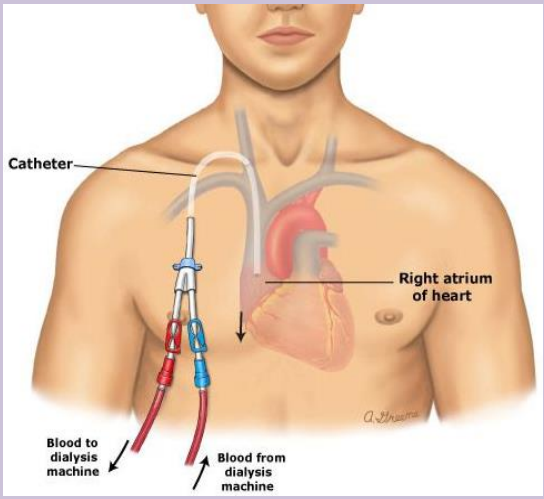
Port-a-Cath® :

Surgically implanted device allowing easy access to venous system.
The port and the catheter are all placed beneath the skin.
Requires a special kit and a specific needle to access.
Paramedic does NOT routinely access this device.
Paramedic may utilize if already accessed with needle/extension.
Paramedic may access if trained on procedure with access to proper equipment.



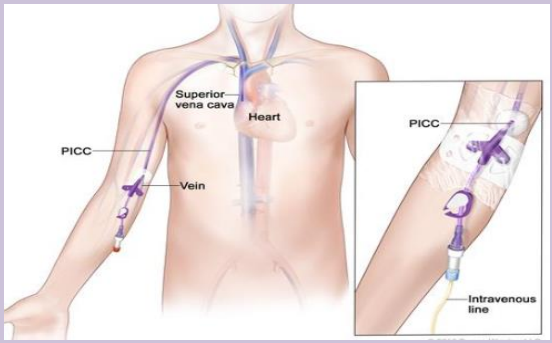
Dialysis Catheter:

Surgically implanted device used to access the vasculature for hemodialysis.
May be tunneled under the skin with access on outside of skin surface or may be non-tunneled with greater portion of catheter on outside of skin surface.
Catheter has a RED port indicating use for dialysis:
Most catheters have a RED port and a BLUE port.
Some catheters have a RED port and a WHITE port.
Dialysis catheters may be used for both short and long-term dialysis and should not accessed or used for delivery of fluids, medications, antibiotics, or blood products as it increases risk of infection, which then requires removal and subsequent loss of dialysis access.
Paramedic and AEMT do NOT routinely access this device.
Paramedic and AEMT MAY access during cardiac arrest only (Only if IV or IO access cannot be established.)



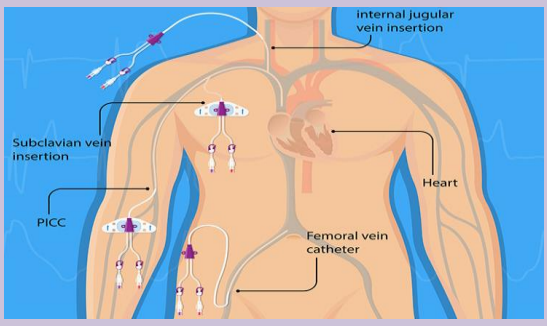
PICC (Peripherally Inserted Central Catheters):

Long catheter inserted into a vein in arm or leg (less common) with the tip of the catheter positioned into the central circulation.
Used for long-term IV fluids, medication administration, blood administration or blood draws.
May have 1 or 2 ports (possibly more, but less common.)
Port ends usually white, blue, or purple. (May be red, less common and is not used for dialysis.)
Paramedic and AEMT may access and utilize following clean technique.



Central Lines:

Catheter placed in large vein in the neck, under the clavicle, or in the groin.
Used for long-term IV fluids, medication administration, blood administration or blood draws.
May have 1 - 4 ports (possibly more, but less common.)
Port ends usually white, blue, or purple. (May be red, less common and is not used for dialysis.)
Paramedic and AEMT may access and utilize following clean technique.



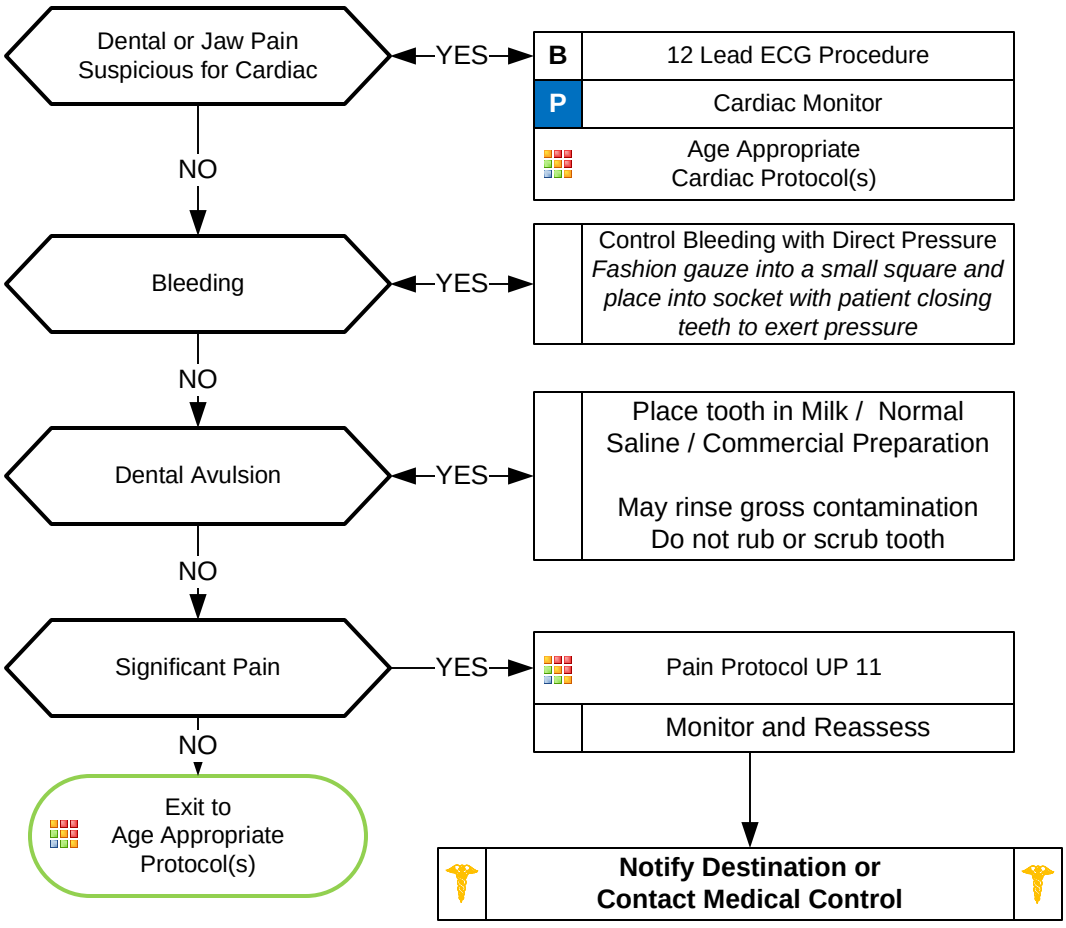
Universal Protocol Section

Dental Problems

History
- Age
- Past medical history
- Medications
- Onset of pain / injury
- Trauma with "knocked out" tooth
- Location of tooth
- Whole vs. partial tooth injury

Signs and Symptoms
- Bleeding
- Pain
- Fever
- Swelling
- Tooth missing or fractured

Differential
- Decay
- Infection
- Fracture
- Avulsion
- Abscess
- Facial cellulitis
- Impacted tooth (wisdom)
- TMJ syndrome
- Myocardial infarction



Universal Protocol Section

Pearls

Recommended Exam: Mental Status, HEENT, Neck, Chest, Lungs, Neuro

- Significant soft tissue swelling to the face or oral cavity can represent a cellulitis or abscess.Scene and transport times should be minimized in complete tooth avulsions. Reimplantation is possible within 4 hours if the tooth is properly cared for, but unlikely when > 1 hour from time of injury.

Cardiac chest pain may radiate to the jaw and teeth mimicking dental pain.

Avulsed tooth:

Handle tooth by the crown, do not touch the root.
Rinse tooth if soiled but do not scrub, as this can damage the ligaments vital for possible reimplantation. Rinse with mild, commercial tooth solution, normal saline or lactated ringers, or the patient's own saliva if dry.
Transport tooth in milk, commercial solution, patient's own saliva, or IV solution in a container to protect..

Emergencies Involving Indwelling Central Lines

History

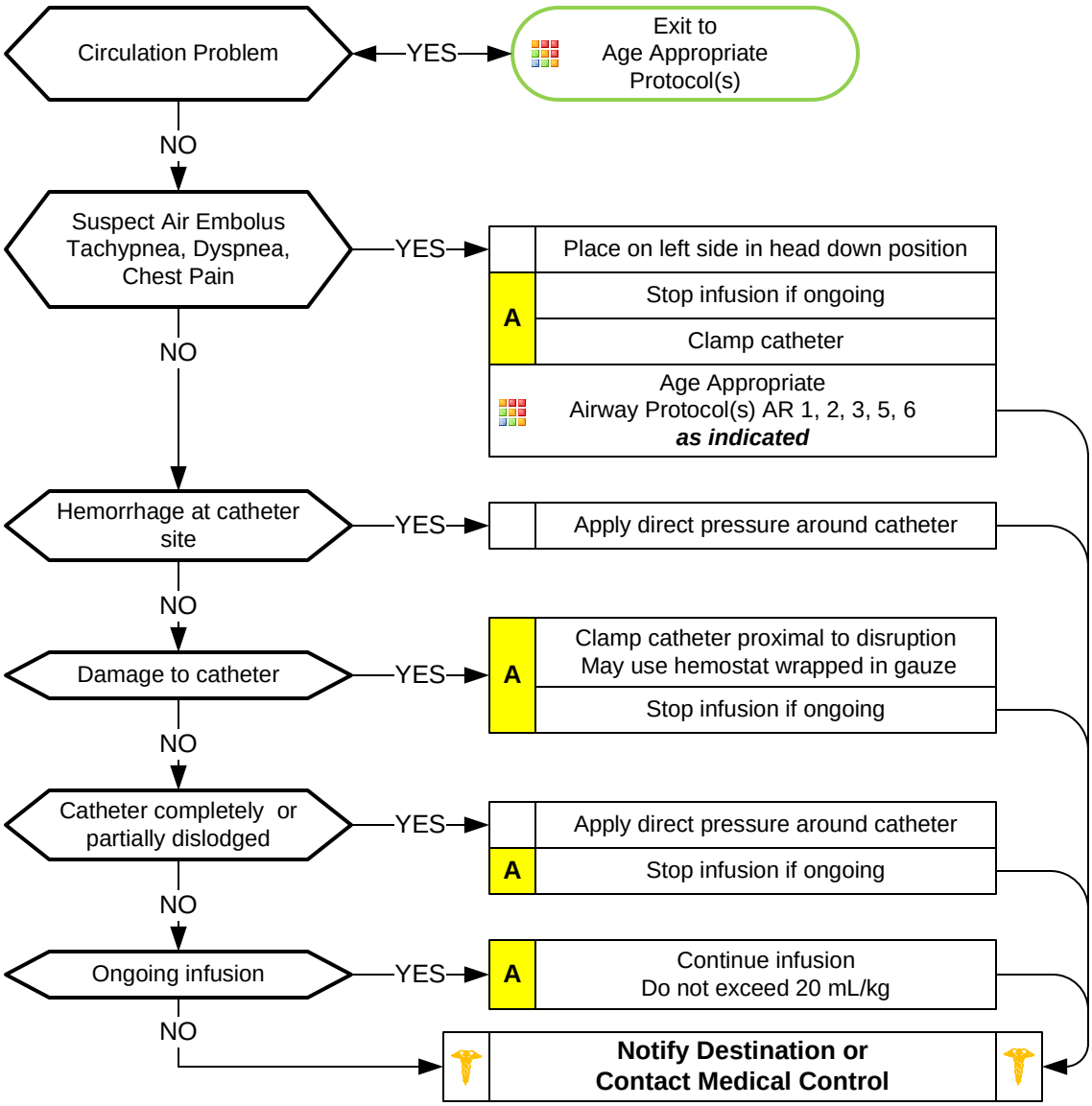
- Central Venous Catheter Type
  - Tunneled Catheter (Broviac / Hickman)
  - PICC (peripherally inserted central catheter
  - Implanted catheter (Mediport / Hickman)
- Occlusion of line
- Complete or partial dislodge
- Complete or partial disruption

Signs and Symptoms

- External catheter dislodgement
- Complete catheter dislodgement
- Damaged catheter
- Bleeding at catheter site
- Internal bleeding
- Blood clot
- Air embolus
- Erythema, warmth or drainage about catheter site indicating infection

Differential

- Fever
- Hemorrhage
- Reactions from home nutrient or medication
- Respiratory distress
- Shock



Universal Protocol Section

Pearls

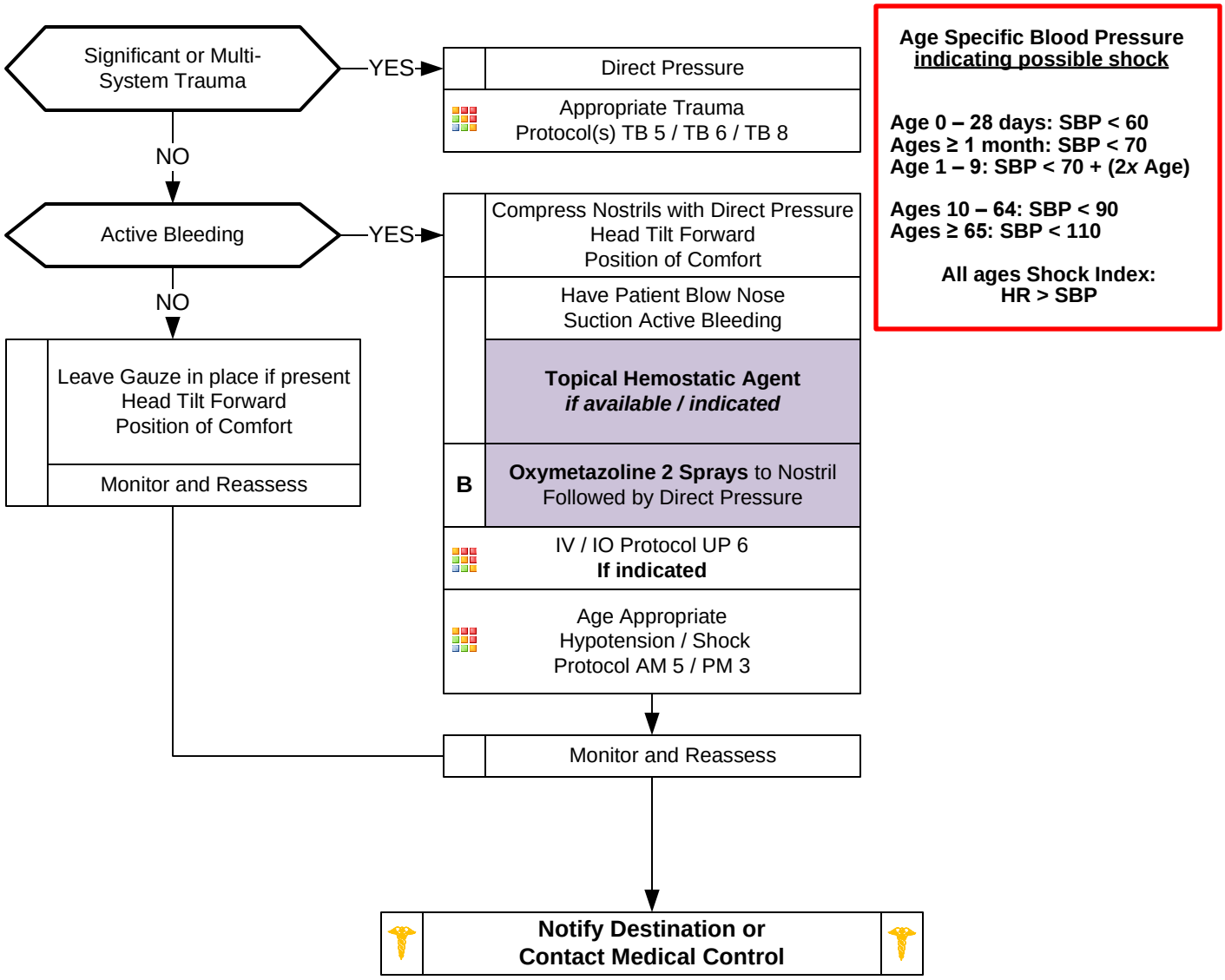
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **Use strict sterile technique when accessing / manipulating an indwelling catheter.**
- **Cardiac arrest: May access central catheter and utilize if functioning properly.**
- Do not attempt to force catheter open if occlusion evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason monitor for hypoglycemia.

Epistaxis

History
- Age
- Past medical history
- Medications (HTN, anticoagulants, aspirin, NSAIDs)
- Previous episodes of epistaxis
- Trauma
- Duration of bleeding
- Quantity of bleeding

Signs and Symptoms
- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

Differential
- Trauma
- Infection (viral URI or Sinusitis)
- Allergic rhinitis
- Lesions (polyps, ulcers)
- Hypertension



Age Specific Blood Pressure indicating possible shock

Age 0 – 28 days: SBP < 60
Ages ≥ 1 month: SBP < 70
Age 1 – 9: SBP < 70 + (2*x* Age)

Ages 10 – 64: SBP < 90
Ages ≥ 65: SBP < 110

All ages Shock Index:
HR > SBP

Universal Protocol Section

Pearls
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- It is very difficult to quantify the amount of blood loss with epistaxis.
- Bleeding may also be occurring posteriorly. Evaluate for posterior blood loss by examining the posterior pharnyx.
- Anticoagulants include warfarin (Coumadin), Apixaban (Elequis), heparin, enoxaparin (Lovenox), dabigatran (Pradaxa), rivaroxaban (Xarelto), and many over the counter headache relief powders.
- Anti-platelet agents like aspirin, clopidogrel (Plavix), aspirin/dipyridamole (Aggrenox), and ticlopidine (Ticlid) can contribute to bleeding.

Fever / Infection Control

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

Signs and Symptoms
- Warm
- Flushed
- Sweaty
- Chills/Rigors

Associated Symptoms (Helpful to localize source)
- myalgias, cough, chest pain, headache, dysuria, abdominal pain, mental status changes, rash

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

Universal Protocol Section

Contact, Droplet, and Airborne Precautions
See Pearls

B — Temperature Measurement Procedure ***if available***

IV or IO Access Protocol UP 6 ***If indicated***

Temperature ≥ 100.4° F (38° C)

NO → Exit to Age Appropriate Protocol(s) ***as indicated***

YES →

B — **PEDS - Ibuprofen 10 mg / kg PO** (if age > 6 months) And / Or **PEDS - Acetaminophen 15 mg / kg PO**

B — **Adult - Ibuprofen 400 – 600 mg PO** And / Or **Adult - Acetaminophen 325 – 1000 mg PO**

A — **Adult - Acetaminophen 1000 mg IV** Infuse over 15 min

Exit to Age Appropriate Protocol(s) ***as indicated***

Pearls

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

- 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.

Droplet precautions include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected. 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 (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.

All-hazards precautions include standard PPE plus airborne precautions plus contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. **SARS, SARS-CoV-2, COVID-19, MERS, Monkeypox**).

- Rehydration with fluids increases the patient's ability to sweat and improves heat loss.
- Allergies to NSAIDs (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen. Do not give to patients who have renal disease or renal transplant.
- NSAIDs should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child, age ≤ 15 years.
- Do not administer **Acetaminophen** to patients with a history of liver disease.

Pain Control

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
- Renal (colic)

Specific Complaint Protocol

Assess Pain Severity

Combination of Pain Scale, MOI, circumstances, Injury or Illness severity

Mild

Ibuprofen 10 mg/kg PO
(400 – 600 mg typical adult)
Maximum 800 mg
Or
Acetaminophen 15 mg/kg
(325 – 1000 mg typical adult)
Maximum 1000 mg
Or
Aspirin 324 to 650 mg PO
(≥ 16 yrs only)

If no improvement
Consider IV Protocol UP 6
if indicated

Moderate to Severe

IV or IO Access Protocol UP 6

A

Ketorolac 15 mg IV / IO
30 mg IM
Peds: 0.5 mg/kg IV / IO / IM
Maximum 30 mg

Or
Acetaminophen 1000 mg IV
(Infuse over 15 min)

Peds: 15 mg/kg (infuse over 15 min)

Cardiac Monitor

P

Nitrous Oxide 70:30 to 50:50 Mix NO/O_2

Fentanyl 50 – 100 mcg IV / IO / IM / IN
Repeat every 5 minutes **Max 500 mcg**

Peds: 1 mcg/kg IV / IO / IM / IN
May repeat 0.5 mcg/kg every 5 minutes
Max 2 mcg/kg
Or
Morphine 4 mg IV / IO / IM
Repeat **2 mg** every 5 minutes as needed
Peds: 0.1 mg/kg IV / IO / IM
May repeat every 5 minutes
Maximum 10 mg

Ketamine 0.3 mg/kg IV / IO
Infuse or IV push over 10 minutes
May repeat every 20 minutes
Maximum 30 mg single dose

Maximum 3 total doses
Or
Ketamine 1 mg/kg IN
Maximum 1 total dose

Moderate or Severe Pain
Consider
Re-dosing same medication before switching to another sedative

Monitor and Reassess
Every 10 minutes following sedative

Notify Destination or Contact Medical Control

Universal Protocol Section

Pain Control

Pearls

- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO or IM medication delivery and at patient hand off. Monitor BP closely as sedative and pain control agents may cause hypotension.**
- **Ketamine:**
  Ketamine may be used in patients who are outside a Pediatric Medication/Skill Resuscitation System product.
  ****Ketamine may be used in patients who fit within a Pediatric Medication/Skill Resuscitation System or ≥ 65 years of age only DIRECT ONLINE MEDICAL ORDER, by the system MEDICAL DIRECTOR or ASSISTANT MEDICAL DIRECTOR.****

- **Ketamine: appropriate indications for pain control:**
  Patients who have developed opioid-tolerance. Sickle cell crisis patients with opioid-tolerance.
  Patients who have obstructive sleep apnea.
  May use in combination with opioids to limit total amount of opioid administration.
  Ketamine administration requires continuous EtCO2 monitoring.
- **Ketamine: caution when using for pain control:**
  Slow infusion or IV push over 10 minutes is associated with less side effects. Do not administer by rapid IV push.
  Avoid in patients who have cardiac disease or uncontrolled hypertension.
  Avoid in patients with increased intraocular pressure such as glaucoma.
  Avoid use in combination with benzodiazepines due to decreased respiratory effort.

- **Both arms of the treatment may be used in concert. For patients in Moderate pain for instance, you may use the combination of an oral medication and parenteral if no contraindications are present.**
- **Pediatrics:**

  For children use Wong-Baker faces scale or the FLACC score (see Assessment Pain Procedure)
  Use Numeric (> 9 yrs), Wong-Baker faces (4-16yrs) or FLACC scale (0-7 yrs) as needed to assess pain

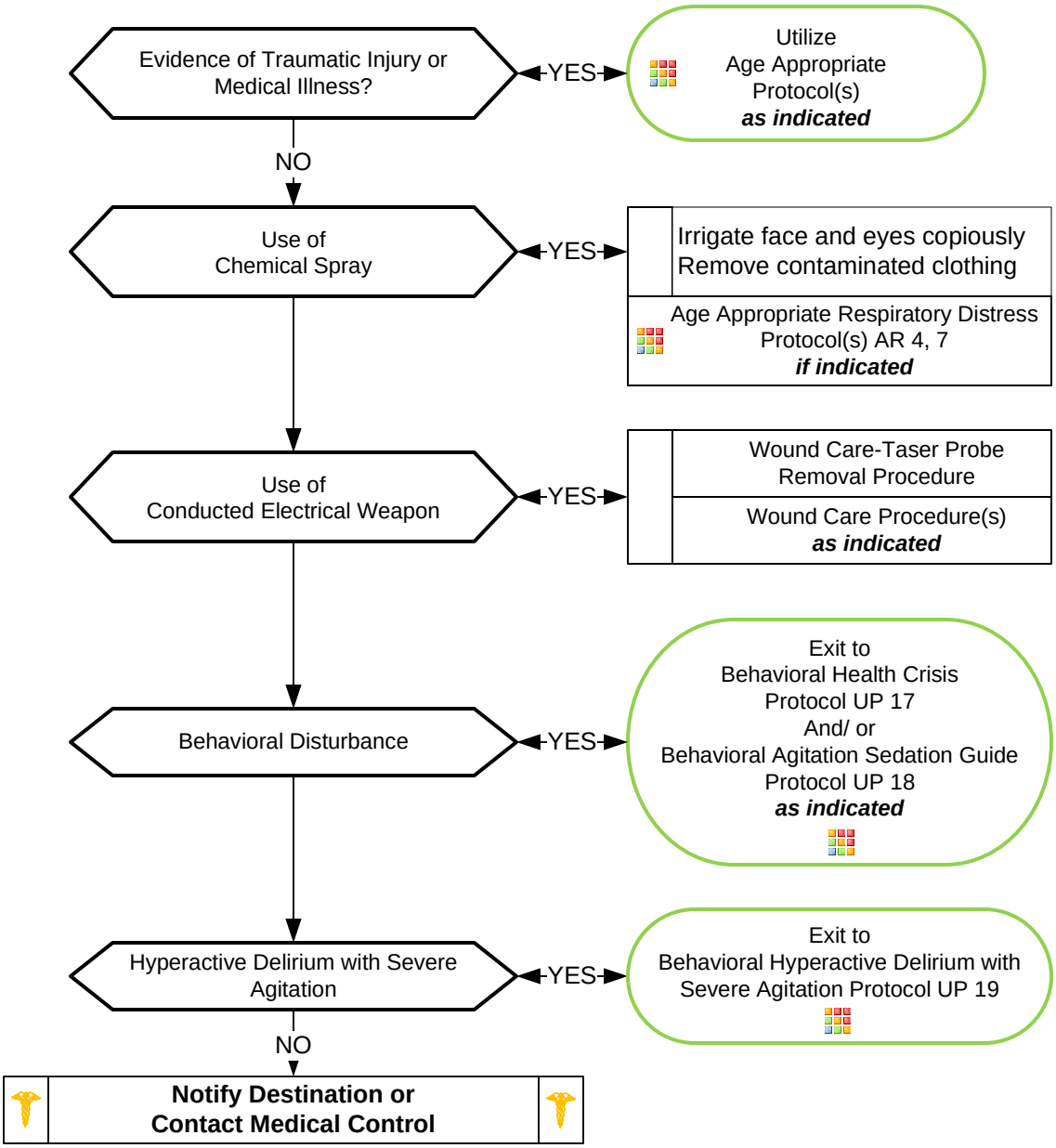
- **Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.**
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction in the event no transport occurs.
- Do not administer **Acetaminophen** to patients with a history of liver disease.
- Burn patients may required higher than usual opioid doses to titrate adequate pain control.
- Consider agency-specific anti-emetic(s) for nausea and/or vomiting.

Police Custody

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

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

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



Universal Protocol Section

Police Custody

Pearls

- **Patient does not have to be in police custody or under arrest to utilize this protocol.**
- **Local EMS agencies should formulate a policy with local law enforcement agencies concerning patients requiring EMS and Law Enforcement services simultaneously.**
- **Agencies should work together to formulate a disposition in the best interest of the patient.**
- **Patients restrained by law enforcement devices must be transported and accompanied by a law enforcement officer in the patient compartment who is capable of removing the devices. However, when rescuers have utilized restraints in accordance with Restraint Procedure, the law enforcement agent may follow the ambulance during transport.**
- **All patients who receive either physical and chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- The responsibility for patient care rests with the highest authorized medical provider on scene per North Carolina law.
- If an asthmatic patient is exposed to irritant/ pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/ difficulty breathing occurs.
- All patients with decision-making capacity in police custody retain the right to participate in decision-making regarding their care and may request care or refuse care of EMS.
- If extremity/ chemical/ law enforcement restraints are applied, follow USP 5 Restraints: Physical.
- **Consider Haldol or Droperidol for patients with history of psychosis or a benzodiazepine for patients with presumed substance misuse.**
- **Haldol is acceptable treatment in pediatric patients ≥ 12 years old. Safety and efficacy is not established in younger ages. Contact Medical Control for advice as needed.**
- **<u>Hyperactive Delirium with Severe Agitation:</u>**
  - Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent/ bizarre behavior, insensitivity to pain, hyperthermia and increased strength.
  - Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers.
  - Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
  - **If patient suspected of Hyperactive Delirium with Severe Agitation suffers cardiac arrest, consider a fluid bolus, administration of calcium gluconate (or chloride), and sodium bicarbonate early.**
- Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.
- Patients exposed to chemical spray, with or without history of respiratory disease, may develop respiratory complaints up to 20 minutes post exposure.

Seizure

History
- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

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

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

Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***as indicated***

Altered Mental Status Protocol UP 4 ***if indicated***

Childbirth/Labor Protocol AO 1
Obstetrical Emergency Protocol AO 3 ***if indicated***

Behavioral Protocol UP 17, 18, 19 ***if indicated***

Loosen any constrictive clothing
Protect patient

Active Seizure Activity — YES → IV / IO Access — YES →

P **Midazolam 2 – 2.5 mg IV / IO**
May repeat every 3 to 5 minutes as needed
Maximum 10 mg

Peds: Midazolam 0.2 mg/kg IV / IO
Maximum single dose 2.5 mg
May repeat every 3 to 5 minutes as needed
Maximum 10 mg

Active Seizure Activity — NO

IV / IO Access — NO

P **≥ 49 kg**
Midazolam 10 mg IM
May repeat in 5 minutes if needed
Maximum 20 mg

< 49 kg
Midazolam 0.2 mg/kg IM
Maximum single dose 5 mg

May repeat in 5 minutes if needed
Maximum 10 mg

Blood Glucose Analysis Procedure

IV or IO Protocol UP 6 ***if indicated***

P Cardiac Monitor ***if indicated***

Monitor and Reassess

Notify Destination or Contact Medical Control

Universal Protocol Section

Seizure

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **Brief seizure-like activity can be seen following ventricular fibrillation or ventricular tachycardia associated cardiac arrest.**
- **Status epilepticus is defined by seizure activity lasting > 5 minutes or multiple seizures without return to baseline.**
- **Most seizure activity is brief, lasting only 1 – 2 minutes, and is associated with transient hypoventilation.**
- **Be prepared for airway problems and continued seizures.**
- **Seizure activity may be a marker of closed head injury, especially in the very young, examine for trauma.**
- **Adult:**
  Midazolam 10 mg IM is effective in termination of seizures.
  Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.
- **Pediatrics:**
  Midazolam 0.2 mg/kg (Maximum 5 mg) IM is effective in termination of seizures.
  Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.
- **Do not delay administration of anti-epileptic drugs to check for blood glucose.**
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures** affect only a part of the body and are not usually associated with a loss of consciousness, but can propagate to generalized seizures with loss of consciousness.
- Be prepared to assist ventilations especially if diazepam or midazolam is used.
- For any seizure in a pregnant patient, follow the OB Emergencies Protocol.
- Diazepam (Valium) is not effective when administered IM. Give IV or Rectally.
- **Optimal conditions for patients refusing transport following a seizure:**
  - Known history of seizures/epilepsy
  - Full recovery to baseline mental status
  - No injuries requiring treatment or evaluation
  - Adequate supervision
  - Seizure not associated with drugs or alcohol
  - Only 1 seizure episode in the past hour
  - Seizure not associated with pregnancy

Suspected Stroke

History
- Previous CVA, TIA's
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma
- Sickle Cell Disease
- Immune disorders
- Congenital heart defects
- Maternal infection / hypertension

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

Differential
- See Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Todd's Paralysis
- Hypoglycemia
- Stroke
  Thrombotic or Embolic (~85%)
  Hemorrhagic (~15%)
- Tumor
- Trauma
- Dialysis / Renal Failure

RACE Stroke Screen Assessment

Blood Glucose Analysis Procedure

Consistent with Acute Stroke

NO → Exit to Appropriate Protocol(s) ***as indicated***

YES

Determine
1. **Last Known Well Time**
2. **Time of Symptom Discovery**

Time of Onset Or Time Last Seen Normal < 24 Hours

YES → **Stroke Severity Screen Procedure**

NO

ECU HEALTH MC Stroke Alert with any symptoms and RACE score of 1

- Altered Mental Status Protocol UP 4 ***if indicated***
- B: 12 Lead ECG Procedure
- IV / IO Protocol UP 6
- Age Appropriate Cardiac Protocol(s) ***if indicated***
- Head Trauma Protocol TB 5 / Multiple Trauma Protocol TB 6 ***if indicated***
- Seizure Protocol UP 13 ***if indicated***

Determine weight of patient or weigh pt upon ECU HEALTH MC arrival

Transport Destination Facility based on:
STROKE
EMS Triage and Destination Plan

- **Refer to plan for Last Known Well Time and Stroke Severity Assessment values**
- **Combination of factors will drive transport destination decision-making based on your region**

Transport based on:
STROKE
EMS Triage and Destination Plan

Goal Scene Time ≤ 15 Minutes
Provide Early Notification of Destination Facility
Suspected Stroke Alert

- Reperfusion Checklist Procedure ***if time allows***
- B: 12 Lead ECG Procedure
- IV or IO Access Protocol UP 6 Preferably 2 Sites
- A: Venous Access Blood Draw Procedure ***if applicable***
- P: Cardiac Monitor
- P: **Persistent Hypertension**
  If SBP ≥ 185 or DBP ≥ 110
  After 3 readings all 5 minutes apart
  Contact Receiving Facility Concerning Treatment of Hypertension

Notify Destination or Contact Medical Control

Universal Protocol Section

Suspected Stroke

Universal Protocol Section

Pearls

- **Recommended Exam: EMS Stroke Screen and Severity Assessment, Mental Status, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Stroke Care Toolkit.**
- **Acute Stroke care is evolving rapidly. Time of onset / last seen normal or well may be changed at any time depending on the capabilities and resources of your regional hospitals based on Stroke: EMS Triage and Destination Plan.**
- **Time of Onset or Last Seen Normal or Well:**
  - **One of the most important items the pre-hospital provider can obtain, of which all treatment decisions are based.**
  - **Be precise in gathering data to establish the time of onset and report as an actual time (i.e. 13:47 NOT "about 45 minutes ago.")**
  - **Without this information patient care may be delayed at facility.**
  - **Wake up stroke: Time starts when patient last awake or symptom free.**
- **Time of Symptom Discovery:**
  - **Time when symptoms of stroke are first noticed by patient, bystanders, witnesses, or family/ caregivers.**

Sources of information pertaining to Last Known Well time:

- **You are often in the best position to determine the actual Time of Onset while you have family, friends or caretakers available.**
- **Often these sources of information may arrive well after you have delivered the patient to the hospital.**
- **Delays in decisions due to lack of information may negatively impact care.**
- **Obtain contact information (phone number and name) of witnesses and give to facility providers.**

- **The Reperfusion Checklist should be completed for any suspected stroke patient as time allows.**
- **If possible place 2 IV sites above the wrists. (Priority - establish 1 – 20 ga+ IV, Right Antecubital)**
- **Blood Draw:**
  - **Many systems utilize EMS venous blood samples. Follow your local policy and procedures.**
- The differential listed in the UP 4 Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting/aspiration).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- Document the EMS Stroke Screen, Stroke Severity Score, and Stroke Alert notification time in the ePCR or PCR. Agencies may use validated pre-hospital stroke screen of choice.
- **Pediatrics:**
  - Strokes do occur in children, they are slightly more common in ages < 2, in boys, and in African-Americans.
  - Newborn and infant symptoms consist of seizures, extreme sleepiness, and using only one side of the body.
  - Children and teenagers symptoms may consist of severe headaches, vomiting, sleepiness, dizziness, and/or loss of balance or coordination.

Suspected Sepsis

History
- Duration and severity of fever
- Past medical history
- Medications / Recent antibiotics
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Indwelling medical device
- Last acetaminophen or ibuprofen
- Recent Hospital / healthcare facility
- Bedridden or immobile
- Elderly and very young – at risk
- Prosthetic device / indwelling device

Signs and Symptoms
- Warm
- Flushed
- Sweaty
- Chills / Rigors
- Delayed cap refill
- Mental status changes

Associated Symptoms (Helpful to localize source)
- myalgias, cough, chest pain, headache, dysuria, abdominal pain, rash

Differential
- Infections: UTI, Pneumonia, skin/ wound
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease: Arthritis, Vasculitis
- Hyperthyroidism
- Heat Stroke
- Meningitis
- Hypoglycemia/hypothermia
- MI / CVA

Consider: Contact, Droplet, and Airborne Precautions

Temperature Measurement Procedure ***if available***

Fever / Infection Control Protocol UP 10 ***if needed***

Altered Mental Status Protocol UP 4 ***if needed***

B 12 Lead ECG Procedure

IV or IO Access Protocol UP 6 ***If indicated***

P Cardiac Monitor

Sepsis Screen Positive

NO → Exit to Age Appropriate Condition Appropriate Protocol(s)

YES → **SEPSIS ALERT**
Notify Receiving Facility Immediately

Venous Access Blood Draw ***if applicable***

A

Isotonic Fluid 500 mL Bolus
Repeat as needed
Titrate SPB ≥ 90 mmHg
and
MAP > 70 mmHg
Maximum 2 L

Peds: 20 mL/kg IV / IO
Repeat to titrate
Age Appropriate
SBP ≥ 70 + 2 x Age
Maximum 60 mL/kg

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3

Adult SIRS Criteria
Temperature
≥ 100.4° F (38° C)
Or
≤ 96.8° F (36° C)
AND
Any 1 of the following:
HR > 90
RR > 20
EtCO < 25 mmHg

Adult qSOFA Criteria
SBP ≤ 100 mmHG
RR ≥ 22
AMS or new mental status change

Pediatrics SIRS Criteria
Temperature
Same as adult

AND
Heart Rate
1 month – 1 year > 180
2 – 5 years > 140
6 – 12 years > 130
13 – 18 years > 120

MAP (Mean Arterial Pressure)

$$\frac{SBP + 2(DBP)}{3}$$

Monitor usually calculates this value on screen

Notify Destination or Contact Medical Control

Universal Protocol Section

Suspected Sepsis

*Mix **4 mg** (4 ml) of **Norepinephrine** in **250 ml D5W or NS** => concentration of 16 mcg/ml*

**Use 60 gtt/mL drip set only

mcg/min	gtt/min (mL/hr	mcg/min	gtt/min (mL/hr	mcg/min	gtt/min (mL/hr
1	4 gtt/min	11	41 gtt/min	21	79 gtt/min
2	8 gtt/min	12	45 gtt/min	22	82 gtt/min
3	11 gtt/min	13	49 gtt/min	23	86 gtt/min
4	15 gtt/min	14	53 gtt/min	24	90 gtt/min
5	19 gtt/min	15	56 gtt/min	25	94 gtt/min
6	23 gtt/min	16	60 gtt/min	26	98 gtt/min
7	26 gtt/min	17	64 gtt/min	27	101 gtt/min
8	30 gtt/min	18	68 gtt/min	28	105 gtt/min
9	34 gtt/min	19	71 gtt/min	29	109 gtt/min
10	38 gtt/min	20	75 gtt/min	30	113 gtt/min

Adverse/Side Effects

Systemic: Ischemic injury due to potent vasoconstrictor action and tissue hypoxia.
Cardiovascular: Bradycardia, probably as a reflex result of a rise in blood pressure, arrhythmias, tachycardia
Nervous: Anxiety, transient headache.
Respiratory: Respiratory difficulty.
Skin and Appendages: Extravasation necrosis at injection site. Gangrene of extremities has been rarely reported.
Overdoses or conventional doses in hypersensitive persons (e.g., hyperthyroid patients) cause severe hypertension with violent headache, photophobia, stabbing retrosternal pain, pallor, intense sweating, and vomiting.

- **Pearls**
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Recommended Exam Pediatrics: In childhood, physical assessment reveals important clues for sepsis. Look for mental status abnormalities such as anxiety, restlessness, agitation, irritability, confusion, or lethargy. Cardiovascular findings to look for include cool extremities, capillary refill >3 seconds, or mottled skin.**
- **Sepsis is a life threatening condition where the body's immune response to infection injures its own tissues and organs.**
- **Severe sepsis is a suspected infection and 2 or more SIRS criteria (or qSOFA) with organ dysfunction such as AMS or hypotension.**
- **Septic shock is severe sepsis and poor perfusion unimproved after fluid bolus.**
- **Agencies administering antibiotics should inquire about drug allergies specific to antibiotics or family of antibiotics.**
- **Following each fluid bolus, assess for pulmonary edema. Consider administration of Norepinephrine.**
- **Supplemental oxygen should be given and titrated to oxygenation saturation ≥ 94%.**
- **EKG should be obtained with suspected sepsis, but should not delay care in order to obtain.**
- **Abnormally low temperatures increase mortality and found often in geriatric patients.**
- Quantitative waveform capnography can be a reliable surrogate for lactate monitoring in detecting metabolic distress in sepsis patients. $EtCO_2$ < 25 mm Hg are associated with serum lactate levels > 4 mmol/L.
- Patients with a history of liver failure should not receive acetaminophen.
- **Droplet precautions:**
  - Include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient.
  - This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected.
  - 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 (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions:**
  - Include standard PPE plus airborne precautions plus contact precautions.
  - This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. **SARS, SARS-CoV-2, COVID-19, MERS, Monkeypox**).
- All patients should have drug allergies documented prior to administering pain medications.
- Allergies to NSAIDs (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen.
- Agency Medical Director may require contact of medical control prior to EMT / MR administering any medication.
- **Sepsis Screen:**
  - Agencies may use Adult / Pediatric Systemic Inflammatory Response Syndrome (SIRS) criteria or quickSOFA (qSOFA) criteria.
  - Receiving facility should be involved in determining Sepsis Screen utilized by EMS.

Syncope

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

Signs and Symptoms
- Loss of consciousness with recovery
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

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

Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***if indicated***

Blood Glucose Analysis Procedure

B 12 Lead ECG Procedure

IV or IO Access Protocol UP 6

P Cardiac Monitor

Altered Mental Status Protocol UP 4 ***if indicated***

Age Appropriate Cardiac Protocol(s) ***if indicated***

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***

Multiple Trauma Protocol TB 6
Spinal Motion Restriction Procedure / Protocol TB 8 ***if indicated***

Age Specific Blood Pressure indicating possible shock

Age 0 – 28 days: SBP < 60
Ages ≥ 1 month: SBP < 70
Age 1 – 9: SBP < 70 + (2*x* Age)

Ages 10 – 64: SBP < 90
Ages ≥ 65: SBP < 110

All ages Shock Index:
HR > SBP

Serious Signs / Symptoms
Hypotension, poor perfusion, shock

YES → **A**

IV or IO Access Protocol UP 6
Consider 2 Large Bore sites

Isotonic Fluid 500 mL Bolus
Repeat as needed
Titrate SPB ≥ 90 mmHg
Maximum 2 L
Peds: 20 mL/kg IV / IO
Repeat as needed
Titrate to Age Appropriate
SBP ≥ 70 + 2 x Age
Maximum 60 mL/kg

Exit to
Age Appropriate
Condition Appropriate
Protocol(s)

NO

Notify Destination or Contact Medical Control

Universal Protocol Section

Syncope

Universal Protocol Section

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Syncope is both loss of consciousness and loss of postural tone. Symptoms preceding the event are important in determining etiology.**
- **Syncope often is due to a benign process but can be an indication of serious underlying disease in both the adult and pediatric patient.**
- **Often patients with syncope are found normal on EMS evaluation. In general patients experiencing syncope require cardiac monitoring and emergency department evaluation.**

Differential should remain wide and include:

Cardiac arrhythmia	**Neurological problem**	**Choking**	**Pulmonary embolism**
Hemorrhage	**Stroke**	**Respiratory**	**Hypo or Hyperglycemia**
GI Hemorrhage	**Seizure**	**Sepsis**	

High-risk patients:

Age ≥ 60	**Syncope with exertion**
History of CHF	**Syncope with chest pain**
Abnormal ECG	**Syncope with dyspnea**

- **Abdominal / back pain in women of childbearing age should be treated as pregnancy related until proven otherwise.**
- **The diagnosis of abdominal aneurysm should be considered with abdominal pain, with or without back and / or lower extremity pain or diminished pulses, especially in patients over 50 and / or patients with shock/ poor perfusion. Notify receiving facility early with suspected abdominal aneurysm.**
- **Consider cardiac etiology in patients > 35, diabetics and / or women especially with upper abdominal complaints.**
- **Heart Rate: Tachycardia is one of the first clinical signs of dehydration, typically increases as dehydration becomes more severe.**
- Syncope with no preceding symptoms or event may be associated with arrhythmia.
- Assess for signs and symptoms of trauma if associated or questionable fall with syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.
- These patients should be transported. Patients who experience syncope associated with headache, neck pain, chest pain, abdominal pain, back pain, dyspnea, or dyspnea on exertion need prompt medical evaluation.
- More than 25% of geriatric syncope is cardiac dysrhythmia based.

Behavioral Health Crisis

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

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

Differential
- Altered Mental Status
- Alcohol Intoxication
- Toxin / Substance abuse
- Medication effect / overdose / withdrawal
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders

Call for help
Call for additional resources
Stage prior to arrival
or
Wthdraw from scene until safe

Screen patient for weapons
Screen for scene safety

Assess for underlying medical or traumatic condition causing behavioral disturbance

Age Appropriate Protocol(s)

Establish rapport
- Genuine respect for feelings / circumstances
- Active listening
- Eye contact and at meet at eye level

Create a quiet and safe environment
- Only 1 provider talks to patient to limit stimuli
- Decrease unnecessary stimuli

Identify major problem or crisis
- "What happened to upset you?"
- "How are you feeling right now?"

Assess for suicidal and/or homicidal thoughts

Identify major problem or crisis
- "What happened to upset you?"
- "How are you feeling right now?"

Exit to
Behavioral
Agitation / Sedation Guide
UP 18
Hyperactive Delirium with Severe Agitation
UP 19
Age Appropriate Protocol(s)

Assess and score: BARS
Behavioral Activity Rating Scale

BARS

1 – Difficult or unable to wake

2 – Asleep, but responds normally to verbal or physical stimuli

3 – Drowsy, appears sedated

4 – Quiet and awake (normal activity)

5 – Overt activity (physical or verbal) Agitated but not disruptive

6 – Extremely or continuously active, Agitated, disruptive, but not violent

7 – Violent, requires restraint Agitated and violent

P
Evaluation and Screening
Mental Health and Substance Use Protocol
CIT Paramedic Only
if available
Page 3

Triage and Alternative Destination
Mental Health / Substance Abuse
if available
Page 3

Notify Destination or
Contact Medical Control

Universal Protocol Section

Behavioral Health Crisis

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neurologic status**
- **Crew / responders safety is the main priority. Call for assistance, stage, or withdraw from scene if necessary.**
- **Law Enforcement:**
  - **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS, must be accompanied by law enforcement during transport.**
  - **Patient should not be transported with upper extremities hand-cuffed behind back as this prevents proper assessment and could lead to injury.**
  - **Consider multidisciplinary coordination with law enforcement to approach verbal de-escalation, restraint, and/or take-down restraint procedure.**
- **Maintain high-index of suspicion for underlying medical or traumatic disorder causing or contributing to behavioral disturbance. Medical causes more likely in ages < 12 or > 40.**
- **General communications techniques**
  - **Ask Open-ended questions (questions that cannot be answered with a yes/no)**
    "Tell me how we can help you?" "What caused you to call 911 today?"
  - **Active listening (stay engaged, be able to summarize patient's story, use your body language to convey listening)**
    Eye contact, nodding your head, periodically repeating back part of patient's story
  - **Encouraging (remain positive, convey interest in patient's crisis)**
    "Tell me more about that…"
  - **Clarifying questions (ask patient to rephrase or repeat if you don't understand)**
    "I'm not sure I understand, can you…?"
  - **Emotional labeling (naming emotions patient is demonstrating, validating emotions**
    "You look upset." "You seem angry."
  - **Conversational pause (okay to allow a period of silence for patient to process information)**
- **Behavioral health disturbance incidents are increasing and commonly involve the following:**
  - **Substance misuse**
  - **Depression / Anxiety / Stress Reactions / Bipolar**
  - **Psychosis**
  - **Schizophrenia or schizophrenia-like illness**
- **Restraints:**
  - **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
  - **Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.**
- Maintain high-index of suspicion for medical, trauma, abuse, or neglect causes:
  Hypoglycemia, hyperglycemia, overdose, substance abuse, hypoxia, head injury, shock, sepsis, stroke, etc.
  Domestic violence, child or geriatric abuse/neglect.
- **Extrapyramidal reactions:**
  Condition causing involuntary muscle movements or spasms typically of the face, neck and upper extremities. May present with contorted neck and trunk with difficult motor movements. Typically an adverse reaction to antipsychotic drugs like Haloperidol and may occur with your administration. When recognized give **Diphenhydramine 50 mg IV / IO / IM / PO** in adults or **1 mg/kg IV / IO / IM / PO** in pediatrics.

Behavioral Agitation/ Sedation Guide

Behavioral Activity Rating Scale (BARS)

Behavioral Activity Rating Scale
BARS scoring: 1 - 4

YES → No sedation required → Exit to Age Appropriate Protocol(s)

NO

Behavioral Activity Rating Scale
BARS scoring: 5
Agitated but not disruptive
Able to calm and redirect

YES → Verbal De-escalation Procedure ASP 11

P
PO / ODT Medication

Examples:
Haloperidol
Droperidol
Lorazepam

NO

Condition Improving?
NO
YES → Exit to Age Appropriate Protocol(s)

Behavioral Activity Rating Scale
BARS scoring: 6

Agitated and disruptive
Not violent

Verbal De-escalation Procedure ASP 11

IV or IO Access Protocol UP 6
if indicated

P
Offer PO / ODT Medication for BARS 5
Or
Age ≥ 12
Haloperidol 2 - 5 mg
IM
Age ≥ 65
2.5 mg IM
May repeat every 5 as needed
Maximum 10 mg
And/Or
Midazolam 2.5 mg IV / IO / IN
5 mg IM
Age ≥ 65
1 – 2.5 mg IV / IO / IN
2.5 mg IM
Peds: 0.1 – 0.2 mg/kg
IV / IO / IM / IN
Repeat every 2-3 minutes as needed

Consider
Restraint Physical Procedure USP 5
Monitor per restraint procedure
if indicated

NO

Condition Improving?
NO
YES → Exit to Age Appropriate Protocol(s)

Behavioral Activity Rating Scale
BARS scoring: 7

Agitated and violent

→ Exit to Hyperactive Delirium with Severe Agitation Protocol UP 19

Universal Protocol Section

Behavioral
Hyperactive Delirium With Severe Agitation

Scene Safe

YES

NO

Call for help
Call for additional resources
Stage prior to arrival
or
Withdraw from scene until safe

Behavioral Activity Rating Scale (BARS)

Behavioral Activity Rating Scale

BARS scoring: 7

P

Ketamine 4 mg/kg IM
Maximum 400 mg *See Pearls*

Pediatrics:
2 mg/kg IM
Maximum 400 mg *See Pearls*

Or
Midazolam 10 mg IM

Age ≥ 65
Midazolam 5 mg IM

Pediatrics:
Midazolam 0.1 – 0.2 mg/kg IM
Repeat every 5 minutes as needed

Midazolam Maximum Dose 20 mg

IV or IO Access Protocol UP 6
Preferably 2 large bore

A

Normal Saline 1 L Bolus
Then **150 – 200 mL / hr**
May repeat **500 mL** Bolus
as needed
Maximum 2 L

Peds: 20 – 60 mL/kg IV / IO
Maximum 60 mL/kg

Restraint Physical Procedure USP 5
Monitor per restraint procedure
if indicated

Restraint Therapeutic Take Down Procedure USP 6
if indicated

Hyperthermia Protocol

P Cardiac Monitor

Notify Destination or
Contact Medical Control

General Guidance

- **Use of protocol is indicated when a medical emergency requires a combination of both physical restraint and chemical restraint in order to prevent imminent injury to a patient and/ or providers.**
- **Use of this protocol requires medical judgement and consultation with Medical Control where indicated.**
- **Non-medical personnel requests or opinions should not be used as a factor when implementing this protocol.**

Universal Protocol Section

Behavioral
Hyperactive Delirium With Severe Agitation

Pearls

- **Ketamine for sedation purposes:**
  Ketamine may be used in pediatric patients who fit within a Pediatric Medication/ Skill Resuscitation System product, ≤ 15 years of age, or ≤ 49 kg) with DIRECT ONLINE MEDICAL ORDER by the system MEDICAL DIRECTOR or ASSISTANT MEDICAL DIRECTOR only.
- **Hyperactive Delirium with Severe Agitation:**
  Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent/ bizarre behavior, insensitivity to pain, hyperthermia and increased strength.
  Potentially life-threatening and associated with use of physical control measures, including physical restraints.
  Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents.
  Alcohol or substance withdrawal as well as head trauma may also contribute to the condition.
- **Restraint use:**
  Physical restraints are not contraindicated in agitated or excited delirium, but you must use caution.
  Once sedated, prevent patient from continued struggle, which can worsen metabolic condition.
  Prevent patient from assuming a prone position for prolonged period, move to supine position as quickly as possible.
  Team approach for sedation and Restraint Therapeutic Take Down Procedure USP-6:
  1 provider for each limb.
  1 provider to lead restraint, maintain airway and control head.
  1 Provider to administer medication.
  Do not position prone or prone with restraints, as this can impede respiration and ventilation.
- Hyperthermia: Assess for and treat hyperthermia.

Procedures

Division of Emergency Medical Services

Airway: BIAD King

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

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

Procedure:

1. Preoxygenate the patient.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
6. Inflate the pilot balloon with 45-90 ml of air depending on the size of the device used.
7. **Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated**.
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
10. **Confirm tube placement using end-tidal CO_2 detector.**
11. **EtCO2 monitoring is mandatory following placement of a BIAD once available on scene**
12. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

Certification Requirements:

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

Airway: BIAD-i-Gel

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Do not leave in place for ≥ 4 hours.
- **This airway does not prevent aspiration of stomach contents.**

Clinical Contraindications:

- Deforming Facial Trauma
- Pulmonary Fibrosis
- Morbid Obesity

Procedure:

1. Pre-Oxygenate the patient with 100% Oxygen
2. Select the appropriate tube size for the patient.
3. Remove the device from the protective cradle and carefully for any signs of damage.
4. Place water-soluble jelly in the middle of the protective cradle.
5. Lubricate the back of the i-Gel on the non-inflatable cuff and ensure no lubricant is in the cuff.
5. Lubricate each side and the tip of the non-inflatable cuff.
6. Grasp along the integral bite block and face the cuff outlet toward the patient's chin.
7. Insert the i-Gel into the mouth in the direction of the hard palate.
8. Glide the device down and back along the hard palate with continuous, gentle pressure, until
9. Connect the i-Gel to an BVM and assess for breath sounds and air entry.
10. **Confirm tube placement using end-tidal CO_2 detector or esophageal bulb device.**
11. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
12. **EtCO2 monitoring is mandatory following placement of a BIAD once available on scene**
13. Re-verify i-Gel placement after every move and upon arrival in the ED
43. Document the procedure, time, and result (success) on/with the patient care report (PCR)
15. **It is strongly recommended that an Airway Evaluation Form be completed with any BIAD use.**

Certification Requirements:

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

Airway: Cricothyrotomy-Surgical

Clinical Indications:

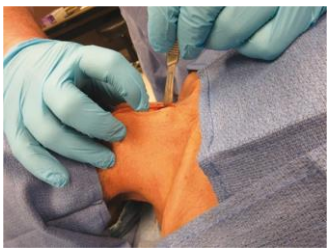
P PARAMEDIC P

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient ≥ 12 years old.

Procedure:

1. Have suction and supplies available and ready.
2. Load a cuffed endotracheal tube on the Bougie and advance approximately 1 fist width from the proximal tip (#5.5 or 6 endotracheal cuffed tube is usually sufficient). Check the endotracheal cuff. Set Bougie and endotracheal tube aside
3. Locate the cricothyroid membrane utilizing anatomical landmarks. Use index finger to palpate the membrane.
4. Prep the area with an antiseptic swab if time permits

5. Make a vertical incision (approximately 4 - 5 cm) through the skin and subcutaneous tissue extending above and below the cricothyroid membrane using a scalpel. (#15 blade is recommended)



6. Use your finger to blunt dissect and expose the cricothyroid membrane.

7. After blunt dissection and locating the cricothyroid membrane, remove your finger and make a horizontal stabbing incision on the cricothyroid membrane. Cut to each side of the initial incision to open the membrane. Remove the scalpel.
8. Using gloved index finger to maintain surgical opening. Using your finger as a guide introduce the Bougie with curved tip anteriorly. Gently advance the Bougie approximately 10 cm.
9. Slide the insert cuffed tube over the distal part of the Bougie into the trachea ensuring the cuff is past the membrane incision (black line marker inside the incision).

10. Inflate the endotracheal cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube. Remove the Bougie.
11. Apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, enroute to the hospital, and at the hospital.
12. All standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, capnography, etc.)
13. Once airway is conformed, secure the endotracheal tube with tube holder or tape.
14. Document ETT size, time, result (success), and placement location by the centimeter marks in the patient care report (PCR). Document initial tube placement and after each movement of the patient.
15. Consider placing an NG or OG tube to clear stomach contents after the airway is secured.

The airway must be monitored continuously through continuous capnography and pulse oximetry

Certification Requirements:

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

Airway: Intubation Oral Tracheal

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

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

Procedure:

1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube (and stylette, if used), have suction ready.
3. Using laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).
4. Limit each intubation attempt to 30 seconds with BVM between attempts.
5. Visualize tube passing through vocal cords.
6. **Confirm and document tube placement using an end-tidal CO_2 monitoring or esophageal bulb device.**
7. Inflate the cuff with 3-to10 cc 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. Consider using a Blind Insertion Airway Device if intubation efforts are unsuccessful.
10. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
11. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
12. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
13. **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube.**

4. It is strongly recommended that an Airway Evaluation Form be completed with all intubations

Certification Requirements:

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

Airway: Video Laryngoscopy Glidescope

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patient requires advanced airway.

Procedure:

1. Preoxygenate the patient and use in conjunction with procuedure ASP - 6.
2. Select the appropriate ETT size and GlideRite Rigid Stylette for the patient. Ready suction.
3. Power on GildeScope and allow 30 seconds for anti-fog mechanism to warm.
4. Using GlideScope visualize the vocal cords and facilitate the intubation:
   - **In the mouth:** looking directly into the patient's mouth and with the VL blade in left hand, introduce GlideScope VL into the midline of the oral pharynx.
     Look into the mouth to prevent soft tissue damage.
   - **At the screen:** With GlideScope VL inserted, look to monitor to identify the epiglottis, then manipulate the scope to obtain the best glottic view.
   - **In the mouth:** Looking directly into the patient's mouth, not at screen, carefully guide the distal tip of the ETT into position near the tip of the GlideScope VL.
     Insert the ETT behind or adjacent to the VL blade.
   - **At the screen:** Look to the monitor to complete tracheal intubation. Gently rotate or angle the ETT to redirect as needed.
     Avoid excessive lifting or pushing of the glottis with the VL blade.
     Reducing the elevation applied to the VL blade may facilitate intubation.
   - **Advance the ETT** while simultaneously withdrawing the stylette with the thumb.
     Withdraw the stylette approximately 5 cm (2 inches).
     Do not insert the stylette into the larynx during intubation – this will prevent passing into the glottis.
   - **Secure and verify the proper ETT placement.**

5. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
6. Secure the ETT tube with tape or mechanical tube holder.
7. **Confirm tube placement using end-tidal CO_2 detector.**
8. **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube.**

12. **Complete the Airway Evaluation Form.**

Certification Requirements:

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

North Carolina College of Emergency Physicians
Standards Procedure (Skill)
Airway: Drug Assisted Airway

Clinical Indications:

P PARAMEDIC P

- Need for advanced airway control in a patient who has a gag reflex or trismus (jaw clinching)
- Failure to protect the airway. Unable to ventilate and / or oxygenate. Impending airway compromise
- A minimum of 2 EMT-Paramedics on scene able to participate in patient care
- This protocol is only for use in patients with patients longer than a Length-based Resuscitation Tape except in agencies utilizing Ketamine for pediatric airway management with direct online medical control via system medical director or assistant medical director.

Clinical Contraindications:

- Refer to drug list for contraindications regarding use of Succinylcholine and Rocuronium.

Procedure:

1. Perform focused neurological exam
2. Evaluate for difficult airway (LEMON)-see appendix
3. Prepare equipment (intubation kit, BVM, suction, DAI medications, BIAD, Cricothyrotomy kit, waveform capnography, other airway adjuncts as available)
4. Pre-oxygenate patient with 100% oxygen via NRB mask or BVM. Apneic oxygenation: May continue high-flow oxygen via NC during entire procedure
5. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
6. Ensure functioning IV / IO access. Two (2) IV sites are preferable
8. In-line c-spine stabilization by second caregiver (in setting of trauma)
9. Administer Etomidate or Ketamine by rapid IV push
10. Administer Succinylcholine or Rocuronium, await fasciculation and jaw relaxation
11. Perform external laryngeal manipulation to improve view during laryngoscopy with the right hand.
12. Intubate trachea or place BIAD if intubation unsuccessful or felt to be unsuccessful during procedure.
13. Verify ET placement through auscultation, Capnography, and Pulse Oximetry
14. May repeat Succinylcholine or Rocuronium if inadequate relaxation
15. Release cricoid pressure (if utilized) and secure tube
16. **Continuous Capnography and Pulse Oximetry is required for DAI. Pre-intubation, minimal during intubation, and post-intubation readings must be recorded in the PCR.**
17. Re-verify tube placement after every move and upon arrival in the ED
18. Document ETT or BIAD 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/methods used to confirm initial tube placement initially and with patient movement.
19. Consider placing a gastric tube to clear stomach contents after the airway is secured.
20. **Completion of the Airway Evaluation Form is required including a signature from the receiving physician at the Emergency Department confirming proper tube placement.**

Certification Requirements:

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

Airway: Tracheostomy Tube Change

A	AEMT	A
P	PARAMEDIC	P

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/ventilate the patient without other obvious explanation.

Procedure:

1. Have all airway equipment prepared for standard airway management, including equipment of orotracheal 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 (e.g., if the patient has a #6.0 Shilley, 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 – i.e., 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 PCR

Certification Requirements:

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

Airway: Endotracheal Tube Introducer (Bougie)

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patients meet clinical indications for oral intubation
- Initial intubation attempt(s) unsuccessful
- Predicted difficult intubation

Contraindications:

- Three attempts at orotracheal intubation (utilize failed airway protocol)
- Age less than eight (8) or ETT size less than 6.5 mm

Procedure:

1. Prepare, position and oxygenate the patient with 100% oxygen;
2. Select proper ET tube without stylet, test cuff and prepare suction;
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal 1/2 of the Endotracheal Tube Introducer (Bougie) (note: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT);
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick's/BURP as needed;
5. Introduce the Bougie with curved tip 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 re-attempted or the failed 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 ET tube 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 ET tube over the Bougie passing the tube to its appropriate depth;
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees 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 ET tube securely and remove the Bougie;
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 3 to 10 cc of air, auscultate for equal breath sounds and reposition accordingly;
13. When final position is determined secure the ET tube, reassess breath sounds, apply end tidal CO2 monitor, and record and monitor readings to assure continued tracheal intubation.

Certification Requirements:

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

Standards Procedure (Skill) Airway Section
Airway Intubation Confirmation – End-Tidal CO_2 Detector

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- The End-Tidal CO_2 detector shall be used with any Endotracheal Tube or Blind Insertion Airway Device use.

End-tidal (EtCO2) monitoring is mandatory following placement of an advanced airway.

Procedure:

1. Attach End-Tidal CO_2 detector to the Blind Insertion Airway Device or the Endotracheal Tube.
2. Note color change. A color change or CO_2 detection will be documented on each respiratory failure or cardiac arrest patient.
3. The CO_2 detector shall remain in place with the airway and monitored throughout the prehospital care and transport unless continuous Capnography is used. Any loss of CO_2 detection or color change is to be documented and monitored as procedures are done to verify or correct the airway problem.
4. Tube placement should be verified frequently and always with each patient move or loss of color change in the End-Tidal CO_2 detector.
5. Document the procedure and the results on/with the Patient Care Report (PCR) as well as on the Airway Evaluation Form.

Certification Requirements:

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

Airway: Foreign Body Obstruction

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

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

Procedure:

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

Certification Requirements:

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

Assessment: Adult

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

Any patient requesting a medical evaluation that is too large to be measured with a current Length-based Resuscitation Tape.

Procedure:

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

Certification Requirements:

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

Pain Assessment and Documentation

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

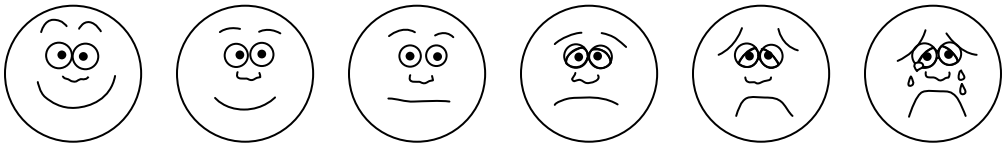
- Any patient with pain.

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 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.
   - 0 – 10 Scale: the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
   - Wong – Baker "FACES" scale: this scale is primarily for use with pediatrics but may also be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value.



0	2	4	6	8	10
No hurt	Hurts little bit	Hurts little more	Hurts even more	Hurts whole lot	Hurts worst

From Hockenberry MJ, Wilson D, Winkelstein ML: Wong's Essentials of Pediatric Nursing, ed. 7, St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

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

CATEGORIES	SCORING		
	0	1	2
FACE	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested.	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, distractable.	Difficulty 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 the local EMS System.

Assessment: Pediatric

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Any child that can be measured with a Length-based Resuscitation Tape.

Procedure:

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

Certification Requirements:

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

Blood Glucose Analysis

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick or when possible simultaneously with intravenous access.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
7. Perform Quality Assurance per manufacture recommendation.

Certification Requirements:

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

Capnography

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

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

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note CO_2 level and waveform changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of CO_2 detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR) and the Airway Evaluation Form.

Certification Requirements:

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

Pulse Oximetry

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patients with suspected hypoxemia.

Procedure:

1. Apply probe to patient's finger or any other digit as recommended by the device manufacturer.
2. Allow machine to register saturation level.
3. Record time and initial saturation percent on room air if possible on/with the patient care report (PCR).
4. Verify pulse rate on machine with actual pulse of the patient.
5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
7. In general, normal saturation is 97-99%. Below 94%, suspect a respiratory compromise.
8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain. Supplemental oxygen is not required if the oxyhemoglobin saturation is >= 94%, unless there are obvious signs of heart failure, dyspneic, or hypoxic to maintain to 94%.
10. Factors which may reduce the reliability of the pulse oximetry reading include but are not limited to:
    - Poor peripheral circulation (blood volume, hypotension, hypothermia)
    - Excessive pulse oximeter sensor motion
    - Fingernail polish (may be removed with acetone pad)
    - Carbon monoxide bound to hemoglobin
    - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
    - Jaundice
    - Placement of BP cuff on same extremity as pulse ox probe.

Certification Requirements:

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

Reperfusion Checklist

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

Rapid evaluation of a patient with suspected acute stroke and/or acute myocardial infarction (STEMI) to:

- Determine eligibility and potential benefit from fibrinolysis..
- Rapid identification of patients who are not eligible for fibrinolysis and will require interventional therapy.

Procedure:

1. Follow the appropriate protocol for the patient's complaint to assess and identify an acute condition which could potentially benefit from fibrinolysis. If a positive finding is noted on one of the following assessments, proceed to step 2.
   - Perform a 12-lead ECG to identify an acute ST elevation myocardial infarction (STEMI).
   - Perform the Los Angles Pre-hospital Stroke Screen to identify an acute stroke
2. Complete the Reperfusion Check Sheet to identify any potential contraindications to fibrinolysis. (See Appendix)
   - Systolic Blood Pressure greater than 180 mm Hg
   - Diastolic Blood Pressure greater than 110 mm Hg
   - Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
   - History of structural Central Nervous System disease (age >= 18, history of aneurysm or AV-malformation, tumors, masses, hemorrhage, etc.)
   - Significant closed head or facial trauma within the previous 3 months
   - Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
   - Bleeding or clotting problem or on blood thinners
   - CPR performed greater than 10 minutes
   - Currently Pregnant
   - Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.
3. Identify if the patient is currently in heart failure or cardiogenic shock. For these patients, a percutaneous coronary intervention is more effective.
   - Presence of pulmonary edema (rales greater than halfway up lung fields)
   - Systemic hypoperfusion (cool and clammy)
4. If any contraindication is noted using the check list and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligable patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to an specialty center capable of interventional care within the therapeutic window of time.
5. Record all findings in the Patient Care Report (PCR).

Certification Requirements:

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

Stroke Scale: RACE

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Suspected Stroke Patient

EMS R.A.C.E. Stroke Scale
Rapid Arterial oCclusion Evaluation Scale

ITEM	Instruction	Result	Score
Facial Palsy	Ask patient to show their teeth (smile)	**Absent** (symmetrical movement) **Mild** (slight asymmetrical) **Moderate to Severe** (completely asymmetrical)	**0** **1** **2**
Arm Motor Function	Extending the arm of the 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**
Leg Motor Function	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**
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**
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 either task requested correctly)	**0** **1** **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**
		RACE SCALE TOTAL	

Procedure:

- **Scores <u>equal to or above 1</u> should have a STROKE ALERT called into communications as soon as the screen is completed with an <u>ETA</u> to the most appropriate facility designated by the Destination Plan.**
- **Document the Stroke activation time on your ePCR in the data field.**
- **Attempt to obtain the following but <u>do not delay transport</u>:** *(Document reason if unsuccessful)*

  1. **Blood Glucose**
  2. **12-lead ECG**
  3. **20ga IV (or larger) in the Right antecubital fossa (AC) to assist with medication delivery in the CT scanner**
  4. **<u>Weigh the patient upon arrival</u> - *if the patient destination is* ECU HEALTH Medical Center**

- **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.
- 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 **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 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**.

Certification Requirements:

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

Temperature Measurement

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation efforts.

Procedure:

1. For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (steps 2 to 4 below). For infants or adults that do not meet the criteria above, a rectal temperature is preferred (steps 6 to 8 below).
2. To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient's tongue with appropriate sterile covering.
3. Have the patient seal their mouth closed around thermometer.
4. If using an electric thermometer, leave the device in place until there is indication an accurate temperature has been recorded (per the "beep" or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least 30 seconds (usually 2 to 3 minutes). Proceed to step 8.
5. Prior to obtaining a rectal temperature, assess whether the patient has suffered any rectal trauma by history and/or brief examination as appropriate for patient's complaint.
6. To obtain a rectal temperature, cover the thermometer with an appropriate sterile cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.
7. Follow guidelines in step 5 above to obtain temperature.
8. Record time, temperature, method (oral, rectal), and scale (C° or F°) in Patient Care Report (PCR).

Certification Requirements:

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

Orthostatic Blood Pressure Measurement

	EMR
B	EMT
A	AEMT
P	PARAMEDIC

Clinical Indications:

- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization. Orthostatic vital signs are not routinely recommended.
- Patients ≥ 8 years of age, or patients larger than the Broselow-Luten tape
- Orthostatic Vital Signs are not sensitive nor specific for volume loss / dehydration and may induce syncope in some cases. Assessment of orthostatic vital signs are not routinely recommended. Local Medical Director should indicate and educate on situations where they may be helpful.

Procedure:

1. Gather and prepare standard sphygmomanometer and stethoscope.
2. With the patient supine, obtain pulse and blood pressure.
3. Have the patient sit upright.
4. After 30 seconds, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 30 mmHg or the pulse rises more than 20 bpm, the patient is considered to be orthostatic.
6. If a patient experiences dizziness upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic examination should be omitted and fluid resuscitation initiated.

Certification Requirements:

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

Standards Procedure (Skill) Assessment / Screening Section

Verbal De-escalation

Agency Name:	SATISFACTORY ☐
Provider Name: Paramedic	UNSATISFACTORY ☐
Instructor Name: EMT AEMT Paramedic Physician	

Instructor:
1. Evaluate providers skill performance using the check off list below.
2. Circle performance indicator:
   - YES = Provider completed skill with no assistance from instructor.
   - NO = Provider unable to complete skill satisfactorily following instructor intervention.
   - IL = Provider able to complete skill satisfactorily following Instructor Led (teaching) intervention.

Satisfactory performance indicated with ≥ 8 YES / IL completions. (Combination of both YES and IL)

	EMR	
B	EMT	B
A	AEMT	A
P	Paramedic	P

YES NO IL	Verbalizes indications for Verbal de-escalation techniques: 1. Behavioral Health Crisis 2. Behavior Activity Rating Score ≥ 5
YES NO IL	Verbalizes contraindications: None
YES NO IL	**Demonstrates respect of patient's personal space** • Maintain about 6 feet of distance and do not position yourself between the patient and only exit • Both you and patient should be able to exit the room without feeing blocked-in
YES NO IL	**Does not provoke patient during interaction** • Your body language must convey that you want to listen and that you do not want to inflict harm Your hands should be visible and open Do not face the patient head-on. Always stand at an angle Avoid prolonged staring or direct eye contact • Make sure others are not provoking the patient (providers, family members, bystanders, providers, police officers)
YES NO IL	**Establishes rapport, initiates and maintains verbal contact** • One person should make and maintain verbal contact, introduce yourself and explain your role Multiple providers talking to the patient will create confusion and may escalate patient's behavior • Emphasize you are there to keep the patient safe • Ask the patient their name and how they want to be addressed
YES NO IL	**Use concise statements when talking** • Agitation creates problems in a patient's ability to process information • Keep your conversation simple and short in nature allowing time for patient to process information • Repeat your statements, requests, or commands to ensure understanding This is called a loop, you may need to repeat 2 – 12 times before patient understands
YES NO IL	**Identify wants, feelings, and stress causing the crisis** "When you called 911, how did you think we could help you?" "I would like to know what caused you to become upset today so we can help you" • Identifying a need can help to quickly de-escalate the situation
YES NO IL	**Listen closely to patient** • You should be able to repeat back what is said by the patient "Tell me if I have all this right" "Let me make sure I understand what you said"
YES NO IL	**Agree or agree to disagree** • If statements are truthful, then agree with the truth • Agree in principle, maybe patient's statement is not true, but you can agree, that in general, the idea is true • Agree with the odds, anyone may be upset by the same circumstances • Do not agree with delusions, at that point you can agree to disagree
YES NO IL	**Set clear limits on acceptable behavior** • Set limits in a positive, matter-of-fact manner, and not in a threatening manner • Inform the patient that harm to self or other providers will not be tolerated • If the patient's behavior is frightening to providers, tell the patient so • Remind the patient you are there to help, keep them safe, but the providers cannot be abused in the process
YES NO IL	**Offer choices to patient (if available) and remain positive in your interactions** • Offer choices that are realistic and that may provide comfort such as drinks, food, blankets, etc. • If medication is needed, offer choice between PO and IM/IV, offer medication early in encounter
YES NO IL	**Debrief provider team following the incident (if restraints necessary, debrief patient as well)** What went well? What could have gone better? What did we learn? Who needs to know?

Instructor notes:

Verbal De-escalation

Clinical Information for Verbal De-escalation

Objective of Procedure:
Verbal engagement with patient and establishing collaborative relationship with patient
Preventing violent behavior
Avoiding use of restraintes
Reducing patient anger and frustration
Maintaining staff and patient safety
Enabling patients to manage their emotions and regain personal control

Scope of Practice: EMR EMT AEMT Paramedic

Indications:
1. Behavioral Health Crisis
2. Behavior Activity Rating Score ≥ 5

Contraindications:
None

Clinical Presentation:
Patient experiencing a behavioral crisis defined as:
- Significantly deviates from society's expectations and commonly held normal behavior
- Behavior that is unusual for patient's baseline
- Bizarre
- Threatening
- Dangerous to self and/or others
- Alarming to patient, family, or bystanders
- Interferes with the patients ability to perform basic life functions and activities of daily living

Behavior Activity Rating Score ≥ 5

Potential Complications:
Injury to patient, provider, or bystander
Need to move to restraint procedure
Exacerbation of agitated condition

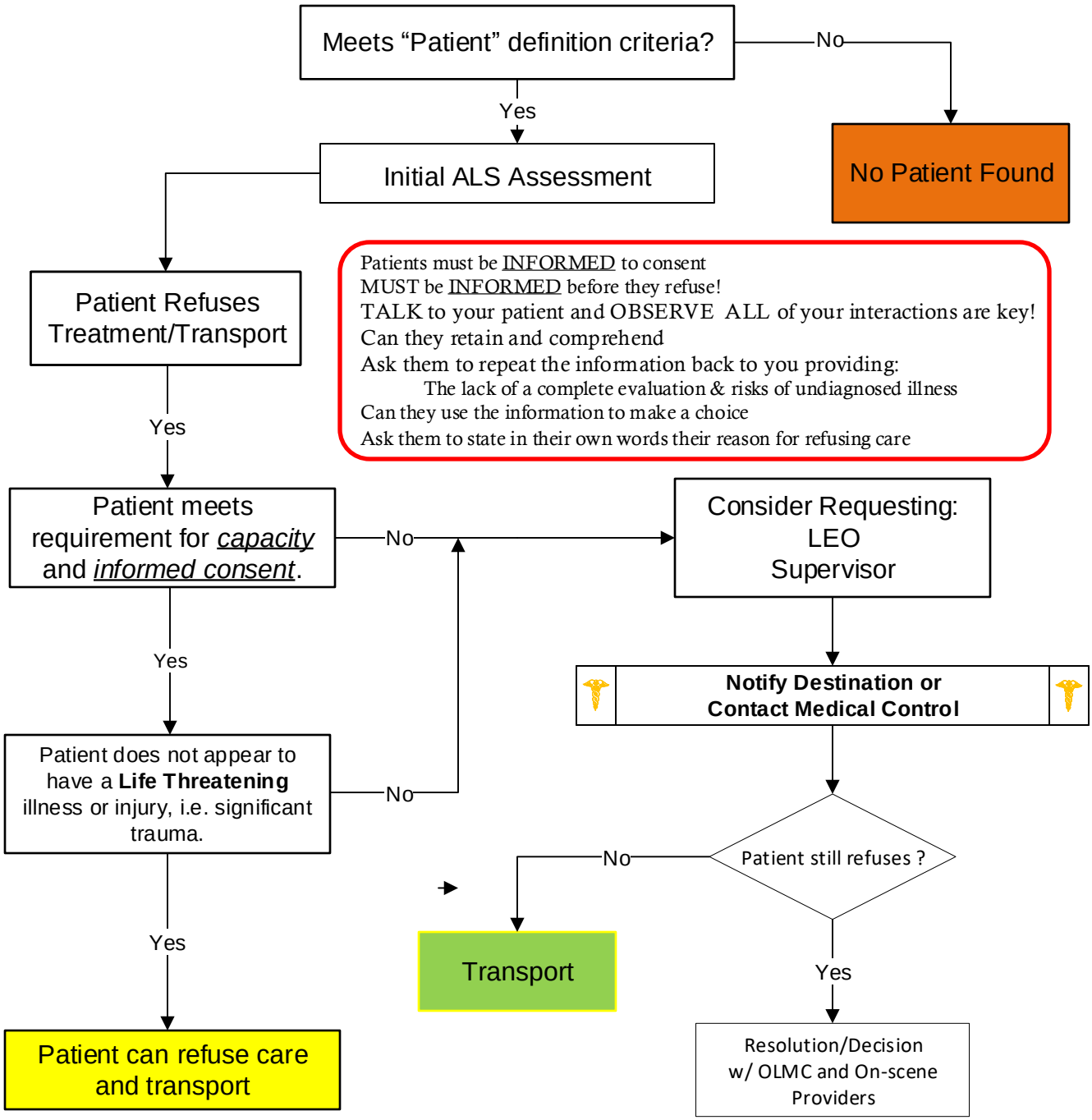
Procedure references:
1. Palmer J. (2019). Joint Commission Issues De-escalation Guidebook for Healthcare Facilities and Workers. Patient Safety and Quality Healthcare (PSQH). https://www.psqh.com/analysis/joint-commission-issues-de-escalation-guidebook-for-healthcare-facilities-and-workers/
2. Richmond JS, Berlin JS, Fishkind AV, et al. (2012). Verbal De-escalation of the Agitated Patient: Consensus Statement of the American Association for Emergency Psychiatry Project BETA De-escalation Workgroup. West J Emerg Med 13(1):17-25. doi: 10.5811/westjem.2011.9.6864

Refusal of Care

Definition of a Patient:

P PARAMEDIC P

A patient is an individual "requesting" or potentially needing medical evaluation or treatment. The patient-provider relationship is established via telephone, radio, or personal contact. It is the provider's responsibility to ensure all potential patients, regardless of the size of the incident, are offered the opportunity for evaluation, treatment, and/or transport. The guidelines for documenting patient encounters are discussed in the Documentation of the Patient Care Report (ePCR) Policy.



Patients with mental capacity retain the right to accept or refuse medical care, even if the consequences of the refusal of care may potentially be harmful for the patient. In the event a patient attempts to refuse medical care, it is important that we should attempt to: 1) Offer transport or treatment without some (or all) of the recommended treatment(s) if that is what the patient will allow (document discussion that lead to the elected course of treatment, obtain refusal documentation including patient signature), 2) Clearly advise the patient of the possible complications of their decision, and Advise the patient to call back if they desire treatment and transport.

Refusal of Care

Pearls:

<u>There are 3 special considerations regarding consent</u>:
EMS personnel shall treat and transport a minor patient, except an emancipated minor, based on implied consent unless a competent parent or legal representative is at scene and refuses evaluation, treatment, or transport or a competent parent or legal representative is contacted by phone for refusal or release at scene.

1) Minors:

a) In general, patients under the age of 18 may not consent to medical treatment or transport. The following groups may consent for the treatment of a minor:

i) Mother or Father or a Legal Guardian
ii) An individual standing in *loco parentis*. A person stands in *loco parentis* when he or she takes on the responsibilities of a parent of the child (e.g., a step-parent)
iii) The leader of a group of children in possession of written permission from the parent authorizing emergency medical treatment (e.g., a school field trip, a child at school where the parent is not present).

b) In the following circumstances, no consent is required prior to initiating treatment:

i) The parent, guardian, or person standing in *loco parentis* cannot be reached and the minor needs to receive medical treatment
ii) The identity of the child is unknown and a delay in rendering treatment would endanger the life of the child
iii) The effort to contact the child's parents, guardian, or a person standing in *loco parentis* would result in a delay that would seriously worsen the condition of the child

c) In North Carolina, a minor may consent to treatment without the knowledge of the parent under the following circumstances:

i) Pregnancy
ii) Treatment for sexually transmitted diseases
iii) Alcohol or drug abuse
iv) Emotional disturbance

2) Life-threatening situations without ability to communicate

a) A patient of any age who is unable to communicate because of an injury, accident, illness, or unconsciousness – AND- is suffering from what reasonably appears to be a life-threatening injury or illness. This patient is treated on the principle of implied consent.
b) The principle of implied consent presumes that if the individual with the illness or injury were conscious and able to communicate, he or she would consent to emergency treatment
c) In these situations, patients may be transported without their consent. Law enforcement, physical restraint, and/or chemical restraint may be required

3) Potentially life-threatening situations

a) Patients in this category generally fall into one of two groups: the alert patient who has a concerning presentation and refuses treatment and/or transport (e.g., the patient with chest pain and EKG changes) or the patient who may be intoxicated but does not have what reasonably appears to be a life-threatening injury (ie. patient who has consumed alcohol with a small laceration). In these situations, the following steps should be taken:

i) Determine orientation to person, place, and time. Document results.
ii) Determine what factor(s) is/are influencing the patient to refuse medical care. Resolve the ones in your power (e.g., patient does not want an IV – offer transport without an IV).
iii) Attempt communication with spouse/significant other/other family members if available.
iv) If patient continues to refuse, make contact with Online Medical Direction.
v) If patient continues to refuse, clearly explain risks of refusal and have the patient repeat these concerns back to you. Document your results in the patient care report.
vi) In a courteous manner, assure the patient they can call back for treatment and transport at anytime.

Cardiac: 12 Lead ECG

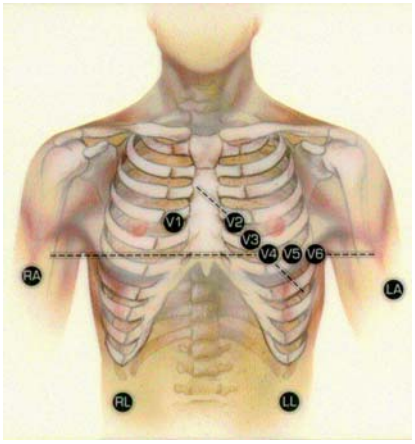
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

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 ECG.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
   - RA -Right arm
   - LA -Left arm
   - RL -Right leg
   - LL -Left leg
   - V1 -4th intercostal space at right sternal border
   - V2 -4th intercostal space at left sternal border
   - V3 -Directly between V2 and V4
   - V4 -5th intercostal space at midclavicular line
   - V5 -Level with V4 at left anterior axillary line
   - V6 -Level with V5 at left midaxillary line



8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12 Lead ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 Lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data by fax to the appropriate hospital.
12. Contact the receiving hospital to notify them that a 12 Lead ECG has been sent.
13. Monitor the patient while continuing with the treatment protocol.
14. Download data as per guidelines and attach a copy of the 12 lead to the PCR.
15. Document the procedure, time, and results on/with the patient care report (PCR)

Certification Requirements:

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

Cardiac: Cardioversion

P PARAMEDIC P

Clinical Indications:

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

Procedure:

1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
3. Consider the use of pain or sedating medications.
4. Set energy selection to the appropriate setting.
5. Set monitor/defibrillator to synchronized cardioversion mode.
6. Make certain all personnel are clear of patient.
7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may a delay between activating the cardioversion and the actual delivery of energy.
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient’s rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.
9. If the patient’s condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.
10. Repeat until maximum setting or until efforts succeed. Consider discussion with medical control if cardioversion is unsucessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR).

Certification Requirements:

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

Cardiac: External Pacing

P PARAMEDIC P

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
- Asystole, pacing must be done early to be effective.
- PEA, where the underlying rhythm is bradycardic and reversible causes have been treated.

Procedure:

1. Attach standard four-lead monitor.
2. Apply defibrillation/pacing pads to chest and back:
   - One pad to left mid chest next to sternum
   - One pad to mid left posterior chest next to spine.
3. Rotate selector switch to pacing option.
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
5. Note pacer spikes on EKG screen.
6. Slowly increase output until capture of electrical rhythm on the monitor.
7. If unable to capture while at maximum current output, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Consider the use of sedation or analgesia if patient is uncomfortable.
10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.

Certification Requirements:

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

Cardiac: Cardiopulmonary Resuscitation (CPR)

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Basic life support for the patient in cardiac arrest

Procedure:

1. Assess the patient's level of responsiveness.
2. If no response, open the patient's airway with the head-tilt, chin-lift and look, listen, and feel for respiratory effort. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining immobilization of the C-spine. For infants, positioning the head in the sniffing position is the most effective method for opening the airway.
3. Check for pulse (carotid for adults and older children, brachial for infants) for at least 10 seconds. If no pulse, begin chest compressions based on chart below:

Age	Location	Depth	Rate
Infant	Over sternum, between nipples (inter-mammary line), 2-3 fingers	At least 1/3 AP diameter of chest About 1.5 inches 4 cm	Continuous compressions at least 100 – 120/minute
Child	Over sternum, just cephalad from xyphoid process, heel of one hand	At least 1/3 AP diameter of chest About 2 inches 5 cm	Continuous compressions at least 100 – 120/minute
Adult	Over sternum, just cephalad from xyphoid process, hands with interlocked fingers	At least 2 inches 5 cm	Continuous compressions at least 100 – 120/minute

4. If patient is an adult, go to step 5. If no respiratory effort in a pediatric patient, give two ventilations. If air moves successfully, go to step 5. If air movement fails, proceed to the Airway Obstruction Procedure.
5. Go to Cardiac Arrest Procedure. Begin ventilations in the adult as directed in the Cardiac Arrest Procedure
6. Provide 1 breath every 6 seconds with the BVM or BIAD. Use EtCO2 to guide your ventilations as directed in the Cardiac Arrest Protocol.
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions (< 5 seconds with a maximum of 10 seconds) are allowed for rhythm analysis, defibrillation, and performance of procedures
8. Document the time and procedure in the Patient Care Report (PCR).

Certification Requirements:

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

Cardiac: Defibrillation-Automated

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patients in cardiac arrest (pulseless, non-breathing).
- Age < 8 years, use Pediatric Pads if available.

Contraindication:

- Pediatric patients who are so small that the pads cannot be placed without touching one another.

Procedure:

1. **If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**
2. Apply defibrillator pads per manufacturer recommendations. Based on 2010 guidelines, place pads preferably in AP or AL position when implanted devices (pacemakers, AICDs) occupy preferred pad positions and attempt to avoid placing directly over device.
3. Remove any medication patches on the chest and wipe off any residue.
4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.
5. Activate AED for analysis of rhythm.
6. **Stop CPR and clear the patient** for rhythm analysis. Keep interruption in CPR as brief as possible.
7. Defibrillate if appropriate by depressing the “shock” button. **Assertively state “CLEAR” and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.** The sequence of defibrillation charges is preprogrammed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.
9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
10. If “no shock advised” appears, perform CPR for two minutes and then reanalyze.
11. Transport and continue treatment as indicated.
12. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.**
13. **If pulse returns please use the Post Resuscitation Protocol**

Certification Requirements:

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

Cardiac: Defibrillation-Manual

P PARAMEDIC P

Clinical Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

Procedure:

1. **Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.**
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
3. After application of an appropriate conductive agent if needed, apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles to the patient's chest in the proper position
   - Paddles: right of sternum at 2nd ICS and anterior axillary line at 5th ICS
   - Pads: anterior-posterior position

   For patients with implanted pacers/defibrillators, paddles or pads can be in AP or AL positions. The presence of implanted pacers/defibrillators should not delay defibrillation. Attempt to avoid placing paddles or pads directly above device.
4. Set the appropriate energy level
5. Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**
6. If using paddles, assure proper contact by applying 25 pounds of pressure on each paddle.
7. **Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.**
8. Deliver the countershock by depressing the discharge button(s) when using paddles, or depress the **shock button** for hands free operation.
9. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
10. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
11. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

Certification Requirements:

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

Cardiac: Defibrillation-Dual or Double

Clinical Indications:

P PARAMEDIC P

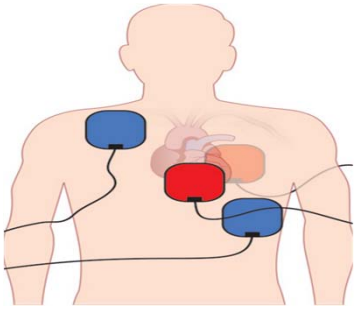
- Cardiac arrest with persistent ventricular fibrillation or pulseless ventricular tachycardia.
- Refractory ventricular fibrillation or pulseless ventricular tachycardia where ≥ 3 shocks delivered.

Procedure:

1. Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.

2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.

3. Prepare sites for second pad set attachment and apply defibrillation hands free pads:



- Pads: First defibrillator pads in anterior-posterior position
- Pads: Second defibrillator pads in anterior-lateral position:
- Ensure pads are not in contact with one another.

For patients with implanted pacers/defibrillators:
Avoid placing paddles or pads directly above device.

4. Set the appropriate energy level and assure controls for both defibrillator / monitors are accessible to provider performing defibrillation.

5. At next pulse / rhythm check, if refractory or persistent VF/VT continues:

Charge the defibrillator to the selected energy level.
Continue chest compressions while the defibrillator is charging.

6. Optional: Agencies may provide a single shock at this point with the second defibrillator / monitor to provide a change in energy vector delivered to the heart then move to step 7 if VF / VT persists.

7. When both monitor / defibrillators have reached selected energy setting:

Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.

2 options at this point:

Option 1 (double simultaneous): Provider depresses both defibrillator shock buttons simultaneously.

Option 2 (dual sequential): Provider depresses monitor 1 shock button and then immediately following, depresses monitor 2 shock button.

8. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.

9. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.

10. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

Certification Requirements:

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

Parenteral Access: Arterial Line Maintenance

Clinical Indications:

P PARAMEDIC P

- Transport of a patient with an existing arterial line.

Procedure:

1. Make certain arterial line is secured prior to transport, including intersection of arterial catheter and IV/Monitoring lines.
2. Use available equipment for monitoring of arterial pressures via arterial line.
3. Do not use the arterial line for administration of any fluids or medications.
4. If there is any question regarding dislodgement of the arterial line and bleeding results, remove the line and apply direct pressure over the site for at least five minutes before checking to ensure hemostasis.

Certification Requirements:

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

Parenteral Access: Venous Blood Draw

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Collection of a patient's blood for laboratory analysis

Procedure:

1. Utilize universal precautions as per OSHA.
2. Select vein and prep as usual.
3. Select appropriate blood-drawing devices.
4. Draw appropriate tubes of blood for lab testing.
5. Assure that the blood samples are labeled with the correct information (a minimum of the patients name, along with the date and time the sample was collected).
6. Deliver the blood tubes to the appropriate individual at the hospital.

Certification Requirements:

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

Parenteral Access: Central Line Maintenance

Clinical Indications:

P PARAMEDIC P

- Transport of a patient with a central venous pressure line already in place

Procedure:

1. Prior to transportation, ensure the line is secure.
2. Medications and IV fluids may be administered through a central venous pressure line. Such infusions must be held while the central venous pressure is transduced to obtain a central venous pressure, but may be restarted afterwards.
3. Do not manipulate the central venous catheter.
4. If the central venous catheter becomes dysfunctional, does not allow drug administration, or becomes dislodged, contact medical control.
5. Document the time of any pressure measurements, the pressure obtained, and any medication administration in the patient care report (PCR).

Certification Requirements:

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

Parenteral Access: Existing Catheters

Clinical Indications:

P PARAMEDIC P

- 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 5cc of normal saline, access the port with sterile technique and gently attempt to flush the saline.
4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 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).

Certification Requirements:

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

Parenteral Access: External Jugular Access

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient ≥ 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.
- External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

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

Parenteral Access: Venous-Extremity

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Any patient where intravenous access is indicated (significant trauma, 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 ALS professional.
2. Paramedic/AEMT can use intraosseous access where threat to life exists as provided for in the Venous Access-Intraosseous procedure.
3. Use the largest catheter bore necessary based upon the patient's condition and size of veins.
4. Fluid and setup choice is preferably:
   - Lactated Ringers with a macro drip (10 gtt/cc) for burns
   - Normal Saline with a macro drip (10 gtt/cc) for medical conditions, trauma or hypotension
   - Normal Saline with a micro drip (60 gtt/cc) 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. Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
9. Prep the skin with an antiseptic solution.
10. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
11. Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
12. Draw blood samples when appropriate.
13. Remove the tourniquet and connect the IV tubing or saline lock.
14. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.

    Rates are preferably:
    - Adult: KVO: 60 cc/hr (1 gtt/ 6 sec for a macro drip set)
    - Pediatric: KVO: 30 cc/hr (1 gtt/ 12 sec for a macro drip set)

    If shock is present:
    - Adult: 500 cc fluid boluses repeated as long as lungs are dry and BP < 90. Consider a second IV line.
    - Pediatric: 20 cc/kg blouses repeated PRN for poor perfusion.
15. Cover the site with a sterile dressing and secure the IV and tubing.
16. Label the IV with date and time, catheter gauge, and name/ID of the person starting the IV.
17. Document the procedure, time and result (success) on/with the patient care report (PCR).

Certification Requirements:

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

Parenteral Access: Intraosseous

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Rapid, regular IV access is unavailable with any of the following:
- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / Respiratory arrest.
- Burns.

Contraindications:

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. **Proximal tibia:** Identify anterior-medial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this.
   Distal tibia: If this site is not suitable, and patient is an adult, identify the anterior-medial aspect of the distal tibia (2 cm proximal to the medial malleolus).
   Distal femur: If this site is not suitable, and patient is a pediatric, identify the patella with the leg out-stretched to prevent bending of the knee. The insertion site is approximately 1 cm above the patella and approximately 1 – 2 cm medially.
   Proximal humerus: Acceptable insertion site for adult patients. Locate the insertion site 1 – 2 cm above the surgical neck on the most prominent aspect of the greater tubercle. This is located on the lateral aspect of the ball of the humerus. Direct the needle at a 45 degree angle or toward the opposite hip.
3. Prep the site recommended by the device manufacturer with providone-iodine ointment or solution.
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, power the driver until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further. Utilize the yellow needle for the proximal humerus. The pink needle is only intended for use in neonatal patients.
6. For the Bone Injection Gun (BIG), find and mark the manufacturers recommended site. Position the device and pull out the safety latch. Trigger the BIG at 90° to the surface and remove the injection device.
7. Remove the stylette and place in an approved sharps container.
8. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow for manual devices only, to verify placement; then inject at least 5 cc of NS to clear the lumen of the needle.
9. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
10. Stabilize and secure the needle with dressings and tape.
11. Paramedic may administer 10 to 20 mg (1 to 2 cc) of 2% Lidocaine in adult patients who experience infusion-related pain. This may be repeated prn to a maximum of 60 mg (6 cc).
12. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

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

Airway: Suctioning-Advanced

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

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

Procedure:

1. Ensure suction device is in proper working order.
2. Preoxygenate the patient as is possible.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. Using the suprasternal notch and the end of the airway into the catheter will be placed as guides, measure the depth desired for the catheter (judgment must be used regarding the depth of suctioning with cricothyrotomy and tracheostomy tubes).
5. If applicable, remove ventilation devices from the airway.
6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
7. Once the desired depth (measured in #4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
8. A small amount of Normal Saline (10 ml) may be used if needed to loosen secretions for suctioning.
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient
10. Document time and result in the patient care report (PCR).

Certification Requirements:

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

Respiratory: Suctioning-Basic

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

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

Procedure:

1. Ensure suction device is in proper working order with suction tip in place.
2. Preoxygenate the patient as is possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient
9. Record the time and result of the suctioning in the patient care report (PCR).

Certification Requirements:

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

Respiratory: Nebulizer Inhalation Therapy

B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patients experiencing bronchospasm.

Procedure:

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

Certification Requirements:

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

Standards Procedure (Skill) Respiratory Section
Respiratory: NIPPV
(Non-Invasive Positive Pressure)

B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Non-Invasive Positive Airway Pressure (NIPPV) is indicated in all patients whom inadequate ventilation is suspected.
  This could be as a result of Pulmonary Edema, CHF, COPD, Pneumonia, or Asthma.
- Agencies may utilize Continuous and/or Bi-Level Positive Airway Pressure Devices

Clinical Contraindications:

- Decreased Mental Status.
- Facial features or deformities that prevent an adequate mask seal.
- Excessive respiratory secretions.

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. If the Positive Pressure is adjustable on the NIPPV device adjust and slowly titrate to achieve a positive pressure as follows:

<u>Continuous pressure device:</u>

5 – 25 cmH_20 for Pulmonary Edema, CHF, COPD, Asthma, Drowning, possible aspiration, or pneumonia.

<u>Bi-Level pressure device:</u>

IPAP 10 – 15 over EPAP 5 – 7 cmH_2O for Pulmonary Edema, CHF, COPD, Asthma, Drowning, possible aspiration, or pneumonia.

During titration keep IPAP – EPAP at least a difference of 5 cmH_2O

25 cmH_20 is maximum pressure that should be utilized with NIPPV.
Increasing positive pressure can cause hypotension.
Use caution or remove and re-evaluate with Systolic Blood Pressures consistently < 100 mmHg.

7. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
8. Titrate oxygen levels to the patient's response. Many patients respond to low FIO2 (30-50%).
9. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for use of the NIPPV device.
10. 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 the local EMS System.

Childbirth

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Imminent delivery with crowning

Procedure:

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check 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.
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. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the **Newly Born Protocol** for further treatment.
11. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue transport to the hospital.

Certification Requirements:

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

Decontamination

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

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:
    - Removal of patients from Hot Zone
    - Simple removal of clothing
    - Irrigation of eyes
    - Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
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 local protocol.

Certification Requirements:

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

Gastric Tube Insertion

Clinical Indications:

P PARAMEDIC P

- Gastric decompression in intubated patients or for administration of activated charcoal in patients with altered mental status.

Procedure:

1. Estimate insertion length by superimposing the tube over the body from the nose to the stomach.
2. Flex the neck **if not contraindicated** to facilitate esophageal passage.
3. Liberally lubricate the distal end of the tube and pass through the patient's nostril along the floor of the nasal passage. Do not orient the tip upward into the turbinates. This increases the difficulty of the insertion and may cause bleeding.
4. In the setting of an intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred after securing airway.
5. Continue to advance the tube gently until the appropriate distance is reached.
6. Confirm placement by injecting 20cc of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.
7. Secure the tube.
8. Decompress the stomach of air and food either by connecting the tube to suction or manually aspirating with the large catheter tip syringe.
9. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

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

Injections: Subcutaneous and Intramuscular

B	*EMT**	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- When medication administration is necessary and the medication must be given via the SQ or IM route (not auto-injector), 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 subcutaneous injection is the arm.
    - Injection volume should not exceed 1 cc.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.
    - Injection volume should not exceed 1 cc for the arm
    - Injection volume should not exceed 2 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
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: 45-degree angle skin pinched **IM: 90-degree 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).

** EMT may administer Epinephrine for anaphylaxis, by IM route, if approved by the system medical director.*

Certification Requirements:

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

Standards Procedure (Skill) Universal Section

Restraints: Physical

Agency Name:	
Provider Name:	Paramedic
Instructor Name:	EMT AEMT Paramedic Physician

SATISFACTORY ☐

UNSATISFACTORY ☐

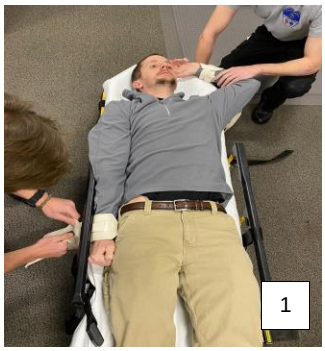
Instructor:
1. Evaluate providers skill performance using the check off list below.
2. Circle performance indicator.
   - YES = Provider completed skill with no assistance from instructor.
   - NO = Provider unable to complete skill satisfactorily following instructor intervention.
   - IL = Provider able to complete skill satisfactorily following Instructor Led (teaching) intervention.

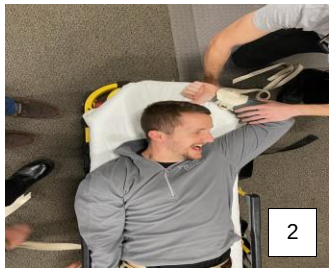
Satisfactory performance indicated with ≥ 12 YES / IL completions. (Combination of both YES and IL)

	EMR	
B	EMT	B
A	AEMT	A
P	Paramedic	P

YES NO IL	Verbalizes indications for physical restraints: 1. Used to ensure the physical safety of the patient, provider, or others 2. Clear and immediate danger to the patient (self), provider, or others 3. When less restrictive alternatives are unsuccessful (e.g.. verbal de-escalation) 4. Delay in restraint will subject patient (self) , providers, or others to risk of serious harm
YES NO IL	Verbalizes contraindications for physical restraints: 1. Patient has medical decision-making capacity and refuses care 2. Patient is not a danger to self, provider, or others 3. Less restrictive alternatives have not been considered or used
YES NO IL	Verbalizes assessment of resource needs: Request Law Enforcement if indicated Contact Medical Control if indicated Call for additional providers if indicated Withdraw from scene if unsafe
YES NO IL	Assemble appropriate equipment and personnel: 1. 3 – 6 providers preferably 2. Don appropriate PPE 3. Soft nylon or leather restraints specifically manufactured for use as restraints
YES NO IL	Remove potential items from all providers that can be used as weapons: 1. Stethoscope, shears or scissors, hemostats, writing pens, badges, pins 2. Window punch, pocket knives, communication devices
YES NO IL	Team leader assign roles to providers and discusses plans and strategies: Team leader explains procedure to patient: If patient standing and will not follow directions use Procedure USP – 6. If patient already on cot or flat surface: • 1 Provider to control the head and airway • 1 Provider for each extremity 1 Team leader attempts verbal instructions to move patient to cot if possible: • 2 Providers take control of both wrists and elbows • 2 Providers take control of both ankles and knees • 1 Provider controls head/airway and 1 Provider is available for medications • **May place in lateral decubitus position – DO NOT place prone:**
YES NO IL	Soft nylon or leather manufacture restraints are applied to wrist and ankles Secure restraints to cot with quick-release tie Examine patient for potential injuries following restrain application
YES NO IL	Both lower extremities restrained extended, cross restraints beneath lower extremities One upper extremity restrained extended by patient's side One upper extremity restrained flexed over patient's head 2 Do not tie restraint to cot undercarriage
YES NO IL	Assess pulse, motor, and sensory immediately following application Perform pulse, motor, and sensory assessments every 15 minutes afterwards
YES NO IL	Patient must remain under constant observation by EMS at all times Appropriate monitoring equipment required based on clinical circumstances
YES NO IL	Patient care report documentation requirements (restraint checklist recommended): Indication for restraint use Type of restrain applied and time of application Pulse, motor, and sensory exams and time of exam

Instructor notes:





Restraints: Physical

Clinical Information for physical restraints

Objective of Procedure:

To protect a patient from self-harm and/or protection of providers or others on scene
Used when less restrictive alternatives have failed
Used as last resort

Scope of Practice: EMR, EMT, AEMT, and Paramedic

Indications:

Physically combative patient not responding to less restrictive means of de-escalation
Immediate danger of self-harm or harm to providers, or others on scene

Contraindications:

Less restrictive techniques have not been used or considered prior to physical restraint
Intact medical decision-making capacity refusing treatment and not a danger to self or others

Clinical Presentation:

Behavioral health crisis
Altered Mental Status with combativeness
Agitation and violence

Potential Complications:

Positional asphyxiation
Injury to patient, providers, or others
Increased mental stress to patient
Injury following escape from restraints
Bodily fluid exposure

Positioning Considerations:

Do not place patient in a supine position or place objects on top of patient
One arm should be restrained above the head
Both legs should be restrained fully extended
May place in a lateral decubitus position, supine is preferred
Head of bed should be elevated to about 30°

Procedure references:

1. Kowalski JM. (2019). Physical and Chemical Restraint. Roberts and Hedges' Clinical Procedures in Emergency Medicine and Acute Care. 7th ed.(pp 1481 - 1498). Philadelphia, PA. Elsevier.
2. Heiner JD, Moore GP. (2018). The combative and difficult. Rosen's Emergency Medicine: Concepts and Clinical Practice. 9th ed. (pp 2375 - 2386). Philadelphia, PA. Elsevier.
3. Booth JS. (2018, Dec 19). Four-Point Restraint. Retrieved from https://emedicine.medscape.com/article/1941454-overview.
4. Bradley S. (2017). Psychiatric Emergencies. AAOS Emergency Care and Transportation of the Sick and Injured. 11th ed. (pp.802 – 827). Burlington, MA. Jones and Bartlett Learning.

Standards Procedure (Skill) Universal Section

Restraints: Therapeutic Take Down

Agency Name:	
Provider Name:	Paramedic
Instructor Name:	EMT AEMT Paramedic Physician

SATISFACTORY ☐

UNSATISFACTORY ☐

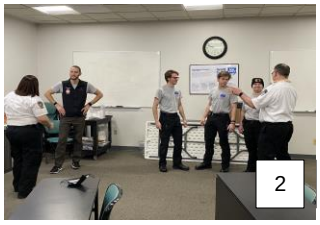
Instructor:
1. Evaluate providers skill performance using the check off list below.
2. Circle performance indicator.
   - YES = Provider completed skill with no assistance from instructor.
   - NO = Provider unable to complete skill satisfactorily following instructor intervention.
   - IL = Provider able to complete skill satisfactorily following Instructor Led (teaching) intervention.

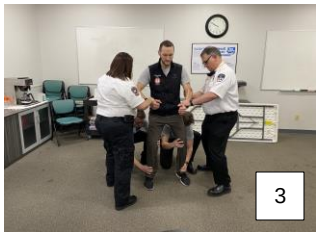
Satisfactory performance indicated with ≥ 12 YES / IL completions. (Combination of both YES and IL)

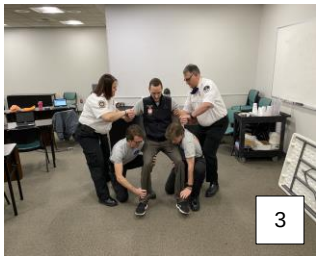
	EMR	
B	EMT	B
A	AEMT	A
P	Paramedic	P

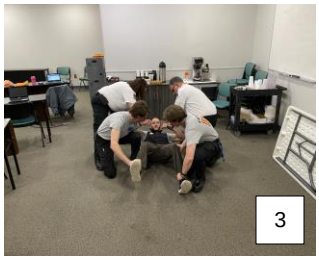
YES NO IL	Verbalizes indications for physical restraints: 1. Used to ensure the physical safety of the patient, provider, or others 2. Clear and immediate danger to the patient (self), provider, or others 3. When less restrictive alternatives are unsuccessful (e.g.. verbal de-escalation) 4. Delay in restraint will subject patient (self) , providers, or others to risk of serious harm	1
YES NO IL	Verbalizes contraindications for physical restraints: 1. Patient has medical decision-making capacity and refuses care 2. Patient is not a danger to self, provider, or others 3. Less restrictive alternatives have not been considered or used	1
YES NO IL	Verbalizes assessment of resource needs: Request Law Enforcement if indicated Contact Medical Control if indicated Call for additional providers if indicated Withdraw from scene if unsafe	2
YES NO IL	Assemble appropriate equipment and personnel: 1. 4 – 6 providers preferably 2. Don appropriate PPE 3. Soft nylon or leather restraints specifically manufactured for use as restraints	2
YES NO IL	Remove potential items from all providers that can be used as weapons: 1. Stethoscope, shears or scissors, hemostats, writing pens, badges, pins 2. Window punch, pocket knives, communication devices	
YES NO IL	Team leader assign roles to providers and discusses plans and strategies: Team leader explains procedure to patient If patient already on cot: 1 Provider to control the head and airway 1 Provider for each extremity 1 Provider to administer medications, if indicated If patient standing or walking: Team leader attempts verbal instructions to move patient to cot if possible 2 Providers approach from front and take control of both wrists and elbows 2 Providers approach from rear and take control of both ankles and knees 1 Provider controls head/airway and 1 Provider is available for medications	3
YES NO IL	With patient supine on cot (may place in lateral decubitus – DO NOT place prone): 2 Providers approach from front and take control of both wrists and elbows 2 Providers approach from rear and take control of both ankles and knees 1 Provider controls head/airway and 1 Provider is available for medications	
YES NO IL	Soft nylon or leather manufacture restraints are applied to wrist and ankles Secure restraints to cot with quick-release tie Examine patient for potential injuries following restrain application	
YES NO IL	Assess pulse, motor, and sensory immediately following application Perform pulse, motor, and sensory assessments every 15 minutes afterwards	
YES NO IL	Patient must remain under constant observation by EMS at all times Appropriate monitoring equipment required based on clinical circumstances	
YES NO IL	Patient care report documentation requirements (restraint checklist recommended): Indication for restraint use Type of restrain applied and time of application Pulse, motor, and sensory exams and time of exam	

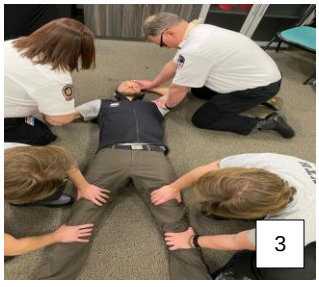
Instructor notes:











Restraints: Therapeutic Take Down

Clinical Information for physical restraints

Objective of Procedure:

To protect a patient from self-harm and/or protection of providers or others on scene
Used when less restrictive alternatives have failed
Used as last resort

Scope of Practice: EMR, EMT, AEMT, and Paramedic

Indications:

Physically combative patient not responding to less restrictive means of de-escalation
Immediate danger of self-harm or harm to providers, or others on scene

Contraindications:

Less restrictive techniques have not been used or considered prior to physical restraint
Intact medical decision-making capacity refusing treatment and not a danger to self or others

Clinical Presentation:

Behavioral health crisis
Altered Mental Status with combativeness
Agitation and violence

Potential Complications:

Positional asphyxiation
Injury to patient, providers, or others
Increased mental stress to patient
Injury following escape from restraints
Bodily fluid exposure

Positioning Considerations:

Do not place patient in a supine position or place objects on top of patient
One arm should be restrained above the head
May place in a lateral decubitus position, supine is preferred
Head of bed should be elevated to about 30°

Procedure references:

1. Kowalski JM. (2019). Physical and Chemical Restraint. Roberts and Hedges' Clinical Procedures in Emergency Medicine and Acute Care. 7th ed.(pp 1481 - 1498). Philadelphia, PA. Elsevier.
2. Heiner JD, Moore GP. (2018). The combative and difficult. Rosen's Emergency Medicine: Concepts and Clinical Practice. 9th ed. (pp 2375 - 2386). Philadelphia, PA. Elsevier.
3. Booth JS. (2018, Dec 19). Four-Point Restraint. Retrieved from https://emedicine.medscape.com/article/1941454-overview.
4. Bradley S. (2017). Psychiatric Emergencies. AAOS Emergency Care and Transportation of the Sick and Injured. 11th ed. (pp.802 – 827). Burlington, MA. Jones and Bartlett Learning.

Chest Decompression

P PARAMEDIC P

Clinical Indications:

- Patients with hypotension (SBP <90), clinical signs of shock, and at least one of the following signs:
  - Jugular vein distention.
  - Tracheal deviation away from the side of the injury (often a late sign).
  - Absent or decreased breath sounds on the affected side.
  - Hyper-resonance to percussion on the affected side.
  - Increased resistance when ventilating a patient.

- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
   - Locate the second intercostals space in the mid-clavicular line on the same side as the pneumothorax.
   - If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.
   - Prepare the site with providone-iodine ointment or solution.
4. Insert the catheter (14 gauge for adults) into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.
5. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter, then advance catheter only to chest wall.
6. Remove the needle, leaving the plastic catheter in place.
7. Secure the catheter hub to the chest wall with dressings and tape.
8. Consider placing a finger cut from an exam glove over the catheter hub. Cut a small hole in the end of the finger to make a flutter valve. Secure the glove finger with tape or a rubber band. (Note – don’t waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb.)

Certification Requirements:

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

Spinal Motion Restriction

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Need for Spinal Motion Restriction as determined by protocol.
- **<u>Guidelines for appropriate use of long spine board (LSB) OR any equivalent device below:</u>**

1. **Spine boards or similar rigid devices, should NOT be used during transport or during inter-facility transfers.** They should be utilized for extrication and / or patient transfers, as well as support for chest compressions. They DO NOT improve outcomes and can induce pain, agitation / anxiety, respiratory compromise, and decreased tissue perfusion at pressure points.

2. Devices such as the long or short spine board, scoop stretcher, soft-body splints, etc., should be considered extrication devices rather than transport-devices. Instead, use of Spinal Motion Restriction which includes a rigid cervical collar, manual in-line spine stabilization, maintaining spinal alignment with movement and transfers, and securing to the ambulance stretcher.
3. Penetrating trauma to head, torso, or back with no evidence of spinal injury does not require Spinal Motion Restriction.

Procedure:

1. Gather LSB, scoop, ambulance cot, or other Spinal Motion Restriction device, securing devices, and appropriate C-collar.
2. Explain the procedure to the patient and assess / record neurological exam and pulse status.
3. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine by second provider. In-line stabilization should not involve traction / tension, but rather maintain the head in a neutral, midline position while the first rescuer applies the collar.
4. Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself.)
5. If indicated, place patient on a Spinal Motion Restriction device with log-roll or similar technique dependent on circumstances, if patient is supine or prone. During extrication or where otherwise unable to be placed prone or supine, place on Spinal Motion Restriction device by the safest method available that allows maintenance of in-line spinal stability.
6. Stabilize the patient with straps / head rolls / tape / other devices as needed. Once the head is secured to the Spinal Motion Restriction device / stretcher, the second rescuer may release manual in-line stabilization. **Once the patient arrives at the stretcher, REMOVE the rigid Spinal Motion Restriction device while maintaining spinal alignment using log-roll or multi-rescuer lift techniques and transfer and secure to the stretcher for transport.**
7. NOTE: Spinal precautions may be achieved by many methods. Never force a patient into a certain position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital. Special equipment such as football players in full pads and helmet may remain immobilized with helmet and pads in place.
8. Document the time of the procedure in the patient care report (PCR).

Certification Requirements:

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

Splinting

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Immobilization of an extremity for transport, either due to suspected fracture, sprain, or injury.
- Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters

Procedure:

1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
2. Remove all clothing from the extremity.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess
7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint:
    - Assess neurovascular function as in #1 above.
    - Place the ankle device over the ankle.
    - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis
    - Extend the distal end of the splint at least 6 inches beyond the foot.
    - Attach the ankle device to the traction crank.
    - Twist until moderate resistance is met.
    - Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

Certification Requirements:

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

Wound Care-General

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Protection and care for open wounds prior to and during transport.

Procedure:

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on "compression" bandage to control bleeding. Direct pressure is much more effective.
3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
5. Monitor wounds and/or dressings throughout transport for bleeding.
6. Document the wound and assessment and care in the patient care report (PCR).

Certification Requirements:

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

Wound Care-Hemostatic Agent

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Serious hemorrhage that can not be controlled by other means.

Contraindications:

- Wounds involving open thoracic or abdominal cavities.

Procedure:

1. Apply approved non-heat-generating hemostatic agent per manufacturer's instructions.
2. Supplement with direct pressure and standard hemorrhage control techniques.
3. Apply dressing.

Certification Requirements:

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

Wound Care-Tourniquet

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Life threatening extremity hemorrhage that can not 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. Place tourniquet proximal to wound
2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear.
3. Secure tourniquet per manufacturer instructions
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds per standard wound care protocol
6. If delayed or prolonged transport and tourniquet application time > 45 minutes: consider reattempting standard hemorrhage control techniques and removing tourniquet

Certification Requirements:

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

Appendices

Division of Emergency Medical Services

Disposition Instruction Form

Instructions

The EMS Patient Disposition Information (PDI) form has been designed to be used by EMS personnel to legally document a variety of situations. This duplicate form consists of a single page. The front of the page is used to describe the situation and the back lists a variety of specific patient instructions by complaint.

The form should be used to document any refusal of care by a patient (complete refusal or refusal of specific aspects of care) and to document the patient / guardian's understanding of medical instructions.

To understand the intent of this form, it is probably simplest to walk through several common patient encounter situations.

1. Complete refusal of EMS care or transport: The first box "Patient Refusal" should be marked. In the first section, the appropriate blocks for "paramedic recommendation" should also be marked. This section should be explained to the patient or guardian, who should understand that their refusal may result in complications up to and including death. The patient or guardian should be asked to sign the form, indicating that he/she understands the seriousness of the situation and the information provided. If the situation warrants, the paramedic should explain the risks of the refusal using the patient instructions section and the back of the form for assistance. If the instructions section is used, the appropriate blocks should also checked.

2. Refusal of a specific procedure (IV therapy, for example): The first box "Patient Refusal" should be marked. In the first section, the specific refused procedure should be marked. The first section should be explained to the patient or guardian, who should understand the potential consequences of their refusal. The patient or guardian should be asked to sign the form, indicating that he/she understands the seriousness of the situation.

3. The box "Patient Instructions" and the appropriate blocks in that section should be marked. This section and the specific instructions (on the back) should all be carefully explained to the patient and/or guardian, who must understand them. The patient or guardian should be asked to sign the form, indicating that he/she understands the instructions and the seriousness of the situation.

In all situations, the top part of the form should be completed, and as much of the signature portion as necessary. It is preferable to have witnesses, particularly if the patient or guardian refuses to sign. The original form should be kept on file, while a duplicate copy should be provided for the patient or guardian.

PCR Number

Emergency Medical Services (EMS)
Patient Disposition Information

Patient's name	Date of Birth	Date
Patient's Address	Phone	EMS Professionals Name No.

PATIENT REFUSAL

☐ *This section only applies if this box is marked*

The Paramedic has recommended:

- ☐ Measuring the patient's blood pressure
- ☐ A backboard and neck collar for the patient
- ☐ Ambulance transportation for the patient
- ☐ A complete physical exam of the patient
- ☐ Giving the patient oxygen
- ☐ Starting an IV for the patient
- ☐ Giving the patient medicine _____
- ☐ Other _____

I refuse the care that the Paramedic has recommended. I understand that my refusal may result in serious injury or death to the patient. I accept full responsibility for this decision. I assume all risks and consequences resulting from my refusal of care. I will not hold the EMS service or its officers, agents, or employees responsible for any bad things that happen to the patient because of my refusal.

My signature below attests that I understand what has been recommended, what the consequences may be if that is not done, and I still refuse to have the recommended care provided by the EMS service.

PATIENT INSTRUCTIONS

☐ *This section only applies if this box is marked*

You have not been evaluated by a doctor.

You should contact or see your doctor immediately.

The patient is being released to:

- ☐ Family member
- ☐ Guardian
- ☐ Law Enforcement Officer
- ☐ Other: _____

Follow the instructions (printed on the back of this form) indicated:

- ☐ Abdominal Pain
- ☐ Back Pain
- ☐ Head Injury
- ☐ Insect Bite/Sting
- ☐ Extremity Injury
- ☐ Vomiting / Diarrhea
- ☒ Universal
- ☐ Fever
- ☐ Respiratory Distress
- ☐ Wound Care

Other instructions: _____

Guardian's name (printed)	☐ Patient ☐ Guardian ☐ Refused to Sign	Patient / Guardian Signature	
Guardian's address ☐ Same as Patient		Date of Signatures	EMS Personnel's Signature
Witness Signature	Witness Signature	Patient's Physician Name / Phone Number	

Discharge Instructions

UNIVERSAL INSTRUCTIONS:

• YOU HAVE NOT RECEIVED A COMPLETE MEDICAL EVALUATION. SEE A PHYSICIAN AS SOON AS POSSIBLE.

• IF AT ANY TIME AFTER YOU HAVE TAKEN ANY MEDICATION, YOU HAVE TROUBLE BREATHING, START WHEEZING, GET HIVES OR A RASH, OR HAVE ANY UNEXPECTED REACTION, CALL 911 IMMEDIATELY.

• IF YOUR SYMPTOMS WORSEN AT ANY TIME, YOU SHOULD SEE YOUR DOCTOR, GO TO THE EMERGENCY DEPARTMENT OR CALL 911.

ABDOMINAL PAIN:

- Abdominal pain is also called belly pain. Many illnesses can cause abdominal pain and it is very difficult for EMS to identify the cause.
- Take your temperature every 4 hours.

Call or see a physician, go to the emergency department, or call 911 immediately if:

- Your pain gets worse or is now only in 1 area
- You vomit (throw up) blood or find blood in your bowel movement
- You become dizzy or faint
- Your abdomen becomes distended or swollen
- You have a temperature over 100° F
- You have trouble passing urine
- You have trouble breathing

BACK PAIN:

- Apply heat to the painful area to help relieve pain. You may use a warm heating pad, whirlpool bath, or warm, moist towels for 10 to 20 minutes every hour.
- Stay in bed as much as possible the first 24 hours.
- Begin normal activities when you can do them without causing pain.
- When picking things up, bend at the hips and knees. Never bend from the waist only.

Call or see a physician, go to the emergency department, or call 911 immediately if:

- You have shooting pains into your buttocks, groin, legs, or arms or the pain increases.
- You have trouble urinating or lose control of your stools or urine.
- You have numbness or weakness in your legs, feet, arms, or hands.

FEVER:

- Always take medications as directed. Tylenol and Ibuprofen can be taken at the same time.
- If you are taking antibiotics, take them until they are gone, not until you are feeling better.
- Drink extra liquids (1 glass of water, soft drink or gatorade per hour of fever for an adult)
- If the temperature is above 103° F, it can be brought down by a sponge bath with room temperature water. Do not use cold water, a fan, or an alcohol bath.
- Temperature should be taken every 4 hours .

Call or see a physician, go to the emergency department, or call 911 immediately if:

- Temperature is greater than 101° F for 24 hours
- A child becomes less active or alert.
- The Temperature does not come down with Acetaminophen (Tylenol) or Ibuprofen with the appropriate dose.

HEAD INJURY:

- Immediately after a blow to the head, nausea, and vomiting may occur.
- Individuals who have sustained a head injury must be checked, and if necessary awakened, every 2 hours for the first 24 hours.
- Ice may be placed on the injured area to decrease pain and swelling.
- Only drink clear liquids such as juices, soft drinks, or water the first 12 hours after injury..
- Acetaminophen (Tylenol) or Ibuprofen only may be used for pain.

Call or see a physician, go to the emergency department, or call 911 immediately if:

- The injured person has persistent vomiting, is not able to be awakened, has trouble walking or using an arm or leg, has a seizure, develops unequal pupils, has a clear or bloody fluid coming from the ears or nose, or has strange behavior.

INSECT BITE/STING:

- A bite or sting typically is a red lump which may have a hole in the center. You may have pain, swelling and a rash. Severe stings may cause a headache and an upset stomach (vomiting).
- Some individuals will have an allergic reaction to a bite or sting. Difficulty breathing or chest pain is an emergency requiring medical care.
- Elevation of the injured area and ice (applied to the area 10 to 20 minutes each hour) will decrease pain and swelling.
- Diphenhydramine (Benadryl) may be used as directed to control itching and hives.

Call or see a physician, go to the emergency department, or call 911 immediately if:

- You develop any chest pain or difficulty breathing.
- The area becomes red, warm, tender, and swollen beyond the area of the bite or sting.
- You develop a temperature above 101° F.

RESPIRATORY DISTRESS:

- Respiratory Distress is also known as shortness of breath or difficulty breathing.
- Causes of Respiratory Distress include reactions to pollen, dust, animals, molds, foods, drugs, infections, smoke, and respiratory conditions such as Asthma and COPD. If possible avoid any causes which produce respiratory distress.
- If you have seen a physician for this problem, take all medication's as directed.

Call or see a physician, go to the emergency department, or call 911 immediately if:

- Temperature is greater than 101° F.
- The cough, wheezing, or breathing difficulty becomes worse or does not improve even when taking medications.
- You have Chest Pain.
- Sputum (spit) changes from clear to yellow, green, grey, or becomes bloody.
- You are not able to perform normal activities.

EXTREMITY INJURY:

- Extremity Injuries may consist of cuts, scrapes, bruises, sprains, or broken bones (fractures).
- Apply ice on the injury for 15 to 20 minutes each hour for the first 1 to 2 days.
- Elevate the extremity above the heart as possible for the first 48 hours to decrease pain and swelling.
- Use the extremity as pain allows.

Call or see a physician, go to the emergency department, or call 911 immediately if:

- Temperature is greater than 101° F.
- The bruising, swelling, or pain gets worse despite the treatment listed above.
- Any problems listed on the **Wound Care instructions** are noted.
- You are unable to move the extremity or if numbness or tingling is noted.
- You are not improved in 24 to 48 hours or you are not normal in 7 to 10 days.

VOMITING/DIARRHEA:

- Vomiting (throwing up) can be caused by many things. It is common in children, but should be watched closely.
- Diarrhea is most often caused by either a food reaction or infection.
- Dehydration is the most serious problem associated with vomiting or diarrhea.
- Drink clear liquids such as water, apple juice, soft drinks, or gatorade for the first 12 hours or until things improve. Adults should drink 8 to 12 glasses of fluids per day with diarrhea. Children should drink 1 cup of fluid for each loose bowel movement.

Call or see a physician, go to the emergency department, or call 911 immediately if:

- Temperature is greater than 101° F.
- Vomiting or Diarrhea lasts longer than 24 hours, gets worse, or blood is noted.
- You cannot keep fluids down or no urination **is** noted in 8 hours.

WOUND CARE:

- Wounds include cuts, scrapes, bites, abrasions, or puncture wounds.
- If the wound begins to bleed, apply pressure over the wound with a clean bandage and elevate the wound above the heart for 5 to 10 minutes.
- Unless instructed otherwise, clean the wound twice daily with soapy water, and keep the wound dry. It is safe to take a shower but do not place the wound in bath or dish water.
- See a physician for a tetanus shot if it has been 10 years or more since your last one.

Call or see a physician, go to the emergency department, or call 911 immediately if:

- See the **Extremity Injury instructions**.
- Temperature is greater than 101° F.
- Bruising, swelling, or pain gets worse or bleeding is not controlled as directed above.
- Any signs of infection, such as redness, drainage of yellow fluid or pus, red streaks extending from the wound, or a bad smell is noted.

On-Scene Physician Form

This EMS service would like to thank you for your effort and assistance. Please be advised that the EMS Professionals are operating under strict protocols and guidelines established by their medical director and the State of North Carolina. As a licensed physician, you may assume medical care of the patient. In order to do so, you will need to:

1. Receive approval to assume the patient's medical care from the EMS Agencies Online Medical Control physician.
2. Show proper identification including current North Carolina Medical Board Registration/ Licensure.
3. Accompany the patient to the hospital.
4. Carry out any interventions that do not conform to the EMS Agencies Protocols. EMS personnel cannot perform any interventions or administer medications that are not included in their protocols.
5. Sign all orders on the EMS Patient Care Report.
6. Assume all medico-legal responsibility for all patient care activities until the patient's care is transferred to another physician at the destination hospital.
7. Complete the "Assumption of Medical Care" section of this form below.

Assumption of Medical Care

I, _____ , MD; License #:_____ ,

(Please Print your Name Here)

have assumed authority and responsibility for the medical care and patient management for

_____ .

(Insert Patient's Name Here)

I understand that I must accompany the patient to the Emergency Department. I further understand that all EMS personnel must follow North Carolina EMS Rules and Regulations as well as local EMS System protocols.

_____ , MD Date: ___ /___ /___ Time: ____ AM/PM

(Physician Signature Here)

_____ , EMS _____ Witness

(EMS Lead Crew Member Signature Here) **(Witness Signature Here)**

Apgar Score

The Apgar score should be obtained and recorded initially and at 5 minutes with the birth of delivery of any infant.

- Each of the 5 parameters should be scored and then totaled.
- The Minimum score is 0
- The Maximum score is 10

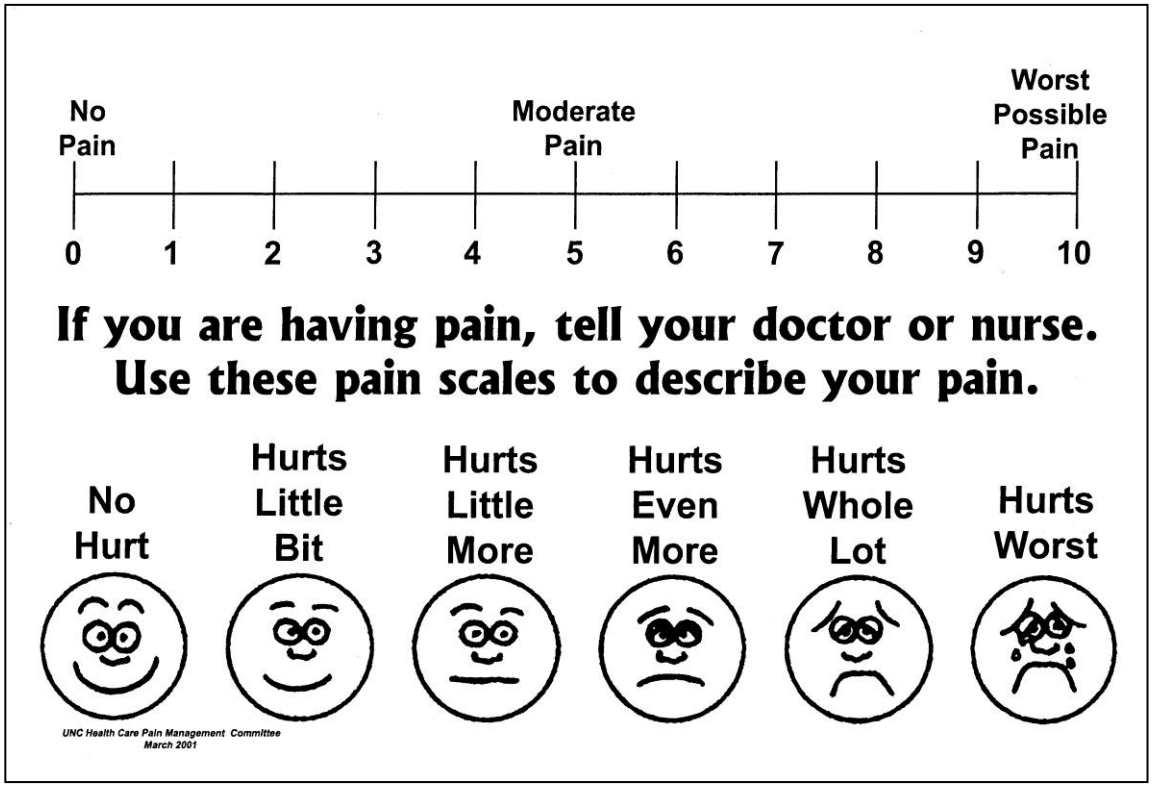
Sign	0	1	2
Heart Rate	Absent	<100 min.	>100 min.
Respiratory Effort	Absent	Weak Cry	Strong Cry
Muscle Tone	Limp	Some Flexion	Good Flexion
Reflex Irritability (when feet stimulated)	No Response	Some Motion	Cry
Color	Blue; Pale	Body Pink Extremities Blue	Pink

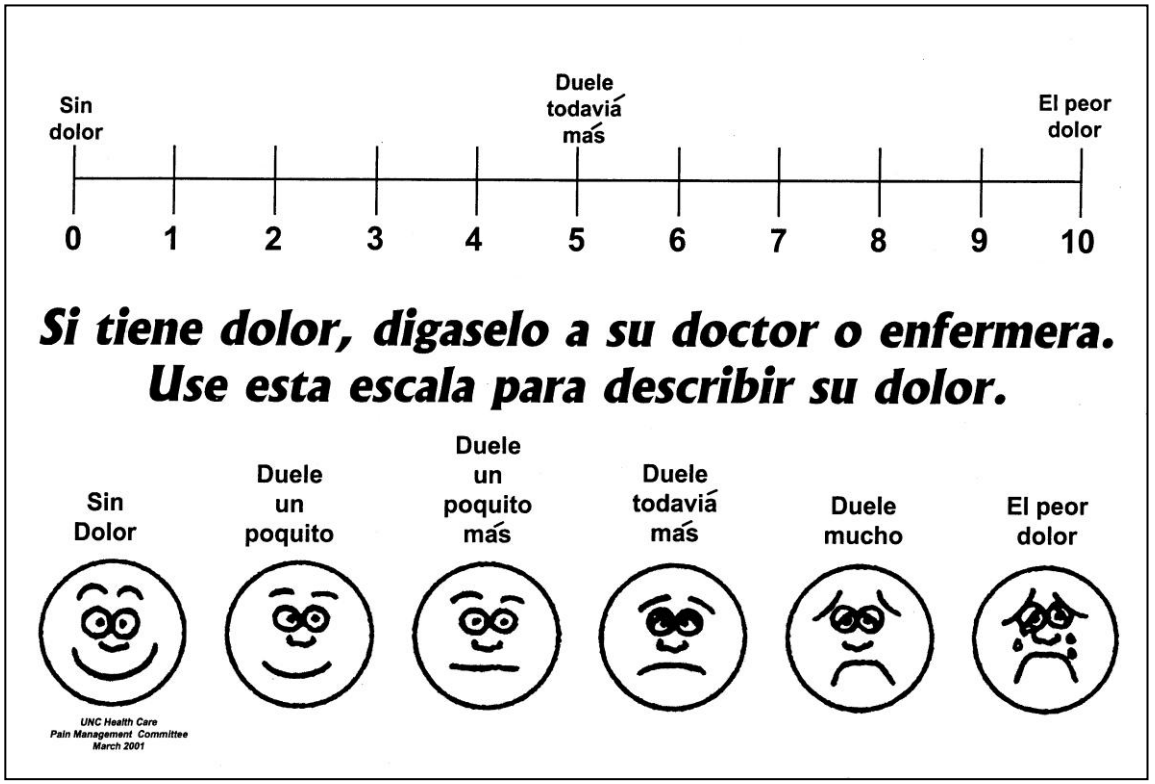
EMS R.A.C.E. Stroke Scale

Rapid Arterial oCclusion Evaluation Scale

ITEM	Instruction	Result	Score
Facial Palsy	Ask patient to show their teeth (smile)	**Absent** (symmetrical movement) **Mild** (slight asymmetrical) **Moderate to Severe** (completely asymmetrical)	**0** **1** **2**
Arm Motor Function	Extending the arm of the 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**
Leg Motor Function	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**
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**
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 either task requested correctly)	**0** **1** **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**
		RACE SCALE TOTAL	

Pain Scale Forms





From Hockenberry MJ, Wilson D, Winkelstein ML; Wong's Essentials of Pediatric Nursing, ed. 7, St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

Restraint Checklist

Patient's Name: _____

PCR Number:_____ **Date:** _____

It is recommended that a Restraint Checklist be completed with any restraint use.

1. Reason for restraint (check all that apply):

- ☐ Patient attempting to hurt self
- ☐ Patient attempting to hurt others
- ☐ Patient attempting to remove medically necessary devices

2. Attempted verbal reassurance / redirection?

- ☐ Yes
- ☐ No

3. Attempted environmental modification? (i.e. remove patient from stressful environment)

- ☐ Yes
- ☐ No

4. Received medical control order for restraints?

- ☐ Yes _____ , MD
- ☐ No **(Medical Control Physician Name Here)**

5. Time and Type of restraint applied (check all that apply):

Date: ___ /___ /___ Time: ____ AM/PM

Limb restraints:

- ☐ LUE
- ☐ RUE
- ☐ LLE
- ☐ RLE

Chemical Restraint:

- ☐ Yes
- ☐ No

If Yes: Drug Used: _____

Total Dose: _____

6. Vital signs and extremity neurovascular exam should be taken every 15 minutes.

7. Transport Position (Patient should NOT be in prone position)

- ☐ Supine position for transport
- ☐ Lateral recumbent position for transport

Signature: _____

(EMS Lead Crew Member)

Approved Medical Abbreviations

The following is a list of approved medical abbreviations. In general, the use of abbreviations should be limited to this list.

A&O x 3	- alert and oriented to person, place and time
A&O x 4	- alert and oriented to person, place, time and event
A-FIB	- atrial fibrillation
AAA	- abdominal aortic aneurysm
ABC	- airway, breathing, circulation
ABD	- abdomen (abdominal)
ACLS	- advanced cardiac life support
AKA	- above the knee amputation
ALS	- advanced life support
AMA	- against medical advice
AMS	- altered mental status
AMT	- amount
APPROX	- approximately
ASA	- aspirin
ASSOC	- associated
BG	- blood glucose
BILAT	- bilateral
BKA	- below the knee amputation
BLS	- basic life support
BM	- bowel movement
BP	- blood pressure
BS	- breath sounds
BVM	- bag-valve-mask
C-SECTION	- caesarean section
C-SPINE	- cervical spine
C/O	- complaint of (complains of)
CA	- cancer
CABG	- coronary artery bypass graft
CAD	- coronary artery disease
CATH	- catheter
CC	- chief complaint
CEPH	- cephalic
CHF	- congestive heart failure
CNS	- central nervous system
COPD	- chronic obstructive pulmonary disease
CP	- chest pain
CPR	- cardiopulmonary resuscitation
CSF	- cerebrospinal fluid
CT	- cat scan
CVA	- cerebrovascular accident (stroke)

Approved Medical Abbreviations

D5W	- 5% dextrose in water
DKA	- diabetic ketoacidosis
DNR	- do not resuscitate
DOA	- dead on arrival
DT	- delirium tremens
Dx	- diagnosis
ECG	- electrocardiogram
EEG	- electroencephelogram
ET	- endotracheal
ETOH	- ethanol (alcohol)
ETT	- endotracheal tube
EXT	- external (extension)
FB	- foreign body
FLEX	- flexion
Fx	- fracture
g	- gram(s)
GI	- gastrointestinal
GSW	- gunshot wound
gtts	- drops
GU	- gastrourinary
GYN	- gynecology (gynecological)
H/A	- headache
HEENT	- head, eyes, ears, nose, throat
HR	- heart rate (hour)
HTN	- hypertension
Hx	- history
ICP	- intracranial pressure
ICU	- intensive care unit
IM	- intramuscular
IV	- intravenous
JVD	- jugular vein distension
kg	- kilogram
KVO	- keep vein open

Approved Medical Abbreviations

L-SPINE	- lumbar spine
L/S-SPINE	- lumbarsacral spine
L&D	- labor and delivery
LAT	- lateral
lb	- pound
LLQ	- left lower quadrant
LMP	- last mestrual period
LOC	- level of consciousness (loss of consciousness)
LR	- lactated ringers
LUQ	- left upper quadrant
MAST	- military anti-shock trousers
mcg	- microgram(s)
MED	- medicine
mg	- milligram(s)
MI	- myocardial infarction (heart attack)
min	- minimum / minute
MS	- mental status
MS	- mental status change
MSO4	- morphine
MVC	- motor vehicle crash
N/V	- nausea/vomiting
N/V/D	- nausea/vomiting/diarrhea
NAD	- no apparant distress
NC	- nasal cannula
NEB	- nebulizer
NKDA	- no known drug allergies
NRB	- non-rebreather
NS	- normal saline
NSR	- normal sinus rhythm
OB/GYN	- obstetrics/gynecology
PALP	- palpation
PAC	- premature atrial contraction
PE	- pulmonary embolus
PEARL	- pupils equal and reactive to light
PMHx	- past medical history
PO	- orally
PRB	- partial rebreather
PRN	- as needed
PT	- patient
PVC	- premature ventricular contraction

Approved Medical Abbreviations

RLQ	- right lower quadrant
RUQ	- right upper quadrant
Rx	- medicine
RXN	- reaction
S/P	- status post
SOB	- shortness of breath
SQ	- subcutaneous
ST	- sinus tachycardia
SVT	- supraventricular tachycardia
Sx	- symptom
SZ	- seizure
T-SPINE	- thoracic spine
T	- temperature
TIA	- transient ischemic attack
TKO	- to keep open (refers to IV's - same as KVO)
Tx	- treatment
UOA	- upon our arrival
URI	- upper respiratory infection
UTI	- urinary tract infection
VF	- ventricular fibrillation
VS	- vital signs
VT	- ventricular tachycardia
WAP	- wandering atrial pacemaker
WNL	- within normal limits
YO (YOA)	- years old (years of age)
M or ♂	- male
F or ♀	- female
+	- positive
-	- negative
?	- questionable
Ψ	- psychiatric
~	- approximately
>	- greater than
<	- less than
=	- equal

Approved Medical Abbreviations

⍑	- upper (increased)
a̅	- before
p̅	- after
c̅	- with
s	- without
Δ	- change
L	- left
R	- right
↓	- lower (decreased)
1°	- primary
2°	- secondary

Reperfusion Checklist

The Reperfusion Checklist is an important component in the initial evaluation, treatment, and transport of patients suffering from an acute ST-elevation myocardial infarction (STEMI) or acute Stroke. Both of these conditions can be successfully treated using fibrinolysis (thrombolytics) if the patient arrives at the appropriate hospital within the therapeutic window of time.

This form should be completed for all acute STEMI and acute Stroke patients.

Patient's Name: _____

PCR Number:_____ Date: _____

1. Has the patient experienced chest discomfort for greater than 15 minutes and less than 12 hours?

☐ Yes ☐ No

2. Has the patient developed a sudden neurologic deficit with a positive Los Angeles Prehospital Stroke Screen?

☐ Yes ☐ No

3. Are there any contraindications to fibrinolysis?

If any of the following are checked "Yes", fibrinolysis MAY be contraindicated.

☐ Yes	☐ No	Systolic Blood Pressure greater than 180 mm Hg
☐ Yes	☐ No	Diastolic Blood Pressure greater than 110 mm Hg
☐ Yes	☐ No	Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
☐ Yes	☐ No	History of structural Central Nervous System disease (tumors, masses, hemorrhage, etc.)
☐ Yes	☐ No	Significant closed head or facial trauma within the previous 3 months
☐ Yes	☐ No	Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
☐ Yes	☐ No	Bleeding or clotting problem or on blood thinners
☐ Yes	☐ No	CPR performed greater than 10 minutes
☐ Yes	☐ No	Currently Pregnant
☐ Yes	☐ No	Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.

4. (STEMI Patients Only) Does the patient have severe heart failure or cardiogenic shock?
These patients may benefit more from a percutaneous coronary intervention (PCI) capable hospital.

☐ Yes	☐ No	Presence of pulmonary edema (rales greater than halfway up lung fields)
☐ Yes	☐ No	Systemic hypoperfusion (cool and clammy)

If any contraindication is checked as "Yes" and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligible patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to an specialty center capable of interventional care within the therapeutic window of time.

Difficult Airway Evaluation

Evaluating for the difficult airway

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

Look externally

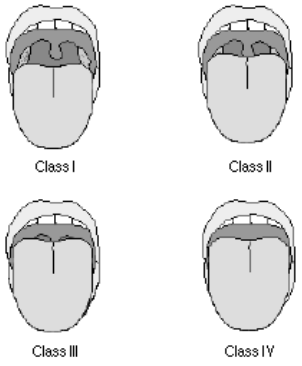
External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, extreme cachexia, edentulous mouth, facial trauma, obesity, large front teeth or "buck teeth", high arching palate, receding mandible, short bull neck.

Evaluate 3-3-2 Rule

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

Mallampati

This scoring system is based on the work of Mallampati et al published in the Canadian Anaesthesia Society Journal in 1985. The system takes into account the anatomy of the mouth and the view of various anatomical structures when the patient opens his mouth as wide as possible. This test is performed with the patient in the sitting position, the head held in a neutral position, the mouth wide open, and the tongue protruding to the maximum. Inappropriate scoring may occur if the patient is in the supine position (instead of sitting), if the patient phonates or if the patient arches his or her tongue.



Class I (easy) = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.
Class II = visualization of the soft palate, fauces and uvula.
Class III = visualization of the soft palate and the base of the uvula.
Class IV (difficult) = soft palate is not visible at all.

Obstruction?

Besides the obvious difficulty if the airway is obstructed with a foreign body, the paramedic should also consider other 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.

Burns Resources

Fluid Formula

Formula for Fluid Resuscitation of the Burn Patient (Also known as the Parkland Formula)

Pts Wt kg x %TBSA x 4.0cc LR infused over 24 hours with half given in the first 8 hours.

(For the equation, the abbreviations are: PW x TBSA x 4.0 cc)

EMS focuses on the care given during the 1st hour or several hours following the event. Thus the formula as adapted for EMS and the first 8 hours is:

PW x TBSA x 4.0 cc, divide by 2

to take this to the hourly rate, divide that solution by 8 and the equation becomes:

PW x TBSA x 4.0cc / 2 / 8 = total to be infused for each of the first 8 hours.

Another way to state the equation is to use:
PW x TBSA x 0.25cc = total to be infused for each hour of the first 8 hours.

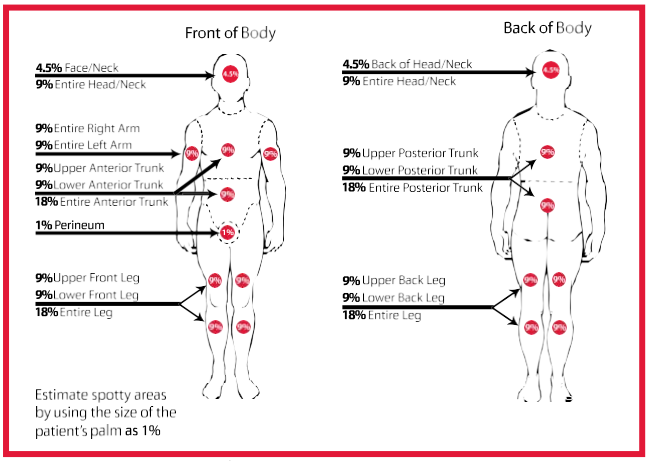
Example, 80 kg patient with 50 %TBSA x 0.25 cc = 1000 cc/hr.

Remember:
Patient's Weight in kg (2.2 lbs = 1.0 kg) example: 220 lbs adult = 100 kg

% TSBA = Rule of Nine Total Body Surface Area

Factor for the 1st hr. and each hr. for the 1st 8 hrs. = 0.25

(Reminder, if two IV's are running, divide total amount to be infused each hr. by 2)



Wt (kg)	% TBSA	Factor	/Hr for 1st 8 Hrs of Care	60 gtt set, gtt/ min	20 gtt set, gtt/ min	15 gtt set, gtt/ min	10 gtt set, gtt/ min
10	10	0.25	25	25	8.3	6.3	4.2
10	20	0.25	50	50	16.7	12.5	8.3
10	30	0.25	75	75	25.0	18.8	12.5
10	40	0.25	100	100	33.3	25.0	16.7
10	50	0.25	125	125	41.7	31.3	20.8
20	10	0.25	50	50	16.7	12.5	8.3
20	20	0.25	100	100	33.3	25.0	16.7
20	30	0.25	150	150	50.0	37.5	25.0
20	40	0.25	200	200	66.7	50.0	33.3
20	50	0.25	250	250	83.3	62.5	41.7
30	10	0.25	75	75	25.0	18.8	12.5
30	20	0.25	150	150	50.0	37.5	25.0
30	30	0.25	225	225	75.0	56.3	37.5
30	40	0.25	300	300	100.0	75.0	50.0
30	50	0.25	375	375	125.0	93.8	62.5
40	10	0.25	100	100	33.3	25.0	16.7
40	20	0.25	200	200	66.7	50.0	33.3
40	30	0.25	300	300	100.0	75.0	50.0
40	40	0.25	400	400	133.3	100.0	66.7
40	50	0.25	500	500	166.7	125.0	83.3
50	10	0.25	125	125	41.7	31.3	20.8
50	20	0.25	250	250	83.3	62.5	41.7
50	30	0.25	375	375	125.0	93.8	62.5
50	40	0.25	500	500	166.7	125.0	83.3
50	50	0.25	625	625	208.3	156.3	104.2
60	10	0.25	150	150	50.0	37.5	25.0
60	20	0.25	300	300	100.0	75.0	50.0
60	30	0.25	450	450	150.0	112.5	75.0
60	40	0.25	600	600	200.0	150.0	100.0
60	50	0.25	750	750	250.0	187.5	125.0
70	10	0.25	175	175	58.3	43.8	29.2
70	20	0.25	350	350	116.7	87.5	58.3
70	30	0.25	525	525	175.0	131.3	87.5
70	40	0.25	700	700	233.3	175.0	116.7
70	50	0.25	875	875	291.7	218.8	145.8
80	10	0.25	200	200	66.7	50.0	33.3
80	20	0.25	400	400	133.3	100.0	66.7
80	30	0.25	600	600	200.0	150.0	100.0
80	40	0.25	800	800	266.7	200.0	133.3
80	50	0.25	1000	1000	333.3	250.0	166.7
90	10	0.25	225	225	75.0	56.3	37.5
90	20	0.25	450	450	150.0	112.5	75.0
90	30	0.25	675	675	225.0	168.8	112.5
90	40	0.25	900	900	300.0	225.0	150.0
90	50	0.25	1125	1125	375.0	281.3	187.5
100	10	0.25	250	250	83.3	62.5	41.7
100	20	0.25	500	500	166.7	125.0	83.3
100	30	0.25	750	750	250.0	187.5	125.0
100	40	0.25	1000	1000	333.3	250.0	166.7
100	50	0.25	1250	1250	416.7	312.5	208.3

Critical (Red)

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
(When reasonable accessible, transport to a Burn Center)

Serious (Yellow)

5-15% TBSA 2nd/3rd Degree Burn
Suspected Inhalation injury or requiring intubation for airway stabilization
Hypotension
GCS < 14
(When reasonable accessible, transport to either a Level I Burn Center or a Trauma Center)

Minor (Green)

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated, Normotensive
GCS>14
(Transport to the Local Hospital)

ECU Health Activation Criteria

Remember, EMS DOES NOT activate Trauma or state trauma "color" activations.

Medical Yellow Alert Guidelines

- Airway Compromise: includes basic or advanced airway **attempts or placement.**
- Ongoing BVM ventilations.
- Non-invasive ventilation support (NIPPV or BiPAP).
- Uncontrolled bleeding not otherwise covered by Trauma Team Activation.
- Hypotension (SBP<90 for adults) with symptoms.
- Any potentially unstable cardiac rhythm including HR: (<60 or >150), V-tach or SVT.
- CPR, defibrillation, or cardioversion prior to arrival.
- Altered Mental Status (GCS<10).
- Active Seizure
- Hypoxia (SpO2 < 90%) despite intervention

Trauma Reporting Guidelines for Injuries/Conditions

Trauma Red:

- **ADULT Shock:** Blood Pressure <90 at any time
- **GERIATRIC Shock: (age ≥ 65): SBP <110 mmHg at any time**
- **PEDIATRIC Shock:** SBP < 70mmHg + (2 x age in years)
- **ADULT Respiratory Distress:** respiratory rate <10 or >29 at any time in Adults
- **PEDIATRIC Respiratory Distress**: Infant <2; RR (<30 or >60), Toddler 2-5 (<24 or >40), School Age 6-12 (<13 or >30) and **Adolescent >12 years of age (<12 or >26**)
- Airway Compromise and/or intubation
- Unresponsive – Glasgow Coma Scale Score <9 with mechanism attributed to trauma
- Gunshot/penetrating wounds to the head, neck, chest, or abdomen or extremities including the elbow/knee or proximal.

Trauma Yellow:

- Depressed skull fracture
- Paralysis (Spinal cord injury-confirmed or suspected).
- Pulseless extremity (Vascular compromise or suspected).
- Amputation above the wrist or the ankle (proximal).
- Tourniquet in place
- Crush, Instability, or flail of chest.
- Two or more proximal long bone fractures (femur and /or humerus).
- Burns > 10% TBSA (second or third degree) and/or inhalation injury
- GCS 9 – 12 with traumatic mechanism. **(MD may direct to a burn center)**
- **Patients with upper/ lower extremity deformities/ or large soft tissue injury with significant mechanism:** Falls > 20 feet, Pedestrian hit (thrown or run over), Motorcycle crash > 20 mph with separation of rider and bike, Motor vehicle crash with: ejection, rollover, speed > 40 mph, or a death in the same vehicle/compartment.
- Crushed, degloved or mangled extremity.

Weight Conversion Tables

(1-250) Pounds to Kilograms (0.5-113)

Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg
1	0.5	26	11.8	51	23.1	76	34.5	101	45.8
2	0.9	27	12.2	52	23.6	77	34.9	102	46.3
3	1.4	28	12.7	53	24.0	78	35.4	103	46.7
4	1.8	29	13.2	54	24.5	79	35.8	104	47.2
5	**2.3**	**30**	**13.6**	**55**	**24.9**	**80**	**36.3**	**105**	**47.6**
6	2.7	31	14.1	56	25.4	81	36.7	106	48.1
7	3.2	32	14.5	57	25.9	82	37.2	107	48.5
8	3.6	33	15.0	58	26.3	83	37.6	108	49.0
9	4.1	34	15.4	59	26.8	84	38.1	109	49.4
10	**4.5**	**35**	**15.9**	**60**	**27.2**	**85**	**38.6**	**110**	**49.9**
11	5.0	36	16.3	61	27.7	86	39.0	111	50.3
12	5.4	37	16.8	62	28.1	87	39.5	112	50.8
13	5.9	38	17.2	63	28.6	88	39.9	113	51.3
14	6.4	39	17.7	64	29.0	89	40.4	114	51.7
15	**6.8**	**40**	**18.1**	**65**	**29.5**	**90**	**40.8**	**115**	**52.2**
16	7.3	41	18.6	66	29.9	91	41.3	116	52.6
17	7.7	42	19.1	67	30.4	92	41.7	117	53.1
18	8.2	43	19.5	68	30.8	93	42.2	118	53.5
19	8.6	44	20.0	69	31.3	94	42.6	119	54.0
20	**9.1**	**45**	**20.4**	**70**	**31.8**	**95**	**43.1**	**120**	**54.4**
21	9.5	46	20.9	71	32.2	96	43.5	121	54.9
22	10.0	47	21.3	72	32.7	97	44.0	122	55.3
23	10.4	48	21.8	73	33.1	98	44.5	123	55.8
24	10.9	49	22.2	74	33.6	99	44.9	124	56.2
25	**11.3**	**50**	**22.7**	**75**	**34.0**	**100**	**45.4**	**125**	**56.7**

Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg
126	57.2	151	68.5	176	79.8	201	91.2	226	102.5
127	57.6	152	68.9	177	80.3	202	91.6	227	103.0
128	58.1	153	69.4	178	80.7	203	92.1	228	103.4
129	58.5	154	69.9	179	81.2	204	92.5	229	103.9
130	**59.0**	**155**	**70.3**	**180**	**81.6**	**205**	**93.0**	**230**	**104.3**
131	59.4	156	70.8	181	82.1	206	93.4	231	104.8
132	59.9	157	71.2	182	82.6	207	93.9	232	105.2
133	60.3	158	71.7	183	83.0	208	94.3	233	105.7
134	60.8	159	72.1	184	83.5	209	94.8	234	106.1
135	**61.2**	**160**	**72.6**	**185**	**83.9**	**210**	**95.3**	**235**	**106.6**
136	61.7	161	73.0	186	84.4	211	95.7	236	107.0
137	62.1	162	73.5	187	84.8	212	96.2	237	107.5
138	62.6	163	73.9	188	85.3	213	96.6	238	108.0
139	63.1	164	74.4	189	85.7	214	97.1	239	108.4
140	**63.5**	**165**	**74.8**	**190**	**86.2**	**215**	**97.5**	**240**	**108.9**
141	64.0	166	75.3	191	86.6	216	98.0	241	109.3
142	64.4	167	75.8	192	87.1	217	98.4	242	109.8
143	64.9	168	76.2	193	87.5	218	98.9	243	110.2
144	65.3	169	76.7	194	88.0	219	99.3	244	110.7
145	**65.8**	**170**	**77.1**	**195**	**88.5**	**220**	**99.8**	**245**	**111.1**
146	66.2	171	77.6	196	88.9	221	100.2	246	111.6
147	66.7	172	78.0	197	89.4	222	100.7	247	112.0
148	67.1	173	78.5	198	89.8	223	101.2	248	112.5
149	67.6	174	78.9	199	90.3	224	101.6	249	112.9
150	**68.0**	**175**	**79.4**	**200**	**90.7**	**225**	**102.1**	**250**	**113.4**

(251-375) Pounds to Kilograms (114-170)

Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg
251	113.9	276	125.2	301	136.5	326	147.9	351	159.2
252	114.3	277	125.6	302	137.0	327	148.3	352	159.7
253	114.8	278	126.1	303	137.4	328	148.8	353	160.1
254	115.2	279	126.6	304	137.9	329	149.2	354	160.6
255	**115.7**	**280**	**127.0**	**305**	**138.3**	**330**	**149.7**	**355**	**161.0**
256	116.1	281	127.5	306	138.8	331	150.1	356	161.5
257	116.6	282	127.9	307	139.3	332	150.6	357	161.9
258	117.0	283	128.4	308	139.7	333	151.0	358	162.4
259	117.5	284	128.8	309	140.2	334	151.5	359	162.8
260	**117.9**	**285**	**129.3**	**310**	**140.6**	**335**	**152.0**	**360**	**163.3**
261	118.4	286	129.7	311	141.1	336	152.4	361	163.7
262	118.8	287	130.2	312	141.5	337	152.9	362	164.2
263	119.3	288	130.6	313	142.0	338	153.3	363	164.7
264	119.8	289	131.1	314	142.4	339	153.8	364	165.1
265	**120.2**	**290**	**131.5**	**315**	**142.9**	**340**	**154.2**	**365**	**165.6**
266	120.7	291	132.0	316	143.3	341	154.7	366	166.0
267	121.1	292	132.5	317	143.8	342	155.1	367	166.5
268	121.6	293	132.9	318	144.2	343	155.6	368	166.9
269	122.0	294	133.4	319	144.7	344	156.0	369	167.4
270	**122.5**	**295**	**133.8**	**320**	**145.2**	**345**	**156.5**	**370**	**167.8**
271	122.9	296	134.3	321	145.6	346	156.9	371	168.3
272	123.4	297	134.7	322	146.1	347	157.4	372	168.7
273	123.8	298	135.2	323	146.5	348	157.9	373	169.2
274	124.3	299	135.6	324	147.0	349	158.3	374	169.6
275	**124.7**	**300**	**136.1**	**325**	**147.4**	**350**	**158.8**	**375**	**170.1**

The NC Eye Bank EMS Referral Policy

Policy:

EMS will refer all appropriate field deaths to The North Carolina Eye Bank, using established criteria, in a timely and consistent manner.

Purpose:

- Enable the North Carolina Eye Bank to offer donation opportunities to families.
- Ensure the notification of The North Carolina Eye Bank for facilitating donation options.
- Honor donation wishes of registered donors at the time of death.

Procedure:

- EMS will call The North Carolina Eye Bank.

- EMS will use following criteria:
    1. Ages 2-75.
    2. Last Seen Alive Time <6 hours.
    3. No John/Jane Does. (unless pending investigation)

- Essential information that should be provided to The North Carolina Eye Bank is as follows:
    1. Caller name and title
    2. Patient demographics
    3. Last seen alive date and time/time of death
    4. Circumstances of death
    5. Next of kin name and contact information
    6. Where the body is going (ex: funeral home, hospital, M.E.)

- The North Carolina Eye Bank is responsible for approaching families about donation when appropriate.

The North Carolina
EYE BANK

24 hour Referral Hotline: 1-800-552-9956

STOP
DO NOT
Resuscitate

Effective Date: _____

Expiration Date, if any _____

☐ Check box if no expiration

DO NOT RESUSCITATE ORDER

Patient's full name _____

In the event of cardiac and/or pulmonary arrest of the patient, efforts at cardiopulmonary resuscitation of the patient SHOULD NOT be initiated. This order does not affect other medically indicated and comfort care.

I have documented the basis for this order and the consent required by the NC General Statute 90-21.17(b) in the patient's records.

_____

Signature of Attending Physician/Physician Assistant/Nurse Practitioner

_____

Printed Name of Attending Physician

_____

Address

_____

City, State, Zip

Telephone Number (office) _____

Telephone Number (emergency) _____

Do Not Copy **Do Not Alter**

HIPAA PERMITS DISCLOSURE OF MOST TO OTHER HEALTH CARE PROFESSIONALS AS NECESSARY

Medical Orders
for Scope of Treatment (MOST)

This is a Physician Order Sheet based on the patient's medical condition and wishes. Any section not completed indicates full treatment for that section. **When the need occurs, first follow these orders, then contact physician.**

Patient's Last Name:	Effective Date of Form:
Patient's First Name, Middle Initial:	Patient's Date of Birth:

Section A *Check One Box Only*

CARDIOPULMONARY RESUSCITATION (CPR): Patient has no pulse and is not breathing.

☐ **Attempt Resuscitation (CPR)** ☐ **Do Not Attempt Resuscitation (DNR/no CPR)**

When not in cardiopulmonary arrest, follow orders in **B, C**, and **D**.

Section B *Check One Box Only*

MEDICAL INTERVENTIONS: Patient has pulse and/or is breathing.

☐ **Full Scope of Treatment:** Use intubation, advanced airway interventions, mechanical ventilation, cardioversion as indicated, medical treatment, IV fluids, etc.; also provide comfort measures. **Transfer to hospital if indicated.**

☐ **Limited Additional Interventions:** Use medical treatment, IV fluids and cardiac monitoring as indicated. Do not use intubation or mechanical ventilation. May consider use of less invasive airway support such as BiPAP or CPAP. Also provide comfort measures. **Transfer to hospital if indicated. Avoid intensive care.**

☐ **Comfort Measures:** Keep clean, warm and dry. Use medication by any route, positioning, wound care and other measures to relieve pain and suffering. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. **Do not transfer to hospital unless comfort needs cannot be met in current location.**

Other Instructions _____

Section C *Check One Box Only*

ANTIBIOTICS

☐ **Antibiotics if indicated**

☐ **Determine use or limitation of antibiotics when infection occurs**

☐ **No Antibiotics** (use other measures to relieve symptoms)

Other Instructions _____

Section D *Check One Box Only in Each Column*

MEDICALLY ADMINISTERED FLUIDS AND NUTRITION: Offer oral fluids and nutrition if physically feasible.

☐ **IV fluids if indicated**	☐ **Feeding tube long-term if indicated**
☐ **IV fluids for a defined trial period**	☐ **Feeding tube for a defined trial period**
☐ **No IV fluids** (provide other measures to ensure comfort)	☐ **No feeding tube**

Other Instructions _____

Section E *Check The Appropriate Box*

DISCUSSED WITH AND AGREED TO BY:

☐ Patient
☐ Parent or guardian if patient is a minor
☐ Health care agent
☐ Legal guardian of the patient
☐ Attorney-in-fact with power to make health care decisions
☐ Spouse
☐ Majority of patient's reasonably available parents and adult children
☐ Majority of patient's reasonably available adult siblings
☐ An individual with an established relationship with the patient who is acting in good faith and can reliably convey the wishes of the patient

Basis for order must be documented in medical record.

MD/DO, PA, or NP Name (Print):	**MD/DO, PA, or NP Signature and Date** (Required):	**Phone #:**

Signature of Patient, Parent of Minor, Guardian, Health Care Agent, Spouse, or Other Personal Representative
(Signature is required and must either be on this form or on file)

I agree that adequate information has been provided and significant thought has been given to life-prolonging measures. Treatment preferences have been expressed to the physician (MD/DO), physician assistant, or nurse practitioner. This document reflects those treatment preferences and indicates informed consent.

If signed by a patient representative, preferences expressed must reflect patient's wishes as best understood by that representative. Contact information for personal representative should be provided on the back of this form.

You are not required to sign this form to receive treatment.

Patient or Representative Name (print)	Patient or Representative Signature	Relationship (write "self" if patient)

SEND FORM WITH PATIENT/RESIDENT WHEN TRANSFERRED OR DISCHARGED

HIPAA PERMITS DISCLOSURE OF MOST TO OTHER HEALTH CARE PROFESSIONALS AS NECESSARY

Contact Information			
Patient Representative:	Relationship:	Phone #: Cell Phone #:	
Health Care Professional Preparing Form:	Preparer Title:	Preferred Phone #:	Date Prepared:

Directions for Completing Form

Completing MOST

- MOST must be reviewed and prepared by a health care professional in consultation with the patient or patient representative.
- MOST is a medical order and must be signed and dated by a licensed physician (MD/DO), physician assistant, or nurse practitioner to be valid. **Be sure to document the basis for the order in the progress notes of the medical record.** Mode of communication (e.g., in person, by telephone, etc.) also should be documented.
- The signature of the patient or his/her representative is required; however, if the patient's representative is not reasonably available to sign the original form, a copy of the completed form with the signature of the patient's representative must be placed in the medical record and "on file" must be written in the appropriate signature field on the front of this form or in the review section below.
- Use of original form is required. **Be sure to send the original form with the patient.**
- MOST is part of advance care planning, which also may include a living will and health care power of attorney (HCPOA). If there is a HCPOA, living will, or other advance directive, a copy should be attached if available. **MOST may suspend any conflicting directions in a patient's previously executed HCPOA, living will, or other advance directive.**
- **There is no requirement that a patient have a MOST.**
- MOST is recognized under N. C. G en. Stat. 90-21.17.

Reviewing MOST

Review of the MOST form is recommended when:

- The patient is admitted to and/or discharged from a health care facility; or
- There is a substantial change in the patient's health status.

This MOST must be reviewed if:

- The patient's treatment preferences change.

If MOST is revised or becomes invalid, draw a line through Sections A – E and write "VOID" in large letters.

Revocation of MOST

A patient with capacity or the patient's representative (if the patient lacks capacity) can revoke the MOST at any time and request alternative treatment based on the known preferences of the patient or, if unknown, the patient's best interests.

Review of MOST

Review Date	Reviewer and location of review	MD/DO, PA, or NP Signature (required)	Signature of patient or representative (preferred)	Outcome of Review
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, **no** new form
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, **no** new form
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, **no** new form
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, **no** new form
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, **no** new form

SEND FORM WITH PATIENT/RESIDENT WHEN TRANSFERRED OR DISCHARGED

DO NOT ALTER THIS FORM!

NCDHHS/DHSR/OEMS
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North Carolina Department of Health and Human Services • Division of Health Service Regulation • Office of Emergency Medical Services
www.ncdhhs.gov • www.ncdhhs.gov/dhsr/EMS/ems.htm
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North Carolina Medical Board
Approved Medications for Credentialed EMS Personnel

EMS personnel at any level who administer medications must do so with medical oversight. Personnel must complete appropriate medical education. All EMS System and SCTP protocols, policies and procedures must be reviewed and approved by the Medical Director of the Office of EMS

All items highlighted in "red" are required by NCCEP in all systems with EMS personnel credentialed at the specified level. Specialty Care (SCTP) required items are not listed here, as they can be found on the Specialized Ambulance Protocol Summary (SAPS) form.

Medications	EMR	EMT	AEMT	MEDIC
ACE inhibitors				X
Acetaminophen	X	X	X[15]	X
Adenosine				X
Aminophylline				X
Amiodarone				X
Anti-arrhythmic				X[12]
Antibiotics				X
Anti-emetic preparations				X
Antivirals				X
Aspirin	X	X	X	X
Atropine	X[4]	X[4]	X[4]	X
Barbiturates				X
Benzodiazepine preparations				X[14]
Beta agonist preparations		X[2]	X	X
Beta blockers				X[13]
Bretylium				X
C1 Esterase-Inhibitors				X
Calcium channel blockers				X[13]
Calcium chloride/gluconate				X
Charcoal		X	X	X
Clonidine				X
Clopidogrel				X
CroFab (Crotalidae Polyvalent Immune Fab)				X[8]
Crystalloid solutions			X	X
Cyanide poisoning antidote kit				X
Digoxin				X
Diphenhydramine	X[3]	X[3]	X	X
Diuretics				X
Dobutamine				X
Dopamine				X
Droperidol				X
Epinephrine	X[1]	X[1]	X	X
Etomidate				X
Flumazenil				X
Glucagon			X	X
Glucose, oral	X	X	X	X
Glucose solutions			X	X
Haloperidol				X

Medications	EMR	EMT	AEMT	MEDIC
Heparin (unfractionated and low molecular weight)				X
Histamine 2 blockers			X	X
Hydroxocobalamin				X
Immunizations			X[6]	X[6]
Insulin				X
Ipratropium			X	X
Isoproterenol				X
Ketamine				X[7]
Levetiracetam				X
Lidocaine				X
Magnesium sulfate				X
Mannitol				X
Methylene blue				X
Milrinone				X
N-acetylcysteine				X
Narcotic analgesics				X
Narcotic antagonists	X[9,10]	X[9,10]	X	X
Nasal spray decongestant		X	X	X
Nesiritide				X
Nitroglycerin		X[2]	X	X
Nitroprusside sodium				X
Nitrous oxide				X
Non-prescription medications		X	X	X
Non-steroidal anti-inflammatory		X	X[15]	X
Norepinephrine				X
Octreotide				X
Oxygen	X[5]	X[5]	X[5]	X[5]
Oxytocin				X
Paralytic agents				X[17]
Phenothiazine preparations				X
Phenylephrine				X
Phenytoin preparations				X
Plasma protein fraction				X
Platelet g-II/IIIa inhibitors				X
Potassium chloride				X
Pralidoxime	X[4]	X[4]	X[4]	X
Procainamide				X
Procaine				X
Proparacaine				X
Propofol				X[8]
Proton pump inhibitors				X
Sodium bicarbonate				X
Steroid preparations				X
Thiamine			X	X
Thrombolytic agents				X
Topical hemostatic agents	X	X	X	X
Total Parenteral Nutrition				X
Tranexamic Acid (TXA)				X[11]
Tuberculosis skin test			X[6]	X[6]
Valprocic acid				X
Vasopressin			X	X

Medications	EMR	EMT	AEMT	MEDIC
Vasopressor				X[16]
Whole blood and components				X
Ziprasidone				X

[1] EMR and EMT use of epinephrine is limited to the treatment of anaphylaxis and may be administered only by auto injector, unless approved by EMS System Medical Director and OEMS.

[2] EMT use of beta-agonists and nitroglycerine is limited to patients who currently are prescribed the medication unless approved by the EMS System Medical Director and OEMS as part of the expanded scope. EMTs may administer these medications from EMS supplies.

[3] EMR/EMT administration of diphenhydramine is limited to the oral route.

[4] As a component of preparedness for domestic terrorism, EMS personnel, public safety officers, and other first responders recognized by the EMS system, may carry, self-administer, or administer to a patient atropine and/or pralidoxime, based on written protocols and medical direction. All personnel except for Paramedics must administer these medications by an auto injector.

[5] Administration of oxygen does not require medical direction.

[6] Administration of immunizations and TB skin tests are not limited to public health initiatives.

[7] Ketamine use is restricted to programs that have been approved by the OEMS State Medical Director. It can be used as an induction or post intubation sedation agent in approved DAI programs. Use outside of DAI programs must meet all the requirements outlined in Medical Policy 2 'Ketamine Program Requirements'.

[8] Propofol use is restricted to programs that have been approved by the OEMS State Medical Director. EMS Systems and SCTP's must submit a policy and education plan to the OEMS prior to approval. EMS personnel cannot initiate Propofol, it can only be used for interfacility transport where infusion has already been started at transferring facility. **EMS units cannot stock Propofol or CroFab. This medication must be provided by the transferring hospital.**

[9] FR, EMR, and EMT administration of Naloxone is limited to the intra-nasal (IN), intra-muscular (IM), and auto-injector routes.

[10] First Responders (FR) who administer Naloxone must do so under the medical oversight of the County EMS Medical Director, following protocols and procedures approved by the OEMS State Medical Director. FR administration must be monitored by the EMS Systems peer review program.

[11] For an EMS System to use Tranexamic Acid (TXA), they must submit for approval by the OEMS State Medical Director a signed letter from any Trauma Centers that would be the recipient of the patient that the destination Trauma Center agrees with its use and will give the 2nd required dose of Tranexamic Acid (TXA).

[12] All Paramedic systems must carry some form of anti-arrhythmic agent. This must either be amiodarone, lidocaine, **or** procainamide.

[13] Paramedic systems must carry either a calcium channel blocker **or** beta-blocker.

[14] All Paramedic systems must carry some form of injectable benzodiazepine.

[15] AEMT systems must carry either acetaminophen **or** a non-steroidal anti-inflammatory.

[16] All Paramedic systems must carry an approved vasopressor. This must either be dobutamine, dopamine, epinephrine, norepinephrine, phenylephrine, **or** vasopressin.

[17] Paralytic agent use is restricted to Drug Assisted Intubation (DAI) programs approved by the OEMS State Medical Director. They require the submission of; signed NCCEP DAI policy by local medical director, unaltered NCCEP DAI protocols, training documentation, and process for peer review of cases. All DAI must have an EMS Airway Evaluation form completed and signed by local medical director in accordance with the NCCEP DAI policy. Systems utilizing must submit monthly airway forms and cases to the OEMS for review.

North Carolina Medical Board
Approved Skills for Credentialed EMS Personnel

All items highlighted in "red" are required by NCCEP in all systems with EMS personnel credentialed at the specified level. Specialty Care (SCTP) required items are not listed here, as they can be found on the Specialized Ambulance Protocol Summary (SAPS) form.

Skills	EMR	EMT	AEMT	MEDIC
12-Lead ECG Acquisition & Transmission		X	X	X
12-Lead ECG Interpretation				X
15-Lead ECG Acquisition				X
Airway Adjuncts (NPA/OPA)	X	X	X	X
Arterial Access - Blood Draw				X
Arterial Line maintenance				X
Blind Insertion Airway Device (BIAD)	X[1]	X[1]	X	X
Capnography (Waveform)	X[6]	X[6]	X[6]	X[6]
Carbon Monoxide Measurement (non-invasive)	X	X	X	X
Cardiac Monitoring		X[4]	X[4]	X
Cardiac Pacing				X
Cardiopulmonary Resuscitation	X	X	X	X
Cardioversion				X
Carotid Massage				X
Central Venous Pressure Line Maintenance				X
Chest Compression-External Device	X	X	X	X
Chest Decompression-Needle				X
Chest Tube Maintenance				X
Childbirth	X	X	X	X
Cricothyrotomy-Needle				X
Cricothyrotomy-Surgical				X[5]
Decontamination	X	X	X	X
Defibrillation-Automated	X	X	X	X
Defibrillation-Manual				X
Direct Laryngoscopy			X	X
Drug Assisted Intubation (DAI)				X[5,6]
Endotracheal Tube Introducer			X	X
Epidural Catheter Maintenance				X
Foreign Body Airway Obstruction	X	X	X	X
Gastric Intubation		X[3]	X[3]	X
Glucose Measurement	X	X	X	X
Hemostatic Agent	X	X	X	X
Injections – Subcutaneous and Intramuscular		X[2]	X	X
Intra-Ventricular Catheter Maintenance				X
Intubation - Nasotracheal			X	X
Intubation - Orotracheal			X[6]	X[6,7]
Intubation Confirmation - Capnometry (color)			X	X
Medication Administration	X[2]	X[2]	X[2]	X[2]
Nebulizer Inhalation Therapy		X	X	X
Non-Invasive Positive Pressure Ventilation	X[9]	X	X	X
Orthostatic Blood Pressure	X	X	X	X
Oxygen Administration	X	X	X	X

Skills	EMR	EMT	AEMT	MEDIC
Patient Assessment	X	X	X	X
Pulse Oximetry	X	X	X	X
Reperfusion Checklist	X	X	X	X
Respirator Operation		X	X	X
Restraints		X	X	X
Specimen Collection		X	X	X
Spinal Motion Restriction	X	X	X	X
Splinting	X	X	X	X
Stroke Screen	X	X	X	X
Suction-Basic	X	X	X	X
Suction-Advanced			X[10]	X[10]
Swan-Ganz Catheter maintenance				X
Taser Probe Removal	X	X	X	X
Temperature Measurement	X	X	X	X
Tourniquet Application	X	X	X	X
Tracheostomy Tube Change			X	X
Urinary Catheterization				X
Venous Access-Blood Draw			X	X
Venous Access-Existing catheters				X
Venous Access-Femoral Line				X
Venous Access-Intraosseous			X	X
Venous Access-Peripheral			X	X
Ventilator Operation		X[8]	X[8]	X
Wound Care	X	X	X	X

[1] EMRs and EMTs using blind insertion airway devices must be functioning in EMS systems with medical direction and written treatment protocols.

[2] EMS personnel educated in approved programs, credentialed by the OEMS, and functioning under physician medical oversight may perform acts and administer intravenous fluids and medications as allowed by the North Carolina Medical Board pursuant to G.S. 143-514. The administration of oxygen does not require medical direction.

[3] Gastric tube insertion may be performed only when utilized in conjunction with a blind insertion airway device.

[4] EMT and AEMT may use the cardiac monitor for vital sign monitoring and EKG transmission.

[5] Systems performing drug assisted intubation (DAI) must have the ability to perform surgical cricothyrotomy. Commercial cricothyrotomy or tracheostomy kits that create an airway comparable to a surgical cricothyrotomy are acceptable.

[6] End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube. EtCO2 monitoring is mandatory following placement of a BIAD once available on scene.

[7] Pediatric intubation is an optional skill/procedure.

[8] Ventilator patients may be transported by EMT/AEMT when all of the following conditions are met:
-Patient is receiving home (or skilled nursing) ventilator therapy.
-The ventilator is portable and can continue to ventilate the patient during transport.
-The patient is accompanied by a non-EMS adult (from either the home or facility) who is knowledgeable, capable, and willing to maintain the ventilator during the EMS transport.
-While in transit, the patient is monitored using pulse oximetry.

[9] Bag Valve Mask ONLY

[10] For a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, BIAD, tracheostomy tube or a cricothyrotomy tube.

-EMD personnel are responsible for:

1) Pre-arrival instructions to callers
2) Determining and dispatching appropriate EMS resources
3) All EMD skills must be performed in EMS systems with medical oversight and written EMS protocols

MEDICATION LIST FOR OVERDOSE

Generic	Trade
Calcium Channel Blockers	
Amlodipine	Norvasc, Lotrel
Bepridil	Vascor
Clevidipine	Cleviprex
Diltiazem	Calan, Calan SR, Cardizem, Covera HS, Isoptin SR, Verelan, Verelan PM
Felodipine	Plendil
Lacidipine	Caldine, Lacimen, Lacipil, Midotens, Motens
Lercanidipine	Lercadip, Zanidip
Levamlodipine	EsCordi Cor, Esam, Eslo, S-Amlip
Isradipine	DynaCirc, DynaCirc CR
Nicardipine	Cardene SR
Nifedipine	Adalat, Nifediac, Nifedical, Procardia
Nimodipine	Nimotop
Nisoldipine	Sular
Verapamil	Calan, Calan SR, Covera-HS, Isoptin SR, Verelan, Verelan PM
Beta Blockers	
Beta-blockers with alpha activity	
Carvedilol	Coreg, Coreg CR
Labetalol	Trandate
Beta-blockers with intrinsic sympathomimetic activity	
Acebutolol	Sectral
Pindolol	Visken
Penbutolol	Levatol
Beta-1 cardioselective beta-blockers	
Atenolol	Tenormin
Betaxolol	Kerlone
Bisoprolol	Zebeta
Celiprolol	Selectol
Metoprolol	Lopressor, Toprol XL
Nebivolol	Bystolic
Sotalol	Betapace, Betapace AF, Sorine
Nonselective beta-blockers	
Nadolol	Corgard
Propranolol	Inderal LA, InnoPran XL
Timolol	Blocadren
TCAs - Tricylic Antidepressants	
Amitriptyline	Elavil, Endep, Levate
Amoxapine	Asendin
Clomipramine	Anafranil
Desipramine	Norpramin, Pertofrane
Dosulepin	Prothiaden, Thaden
Doxepin	Adapin, Sinequan
Imipramine	Tofranil
Lofepramine	Gamanil, Lomont
Maprotiline	Deprilept, Ludiomil, Psymion
Mianserin	Bolvidon, Norval, Tolvan
Nortriptyline	Pamelor
Protriptyline	Vivactil
Trimipramine	Surmontil

Generic	Trade
SNRIs – Serotonin & Noradrenaline	
Desvenlafaxine	Pristiq
Duloxetine	Cymbalta
Levomilnacipran	Fetzima
Milnacipran	Savella
Venlafaxine	Effexor, Effexor XR
SSRI	
Citalopram	Celexa
Escitalopram	Lexapro, Cipralex
Fluoxetine	Prozac, Sarafem; Pexeva
Fluvoxamine	Luvox
Paroxetine	Paxil, Paxil CR
Sertraline	Zoloft
Vilazodone	Viibryd
NDRI - Norepinephine & Dopamine	
Bupropion	Wellbutrin, Wellbutrin SR, Wellbutrin XL, Zyban; Aplenzin
MAOIs	
Isocarboxazid	Marplan
Moclobemide	Manerix
Phenelzine	Nardil
Tranylcypromine	Parnate
Selegiline	Emsam (transdermal patch)
Mood	
Lithium	Eskalith, Lithane, Lithobid
Quetiapine	Seroquel, Xeroquel, Ketipinor
Miscellaneous Antidepressants	
Atomoxetine (Norepinephrine reuptake Inhibitor)	Strattera
Agomelatine (5-HT2C receptor antagonist)	Valdoxan
Buspirone (5HT1A receptor agonist)	Buspar
Nefazodone (5HT2-receptor antagonist)	Nefadar, Serzone
Tandospirone (azapirone, 5HT1A receptor agonist)	Sediel
Tianeptine (Serotonin reuptake enhancer)	Stablon
Trazodone (5HT2-receptor antagonist, triazolopyridine- derivative)	Desyrel, Apo-Trazodone, Oleptro
Reboxetine (Norepinephrine Reuptake Inhibitor)	Edronax, Vestra
Viloxazine (Norepinephrine Reuptake Inhibitor)	Vivalan
Vilazodone (Selective serotonin reuptake inhibitor, Serotonin 5HT 1A receptor agonist)	Viibryd
Serotonin Modulator and Stimulator	
Vortioxetine	Brintellix
Combinations	
Fluoxetine/Olanzapine (SSRI/antipsychotic)	Symbyax
Amitriptyline/Perphenazine (TCA/antipsychotic)	Etrafon, Triavil