Wake County EMS System STANDARDS and PRACTICE

The Wake County EMS System Policies, Procedures, Protocols, & Associated References

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- On-Scene Physician Form
- Apgar Score
- Los Angeles Prehospital Stroke Screen
- Pain Scale
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- Difficult Airway Evaluation Resource
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- DNR form - sample
- MOST form - sample

NC Medical Board Approved Meds & Skills for EMS Personnel

WAKE COUNTY NORTH CAROLINA

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Introduction and Foundations of Practice

This document describes the methods by which the Wake EMS System will continue to provide the highest quality pre-hospital patient care. We have incorporated evidence-based guidelines with historically proven practices to produce this document. While it is impossible to address every possible variation of disease or traumatic injury, these policies, procedures, and protocols do provide a foundation for treating the vast majority of patients we encounter. Certainly, our education, experience, and clinical judgment will assist us as we strive to provide the highest quality pre-hospital patient care in the world. As always, on-line medical direction is available for those patient presentations that do not fall within the scope of the document.

Foundations of Practice

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.

Rights of a Patient

Once we have begun collecting information regarding a patient encounter, it is important for us to take every precaution to protect patient **confidentiality.** While we certainly have HIPAA issues to consider, we also have ethical obligations to protect a patient's confidential information. This applies not only to the sharing of written information but also requires us to monitor our speech so as not to inadvertently share patient information in conversation.

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 to recall that we should:

1. Be courteous
2. 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).
3. Clearly advise the patient of the possible complications of their decision.
4. Advise the patient to call back if they subsequently desire treatment and transport
5. Accurately document all components of the patient encounter.

There are three situations regarding **consent** that deserve special consideration:

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 giving 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, under the following circumstances, a minor may consent to treatment without the knowledge of the parent:
   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 (e.g., the 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, consider making contact with and Advanced Practice Paramedic, Office of Medical Affairs representative, or on-line medical control as described in the "Atypical Protocol Utilization and Online Medical Direction" policy.
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 any time.

Automatic Notification of the Medical Director

As we work together to provide the highest quality patient care, any incident which potentially has an adverse or negative impact on the patient or the System **must be immediately reported to 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 or via Raleigh-Wake Communications Center. Events that require this notification include:

- Cardiac and/or respiratory arrest occurring after administration of 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 is defined not only by State Certification but by the provider's level of approved practice within the System.
- 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 via email or phone call to a member of the Office of Medical Affairs (MD1, MD2, or MD20) during regular business hours.

Guidelines for the Use of Protocols

In general, the protocols are divided into sections, including medical, trauma, and other special groupings. For pediatric patients, the appropriate pediatric-specific protocol should be utilized if one exists. If there is not a pediatric-specific protocol for a given pediatric patient situation, utilize the adult protocol for care guidance, but always use pediatric weight-based dosing for medications. Never exceed adult doses of medication for a pediatric patient.

You will notice the individual protocols are divided into essentially three sections. The upper sections usually include **History, Signs and Symptoms, and Differential.** The information in these boxed areas is meant as a guide to assist in obtaining pertinent patient information and to remind each of us to consider multiple potential causes for a patient complaint. From this, providers should choose those elements which are pertinent to their particular patient encounter. It is not expected that every historical element or sign/symptom be recorded for every patient; it is expected that those elements pertinent to your patient will be included in the patient evaluation and documentation.

The center section describes the **Essentials of Patient Care** which are presented in flow chart style. The Protocol Committee, the Wake County EMS System Peer Review Committee, and the North Carolina College of Emergency Physicians EMS Committee have extensively reviewed the included elements. These represent the **proven practices**

which are the foundation of the care we provide. Virtually every patient should receive the care suggested in this section, usually in the order described. Certainly exceptions will exist; the rationale for any deviation from the recommended course should be clearly explained in the narrative of the patient care report. It is anticipated that such exceptions will be rare, and Providers are strongly encouraged to contact the medical director or on-line medical control prior to any deviations (as long as the patient's condition is stable).

You will note that some of the text in this section is in red or orange. Any patient care element that is part of the quality assurance report is presented in red or orange so that we all will know what is being measured.

Finally, the **Pearls** section on the second page or at the bottom of the protocols provides further guidance and adjuncts for patient care based on experience and common medical knowledge. It is impossible to condense emergency medicine to a single page flow chart; the pearls allow for expanded medication advice, dosages, and description of special situations. The Pearls should be studied along with the rest of the protocols and should be followed if applicable. As with the first section, not every patient will require every element under the pearls section. It is anticipated this section will be used as practical guide for the implementation of the **essentials of patient care** section.

Protocol Clarifications for Wake County Practice

As you know, the State of North Carolina has a mandated common protocol set that provides a baseline standard of care across the state. Individual systems may exceed the baseline standard of care, as we have done in multiple Wake County Protocols, but all protocols start with the provided basic flow chart and language common to the State Office of EMS protocol set. Therefore, the protocol format, standard items, and much of the common language reoccurs in many areas throughout the document, especially with regard to contacting medical control. Here is how to interpret those areas for Wake County Practice:

1. In all protocols, the instructions that state "Notify destination or contact medical control" is satisfied in our system by contacting the receiving hospital at the appropriate time. We have no restriction to contract medical control prior to administering any treatments in subsequent boxes. Obviously, if you need to contact medical control at any time for patients with unusual presentations, high risk refusals, or other unusual circumstances, please continue so to do.

2. In all protocols where there is reference to end-tidal CO2, respiratory rates, and O2 saturations, the following applies:

a. If the patient is *in extremis* and there is difficulty in obtaining a pulse oximetry reading due to poor/no perfusion, cool extremities, etc, an end tidal CO2 value greater than 20 with a good waveform is a satisfactory substitute for the SpO2. As soon as possible, an SpO2 value should be obtained, but it is understood that certain patient conditions preclude such a reading.

b. The respiratory rate should be guiding the EtCO2 only when the rate is too low for the patient. In other words, for a patient with pulse and blood pressure with assisted ventilations, the EtCO2 should be greater than 35. If it is not, one consideration is the possibility of hyperventilation. In the prehospital setting, there is no reason to take a respiratory rate above 12 to address an EtCO2 except as directed in the Head Injury protocol for pending herniation.

3. With regard to intravenous access, it is appropriate to continue attempts to obtain access in the patient who is unstable or potentially unstable past 3 attempts without contacting medical control.

4. The EMT description for "blind insertion airway device" applies to EMTs who are assigned to transport ambulances and have completed the Office of Professional Development in-service on BIAD use, and EMTs responding as part of Raleigh Durham International Airport's Crash Fire Rescue service. This does not apply to other first response EMTs.

Summary

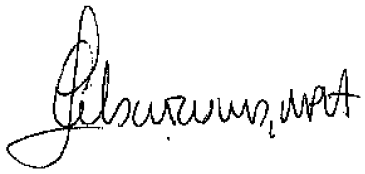
In summary, these protocols describe the proven practices that are the foundation of our care. The additional information coupled with your experience and education will allow us to provide pre-hospital patient care that is second-to-none.

Finally, the manner in which we carry ourselves and the customer service we provide is often as important as the care we provide. For many of our less critically ill or injured patients, the human interaction has more of a healing effect than any of our proven practices. Perhaps our colleague Dr. Ed Racht, the former long-time Medical Director for Austin/Travis County in Texas, states this best:

> ***Being a professional has nothing to do with pay or rank or level of certification you hold. It is the goal that every member of our Practice, from basic provider to Medical Director, constantly strives to remain a comprehensive, clinically sophisticated, and compassionate EMS System.***

Our System operates a unique practice of prehospital medicine, and we are proud of our practice. Thank you for continuing to provide prompt, compassionate, clinically excellent care.

Sincerely,



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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:

    - Body decomposition
    - Rigor mortis
    - Dependent lividity
    - 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)
    - Meets criteria established in TB 10 Traumatic Arrest Protocol

2. 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 TB 10 Traumatic Arrest Protocol.

3. If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:
    a) Resuscitation efforts meet the criteria for implementing the **Discontinuation of Prehospital Resuscitation Policy** (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:

Refer to Wake County EMS Protocol UP 22- Deceased Persons- for protocol flow chart

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 (or law enforcement) 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, in 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) and other advanced life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital when this procedure is followed.

Purpose:

The purpose of this policy is to:

- Allow for discontinuation of pre-hospital resuscitation after the delivery of adequate and appropriate ALS therapy.

Procedure:

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

    - Patient must be 18 years of age or older, or family of a minor is agreeable after consultation with the APP or District Chief.
    - Adequate CPR has been administered.
    - Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, nasotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy.
    - IV or IO access has been achieved.
    - Rhythm appropriate medications and defibrillation have been administered according to protocol.
    - Persistent asystole or agonal rhythm is present and no reversible causes are identified after a minimum of 25 minutes of resuscitation.
    - Failure to establish sustained palpable pulses or to establish persistent/recurring ventricular fibrillation/tachycardia or lack of any continued neurological activity such as eye opening or motor responses
    - All EMS paramedic 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 pre-hospital resuscitation is possibly indicated or desired, **contact Medical Control**.

    3. The **Deceased Subjects Policy and UP22 Deceased Persons protocol** should be followed. **Refer to Protocol UP 22- Deceased Persons for protocol flow chart.**

    4. After discontinuation, contact Organ Procurement Agency if indicated, see Disposition Policy 9 – Organ Procurement. HonorBridge number is 1-800-252-2672.

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)

- 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:
  - Offered 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 an EMS unit prior to refusal so that an EMS assessment may be performed and appropriate patient refusal documentation completed via an EMS patient care report. 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. Refer to the "Foundations of Practice" for the Wake County EMS System "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, and meet criteria for capacity as described in the "capacity checklist" in the altered mental status and well person check protocols.
- 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 capacity criteria may be capable of making a medical decision.
- Patients treated for hypoglycemia under the altered mental status protocol or the well person protocol that meet criteria for non-transport 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" Procedure 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.

Do Not Resuscitate (DNR), MOST, & Advance Directives – Pg 1

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. 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). The **Medical Orders for Scope of Treatment** (MOST) form shall be honored as directed below.

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:

- 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. 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
   - The effective date and expiration date must be completed and current
   - <u>Out-of-state or US military form:</u>
     - Must be an original MOST, DNR, POLST (Physician Orders for Life Sustaining Treatment) or POST (Physician Orders for Scope of Treatment).
     - The effective date and expiration date must be completed and current
     - The DNR and/or MOST Form must be signed by a physician, physician's assistant, or nurse practitioner

2. A valid DNR or MOST form may be overridden by the request of (N.C.G.S. 90-21.13):
   - Court appointed guardian
   - Health care power of attorney
   - Spouse
   - Majority of patient's reasonably available parents and/or children who are ≥ 18 years old
   - Majority of patient's reasonably available siblings who are ≥ 18 years old
   - Patient's attending physician

   *EMS personnel should contact **Medical Control** to obtain assistance and direction if clarification is necessary.*

**** See next page****

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. See page 1, #2 of this policy for order of healthcare decision-makers for a 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. A living will (or other legal document) that identifies the patient's desire to withhold CPR or other medical care may be honored with the approval of **Medical Control**. Ideally, consultation with patient's family and personal physician is suggested as time allows.

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.

Physician on Scene

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 Wake 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 Wake 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 Wake County EMS System Standards Document (this document) and the North Carolina Medical Board.

Opioid Overdose/Misuse

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:
**** Utilize in conjunction with protocol TE7 – Overdose/Toxic ingestion ****
1. Patients must be over 18 years of age and experienced unintentional overdose or misuse of an opioid drug/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 or IN 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) Refer to a community substance abuse treatment facility if available
    b) Provide literature outlining resources for substance misuse treatment programs in the community if available

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		**Wake County EMS- Contact HonorBridge When indicated**
Cabarrus	Madison		
Cherokee	Mecklenburg		
Clay	Polk		
Cleveland	Rutherford		
Gaston	Stanly		
Graham	Swain		
Haywood	Transylvania		
Henderson	Union		

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) in a timely fashion, 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 as soon as possible after the time of the patient encounter. **Documentation should be completed by treating EMS providers 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.**

3. For EMS Systems, PCRs must be completed in the PreMIS System or electronically submitted to the PreMIS System as soon as possible after the EMS event or patient encounter's completion (to PreMIS within 24 hours). 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 BPs are acceptable for **REPEAT** vital signs.

3. Based on patient condition, complaint, and protocol used, vital signs may 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 Advanced EMT 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 (PCR)

Policy: For every patient contact, the following describes the minimum required documentation.

**** FIRST RESPONDERS should follow documentation guidance in the First Responder Handbook.**

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 PCR. 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. When appropriate, this information should be included in the procedures 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, pulse oximetry at minimum). These vital signs should be repeated and documented after drug administration, prior to patient transfer, and as needed during transport.
4. Only approved medical abbreviations may be used- see appendix.
5. The CAD to PCR interface embedded within the PCR system should be used to populate all PCR 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. 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 immobilization, document motor function before/after spinal immobilization.
11. For IV administration, the catheter size, site, number of attempts, type of fluid, and flow rate.
12. A lead II strip should be attached for all patients placed on the cardiac monitor. All 12-leads should also be included. Any significant rhythm changes should be documented.
13. Any requested medical control orders, whether approved or denied, should be documented clearly.
14. Any waste of controlled medications should include the quantity wasted, where wasted, and name of the person who witnessed the waste. Hospital personnel should be utilized (if available) to witness.
15. ALL crew members are responsible for, and should review, the content of the PCR for accuracy.
16. 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 PCR.
17. A copy of the PCR and related patient information (including appropriate cardiac monitor tracings, original DNR or MOST forms and, when applicable, documentation of refusal to accept an appropriate assessment, treatment, or hospital destination from EMS) shall be provided to the receiving hospital.
18. For all patients who receive EMS medications or procedures (beyond KVO IV), the PCR shall be completed prior to leaving the hospital to ensure appropriate transfer of care. Completing the record includes collecting data provided by the receiving hospital and marking the record "complete" in the PCR system and uploading the record to the server.
19. When possible, ALL PCRs should be completed prior to leaving the hospital, to include capture of hospital-based patient information to ensure accurate hospital data exchange. At minimum, all PCRs should be available to the receiving facility within 4 hours. If the PCR cannot be completed and uploaded before departing the hospital, the narrative section of the call report should explain the delay and indicate the means used to deliver the patient care information and confirm that it was received.
20. In summary, PCRs should be completed and uploaded promptly upon transfer of patient care, or immediately upon completion of non-transports, unless call demand dictates otherwise. All patient care documentation must be completed by the end of the shift.

Standards Policy: Documentation Policy Section

Documentation with Multiple Providers, Includes APP and DC Documentation

Purpose:

The purpose of this policy is to:

- Provide world class patient care and EMS service to the citizens of Wake County.
- Provide a consistent method for documenting patient care encounters that include multiple providers, particularly when an Advanced Practice Paramedic (APP) is involved.

Policy:

1. All providers involved in the patient care activity are responsible for ensuring accurate and complete patient care documentation. The lead provider (listed as “primary attendant”) on the PCR 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, an APP or District Chief provided some patient care on-scene but did not accompany the crew to the hospital, or an APP provided on-line advice, etc.), the following shall be accomplished:

   a. The APP or DC will complete a PCR to include patient name and demographics.

   b. 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.

   c. In the case of a patient in whom follow-up is performed by an APP after the call, or specific APP or District Chief assessment is performed, this care shall be documented by the APP or DC in an addendum to the primary PCR completed as per section b above.

   d. If there is any dispute over documentation, the first attempt to reconcile will be accomplished via conversation between the APP and the primary provider. Corrections will be placed in an addendum. If the dispute cannot be resolved in this manner, the office of medical affairs shall be contacted for mediation.

4. All patient care documentation must be completed by the end of the shift.

EMS Dispatch Center Time and Emergency Medical Dispatch

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 call 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. Based on pre-approved EMD criteria and standards developed by the Medical Director, some low-acuity 911 calls may be referred by EMD personnel to an affiliated "nurse navigation line" for possible disposition other than EMS unit response. These dispositions may include telemedicine referral or recommendation for alternate transport to an appropriate non-ED alternate destination (e.g. urgent care). All 911 callers retain the right to request an EMS ambulance regardless of nurse navigation referral.

4. 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).

EMS Dispatch Center Time and Emergency Medical Dispatch (page 2)

5. 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.

6. 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.

7. 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.

8. 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.
   - In general, EMS unit diversion from one call to another should be managed by the 911 center and its computer-aided dispatch (CAD) features that assist in appropriate resource prioritization (e.g. auto-swap).

9. 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.

10. Emergency Medical Dispatch performance metrics, to include Emergency Medical dispatch times, EMS Dispatch Delays, and nurse navigation referrals, will be reviewed regularly within the EMS System Peer Review Committee.

Standards Policy: Medical Policy Section

Atypical Protocol Utilization and Online Medical Direction

Purpose:

The purpose of this policy is to:

- Provide world-class patient care and EMS service to the citizens of Wake County.
- 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 (sick outs, injuries, narcotic replacements, etc.)

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, non-intubated post-ROSC patients) 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 in steps 4 and 5 below. The provider requesting OLM must be at the scene with the patient.

3. The first call for (a) operational/administrative issues related to an individual patient or patients should be placed to the Advanced Practice Paramedic (APP) on duty for the region. If possible, the call should be placed directly to the “Medic xx” cell phone. If this is not practical, the APP may be contacted on Dispatch 1 and then move to the appropriate “Admin” talk group.

4. If the request is for OLM or if there are no APPs immediately available for administrative/operational issues, the next call will be placed to a member of the Office of Medical Affairs (MD-1, MD-2, MD-20 (NOTE: MD-20 for administrative/operational calls).

5. If neither an APP nor members of OMA are available, request OLM from a physician at the most appropriate receiving hospital via radio. Only physicians may provide medical direction.
   *Other staff, including PAs and nurses, may not provide online medical direction.

6. In the electronic patient care report, the name of the individual (and unit number if applicable) providing OLM and/o APU will be documented in the narrative section. The APP will add a note confirming the advice provided as stated in the “APP Documentation” Policy.

7. Additionally, the APP for the region may take any calls from the Foundations of Practice document in which immediate notification of the Medical Director is required if a member of the OMA cannot be reached.

Standards Policy: Medical Policy Section
Domestic Violence (Partner, Elder, and/or Disabled Abuse) Recognition and Reporting

Policy:

Domestic violence is physical, sexual, or psychological abuse and/or intimidation, which attempts to control another person in a current or former family, dating, or household relationship. The recognition, appropriate reporting, and referral of abuse is a critical step to improving patient safety, providing quality health care, and preventing further abuse.

Elder abuse, or the abuse of a disabled person is the physical and/or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen or disabled person by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and wellbeing of senior citizens and disabled individuals.

Purpose:

Assessment of an abuse case is based upon the following principles:

- **Protect** the patient from harm, as well as protecting the EMS team from harm and liability.
- **Suspect** that the patient may be a victim of abuse, especially if the injury/illness is not consistent with the reported history.
- **Respect** the privacy of the patient and family.
- **Collect** as much information and evidence as possible and preserve physical evidence.

Procedure:

***Immediately report any suspicious findings of abuse or neglect to the receiving hospital.**

1. Assess the/all patient(s) for any psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, behavioral disorders, substance abuse, medical non-compliance, or repeated EMS requests. This is typically best done in private with the patient.
2. Assess the patient for any physical signs of abuse, especially any injuries that are inconsistent with the reported mechanism of injury. Defensive injuries (e.g. to forearms), and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence.
3. Assess all patients for signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. <u>For suspected elder abuse or neglect, or suspected abuse of a disabled person</u>, contact Wake County Human Services' Senior and Adult Services Department at 919-212-7264. After office hours, the adult social services worker on call can be contacted by the 911 communications center.
5. <u>For suspected domestic violence</u>, EMS personnel should attempt in private to provide the patient with the Wake County InterAct crisis hotline, 919-828-3005 for sexual assault, or 919-828-7740 for other domestic violence, or the **National Hotline, 1-800-799-SAFE**.

Transport and Screening for Mental Health and Substance Abuse Patients

Purpose: To establish criteria for EMS referral to approved Alternative Destinations (i.e. Transport to a location other than the emergency department) in order to facilitate the most appropriate triage and care for persons with acute mental health or substance abuse concerns.

Procedure: Patients with a primary mental health or substance abuse complaint are eligible for consideration for alternative destination if the following criteria are met:

1) Patient has no acute medical or traumatic conditions. Patients with unexplained persistent or recurring changes in mental status should be referred to the emergency department for evaluation. Patients with superficial abrasions may be evaluated at WakeBrook whereas any patient with on-going bleeding or wounds requiring repair should be referred to the emergency department for evaluation.
2) Patient is ambulatory and can take fluids by mouth
3) Pulse is less than 120
4) Patient is either compliant with medications for chronic conditions or knows the name and dosage of medications for his or her chronic condition(s) and is willing to take these medications
5) If a patient has taken medications outside of normal dose, an Advanced Practice Paramedic (APP) will discuss this with the poison center (800-222-1222). When calling, the APP should be prepared with the information outlined in this policy.
6) Emergency department evaluation will be initiated if recommended by the poison center. If no emergency department evaluation is recommended and the patient meets all other criteria, the approved alternative destination should be notified of the poison center consultation, guidance received during consultation, and the case/ reference number as available.
7) Isolated hypertension (i.e., HTN with no associated symptoms such as headache, neurologic changes, chest pain, or shortness of breath) in a patient with a history of hypertension will not be a reason to decline the referral to alternate destination.
8) Patient should be able to perform activities of daily living (ADLs) independently.
9) Patients with a history of diabetes who have no evidence of ketoacidosis and a blood glucose <300 are appropriate for referral to alternate destination.
10) Blood alcohol concentration (BAC) is a determinant of which alternative destinations are an option for a patient. Patients with a primary substance abuse complaint with a BAC of less than or equal to 0.35 may be referred to Crisis and Assessment at WakeBrook, The Healing Place, or Holly Hill Hospital. Patients with a BAC between 0.35 and 0.4 may only be referred to The Healing Place. Patients with a BAC greater than 0.4 are not eligible for alternative destination and must be referred to the Emergency Department.

In any circumstance, transport crews must communicate directly with the APP either on-scene, on the phone, or by radio to ensure that proper notification of the Alternate Destination can be made by the APP. The APP must approve the patient for potential alternate destination in all cases. If an APP believes a patient to be appropriate for Alternative Destination but the patient does not meet one or more criteria above, then acceptance of a referral on a case-by-case basis may be allowed after approval from clinical personnel at the Alternative Destination.

Purpose: The purpose of this policy is to provide guidance regarding when a mechanical CPR device may and may not be used for patients in cardiac arrest.

Policy:

1. In general, a mechanical CPR device is NOT BETTER than human-performed chest compressions in terms of likelihood of ROSC or survival. Providers in our system perform excellent chest compressions with high CPR fraction and quality. Therefore, two main policy statements apply:

a. The benefit of a mechanical CPR device in our system is only realized when TRANSPORT of a medical cardiac arrest patient is indicated. During transport (e.g. in the back of a moving ambulance or on a moving stretcher), mechanical CPR devices likely provide higher quality chest compressions and allow for a greater degree of provider safety.

b. GREAT CARE should be taken to maximize CPR fraction (i.e. minimize pauses in compressions) when a mechanical CPR device is being applied, adjusted, or during transport and transitions of care. Usual cardiac arrest practices apply, i.e. “pit crew” CPR. If we are “doing it right,” some patients will get ROSC while using the device. In these cases, the device should stay on the patient (“paused”) in case of re-arrest.

2. The mechanical CPR device is designed and configured to mimic excellent quality chest compressions of an appropriate rate and depth for an ADULT patient. It is not always possible to know the age of cardiac arrest patients, therefore if the ADULT cardiac arrest protocols are being used, mechanical CPR may be used, when indicated. If PEDIATRIC cardiac arrest protocols are used, mechanical CPR may NOT be used.

3. Contraindications for using the mechanical CPR device are: 1) if it is not possible to position the device correctly on the chest per the manufacturer’s recommendations; and 2) if the patient is too small or too large for the device, per manufacturer’s recommendations and system training.

4. Also, the mechanical CPR device SHALL NOT be used for trauma arrests. Consider that the greatest chance of survival for any trauma arrest is created by rapid transport to a trauma surgeon, followed by immediate operative intervention, usually on the thorax. Other EMS interventions (refer to Traumatic Cardiac Arrest Protocol) and rapid transport take precedence in these cases.

5. Mechanical CPR devices are deployed with single responders. The single responder (District Chief or APP) is responsible for directing device application, overseeing use, and is the on-scene authority regarding when the device may be utilized.

6. There are two clinical scenarios in which the mechanical CPR device should be utilized, both involve when a cardiac arrest patient needs transport to the ED:

a. Patients with ROSC (device should be placed in case of re-arrest during transport)
b. Patients in whom on-scene efforts have not resulted in ROSC, but the code cannot be discontinued on scene (refer to Discontinuation of Prehospital Resuscitation Policy) for whatever reason. In these cases, the device should not be utilized until the decision to transport is made (i.e. on-scene efforts should utilize manual compressions).

** If a patient that was not initially a cardiac arrest has an arrest during transport, the unit should pull over and call for a code response as per usual system practice, which will include a single responder. Whether or not ROSC is obtained, the mechanical CPR device should be utilized to continue transport to the ED, once pit-crew positions are established and “on-scene” priorities are completed (e.g. rhythm analysis and defibrillation, pit-crew organization), and the decision to continue transport has been made.

Child with Special Health Care Needs (NC Kidbase)

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.
- Promote, request, and use the “Kidbase” form, which catalogs the health care problems, needs, and issues of each child with a special healthcare need.

Procedure:

1. Caregivers who call 911 to report an emergency involving a child with special health care needs may report that the emergency involves a “Kidbase child” (if they are familiar with the NC Kidbase program) or 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 “Kidbase Form”, which is the North Carolina terminology for the Emergency Information Form (EIF).

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.

Child Abuse Recognition and Reporting

Policy:

Child abuse is the physical and mental injury, sexual abuse, negligent treatment, and/or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.

Purpose:

Assessment of a child abuse case is based upon the following principles:

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

Procedure:

1. With all children, assess for and document psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders

2. With all children, assess for and document physical signs of abuse, including and especially any injuries that are inconsistent with the reported mechanism of injury.

3. With all children, assess for and document signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.

4. Immediately report any suspicious findings to both the receiving hospital (if transported) and to the Department of Social Services social worker on on call by contacting the 911 center. While law enforcement may also be notified, North Carolina law requires the EMS provider to report the suspicion of abuse to DSS. EMS should not accuse or challenge the suspected abuser. This is a legal requirement to report, not an accusation. In the event of a child fatality, law enforcement must also be notified.

*** To report suspected child abuse or neglect, call the Wake County Child Protective Services Intake phone number at 919-212-7990. After hours and on weekends, if this number is not staffed, contact the 911 center (RWCCC) and have them contact the on-call social worker for Child Protective Services, who will then return your phone call and receive your report.***

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 the EMS patient care report (PCR) is completed and left with the receiving medical facility (This requirement may be waived under emergency or low system resource conditions when approved by the facility at the request of a System chief officer. Where this occurs it should be documented in the subsequent patient care report).
- 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 to the receiving medical facility staff.

3. EMS personnel will provide an interim or final Patient Care Report (PCR) to the receiving medical facility staff as per the documentation policies. A complete PCR should be completed as soon as possible but should not cause a delay in the EMS Back in Service Time.

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

Standards Policy: Service Metric Policy Section

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 00:59 (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. 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.

5. EMS Response Delays will be reviewed regularly within the structure of the EMS System Peer Review Committee.

Hospital Diversion

This Policy applies to all Levels of Certification

Purpose: To establish a protocol to be utilized in instances when capacity has been exceeded and there is assurance that all reasonable options to safely accommodate patients have been explored.

Policy: When a facility cannot safely provide appropriate care to ambulance patients, the hospital will redirect, to the extent possible, patients to other area hospitals. The following status conditions are established in agreement with all hospitals in Wake County and the Wake County EMS System. A patient who refuses diversion recommendations may complete a refusal form at the discretion of the EMS crew; at minimum the risks/benefits of diversion refusal must be discussed and documented in the PCR. In all cases, a hospital shall not be on a **RED** diversion for longer than 2 hours. After 2 hours of **RED** diversion utilization, a hospital must remain **GREEN** for a minimum of 2 hours. If 3 hospitals are on diversion, all hospitals will be re-opened for a period of 2 hours.

Procedure:

GREEN Business as usual, normal transport procedures are in effect. All ambulance personnel should assume each hospital is in this condition until notified otherwise.

YELLOW A YELLOW diversion may be initiated by a hospital when the emergency department is unable to adequately care for an additional critical patient. Examples of critical patients include but are not limited to patients with: hemodynamic instability, respiratory distress, active chest pain, IV medication administration, altered mental status, or any patient in which ALS Protocols are being used. Under a YELLOW diversion, only BLS patients will continue to be transported to the hospital by EMS. Exceptions include cardiac/respiratory arrests to the closest hospital, OB patients in active labor to the hospital of their choice and patients who meet trauma criteria to a trauma center.

RED Total diversion may be initiated by the emergency department when the department cannot accept any patients except cardiac/respiratory arrests to the closest appropriate hospital, OB patients in active labor to the hospital of their choice, and patients who meet trauma, STEMI, or stroke criteria to the appropriate specialty center per established triage and destination plans.

BLACK The emergency department may initiate BLACK diversion when the department is unable to accept any patients. This condition assumes an internal disaster status within the facility and may not be used as a result of volume in the emergency department.

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

Standards Policy: Toxic Environmental Policy Section

EMS Distribution of Naloxone Kits

Policy:

EMS Personnel may distribute naloxone kits intended for layperson use from a supply separate from the usual naloxone utilized for patient care.

Purpose:

The purpose of this policy is to:

- Authorize EMS personnel to distribute naloxone kits and delineate a procedure for distribution

Procedure:

1. EMS logistics staff will receive naloxone kits intended for layperson use (including all applicable components per the STOP act as referenced below) as they are available from external suppliers, e.g. Wake County division of public health or similar.

2. Naloxone kits will be distributed to EMS units in a manner similar to current supply chain procedures. APP units may receive preference for distribution depending on the volume of available supply and the nature of APP response.

3. EMS personnel will use their discretion to give a naloxone kit to any person encountered on an EMS call that is at risk of experiencing an opiate overdose (e.g. a current opiate overdose patient who refuses transport) or any person in position to assist a person at risk of opiate overdose.

4. EMS personnel must document that a kit was distributed, in accordance with established medical provider documentation guidelines. Follow current system guidance to document distribution. At minimum, EMS providers shall write whichever of the following is applicable at the end of their patient care report narrative:

    a. “A naloxone kit was given to this patient” **or**
    b. “A naloxone kit was given to a bystander during this call”

5. EMS personnel shall not give naloxone to patients or bystanders from the regular EMS patient care supply.

6. EMS units may resupply their naloxone kits, as stock is available, via usual supply chain procedures. It may be the case that no resupply is available; layperson naloxone kits are not a required medication on Wake EMS response units.

Reference: North Carolina “STOP Act” available at:

http://www.ncleg.net/Applications/BillLookUp/LoadBillDocument.aspx?SessionCode=2017&DocNum=2402&SeqNum=0

Air Transport

Policy:

Air transport should be utilized only when patient care can clearly be improved by decreasing transport time to a specialty receiving center (i.e. level one trauma center)

Purpose:
The purpose of this policy is to allow for rapid transport in major trauma and/or mass casualty events

Procedure:

Patient transportation via ground ambulance will not be delayed to wait for helicopter transportation. If the patient is packaged and ready for transport and the helicopter is not on the ground, or within a reasonable distance, the transportation will be initiated by ground ambulance.

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

1. Patient meets criteria for trauma center evaluation.
2. The patient is entrapped and extrication is expected to last greater than 20 minutes.
3. The ground transport time is greater than 15 minutes.
4. The patient is not in traumatic 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) with significant distance to the trauma center
- The patient meets burn center criteria.

Usual Air Transport request procedures:

1. The highest certified technician on the crew will determine that a helicopter may be needed for the patient. An on-scene Fire Department Officer may request a helicopter to expedite its arrival.
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. If the scene conditions or patient situation improves after activation of the air medical transport service and air transport is determined not to be necessary, paramedic or administrative personnel may cancel the request for air transport.
6. **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:

- 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:

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 minimized, ideally 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 minimized, ideally 10-15 minutes or less for acute Stroke patients and STEMI patients, taking into consideration necessary diagnostic procedures and ease of scene egress.

2. 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.

3. No patients will be transported in initial response non-transport vehicles. In unusual circumstances (such as severe weather under the “Emergency Rule” or Disaster/MCI situations) transport in other vehicles may be appropriate when directed under the authority of the Medical Director or Medical Director’s designee.

4. In unusual circumstances, transport in other vehicles may be appropriate when directed by EMS administration.

Interfacility Transfers

Purpose:

To provide guidance regarding transporting a patient from a medical facility to another medical facility that requires Advanced Life Support care during transport and the facility does not send a registered nurse to attend the patient.

Procedure:

*** In general, Wake EMS providers should only perform interfacility transfers for time-critical conditions, including those patients who meet specialty destination center criteria who are not already at an appropriate specialty receiving center: Trauma, Stroke, STEMI, Post-Cardiac Arrest, and Pediatrics. See Triage and Destination Plans for guidance.**

*** Should a Wake EMS crew be contacted regarding an interfacility transfer for a non-time-critical patient, the crew should contact their District Chief for guidance regarding how to proceed.**

1. The transporting paramedic may maintain any infusion approved by the North Carolina Medical Board (NCMB) for interfacility transport by an Paramedic provided:

   a. The technician is familiar with the medication being infused.
   b. The medication is being regulated by an IV pump while enroute to the new medical facility, and the paramedic has been trained on the pump being utilized.
   c. The patient has stable vital signs prior to departure from the facility.

2. If the transporting paramedic is not familiar with a medication being infused and/or not familiar with any medical device or medication pump (or active pump management is required), regardless of the device or medication's formulary approval by the NCMB, then transferring facility medical personnel familiar with the pump(s) and medication(s) and/or device(s) should accompany the crew for the entirety of the interfacility transport during which patient care is being provided. Should a Wake EMS crew encounter any difficulty with these communications, the crew should contact their District Chief for guidance regarding how to proceed.

3. The transporting paramedic should ensure that all appropriate documentation accompanies the patient.

4. While in transit to the new facility, all appropriate standing orders shall remain in place.

5. If the patient deteriorates, the transferring facility should be notified via radio or cellular phone.

6. If additional ALS orders are needed, the receiving facility should be contacted to issue those orders if the receiving hospital is inside of Wake County. If the receiving facility is outside of Wake County, the transferring facility should be contacted for ALS orders.

Standards Policy: Transport Policy Section

Patient Evaluation, Treatment, and Transport

Policy:

- An appropriate EMS resource will be dispatched to every request for EMS service.

- For the purposes of this policy, “Paramedic,” “AEMT,” and “EMT” refer to Wake County EMS System credentialed personnel with no current restrictions on their clinical practice.

- The provider with the highest level of Wake 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 highest-credentialed provider performing the initial 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.

- Should an EMS crew encounter a patient that meets the criteria below for non-transfer to a lower credential, or encounter any situation in which paramedic care is needed, and a paramedic is not on-scene, a paramedic should be requested to respond to the scene or intercept the EMS unit en-route to the hospital in order to participate in patient care. Depending on the circumstances, appropriate care options include:

  A. Request for the closest paramedic unit to be dispatched to respond to the scene; wait on scene until a paramedic arrives.

  B. Coordinate a paramedic intercept while the non-paramedic unit is en-route to the ED

  C. Transport directly to the ED without a paramedic if the appropriate ED is closer than the closest available paramedic unit.

** Triage and Destination plans should be followed when taking into account whether the closest paramedic unit is a faster source of advanced care than transport to the ED. For example, a patient meeting trauma criteria should still be transported to an appropriate trauma center rather than the closest ED. In this case, a paramedic intercept should be coordinated at the discretion of the transporting EMS crew, considering time, distance, and urgency of need for paramedic-level interventions. An exception to this guidance is medical cardiac arrest; all medical cardiac arrests should have initial on-scene treatment and request for a code response to the scene consistent with our cardiac arrest protocols.

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

Patient Evaluation, Treatment, and Transport (continued)

(continued from previous paged)

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

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. As a general rule, if providers are questioning who should attend the patient, a 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 do NOT meet any of the criteria in #1-4, and 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.

The following criteria MUST be met to transfer such a patient to a technician of lower credential:

A. All providers agree that it is unlikely that repeat medication doses will be needed during transport,

B. The patient must be monitored on scene for a time sufficient to ensure that an adverse reaction to the medication is unlikely.

Transport and Care Plans

Purpose: To establish a uniform protocol for the transportation of the sick and injured.

Procedure: All sick or injured persons requesting transport shall be transported without delay to an appropriate local emergency department **of the patient's preference. The only exceptions to this rule are found below.**

1. An "appropriate local emergency department" includes **ALL** WAKE COUNTY EMERGENCY DEPARTMENTS (ED), hospitals in contiguous counties, and UNC Hospitals in Chapel Hill. The ability to pay or insurance status if known SHALL NOT BE A FACTOR. If the unit availability status of the System is a concern, contact your supervisor prior to patient-requested out-of-county transport.

2. All sick or injured persons requesting transport **who do not express a preference** will be transported without delay to the closest appropriate local hospital or ED.

3. Patients whose conditions are covered by a formal Destination Plan (Pediatric, Post-Resuscitation, STEMI, Stroke, Trauma, etc) or who meet Alternative Destination Screening Criteria shall be transported in accordance with those specialty algorithms to the appropriate destination. All other patients should be transported per this policy.

4. In unusual circumstances, transport in other vehicles may be appropriate when directed under the authority of the Medical Director or Medical Director's designee.

5. Select patients who may or may not be frequent utilizers of the EMS System may have a designated CARE PLAN as developed with the patient and his or her health care providers, the Wake County EMS System, and one or more local hospitals. If a patient has a formal CARE PLAN approved by the Wake County EMS System, then the patient should be treated and transported in accordance with the CARE PLAN, unless the patient meets criteria to be transported to a specialty receiving center as in #3 above. In many cases, the patient's designated CARE PLAN hospital may also be an appropriate specialty receiving center. Regardless of the existence of a CARE PLAN, patients known to be discharged from an emergency department within the last 48 hours should generally, but not always, be transported back to the same emergency department, unless they meet specialty destination criteria as noted. Many exceptions to this guideline may exist; do not hesitate to seek guidance from a supervisor.

6. Transport decisions should take into strong consideration a patient's pre-existing health care relationships. In general, patients should be taken to the hospital at which they have a pre-existing patient-provider relationship unless the patient expressly requests otherwise. For example, a patient who has had recent surgery who now has a possible surgical complication should return to the hospital at which the surgery was performed. If a patient has a Duke cardiologist, for example, the patient should generally be taken to Duke for possible cardiac problems. These situations are not necessarily inconsistent with time-sensitive conditions and the Triage and Destination Plans. Patients may choose their preferred destination specialty receiving hospital; providers should document discussion of possible risks and benefits associated with possible longer transport times.

Practitioner Disciplinary Policy

In Wake County's EMS System, a practitioner's right to practice medicine is based on extension of the Medical Director's license to practice medicine. For the purposes of this procedure, a "practitioner" is any individual practicing in the Wake EMS System at the level of Medical Responder or higher level of certification. If, in the opinion of the Medical Director, an action (or failure to act) on the part of a practitioner is of such a nature that the action or failure to act is inconsistent with, or a violation of, these procedures, or the practice standard generally accepted in the medical community, the actions described below shall occur, pursuant to the provisions of 10 NCAC 03D .2803:

1. The practitioner will be notified in writing of the issues/concerns that merit attention by the Medical Director. Notwithstanding this written-notice provision, the provisions of 2 and 3, below, and based on the severity and nature of the act (or failure to act), the Medical Director or his designee may suspend a practitioner's right to practice upon receipt of information sufficient in the judgment of the Medical or his designee Director to support immediate suspension in the interests of patient safety. If the Medical Director or his designee invokes an immediate suspension, this shall be followed by written notice within three (3) working days of such immediate suspension.

2. A written explanation by the individual explaining the incident shall be presented to the Medical Director within three (3) working days of receipt of the Medical Director's issues/concerns. If no written explanation of the incident is sent to the Medical Director by that deadline, the Medical Director may base his decision upon such information that is available to him/her as of that deadline.

3. The Medical Director or the individual may request a second meeting to further discuss the issues/ concerns. If this option is exercised, the meeting shall occur within five (5) working days of receipt of the request.

4. After reviewing all materials, the Medical Director will issue a disposition of the matter. The Medical Director may exercise one or more of the following options:
   a. No action taken / matter resolved
   b. Remediation training
   c. Warning
   d. Require to precept at the approved level again
   e. Temporary suspension of all practice privileges or suspension of specific practice privileges
   f. Permanent Suspension of practice privileges

Any suspension of practice privileges will extend to all jurisdictions where the practitioner's right to practice relies on the extension of the Wake EMS System Medical Director's license to practice medicine.

5. After the individual is notified in writing of the Medical Director's decision, he/she may appeal to the Patient Safety Subcommittee of the Peer Review Committee (hereinafter, "Patient Safety Subcommittee"). This appeal request must be presented within five (5) working days of the decision of the Medical Director to the Medical Director or his/her designee for referral to the Patient Safety Subcommittee.

Practitioner Disciplinary Policy (continued)

6. The Patient Safety Subcommittee will meet as soon as is practical after the receipt of the written request for appeal. If the practitioner's ability to practice has been suspended for greater than 7 days, this meeting will be held with all deliberate speed and effort will be made to convene the meeting within 10 days. The committee shall consist of the following representatives:
   a. One Physician Member who is not the Medical Director;
   b. In cases involving paramedics, four paramedics each primarily and currently employed by Wake County EMS.
   c. In cases involving practitioners other than paramedics, two paramedics each primarily and currently employed by Wake EMS and two practitioners of standing equivalent to that of the individual filing the appeal.

7. One member of the Patient Safety Subcommittee shall be designated by the Patient Safety Subcommittee as the presiding officer for purposes of hearing an appeal. The Patient Safety Subcommittee may hear witnesses (the participation of which is the responsibility of the party calling the witness) and consider documentary and other evidence. The practitioner exercising the appeal may be accompanied by any individual(s) of their choice. Patient Safety Subcommittee meetings are not adversarial, however, so the only individual who may address the Subcommittee is the practitioner. The decision of the Patient Safety Subcommittee shall be in the form of written findings of fact and imposition of action(s) consistent with those findings of fact.

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.

Definitions:

1. Consecutive Hours Worked: All cumulative hours worked in any rolling time period in which the employee does not have a period of 8 continuous hours of rest.

2. Work: 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.

3. Rest: Non-work activity that occurs outside of a work environment that is conducive to mental and emotional relaxation. 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. Ideally, the rest period would include a six hour, or more, continuous period of sleep.

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 (as detailed in the Patient Safety Protocol), 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. For transport-capable vehicles, when at least one medically cleared Paramedic whose credential to practice is unrestricted in the Wake County EMS system and one other locally credentialed EMS technician are no longer available to staff and safely affect an emergency response, the EMS technician(s) staffing the vehicle should verbalize and seek acknowledgement from the communications center that the vehicle is out of service calls. This includes the illness/injury of a technician, a technician exceeding 24 hours of work without 8 hours break from such work (see below), or recognition that the technician is otherwise unfit to affect a safe response. This also applies if necessary to respond to an appropriate order to exit service for a specific administrative task (out of service admin).

c. In the following scenarios, units may mark out-of-service in addition to items mentioned in "b" above:

i. Unit assigned to patient care activity after scheduled shift change or to clear from an assigned coverage within 15 minutes prior to scheduled shift change: At the conclusion of the patient care activity, the unit may mark out of service in order to return to primary station for shift change. This is not permitted during ESTAT periods.

Readiness for Response

Policy (continued):

ii. Unit staffed with at least one technician that has completed 24 consecutive hours of work: The unit should check out of service at the conclusion of patient care activity and return to the primary station for shift change. During ESTAT, this will require authorization from the Shift Commander or Supervisor managing the ESTAT.

iii. Unit in the primary station at the time of scheduled shift change: If possible, personnel should remain at the primary station and be ready to respond. If personnel cannot remain past the scheduled shift change, this should be communicated with the appropriate supervisor and should verbalize and seek acknowledgement from the communications center that the vehicle is out of service calls. During ESTAT, this will require authorization from the Shift Commander or Supervisor managing the ESTAT.

d. 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.

e. A single responder using an ambulance may occur as follows. When a single medically cleared technician whose credential to practice is unrestricted in the Wake 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.

f. 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.

2. EMS technicians will verify that the mobile data terminal (MDT) in their response vehicle has evidence of connectivity to the automated vehicle location system and is “polling” with each movement of the vehicle that was not dispatched, and on completion of each non-dispatched travel segment.

3. As delineated above, no EMS provider shall work more than 24 consecutive hours. If the provider has worked 24 consecutive hours, there must be a minimum of 8 hours of rest prior to return to work.

4. In general, variances from this policy will not be approved. In extreme circumstances (such as invocation of the EMS Emergency Rule), specific, time-limited exceptions to this policy may be granted by the Medical Director or designee.

System Provider Reintegration

Purpose:

Providers engaging in patient care are responsible for demonstrating competency in skills, knowledge, and abilities detailed in the system protocols and procedures. This policy ensures that all providers who are separated from response capability due to illness, injury, FMLA, military service, or any other condition, have a smooth transition back to independent practice with competency commensurate with that of other locally credentialed providers.

Policy:

Providers must meet criteria, determined by the elapsed time the provider was separated from Wake EMS System response, before being reinstated as an independent practitioner. Providers in reintegration require supervised practice with a System Field Training Officer (FTO) and are only permitted to engage in patient care under the direct supervision of a FTO. Providers will have documentation of their performance completed in a Daily Observation Report (DOR). During that time, the FTO is responsible for ensuring that the provider is competent in their role as a practitioner. The FTO will make a recommendation to Professional Development when the provider has demonstrated competency and is ready to return to independent duty.

For providers separated from employment for greater than one year, this policy will not apply. Providers separated from employment for greater than one year will be required to reenter the system through the standard System Entry process.

3 - 6 months: Complete all CME that was missed. Complete, at a minimum, 3 shifts with a FTO.

6 - 12 months: Complete all CME that was missed. Complete, at a minimum, 7 shifts with a FTO.

12 - 18 months: Complete the clinical portion of the System Academy, including; skills, simulations, and exams. Complete, at a minimum, 14 shifts with a FTO. Upon recommendation from the FTO, the provider must successfully complete Release-to-Practice.

> 18 months: Complete the full System Academy. Complete, at a minimum, 14 shifts with a FTO. Upon recommendation from the FTO, the provider must successfully complete Operational Clearance and Release-to-Practice.

Procedure:

When given the authorization to return to work, providers must contact Professional Development to determine what credentialing requirements must be completed prior to returning to duty. Professional Development will verify the provider's State certification and official time separated from system response. Professional Development will then develop the provider's reintegration plan in accordance with this policy and meet with the provider to review and begin the reintegration process. Professional Development will notify the provider when the reintegration plan is complete, only then is the provider cleared to function independently, in accordance with their local credential.

Equipment Failure

Purpose:

To address and minimize the failure of equipment integral to patient care or mechanical failure of a transport vehicle. Each system 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 written clearance to do so is provided by the Office of Medical Affairs. 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.

7. As noted in the patient safety policy, a Wake EMS System Clinical Unusual Event Report shall be completed and forwarded to the Office of Medical Affairs as soon as practical after the failure. In all cases, this form shall be completed prior to the end of the shift of the personnel involved.

Airway: BIAD King

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.
- **WARNING: This airway may not prevent aspiration of stomach contents!**

Procedure:

1. Preoxygenate the patient. Consider the use of passive oxygenation before and during any airway management.
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. Once placement is confirmed, secure tube prior to movement/transport.
12. **It is required that the airway be monitored continuously through waveform Capnography and Pulse Oximetry.**

Certification Requirements:

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

Airway: BIAD-i-Gel

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. Utilize passive oxygenation (via nasal cannula) during any airway management.
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, and 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 resistance is met. Tape to secure or use a commercial tube holder.
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. **It is required that the airway be monitored continuously through Capnography and Pulse Oximetry.**
13. Re-verify i-Gel placement after every move and upon arrival in the ED
14. 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 Wake EMS System. Assessment should include direct observation once per certification cycle.

Airway: Surgical (Rusch QuickTrach)

Clinical Indications:

P PARAMEDIC P

- Surgical Airway as Indicated by the 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. Pre-oxygenate patient when possible. Utilize Passive Oxygenation via nasal cannula.
2. Assemble all available additional personnel
3. Locate cricothyroid membrane at the inferior portion of the thyroid cartilage (with head in neutral position, membrane is approximately 3 finger widths above the sternal notch).
4. Have assistant hold skin taunt over membrane and locate the midline.
5. Prep area with betadine if possible.
6. Hold the needle bevel up at a 90 degree angle, aimed inferiorly as you approach the skin.
7. Puncture the skin with the needle and continue with firm, steady pressure while aspirating for air with the syringe.
8. As soon as air is aspirated freely, stop advancing the needle/airway assembly.
9. Modify the angle to 60 degrees from the head and advance to level of the stopper.
10. Remove the stopper while holding the needle/airway assembly firmly in place. Do not advance the needle further. (NOTE: if the patient is obese and no air can be aspirated with the stopper in place, you may remove the stopper and continue advancing until air is aspirated. Be aware that without the stopper, risk of perforating the posterior aspect of the trachea is greatly increased.)
11. Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe.
12. Secure the cannula with the neck strap.
13. Apply the EtCO2 detector, then the connecting tube to the EtCO2 detector and connect the other end to the BVM.
14. Confirm placement with the use of breath sounds, pulse ox, and EtCO2.
15. Ensure 100% FiO2 to BVM via supplemental O2.

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 Wake EMS System.

Page 2 Airway: Surgical – Cricothyrotomy

(If Equipment Available and Authorized)

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. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Prep the area with an antiseptic swab (Betadine).
4. Attach a 5-cc syringe to an 18G - 1 & 1/2-inch needle.
5. Insert the needle (with syringe attached) perpendicularly through the cricothyroid membrane with the needle directed posteriorly.
6. During needle insertion, gentle aspiration should be applied to the syringe. Rapid aspiration of air into the syringe indicates successful entry into the trachea. Do not advance the needle any further. Attach forceps and remove syringe.
7. With the needle remaining in place, make a 1-inch vertical incision through the skin and subcutaneous tissue above and below the needle using a scalpel. Using blunt dissection technique, expose the cricothyroid membrane. This is a bloody procedure. The needle should act as a guide to the cricothyroid membrane.
8. With the needle still in place, make a horizontal stabbing incision approx. 1/2 inch through the membrane on each side of the needle. Remove the needle.
9. Using (skin hook, tracheal hook, or gloved finger) to maintain surgical opening, insert the cuffed tube into the trachea. (Cric tube from the kit or a #6 endotracheal tube is usually sufficient).
10. Inflate the cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube.
11. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, end-tidal CO_2 detector, etc.) Esophageal bulb devices are not accurate with this procedure.
12. Secure the tube.
13. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
14. Document size, time, result (success), and placement location by the centimeter marks at the patient's skin on/with the patient care report (PCR). Document all devices used to confirm 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.
16. **It is required that the airway be monitored continuously through waveform Capnography and Pulse Oximetry.**

Certification Requirements:

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

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 and/or feel “clicks” of bougie.
6. **Confirm and document tube placement using end-tidal CO_2 monitoring**
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. Apply waveform capnography monitor. After 3 ventilations, ETCO2 should be >10 or comparable to pre-intubation values. If < 10, check for adequate circulation, equipment, and ventilatory rate. If ETCO2 still < 10 without physiologic explanation, remove the ET Tube and ventilate by BVM.
10. Consider using a Blind Insertion Airway Device if intubation efforts are unsuccessful.
11. Apply end tidal carbon dioxide monitor (waveform Capnography) and record readings on scene, en route to the hospital, and at the hospital.
12. 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.
13. Place an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
14. **It is required that the airway be monitored continuously through Waveform Capnography and Pulse Oximetry.**

Certification Requirements:

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

Airway: Orotracheal Intubation

Using Video Laryngoscopy

Clinical Indications:

- Providers should utilize a **video laryngoscope** for ALL attempts at orotracheal intubation, unless orotracheal intubation is indicated and there is not a video laryngoscope available.

A	AEMT	A
P	PARAMEDIC	P

Procedure, using the McGrath MAC EMS video laryngoscope:

1. Prepare, ***POSITION*** and oxygenate the patient with 100% Oxygen. Power-on the VL device.
2. Select proper ET tube size for patient (and stylette or bougie); have suction ready.
3. Choose your blade. For most adults, a Mac 3 blade or a hyperacute "X-blade" is a good first choice. If using the "X-blade," a more rigid stylette is recommended versus using a bougie.
4. Whether you are using a traditional Mac blade or an X-blade, ensure that your stylette or bougie is curved to match and hold the curve of the chosen blade.
5. Using the VL device, "walk your way in" to the mouth/airway, using indirect (camera) views to recognize airway landmarks and place the tip of the blade into the vallecula. The McGrath MAC may also be used for direct laryngoscopy if needed, using traditional Mac blade technique. **Suction** the airway as necessary to achieve a good view.
6. Visualize vocal cords (Use Sellick maneuver/BURP to assist you). Pass the tube through the cords. Remove the stylette or bougie and inflate the cuff with 3-10cc of air. **TWO** intubation-credentialed providers must visualize (usually via indirect/camera view) the tube in final position with the stylette out and the balloon inflated before removing the VL device.
7. **Confirm and document tube placement using end-tidal CO_2 monitoring.** **Continuous monitoring via Waveform Capnography and Pulse Oximetry is required.**
8. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with BVM.
9. After 3 ventilations, ETCO2 should be >10 or comparable to pre-intubation values. If < 10, check for adequate circulation, equipment, and ventilatory rate. If ETCO2 still < 10 without physiologic explanation, remove the ET Tube and ventilate by BVM or BIAD.
10. Consider using a Blind Insertion Airway Device (BIAD) if intubation efforts are unsuccessful.
11. Place an NG or OG tube to clear stomach contents after the airway is secured with an ET tube. Follow usual documentation guidelines as with traditional intubation.

Video Laryngoscope use and care:

1. Power-down the device after tube confirmation, to conserve battery. A spare battery should be carried with the device; replace the battery when the time remaining is flashing on-screen.
2. Blades are single-use disposable. The entire device may be wiped down with non-bleach-based disinfectants. When significantly soiled, remove the battery and the device may be cleaned while completely submerged in a disinfectant solution.

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 Wake EMS System. Assessment should include direct observation at least once per certification cycle.

Airway: Intubation Nasotracheal

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

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

Procedure:

1. Premedicate the patient with nasal spray.
2. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage.
3. Preoxygenate the patient. Lubricate the tube. The use of a BAAM device is recommended.
4. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
5. Continue to pass the tube listening for air movement and looking for to and fro vapor condensation in the tube. As the tube approaches the larynx, the air movement gets louder.
6. Gently and evenly advance the tube through the glottic opening on the inspiration. This facilitates passage of the tube and reduces the incidence of trauma to the vocal cords.
7. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.
8. Auscultate for bilaterally equal breath sounds and absence of sounds of the epigastrium. Observe for symmetrical chest expansion. The 15mm adapter usually rests close to the nostril with proper positioning.
9. Inflate the cuff with 5-10 cc of air.
10. **Confirm tube placement using end-tidal CO_2 monitoring:** Apply waveform capnography monitor. After 3 ventilations, ETCO2 should be >10 or comparable to pre-intubation values. If < 10, check for adequate circulation, equipment, and ventilatory rate. If ETCO2 still < 10 without physiologic explanation, remove the ET Tube and ventilate by BVM.
11. Secure the tube.
12. Reassess airway and breath sounds after transfer to the stretcher and during transport. These tubes are easily dislodged and require close monitoring and frequent reassessment.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).
14. **It is required that the airway be monitored continuously through Capnography and Pulse Oximetry.**

Certification Requirements:

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

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 Wake 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 Wake 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

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.

It is required that continuous Capnography be used in place of or in addition to the use of an End-Tidal CO_2 detector.

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

	MR	
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 Wake EMS System.

Assessment: Adult

	MR	
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 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 Wake EMS System.

Pain Assessment and Documentation

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

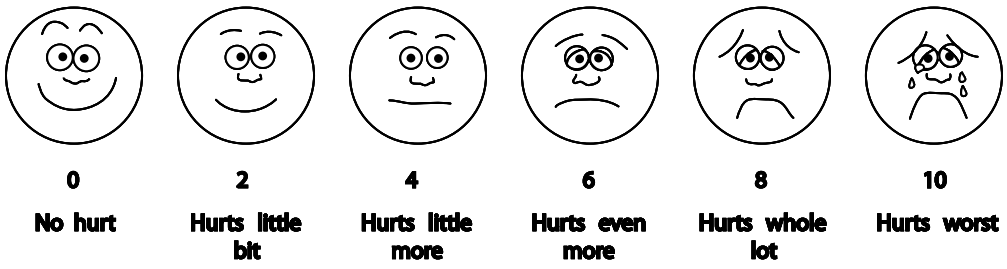
- Any patient with pain.

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.



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 Wake EMS System.

Assessment: Pediatric

	MR	
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. Classify using AGE and/or length based resuscitation tape. Refer to Wake EMS system age/ ideal weight app ("Handtevy") for med dosages.
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). 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.
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 Wake EMS System.

Blood Glucose Analysis

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patients with suspected hypoglycemia or hyperglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick or when possible simultaneously with intravenous access.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
7. Perform Quality Assurance on glucometers at least once every 7 days, if any clinically suspicious readings are noted, and/or as recommended by the manufacturer and document in the log.

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 Wake EMS System.

Capnography

B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Capnography shall be used when available with the use of all airway procedures including endotracheal, nasotracheal, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography shall be used with all airway management (including BVM) or any patient with respiratory distress, including all utilization of CPAP.
- Capnography should be used liberally to monitor patients in whom there is any concern about ability to protect the airway or respiratory status. Strongly consider capnography with use of opioid pain medications or benzodiazepines, and for any patient who is sedated either by medications or by underlying medical condition.

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 Wake EMS System.

Pulse Oximetry

	MR	
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 Wake EMS System.

Stroke Screen – Page 1
Step 1: Modified LA Prehospital

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Suspected Stroke Patient

Procedure:

1. Assess and treat suspected stroke patients as per protocol.
2. The Los Angeles Prehospital Stroke Screen (LAPSS) form should be referenced as necessary for all suspected stroke patients (see appendix). There are six screening criteria items on the LAPSS form- see below for Wake County-specific modifications.

3. Screen the patient for the following criteria:
   - For the utilization of this screen in the Wake County EMS System, there is no age cutoff; consider any age patient as "yes" for possible stroke. HOWEVER, there is no "CODE STROKE" process for pediatric (age less than 18) patients. If a pediatric patient screens positive for possible stroke, give this information during your usual call-in, but there is NOT an in-hospital "code stroke" response for pediatrics.
   - New onset of neurologic symptoms in last 24 hours
   - For the utilization of this screen in the Wake County EMS System, there is no ambulatory requirement; i.e. patients non-ambulatory at baseline can screen "yes" for possible stroke.

4. The final criterion consists of performing a patient exam looking for facial droop, unilateral grip weakness/absence, or unilateral arm weakness. If the patient has one of these exam components, they are POSITIVE for this Step 1 of the Stroke Screen.

5. If all of the LAPSS screening criteria are met ("yes" to all criteria, including at least one exam component OR if unknown), OR if the patient has slurred speech not related to alcohol or toxic ingestion or cannot talk, follow the EMS System Stroke Destination Plan and alert the receiving hospital of a possible stroke patient as early as possible.

6. If the patient is POSITIVE for this initial stroke screen, proceed to PAGE 2 of THIS PROCEDURE to complete a VAN assessment for possible large vessel occlusion.

7. Documentation of ALL stroke screening should be completed in your 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 Wake EMS System.

Stroke Screen – Page 2
Step 2 (*if Step 1 is positive): VAN

Clinical Indications:

- Suspected Stroke Patient with POSITIVE initial mLAPSS

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Procedure:

EMS VAN: Acute Stroke Screening Tool for Large Vessel Occlusion

STEP 1: Is ARM weakness present?

- If arm weakness is present, continue the VAN exam to Step 2 below.
- If arm weakness is absent, the patient is VAN NEGATIVE. Stop VAN exam.

STEP 2: Does the patient have Visual Disturbance, Aphasia, or Neglect?

- If the patient does NOT have Visual Disturbance, Aphasia, or Neglect, then the patient is **VAN NEGATIVE**

- If the patient has any degree of arm weakness PLUS ANY ONE of the following, this is likely a large artery blood clot (cortical symptoms) = **VAN POSITIVE**

1. Visual Disturbance: Assess for new onset blindness, double vision, or visual field cut by testing both sides, holding fingers at the periphery of their vision.

2. Aphasia: Does the patient have the inability to speak coherently (word salad) or understand your speech (repeat and name 2 objects, close eyes, make fist)

3. Neglect: Does the patient have a forced gaze to one side, or ignoring one side of the body? Touch both sides of the patient's body, can the patient tell you are touching them?

** Upon completion of the VAN test, use this information to help determine transport destination as per the **Wake County EMS Stroke Triage and Destination Plan**. Document your VAN score in your PCR, as well as the result of your initial stroke screening. As with ALL suspected stroke patients, limit scene time, make early notification to the destination facility, and realize that the MOST IMPORTANT element of the patient's history is the patient's LAST KNOWN WELL time. Communicate this information during your radio call-in to the destination 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 Wake EMS System.

Temperature Measurement

	MR	
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. Multiple methods of temperature management are acceptable; refer to manufacturer's instructions for these devices as necessary:
   a. For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (step 2 below).
   b. For adult or pediatric patients being evaluated for a suspected infectious disease, utilization of the touchless temporal thermometer is indicated (step 3 below).
   c. Alternative methods: for infants or adults that do not meet the criteria above, a tympanic temperature may be performed (step 4 below). Rectal temperature measurement (step 5) is also acceptable, as is esophageal temperature probe in the setting of induced hypothermia; follow the Gastric Tube Insertion procedure (Paramedic Only) to place the esophageal probe.

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 covering. Have the patient seal his or her mouth closed around 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).

3. To obtain a touchless temporal reading, point the device towards the patient's temple with the device 2-3 inches from skin surface (temporal artery reading) in an enclosed area without wind. Pull the trigger and the unit will beep and give an immediate reading. Additional readings may be obtained after 15 seconds.

4. To obtain a tympanic (ear) temperature, ensure there is no ear trauma, cover the thermometer with an appropriate cover, place the device gently in the external auditory canal, press the button and the unit will beep within seconds and provide a reading.

5. To obtain a rectal temperature, ensure the patient has not suffered any rectal trauma by history and/or brief exam as appropriate for patient's complaint. Cover the thermometer with an appropriate cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.

6. Record time, temperature, method (oral, tympanic, temporal, esophageal, 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 Wake EMS System.

Orthostatic Blood Pressure Measurement

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal precautions. Orthostatic vital signs are not routinely recommended.
- Patients ≥ 8 years of age, or patients larger than the length based 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, but may be helpful in some cases. Use per paramedic's discretion.

Procedure:

** If a patient experiences dizziness or pre-syncope upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic vitals examination should be omitted and fluid resuscitation initiated.

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.

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 Wake 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

Carboxy/Methemoglobin Monitoring

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Persons with suspected or known exposure to carbon monoxide or substance likely to produce methemoglobin.

Procedure:

- Apply probe to patient's middle finger or any other digit as recommended by the device manufacturer. If near strobe lights, cover the finger to avoid interference and/or move away from lights if possible. Where the manufacturer provides a light shield it should be used.
- Allow machine to register percent circulating carboxyhemoglobin or methemoglobin values
- Record levels in patient care report or on the scene rehabilitation form.
- Verify pulse rate on machine with actual pulse of the patient.
- 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.
- Document percent of carboxyhemoglobin or methemoglobin values every time vital signs are recorded during therapy for exposed patients.
- Use the pulse oximetry feature of the device as an added tool for patient evaluation. Treat the patient, not the data provided by the device. Utilize the relevant protocol for guidance.
- 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.
- Factors which may reduce the reliability of the reading include:
    1. Poor peripheral circulation (blood volume, hypotension, hypothermia
    2. Excessive external lighting, particularly strobe/flashing lights
    3. Excessive pulse oximeter sensor motion
    4. Fingernail polish (may be removed with acetone pad)
    5. Irregular heart rhythms (atrial fibrillation, SVT, etc.)
    6. Jaundice
    7. 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 Wake EMS System.

Advanced Practice Paramedic Wellness Check

Indications:
When patient safety needs to be ensured for patients who are evaluated by advanced practice paramedics for presumed non-urgent situations. This includes patients who are referred by other EMS providers, those identified by query of patient records, and those referred by external entities.

A	APP	A

Contraindications:
Any patient for whom an emergency medical condition exists that would normally be treated under another Wake EMS System protocol, policy, and/or procedure.

Procedure:

1) Ensure scene safety and at all times make RESCOM aware of your location. When possible, remain available for dispatch to high acuity calls.
2) Politely introduce yourself to the patient and family.
3) Determine the nature of the visit and record in electronic database (diabetes, CHF, falls prevention, pediatric asthma, high-risk refusal follow-up, or other).
4) For all patients, determine the name of the primary care physician. If one does not exist, utilize APP reference materials and communicate the available primary care physicians to the patient.
5) Assist all patients with medication compliance. If pill minders or refills are needed, note this in the electronic database. It is appropriate to communicate these needs with the primary care physician when possible. APPs may not pick up or in other ways transport prescription medications without specific authorization from medical control.
6) If the patient is diabetic, ensure daily blood glucose logs are being maintained. Asymptomatic patients with more than 2 consecutive blood glucose measurements above 300 should make contact with their primary care physician within 24 hours. A phone follow-up by the APP to ensure glucose is not rising is appropriate. If the blood glucose is rising by more than 50 mg/dL and/or any reading is above 500, transport to the emergency department shall be recommended.
7) If the patient has CHF, ensure the patient has a scale and is performing weight checks. Asymptomatic patients with unexplained weight gain of more than 4 pounds should be referred to their primary care physician within 24 hours.
8) For patients with concern over falls prevention, ensure there are no loose rugs, handrails are present on all steps, and restroom facilities have available hand rails and slip resistant surfaces in showers/bath tubs. If these items are needed, note this in the electronic patient care report.
9) For pediatric asthma patients, assure medications are available. If smoking in the home or potential pet allergens is identified, discuss this with the patient's family and include this in your electronic patient care report.

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 Wake EMS System.

Request for Alternative Destination

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Purpose:

The purpose of this policy is to:

- Give direction for providers who encounter patients with mental health and substance abuse crisis that may be better served by a receiving facility other than an emergency department.
- Establish an orderly method by which clinical issues can be rapidly addressed.

Procedure:

1. If a patient presents with primary substance abuse and/or mental health crisis (e.g., suicidal ideation without actual attempt), they should be evaluated on both the "Behavioral" and the "Well Person" protocols. If the patient is non-combative (and thus does not require medication from the Behavioral protocol) and successfully passes the Well Person screen, an Advanced Practice Paramedic (APP) on duty may be contacted; otherwise, the patient should be transported as per the usual and customary procedures. See the Wake EMS Patient Disposition policy regarding transport of patients who may lack capacity and/or are a danger to themselves or others.

2. After contact with the APP, the originally responding EMS crew will maintain appropriate clinical contact and monitoring of the patient until the APP arrives. If response of the APP is delayed, the EMS crew and APP will communicate via phone or radio and determine the most appropriate treatment plan and destination for the patient.

3. Until an appropriate destination for the patient has been determined, the patient will not be left unattended by EMS personnel.

4. Once the screening exam by the APP is complete, the patient may be referred to Wakebrook Crisis and Assessment ("Wakebrook," formerly CAS), Holly Hill Hospital, Healing Transitions of Wake County, or other approved alternative destination facility (provided the patient meets the facility's screening criteria) via appropriate transportation. If law enforcement or other means of transportation are not available, the patient may be transported as a "request for service" non-billed transport to the alternate destination. Patients transported to Holly Hill and CAS require the APP to complete a APP CIP form.

5. If the patient's condition is determined not to be appropriate for transport to a destination other than an emergency department, or the patient refuses the recommended alternative destination, transportation to a receiving emergency department by a Wake County EMS System ambulance shall be offered.

6. Where transportation to a non-emergency department destination is deemed to be appropriate and the patient accepts that destination, the APP will be responsible for primary documentation of the patient encounter if the APP physically evaluated the patient on scene. If the APP did not physically evaluate the patient, all providers should document in accordance with the "documentation with multiple providers" policy.

Fire and Technical Rescue Scene Response

EMS responds to structural fire and technical rescue incidents to address three distinct needs in the "Cold" and "Warm" zones:

	MR	
B	EMT	B
I	EMT- I	I
P	EMT- P	P

1. Treatment of the ill or injured responder
2. Provision of care for victims of the incident
3. Provision of responder rehabilitative/preventive medical assistance during extended incidents

An EMS ambulance shall be dispatched to these scenes to serve as an evaluating (rehab) unit for the fire or rescue agency managing the scene. These responses include, but are not limited to incidents where responders will be:

- Working on the scene for more than an hour.
- In the presence of weather that will exceed 90 degrees F or be below 10 degrees F.
- Expected to use SCBA for approximately 45 minutes or more before the scene is under control, or are using supplied air respirators for any duration.

The initial response shall be one ALS Ambulance as directed by Emergency Medical Dispatch priority. It is acceptable for the responding EMS Resource(s) to monitor the radio traffic of the first-in Fire/ Rescue Resource and cancel and/or downgrade response as appropriate. If the scene is known or suspected to have incident victims, additional transport ambulance resources should be requested in numbers sufficient to address victim needs and prevent unnecessary delays in addressing rehabilitative/preventive medical needs of responders.

An EMS District Chief is automatically dispatched to declared working fires. For more complex or extended incidents, give consideration to requesting a second District Chief and the Major Operations Support Unit (MOSU). A Medical Director may be requested to respond and assist with rehab assessment if needed.

If any firefighter or other victim requires transport to the hospital, an additional ALS ambulance will be dispatched to assume the rehab duties at the fire scene. Personnel on the scene will determine the level of response for the second ambulance (e.g., lights and siren vs. no lights and siren).

Transport of an injured firefighter or other victim will not be delayed while waiting for a second ambulance to arrive. If there is an urgent need for ALS personnel on the scene, the second ambulance should be dispatched with lights and siren and the injured party transported without delay. In most all circumstances, the EMS Supervisor and/or the Medical Branch Director will be present to render aid while awaiting the second ambulance.

Where specialized care for patients or responders is potentially needed in the "hot zone" of technical rescue incidents, request specialized USAR/HazMat paramedics.

(continued next page)

Fire and Technical Rescue Scene Response (continued)

Routine Working Fires/Technical Rescue Incidents

For a routine working fire or technical rescue incident, an EMS District Chief will be dispatched. The following actions are expected of the first arriving transport unit to these events:

1. Park close to the incident to allow for rapid removal and transportation of injured persons. In choosing a location, do no impair the ability of apparatus to depart or access the scene or fire hydrants. Work to establish clear means of egress even as other units respond.
2. Initial actions:

a. If a victim is known, and has been removed from the hazard zone, initiate care for the victim and request appropriate supplemental resources to respond.
b. If a victim has been removed to a "warm zone," don full turnout gear, initiate care for the victim, and request appropriate supplemental resources to respond.
c. If no victim is known or suspected, and the EMS District Chief is not yet on scene all EMS technicians shall don full turnout gear, load the stretcher with medical equipment (to include cardiac monitor, oxygen, ALS medications, suction, immobilization equipment and burn sheets) and report with equipment to the incident command post.
d. As directed by the incident commander or arriving EMS District Chief, prepare the medical rehab area and screen responders as directed in the incident rehabilitation protocol.

As a matter of practice, at least one crew of EMS responders will remain in turnout gear, conspicuous and in proximity of the command post to provide a rapid medical intervention team whenever fire suppression or technical rescue activities are ongoing. If additional EMS personnel are assigned to a rehab function, they should also remain conspicuous, and in proximity of the rehab area through the duration of the event. It is recognized that a large number of fire service injuries and deaths occur during post-incident activities including salvage, overhaul, and take up. It is expected that EMS technicians will continue to be conspicuous and provide incident support through all phases of response unless directed otherwise by through the incident management system.

Major Working Fires

Upon declaration of a major working fire, ensure additional resources to total three ALS ambulances, two EMS District Chiefs, and the EMS Major Operations Support Unit (MOSU). In addition to the actions identified for the "routine" working incidents above, the following actions are expected:

1. First arriving District Chief reports to the command post as medical branch director (if necessary, take verbal report from previous medical branch director). Dons the MEDICAL vest.
2. Take actions to secure a good parking location for the MOSU.
3. REHAB- at least 2 ALS ambulances and the MOSU. Second arriving District Chief or a Senior Paramedic will assume the Rehab Unit Supervisor role, and will don the REHAB vest.
4. Work to assure clear ingress and egress for responding ambulances.
5. Assure on-going supply of ice, water, and flavorings.
6. Advise the IC with regards to ongoing hydration, nutrition needs, etc.
7. Consider the need for portable toilets early (contact Emergency Management). These requests are often not processed as quickly as the kidneys process fluids.
8. Assign a scribe to MEDICAL when possible.
9. Send an EMS Chief Officer to the RWECC for system status control and consideration of out-of-county mutual aid as necessary, and ensure EMS command staff have been notified.

12 Lead ECG and CODE STEMI Activation

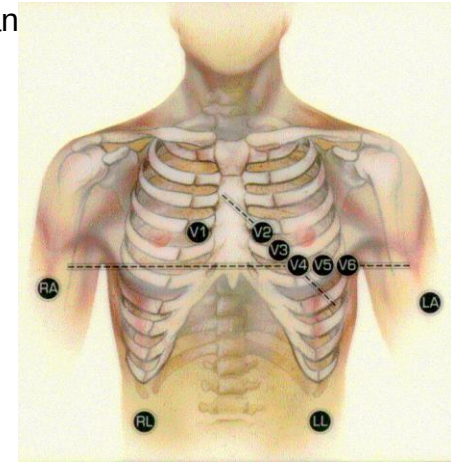
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications for 12 lead ECG:

- Suspected cardiac patient or Suspected Stroke Patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope
- Any patient age 35 or over with chest pain

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 lan
   - 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 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 ACR.
15. Document the procedure, time, and results on/with the patient care report (PCR)

16. Go to the next page for procedures regarding suspected STEMI

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 Wake EMS System.

12 Lead ECG page 2
EMS CODE STEMI: Cath Lab Activation

Clinical Indications:

- Suspected ST-Elevation MI (STEMI), based on patient condition and ECG

Procedure:

P EMT- P P

1. Enter the first 5 letters of the patient's last name in the "patient last name" field, and transmit diagnostic 12-lead ECG; transmit multiple ECGs as necessary:
    a. Press "Transmit", then "Data", Select "12-lead X" as Report, Select Site of *REX IP or WAKE IP,* and Select "Send"

2. Obtain the following information *before* your radio call in:
    a. Patient age and gender
    b. Patient cardiologist and preferred STEMI hospital (if present)
    c. Clinical presentation, history, symptoms that suggest this is an acute cardiac event
    d. What are the 2 or more anatomically contiguous leads with 1 + mm ST elevation, (SEE CHEST PAIN PROTOCOL for STEMI localization tool)
    e. Is there a **LBBB not known to be old?**
    f. Absence or **presence of LVH**
    g. Absence or **presence of profound tachycardia (heart rate >129)**
    h. Absence or **presence of pacemaker activity**
    i. Was the patient **resuscitated from cardiac arrest but does not have obvious STEMI?**

3. If patient has 1+ mm of ST elevation in two anatomically contiguous leads and none of the characteristics in red above, call a CODE STEMI to the hospital. If any of the characteristics in red are present do NOT call "Code STEMI." Instead, transmit the 12-lead for physician consultation; be sure to communicate the need for physician consult due to concern for possible STEMI.

4. Give your standard radio call-in including the following information:
- This is EMS (unit #) enroute with a CODE STEMI patient, ETA (X) minutes
- The 12-lead (has been/could not be) transmitted.
- Clinical presentation suggesting acute event: Chest Pain, Shortness of Breath, diaphoresis, etc.
- (X) mm of ST segment elevation are present in leads (X,Y…), with reciprocal depression in (X,Y…) (SEE CHEST PAIN PROTOCOL FOR LOCALIZATION TOOL) *OR* patient was resuscitated from V-fib/VTach arrest and now has evidence of STEMI.
- There is no LVH noted.
- The patient has no pacemaker (or no pacer spikes are present).
- (He/She) is a patient of Dr. (X) (or has no cardiologist).
- Provide patient's name and DOB if requested (Not A HIPAA Issue)

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 Wake 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 Wake 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 (only significantly symptomatic ectopy)

Procedure:

1. Attach standard four-lead monitor.
2. Apply defibrillation/pacing pads to chest and back:
   - One pad to left mid chest next to sternum
   - One pad to mid left posterior chest next to spine.
3. Rotate selector switch to pacing option.
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
5. Note pacer spikes on EKG screen.
6. Typical mechanical capture thresholds are 50-90mA, but may vary widely. NOTE:
   - For critically ill patients (e.g. hypotension, peri-arrest, unconscious), start pacing attempts at maximum current output. For critically ill patients, the most important step in pacing is to immediately ensure mechanical capture at whatever mA is required. Once mechanical capture is confirmed by a palpable pulse at the rate consistent with “electrical capture” on the monitor, current may be slowly decreased and set at 10-20 mA above mechanical capture threshold.
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 Wake EMS System. Assessment should include direct observation at least once per certification cycle.

Cardiopulmonary Resuscitation (CPR)

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Basic life support for the patient in cardiac arrest

Procedure:

1. Within 10 seconds, assess the patient's level of responsiveness, (shake and shout), assess for normal breathing, and check pulse.
2. If the patient is not breathing normally, check for carotid pulse in adults and older children, brachial pulse for infants. If no pulse or if you are unsure if there is a pulse, begin continuous chest compressions based on chart below:

Age	Location	Depth	Rate
Infant	Over sternum, between nipples (inter-mammary line), 2-3 fingers	1.5 inches (at least 1/3 AP diameter of chest)	Approx 120/minute
Child	Over sternum, just cephalad from xyphoid process, heel of one hand	2 inches (at least 1/3 AP diameter of chest)	Approx 120/minute
Adult	Over sternum, just cephalad from xyphoid process, hands with interlocked fingers	At least 2 inches	Approx 120/minute

4. If patient is an adult, go to step 5. If no respiratory effort in a pediatric patient, ensure open airway and give two ventilations. If difficulty with ventilations, consider Airway Obstruction Procedure. Minimize interruptions in compressions.
5. Go to Cardiac Arrest Protocol. Continue continuous chest compressions and begin ventilations as directed in the age appropriate Cardiac Arrest Protocol.
6. Provide approximately 8 - 10 breaths per minute with the BVM (1 breath every 6 seconds). 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) are allowed for rhythm analysis, defibrillation, and 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 Wake EMS System.

Cardiac: Defibrillation-Automated

	MR	
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; if unavailable, use adult pads.

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 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 Wake EMS System. Assessment should include direct observation at least once per certification cycle.

Cardiac: Defibrillation-Automated CR2 Device

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patients in cardiac arrest (pulseless, non-breathing).
- Age – device can be used on any age patient with the installed set of pads; if patient < 12 years of age, depress the Baby icon button after opening

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. Open the case to activate the device. Apply defibrillator pads preferably in Anterior-Posterior (YELLOW pad to back and RED pad to left-center chest) or Anterior-Lateral 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 patient is less than 12 years of age, press the Baby icon button.
5. **Do Not Stop CPR** for rhythm analysis.
6. Defibrillate if appropriate when prompted by depressing the “shock” button. **Assertively state “CLEAR” and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.**
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation. The CR2 can analyze the rhythm through CPR and defibrillate if indicated.
9. **Do Not Stop CPR** for rhythm analysis.
10. Continue CPR and following the guidance from the device until a LP15 arrives at the patient side.
11. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.**
12. **If pulse returns please use the Post Resuscitation Protocol.**
13. With the arrival of a LP15 device, disconnect the CR2 pads from the CR2 device by pulling the clear tab in the center of the AED pad tray to remove the connector and then attach to the therapy cable of the LP15.

Cardiac: Defibrillation-Automated CR2 Device

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Data Transfer:

- After device is removed from the patient, replace the CR2 pads and close the lid.
- The device will wirelessly connect to the network and upload all patient encounter information to the Cloud to the proximity of any EMS vehicle or any County Fire vehicle.

Certification Requirements:

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

Device Specific Information:

- The CR2 has cprINSIGHT which allows chest compressions to continue during ECG analysis.
- The CR2 has an integrated metronome that is set for 100 compressions per minute. Crews should attempt to follow the usual separate metronome at 120 compressions per minute but if this is too distracting and affecting CPR quality, crews may follow the CR2 metronome.
- The CR2 pads are functional for both adult and pediatric patients. These pads are also fully functional with the LP15, **HOWEVER standard LP15 pads will not work with the CR2.**
- After each use, a new set of CR2 pads should be connected to the device.

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. Apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles (if only paddles are available), to the patient's chest in the proper position. Apply an appropriate conductive agent if paddles are to be used.
   - Pads: anterior-posterior (AP) position is preferred, vs. antero-lateral position if AP cannot be quickly and easily obtained
   - Paddles: right of sternum at 2nd ICS and anterior axillary line at 5th ICS

   For patients with implanted pacers/defibrillators, pads or paddles 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 **shock button** for hands free operation. If using paddles, press the dicharge button(s).
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 Wake EMS System. Assessment should include direct observation at least once per certification cycle.

Cardiac: Defibrillation-Dual or Double

Clinical Indications:

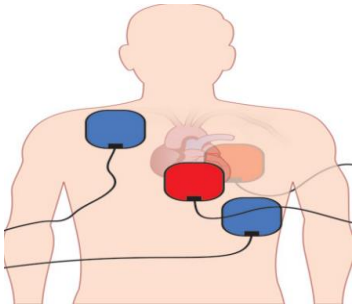
P PARAMEDIC P

- Any patient who has persisted in ventricular fibrillation/tachycardia, without even transient interruption of fibrillation, as per the persistent VF/VT protocol.
- Refractory ventricular fibrillation or pulseless ventricular tachycardia where ≥ 3 shocks delivered.
- At least one shock was delivered using different pads applied so as to produce a different current vector than the first set

Procedure:

1. Ensure ongoing high quality CPR that is interrupted only when absolutely necessary.

2. Prepare sites for second pad set attachment and apply defibrillation pads as per the VF/VT protocol.



- Pads: First defibrillator pads preferred in AP position, with anterior pad just to patient's left of sternum (red pads in diagram)
- Pads: Second defibrillator pads in AL position, with anterior pad to patient's right of sternum and lateral pad at the patients left anterior axillary line (blue pads in diagram)
- Ensure pads are not in contact with one another.

For patients with implanted pacers/defibrillators:
Avoid placing paddles or pads directly above device.

3. Set the appropriate energy level and assure controls for both defibrillator / monitors are accessible to provider performing defibrillation.
4. Follow procedure outlined in the VF/VT protocol. If refractory or persistent VF/VT continues:

***Charge the defibrillators to the selected energy level; Continue chest compressions while the defibrillator is charging.**

5. 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. Push both defibrillator shock buttons simultaneously.**

6. 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.
7. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm, as per VF/VT protocol.
8. 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 Wake EMS System. Assessment should include direct observation at least once per certification cycle.

Mechanical CPR – LUCAS – Page 1

B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications for Mechanical CPR:

- Adult medical cardiac arrest patient when the decision to transport to the ED has been made. This includes patients with ROSC (device should be placed in case of re-arrest) and without ROSC (code cannot be discontinued on scene for any reason).

Procedure:

1. Single responder brings the device to patient's side next to person performing chest compressions.

2. Case side handle should face provider in charge of device application; unzip and POWER-ON device.

3. Remove back plate from the case and place towards patient's head; remove neck strap from the case and place nearby.

4. The device will be placed on the patient using a three step process that occurs during a ~five second rhythm check (STEP I), the subsequent two minute CPR period (STEP II), and the next ~five second rhythm check (STEP III):

STEP I: At the end of a two minute CPR cycle, pause compressions for rhythm check and defibrillate if indicated. IMMEDIATELY AFTER shock (or no shock) compressors and single responder should lift the patient's torso and place the backplate underneath the patient (drawing an imaginary line between the center of both backplate connector poles and the center of the sternum where the compressors' hands are in correct position). Resume manual compressions, minimizing pause time to less than ten seconds.

STEP II: While compressions are ongoing, adjust defib pads if necessary to minimize overlap of the suction cup; some overlap is ok and will likely occur. Adjust patient's arms above head, or out of the way of the device. The single responder should remove LUCAS from case by the handles (pull and release the release rings once) and ensure the control panel is facing the single responder. Lock only the side of the device closest to the single responder into the backplate.

STEP III: At the end of the two minute CPR cycle, pause compressions for a rhythm check and defibrillate if indicated. IMMEDIATELY AFTER shock (or no shock), rotate the device across the patient's chest and lock the second side of the device into the backplate (this may require the assistance of the person in pit crew position two). Using your hand, check that the lower edge of the suction cup is just above the end of the sternum. If necessary, scoot the device/backplate into a better position. Lower the piston/suction cup to the patient's chest and PRESS PAUSE (2). The device will slightly adjust the suction cup to the correct start position. PRESS PLAY(3) top-continuous to initiate LUCAS compressions. Minimize total pause time to less than ten seconds.

*If the device will not lock into the back plate, adjust patient position as necessary. If the device will not lock, or the device alarms when attempting to adjust the piston/suction cup, immediately resume manual compressions. (see next page for information on clearing any ALARM).

5. Check device placement during operation, ensure suction cup is compressing in the appropriate position. Apply neck strap. Using marker, mark position on chest at top and bottom of suction cup. Secure patient's wrists and/or forearms, considering flow/position of any IV or IO. *** GO TO NEXT PAGE ***

Mechanical CPR – LUCAS – Page 2

Procedure (continued) :

6. Ensure compression cycles remain every two minutes. Coordinate use of stopwatch with LUCAS using usual cardiac arrest checklists and protocols. Press PAUSE (2) to check rhythm, defibrillate as necessary, or press PAUSE (2) if a pulse is found at a rhythm check.

* If a patient obtains ROSC with the device already on, leave the device in pause mode for transport and monitor closely for re-arrest per usual cardiac arrest protocols. The device will power down if "paused" for several minutes. In the case of re-arrest, you may need to power-on, lower piston, press PAUSE (2) for final adjustment, then press PLAY (3) to re-initiate compressions.

* If ROSC is obtained prior to device arrival, apply the device when it arrives, adjust piston and press PAUSE (2), but DO NOT press PLAY (3). The device will power down if "paused" for several minutes. In the case of re-arrest, you may need to power-on, lower piston, press PAUSE (2) for final adjustment, then press PLAY (3) to re-initiate compressions.

7. A device may be used **IN-HOSPITAL** for a time. If the device is in-use on a patient at the hospital, the single responder should offer to stay with the patient and operate/troubleshoot the device. The patient and medical decision making are in care of the HOSPITAL TEAM. If necessary, leave your device and equipment on the patient with the care team and pick up a new device at a LUCAS storage location; see page 4 for post-use procedures. If death is pronounced in the ED and/or the hospital care team requests removal of the device for any reason, remove it and decon as per page 4 of this procedure.

** See next pages for QUICK REFERENCE GUIDE for Application and Use (this document is also stored with the LUCAS device) and Additional Tips and POST-USE PROCEDURES

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 Wake EMS System.

LUCAS Quick Reference Guide for Application and Use

- INDICATED for adult medical cardiac arrest patients who need to be transported to the ED

- CONTRAINDICATED for pediatrics, trauma, or unable to fit the device properly

STEPS to apply and use the device:

1. Single responder brings device to patient's side. Unzip and power-on device.

2. Remove back plate from the case and place towards patient's head; remove neck strap from case and place nearby.

3. As the end of a two minute CPR cycle approaches, prepare to place the backplate under the patient. Placing the backplate will occur during the pause AFTER rhythm check (and defibrillation if necessary).

4. IMMEDIATELY AFTER shock (or no shock), lift the patient's torso and place the backplate underneath the patient's upper back. Immediately resume manual compressions.

5. Adjust defib pads as necessary to minimize overlap between suction cup and pads.

6. Adjust patient's arms above head, or out of the way of the device

7. Remove LUCAS from case by the handles and pull one time on the release rings.

8. Ensure that the control panel is facing the single responder and lock the side of the device closest to the single responder into the back plate.

9. At the end of the 2-minute CPR cycle, pause to check rhythm and defibrillate as indicated.

10. IMMEDIATELY AFTER shock (or no shock), lock the second side of the device into the backplate.

11. Using your hand, check that the lower edge of the suction cup is just above the end of the sternum.

12. Lower piston/suction cup to the patient's chest and press PAUSE (2); the device will slightly adjust.

14. Press PLAY (3 top- continuous) to initiate LUCAS compressions

15. Apply neck strap and secure patient's wrists/forearms, considering flow of any IV or IO.

16. Ensure suction cup is compressing in appropriate position and mark position on chest with marker.

17. Ensure compression cycles remain every 2 minutes, pressing PAUSE (2) to check rhythm at the end of each cycle. Follow usual cardiac arrest protocols and checklists.

LUCAS Quick Reference Guide: Additional TIPS and POST-USE PROCEDURES:

I. A fully-charged **BATTERY** should last for about 45 minutes of continuous compressions. **DO NOT let the battery go all the way dead** and shut-off the device. If battery shows **"one bar,"** change battery during a rhythm check. To change, PRESS PAUSE (2) (rhythm check, defib if indicated), remove low battery using "out and up" technique, and replace with charged battery. PRESS PLAY (3) to resume compressions.

II. The device makes two distinct **ALARMS** indicating it cannot deliver compressions:

* High-pitched continuous chiming when lowering the piston indicates the patient is too small for the device. Immediately remove the device and resume manual compressions.

* Loud warning tone and flashing red alarm light on the control panel indicates interference with the piston. **Press and hold the power button while removing and immediately replacing the battery.** The piston will return to the prior setting. Press PAUSE (2) then PLAY (3) to resume compressions. If alarm is unable to be cleared, remove the device immediately and resume manual compressions.

III. A device may be used **IN-HOSPITAL** for a time (see page 2). If necessary, leave your device and equipment on the patient with the care team and pick up a new device at a LUCAS storage location. Notify the Shift Commander and EMS Logistics by email: 1) where your left a device at, and 2) where you took a spare device from, including the device numbers. This will allow the original device to be retrieved and returned to the appropriate location. Whoever retrieves the used device from the hospital should TRANSMIT as below.

IV. AFTER EACH USE, please do the following:

1. Upload data: With the device in Power OFF mode and near an EMS System Cradlepoint device (currently the ambulance-based WiFi- no other network will work), press the TRANSMIT key (top right corner). The lights next to the key will blink. Once transmission is complete the device will turn off.

2. Decon: Using Purple Top wipes provided by EMS, wipe down device surfaces and perform basic decon. Inspect the SUCTION CUP after use. To remove cup for inspection, lay device so cup is facing away from you. Peel off pressure pad. If there is visible contamination, decontaminate with hot soap and water, disinfect with a purple top wipe, and allow to air dry Check the cup for tears, holes, and suction (test to table). Reapply the cup if functional, or apply a new cup as necessary. Spare cups will be available with the AC charger at each LUCAS storage location (ESEC Warehouse, Fairgrounds, East Raleigh stations).

3. If the used device CAN go back into service after basic decon, swap your used batteries for fully charged batteries (in desktop chargers) at the LUCAS storage locations . DOUBLE CHECK that you have TWO FULLY CHARGED batteries before the device is in service. If the batteries in the desktop chargers are still charging from a recent use, take the two batteries from the spare LUCAS and its case, put one dead battery into the spare LUCAS to charge, and leave the other dead battery next to the chargers. Notify the shift commander and EMS logistics by email of the location so all batteries can be charged.

4. If the used device CANNOT go back into service after basic decon for any reason (e.g. will not operate, broken, unable to be decontaminated), swap the device and its used battery for a spare device with fully charged battery in the device and extra charged battery in the case at one of the LUCAS storage locations. CLEARLY MARK the device as non-functional with an out of service tag/note, and plug it in to charge. Notify the shift commander and EMS logistics by email of the device number and location so that it can be retrieved/serviced.

- There will be no need to charge these devices while stored on a vehicle. Upon inspection, should you find one of the two batteries has lost some/all charge, replace the battery with the spare and then replace the drained battery as you would post-use with a battery from an AC charger.

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 Wake EMS System.

Parenteral Access: Venous Blood Draw

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Collection of a patient's blood for laboratory analysis
- Blood draws may be requested from time to time by law enforcement as per state statute. These requests should be referred to the nearest on-duty APP.
- Patient is an ACUTE STROKE patient and is getting pre-hospital blood draw to facilitate expeditious care at the hospital.

Procedure:

1. Utilize universal precautions as per OSHA.
2. Select vein and prep as usual. Have all supplies ready prior to initiating the IV stick.
3. Select appropriate blood-drawing devices (Vacutainer holder, adapter, lab tubes).
4. Place a venous tourniquet and insert the IV needle-catheter device into the skin. Advance the catheter and leave the tourniquet in place for drawing blood.
5. Attach the vacutainer adapter and device to the catheter hub. Draw blood by pushing the lab tubes onto the needle inside the vacutainer- blood should flow easily into the lab tube. Allow to fill until flow ceases. Repeat as needed; once each tube is filled, rock gently end over end 8-10 times to ensure that the tube additive is well mixed with the blood in the tube.
6. Draw the appropriate type and number of tubes of blood for indicated lab testing (***for stroke patients, draw tubes in alphabetical order***).
7. Once blood drawing is complete, remove tourniquet, occlude vein, and insert IV tubing or saline lock onto the catheter hub and refer to the venous access procedure.
8. **Assure that the blood samples are labeled with the correct patient information** (if the tubes are not properly labeled, they may not be usable at the hospital!) Label with the patient's name, along with the date and time the sample was collected, and the initials of the EMS provider that collected the blood.
9. Deliver the blood tubes to the appropriate individual at the emergency department.

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 Wake EMS System.

Parenteral Access: Central Line Maintenance

Clinical Indications:

P PARAMEDIC P

- Transport of a patient with a central venous 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 line if that line has already been accessed and the patient is currently receiving medications or fluids through the line.
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 and do not use the line.
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 Wake 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:

* EMS providers should avoid accessing subcutaneous ports or lines that require special equipment not usually utilized in EMS continuing education (ex. Huber needle access for port-a-caths). If these devices are ALREADY accessed (i.e. EMS personnel can give medications or fluids via usual luer lock or similar device) then these lines may be used as per this procedure.

* For patients in cardiac arrest or in extremis, recall that IO access may be faster and more efficient than attempting to access a line that you are unfamiliar with.

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 Wake 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.
- For critically ill patients, consider IO access in addition to or instead of an EJ attempt.
- External jugular cannulation may 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. Compressing or "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 Wake 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 Wake EMS System.

Parenteral Access: Intraosseous

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patients where rapid, regular IV access is unavailable with any of the following:
- Cardiac arrest.
- Multisystem trauma with severe hypovolemia and/or a significantly burned patient with no IV access.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / Respiratory arrest.
- Any other immediately life-threatening, peri-arrest clinical condition in which IV access is unobtainable.

Contraindications:

- Fracture or large open wound proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient >12 years of age, identify the anteriormedial aspect of the distal tibia (2 cm proximal to the medial malleolus). Proximal humerus is also an acceptable insertion site: for patients > 40 Kg, lateral aspect of the humerus, 2 cm distal to the greater tuberosity. Distal Femur is also an acceptable insertion site in pediatrics; just proximal (0.5-1cm) to the patella, and approximately 1-2cm medial to midline.
3. Prep the site 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 larger needle for the proximal humerus. The smallest needle is only intended for use in neonatal patients.
6. Remove the stylette and place in an approved sharps container.
7. 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.
8. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
9. Stabilize and secure the needle with dressings and tape or a commercial needle holder if available.
10. Paramedic may administer 10 to 20 mg Lidocaine (1 to 2 mL of 2% Lidocaine at 20mg/mL) in adult and pediatric patients who experience infusion-related pain. Follow current drug reference for dose and volume information by age/weight of patient. For adults, this may be repeated prn to a max of 60mg (6mL); follow drug reference for pediatrics.
11. Following the administration of any IO medications, flush the IO line with 10 mL of IV fluid.
12. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

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

Parenteral Access: LifeFlow

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Any patient being treated on the Suspected Sepsis protocol (UP-15) in whom fluid delivery is indicated.

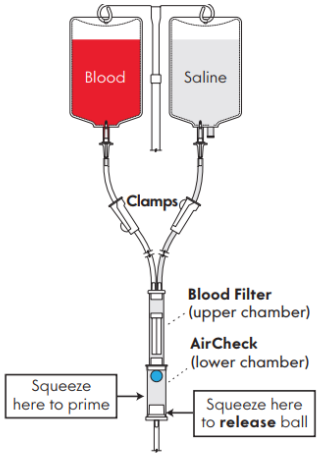
Procedure:

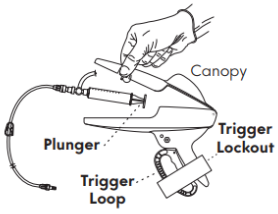
1. Establish usual IV or IO access. LifeFlow may not be used with an external jugular (EJ) catheter.
2. Refer to the LifeFlow In-Service Training Guide (in device packaging) for further instructions as necessary.

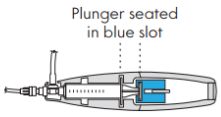
CAVEAT: As per our training, we are not using Lifeflow to deliver blood products. In the diagram below, imagine there is not a "blood" bag, and leave the "blood" clamp closed throughout use of the device.

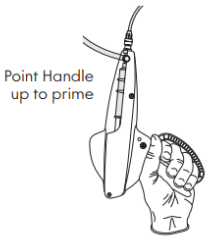
SET UP

- ☐ Close both clamps
- ☐ Spike saline and blood bags
- ☐ Open saline clamp
- ☐ Squeeze the middle of AirCheck® to prime
- ☐ Squeeze until fluid is halfway up the Blood Filter (upper chamber)
- ☐ Release ball if necessary
- ☐ Open canopy – squeeze tabs
- ☐ Load syringe into Handle
  - ○ Numbers up
  - ○ White plunger into blue slot
  - ○ Demonstrate correct and incorrect methods
- ☐ Point Handle up and cycle Trigger Loop until syringe and tubing are primed



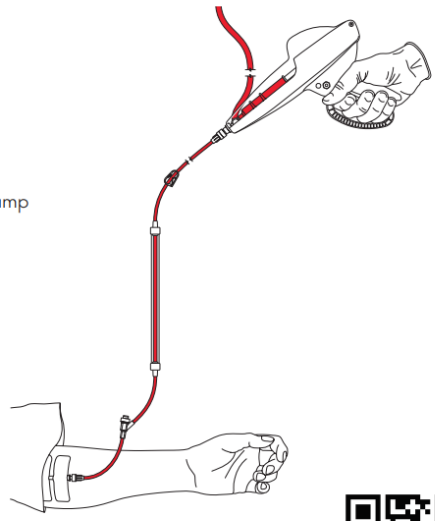






USING LIFEFLOW PLUS

- ☐ Attach to vascular access
- ☐ Monitor IV patency on first pulls and throughout infusion
  - ○ Watch and feel for infiltration
- ☐ To infuse blood, close the saline clamp and open the blood clamp
- ☐ Infuse by repeatedly squeezing the trigger loop
- ☐ Stop infusing when a small volume of fluid remains in the bag
- ☐ Close clamp
- ☐ Spike new bag and open clamp
- ☐ Squeeze lower chamber to prime
- ☐ Continue infusing



TRAINING VIDEO

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 Wake EMS System.

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, BIAD, tracheostomy tube, or a cricothyrotomy tube.

Procedure:

1. Ensure suction device is in proper working order.
2. Preoxygenate the patient if you are able. Utilize passive oxygenation.
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 Wake EMS System.

Respiratory: Suctioning-Basic

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 if you are able. Utilize passive oxygenation.
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 Wake EMS System.

Standards Procedure (Skill) Respiratory Section
Respiratory: NIPPV
(Non-Invasive Positive Pressure Ventilation, aka "CPAP" or "BiPAP")

B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Non-Invasive Positive Airway Pressure (NIPPV) is indicated in all patients in whom inadequate ventilation is suspected and who have adequate mental status and respiratory drive to allow NIPPV to function. Distress could be due to Pulmonary Edema, CHF, COPD, Pneumonia, Asthma, or other cause.
- Continuous and/or Bi-Level Positive Airway Pressure may be used, as available.

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:

Continuous pressure device:

5 – 25 cmH_20 for Pulmonary Edema, CHF, COPD, Asthma, Drowning, possible aspiration, or pneumonia. For COPD/asthma/pneumonia, **5 cmH_20** is often effective; the risk of increasing PEEP and increased thoracic pressure (and "auto peep") in these patients should be considered.

Bi-Level pressure device: 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. Many patients will require significant coaching and frequent reassessment for device success. 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.

Respiratory: Respirator Operation

A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Transport of an intubated patient

Procedure:

1. Confirm the placement of tube as per airway protocol.
2. Ensure adequate oxygen delivery to the respirator device.
3. Preoxygenate the patient as much as possible with bag-valve mask.
4. Remove BVM and attach tube to respiration device.
5. Per instructions of device, set initial respiration values. For example, set an inspiratory:expiratory ratio of 1:4 (for every 1 second of inspiration, allow 4 seconds and expiration) with a rate of 12 to 20.
6. Assess breath sounds. Allow for adequate expiratory time. Adjust respirator setting as clinically indicated.
7. **It is required that patients on a transport ventilator should be monitored continuously through Capnography and Pulse Oximetry. The ventilatory rate should adjusted to maintain a pulse oximetry of >90 (preferably ≥ 94%) while maintaining a pCO2 of 30-35.**
8. If any worsening of patient condition, decrease in oxygen saturation, or any question regarding the function of the respirator, remove the respirator and resume bag-valve mask ventilations.
9. Document time, complications, and patient response on 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: Ventilator Operation

P PARAMEDIC P

Clinical Indications:

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

Procedure:

1. Transporting personnel should review the operation of the ventilator with the treating personnel (physician, nurse, or respiratory therapy) in the referring facility prior to transport if possible.
2. All ventilator settings, including respiratory rate, FiO_2, mode of ventilation, and tidal volumes should be recorded prior to initiating transport. Additionally, the recent trends in oxygen saturation experienced by the patient should be noted.
3. Prior to transport, specific orders regarding any anticipated changes to ventilator settings as well as causes for significant alarm should be reviewed with the referring medical personnel as well as medical control.
4. Once in the transporting unit, confirm adequate oxygen delivery to the ventilator.
5. Frequently assess breath sounds to assess for possible tube dislodgment during transfer.
6. Frequently assess the patient's respiratory status, noting any decreases in oxygen saturation or changes in tidal volumes, peak pressures, etc.
7. Note any changes in ventilator settings or patient condition in the PCR.
8. Consider placing an NG or OG tube to clear stomach contents.
9. **It is required that the airway be monitored continuously via continuous Waveform Capnography and Pulse Oximetry.**
10. If any significant change in patient condition, including vital signs or oxygen saturation or there is a concern regarding ventilator performance/alarms, remove the ventilator from the endotracheal tube and use a bag-valve mask with 100% O_2. Contact medical control immediately.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Wake 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
- Gastric Tube insertion may be performed by EMT and AEMT only when utilized in conjunction with a BIAD, as per NC Medical Board approved skills for Credentialed EMS Personnel. Placement should be confirmed by at least two providers, at least one of whom is a paramedic.

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 Wake 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.

Confirm the "5 RIGHTS" of medication administration with your partner and VERIFY THE CORRECT ANSWER to each of the 5 rights before administration.

4. The most common site for subcutaneous injection is the arm.
   - **SQ Injection volume should not exceed 1 cc.**
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.
   - **IM Injection volume should not exceed 1-2 cc for the arm**
   - **IM Injection volume should not exceed 2-3 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.*

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 Wake EMS System.

Standards Procedure (Skill) Universal Section

Restraints: Physical

Agency Name:	
Provider Name:	Paramedic
Instructor Name:	EMT AEMT Paramedic Physician

SATISFACTORY ☐

UNSATISFACTORY ☐

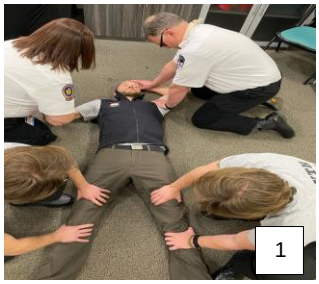
Instructor:
1. Evaluate providers skill performance using the check off list below.
2. Circle performance indicator.
   - YES = Provider completed skill with no assistance from instructor.
   - NO = Provider unable to complete skill satisfactorily following instructor intervention.
   - IL = Provider able to complete skill satisfactorily following Instructor Led (teaching) intervention.

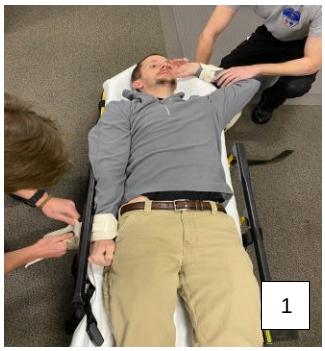
Satisfactory performance indicated with ≥ 12 YES / IL completions. (Combination of both YES and IL)

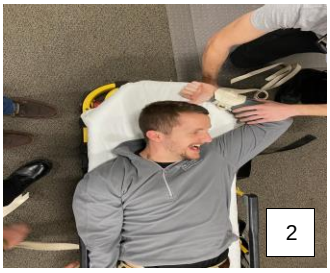
	EMR	
B	EMT	B
A	AEMT	A
P	Paramedic	P

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
In general, medication(s) given under the Behavioral protocol(s) should be utilized whenever physical restraints are utilized

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 prone position or place objects on top of patient
One arm should be restrained above the head and 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°

**If a patient is restrained by law enforcement personnel with handcuffs or other devices that EMS personnel cannot remove, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle.

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 who are peri-arrest with hypotension (SBP <85), have 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.

- In patients with penetrating trauma to the chest or upper back, or gunshot wound to the neck or torso, who are in respiratory distress, a weak or absent radial pulse may be substituted for blood pressure measurement as above; signs of tension pneumothorax listed above may also be present.

- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
   - Locate the second intercostal space in the mid-clavicular line on the same side as the pneumothorax.
   - Prepare the site with providone-iodine ointment or solution.
4. Insert the catheter (12-14 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 Wake EMS System. Assessment should include direct observation once per certification cycle.

Spinal Motion Restriction

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Need for Spinal Precautions and Spinal Motion Restriction per protocol.
- **Guidelines for appropriate use of long spine board (LSB) OR any equivalent device below:**

1. **Spine boards or similar rigid devices** should be utilized for extrication and / or patient transfers to the stretcher, 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, “Reeves Sleeve,” soft-body splints, etc., should be considered extrication and/or patient movement devices.
3. Spinal Motion Restriction includes a rigid cervical collar, manual in-line spine stabilization as necessary to maintain spinal alignment with movement and transfers, and securing the patient FLAT to the Ambulance Stretcher (i.e. no sitting up or head elevation). Patients with need for Spinal Motion Restriction / Spinal Precautions DO NOT have a “clear” spine and SHOULD NOT sit up or be transferred to a wheelchair or the waiting room at the destination facility prior to evaluation of the spine by an emergency medicine provider.
4. Patients with penetrating trauma to head, torso, or back with no evidence of spinal injury do 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.
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 Wake EMS System.

Splinting

	MR	
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).
9. Utilize the pain control protocol unless contraindicated.

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-Conducted Electrical Weapon Removal

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Patient with uncomplicated conducted electrical weapon probes embedded subcutaneously in non-sensitive areas of skin.
- Conducted electrical weapon probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.
- Law enforcement personnel who have used a conducted electrical weapon are trained in probe removal, and should be encouraged to remove uncomplicated embedded probes after weapon use.

Contraindications:

- Patients with conducted electrical weapon probe penetration in vulnerable areas of body as mentioned below should be transported for further evaluation and probe removal
- Probes embedded in skin above level of clavicles, female breasts, or genitalia
- Suspicion that probe might be embedded in bone, blood vessel, or other sensitive structure.

Procedure:

- Providers should take care to ALWAYS wear eye protection when performing this procedure.
- Ensure wires are disconnected from weapon.
- Stabilize skin around probe using non-dominant hand.
- Grasp probe by metal body with pliers or hemostats to prevent puncture wounds to EMS personnel.
- Remove probe in single quick motion.
- Wipe wound with antiseptic wipe and apply dressing.

Certification Requirements:

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

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.
- Place a tourniquet immediately proximal to an extremity amputation, regardless of whether the amputation site is bleeding. Often these sites will re-bleed with resuscitation.

Contraindications:

- Non-extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical. Also do not place directly on top of a dialysis shunt or fistula or graft.
- Snakebites or other envenomations

Procedure:

1. Place tourniquet proximal to wound
2. Tighten per manufacturer instructions until hemorrhage stops and 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
7. If one tourniquet is not sufficient or not functional to control hemorrhage, consider the application of a second tourniquet more proximal to the first.
8. If EMS personnel encounter a non-functional or improperly placed tourniquet placed by a bystander or other responder (i.e. the tourniquet is not controlling bleeding and/or pulses are palpable distal to the tourniquet), the non-functional tourniquet should be removed and bleeding control should be attempted with standard hemorrhage control techniques (i.e. direct pressure). If direct pressure is insufficient for bleeding control, a new, properly placed and tightened tourniquet should be placed by EMS for bleeding control.

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- Irrigation

Clinical Indications:

	MR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

- Initial decontamination and irrigation for wounds, burns, and eye injuries prior to and during transport.

Irrigation Guidelines and Procedures:

1. Wound irrigation and decontamination are key to stopping ongoing tissue injury, preventing infection, and promoting wound healing. Irrigation should be started in the field if possible.
2. Refer to the Decontamination Procedure for any patient(s) who may have significant hazardous materials exposure. Follow these irrigation guidelines for isolated injury or exposure (e.g. small burn to the extremity, chemical splash to an eye).
3. Control bleeding and evaluate and treat life threats first. Refer to the Wound Care- General procedure, and appropriate trauma protocols.
4. Irrigate thermal burns, chemical burns, or contaminated wounds with normal saline, Ringer's lactate or sterile water as appropriate. Consider analgesia per protocol prior to irrigation.
5. Sterile solutions are preferred for irrigation, however if not available, do not delay- use tap water. Flush the area as soon as possible with the cleanest readily available water or sterile solution using copious amounts of fluids.
6. For chemical splashes to the eye, emergent irrigation is critical to preventing further tissue damage. If there is no concern for physical trauma to the eye, utilize a Morgan Lens to immediately provide copious irrigation directly to the globe. Have patient remove contact lenses. Follow the "Eye Complaint" Protocol.
7. To utilize the Morgan Lens, follow these steps:
   a. Instill topical ocular anesthetic (e.g. 2 drops tetracaine)
   b. Attach Morgan Lens set to IV tubing to sterile solution (e.g. saline bag); START FLOW.
   c. Have patient look down, retract upper lid, insert Morgan lens under upper lid.
   d. Have patient look up, retract lower lid, then gently drop lens in place.
   e. Release lower lid over lens and ensure steady, copious flow. Secure tubing to prevent accidental lens removal. Absorb outflow with towels. DO NOT RUN DRY.
   f. Irrigate with at least one liter of sterile solution. For lens removal, ENSURE FLOW OF SOLUTION IS CONTINUING, have patient look up, retract lower lid (and upper lid slightly if necessary), slide Morgan Lens out. Stop flow only after removing Lens.
8. Document the procedure, including solution and volume used to irrigate, 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 Wake EMS System.

Key to Protocol Utilization - NCCEP EMS Committee

History
- Important history items
- Circumstances of event
- SAMPLE
- Time of onset
- Duration

Signs and Symptoms
- Important Signs and Symptoms specific to each protocol

Differential
- A list of other disease or injury which should be considered

Black Box

Hightlights Important Information

Universal Patient Care Protocol
Assumed all protocols utilize and will not appear on individual protocols

Red Box

Highlights Critical Information

May direct to another protocol

Signals protocol within a protocol

Indicates Entry / Exit from / to to another protocol(s)

Information box

Decision Point
Darker outline to highlight

Highlights medication after Contact Medical Control
May be added by Local Medical Director

Purple Shading of Information Box
Indicates items changeable at local agency level, including medications / dosages on NCMB formulary
Local Medical Director may add / change at his / her discretion
Local medical director may add page 2 to any protocol where none exists for additional comments

Algorithm Legend	
	Emergency Medical Responder
B	Emergency Medical Technician
A	Advanced Emergency Medical Technician
P	Paramedic
	Notify Destination or Contact Medical Control

Pearls
- Important information specific to each protocol will appear here.
- Will usually appear on page.
- Important exam items listed here specific to protocol.

Universal Patient Care

Scene Safe

YES

NO

Call for help / additional resources
Stage until scene safe

Bring all necessary equipment to patient
Demonstrate professionalism and courtesy
Mass assembly consider WMD
Utilize appropriate PPE

Consider Airborne, Contact, or Droplet Isolation ***if indicated***

Initial assessment, BLS maneuvers
Initiate oxygen ***if indicated***

Adult Assessment Procedure

Pediatric Assessment Procedure
Use Length-based tape or other appropriate pediatric size/weight assessment system

Required VS:
Blood pressure
Palpated pulse rate
Respiratory rate
Pulse ox if available

If Indicated:
Glucose
12 Lead ECG
Temperature
Pain scale
CO Monitoring
EtCO2 Monitoring

Medical or Trauma

Trauma Patient

Medical Patient

Evaluate MOI

Mental Status Exam

Significant MOI

No Significant MOI

Unresponsive

Responsive

Primary and Secondary trauma assessment

Primary and Secondary trauma assessment

Focused assessment on specific injury

Primary and secondary assessment

Obtain history of present illness from available sources / scene survey

Obtain Chief Complaint

Primary and Secondary assessment
Focused assessment on specific complaint

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

Obtain VS

Obtain SAMPLE

Repeat assessment while preparing for transport

Exit to
Age Appropriate Protocol(s)
as indicated

Continue on-going assessment
Repeat initial VS
Evaluate interventions / procedures

Transfer
Patient hand-off includes patient information, personal property and summary of care and response to care

Patient does not fit specific protocol

Notify Destination or Contact Medical Control

Universal Protocol Section

Universal Patient Care

Scene Safety Evaluation: Identify potential hazards to rescuers, patient and public. Identify number of patients and utilize triage protocol if indicated. Observe patient position and surroundings.

General: All patient care must be appropriate to your level of training and documented in the PCR. The PCR / EMR narrative should be considered a story of the circumstances, events and care of the patient and should allow a reader to understand the complaint, the assessment, the treatment, why procedures were performed and why indicated procedures were not performed as well as ongoing assessments and response to treatment and interventions.

Adult Patient: An adult should be suspected of being acutely hypotensive when Systolic Blood Pressure is less than 90 mmHg. Diabetic patients and women may have atypical presentations of cardiac related problems such as MI. General weakness can be the symptom of a very serious underlying process. Beta blockers and other cardiac drugs may prevent a reflexive tachycardia in shock with low to normal pulse rates.

Geriatric Patient: Hip fractures and dislocations have high mortality. Altered mental status is not always dementia. Always check Blood Sugar and assess signs of stroke, trauma, etc. with any alteration in a patient's baseline mental status. Minor or moderate injury in the typical adult may be very serious in the elderly.

Pediatric Patient: 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.

Special note on oxygen administration and utilization: Oxygen is ubiquitous in prehospital patient care and probably over utilized. Oxygen is a pharmaceutical with indications, contraindications as well as untoward side effects. There is potential harm when given in overdose (hyperoxia / hyperventilation). Utilize oxygen when indicated and not because it is available. A reasonable target 02 saturation for most patients is 90-99 % regardless of delivery device.

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 patient care record with explicit disposition information and patient instructions. Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications. 2 complete sets of vital signs (at minimum) for patient transports.**

- **Patient Refusal and Determining Capacity**

  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 and make a choice. Should be able to describe the reasoning they are using to come to the decision, though you may not agree with decision.

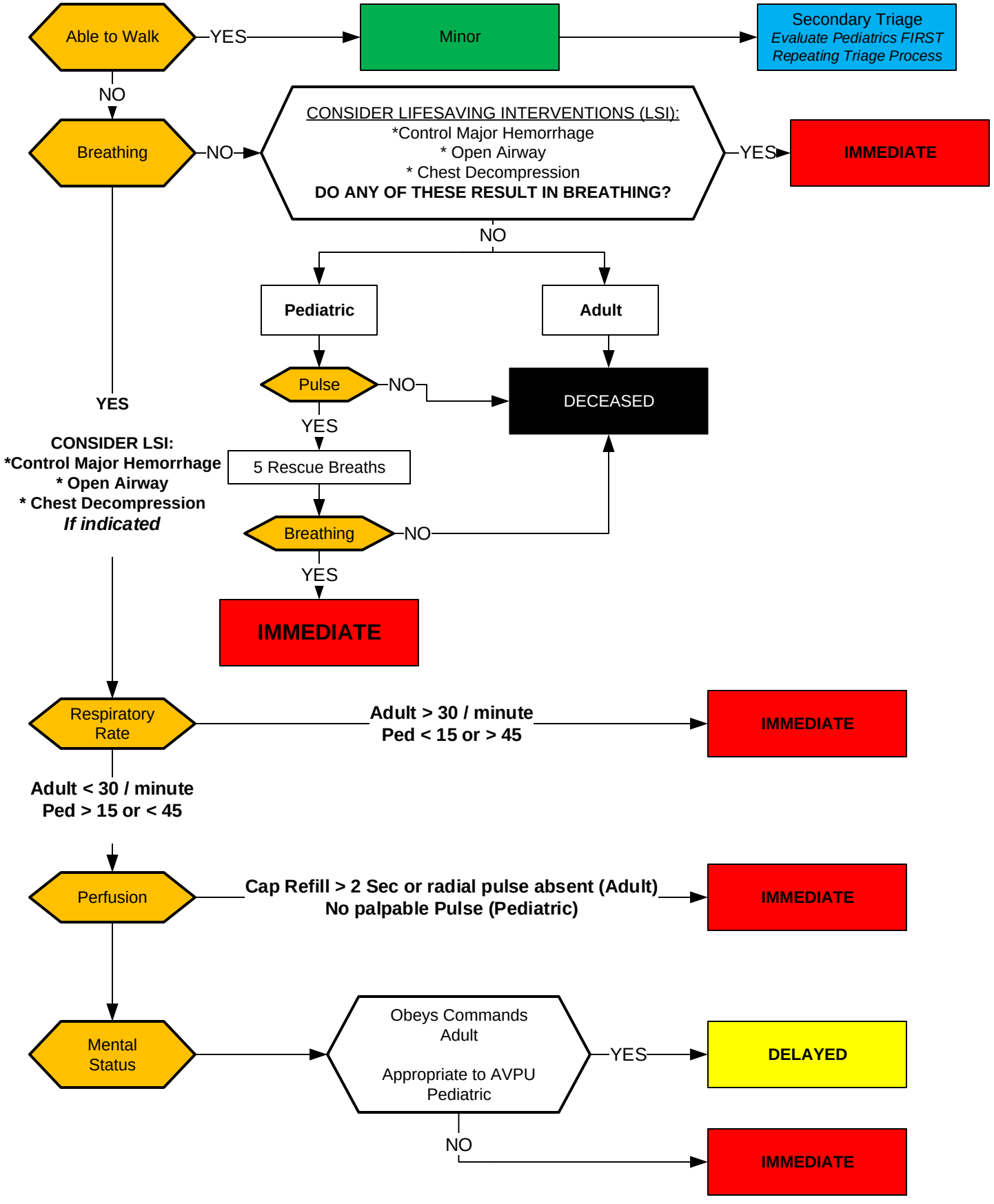
- **CAPACITY/REFUSAL CHECKLIST:**
  - Is the patient age > 17 and/or emancipated minor?
  - Can the patient retain and comprehend relevant information?
  - Can the patient believe information?
  - Can the patient use information to make a choice?
  - Is the patient NOT DANGEROUS to self or others (i.e. no suicidal or homicidal ideation)?

  **If all are "YES" then the patient has capacity to decline further care/transport. If any are "NO" then the patient does not have capacity to make his or her own medical decisions. Document these concepts clearly in your narrative- simply stating "alert and oriented" is not sufficient. Don't hesitate to request an APP or contact medical control if there are questions about capacity.

- Never hesitate to contact medical control or the appropriate "high risk refusal" resource for any 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- modified START/JUMPSTART

* All **infants** who are patients in a MCI are automatically triage category "**IMMEDIATE**" or "red tag"



Universal Protocol Section

Triage

Universal Section

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, WMD or CO poisoning.
  2. Utilize Triage system if available
  3. Determine number of patients. Communicate the number of patients and nature of the incident, establish unified command and establish a medical officer, triage officer, and transport officer if personnel are available to perform these functions

- **Triage is a continual process and should recur 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 third.
  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 5 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
  P: Perfusion
  M: Mental Status

- Attempt only lifesaving interventions (LSI), or administer an antidote if indicated, before moving to next patient.

- **Treatment:**
  Once casualties are triaged focus on treatment can begin. Utilize other relevant protocols as necessary. You may need to move patients to treatment areas (see Active Threat Protocol).
  As more help arrives then the triage / treatment process may proceed simultaneously.

- Capillary refill can be altered by many factors including skin temperature. Age-appropriate heart rate may also be used in triage decisions.

- SMART triage tag system is utilized in NC. Patients may also be sorted by whether or not they meet CDC Field Triage Trauma Criteria. Determining that a patient “meets trauma criteria” or “does not meet trauma criteria” may help the destination hospital(s) allocate resources.

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

	Consider Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure
A	IV Procedure
P	Cardiac Montior
	Age Appropriate Diabetic Protocol AM 2 / PM 2 ***if indicated***
	Pain Control, Protocol UP 11 ***if indicated***
	Age Appropriate Cardiac Protocol(s) ***if indicated***

Serious Signs / Symptoms
Hypotension, poor perfusion, shock

YES →

A	IV / IO Procedure Consider 2 Large Bore sites
	Normal Saline 500 mL Bolus Repeat as needed; Titrate to SPB ≥ 90 mmHg, **Max 2L** **Peds: 20 mL/kg IV / IO** Repeat as needed; Titrate to Age Appropriate SBP; SBP ≥ 70 + 2 x Age **Max 60 mL/kg**
P	**Ondansetron** **Adult: 4 mg IV/ IO/ODT/ IM** **Peds: 0.2 mg/kg IV / IO / PO / ODT, max 4mg** **Do not give if age <3mos,** May repeat x 1 in 15 min
	<u>In ADULTS ONLY,</u> If no response to Ondansetron or Ondansetron not available (see pearls): **Droperidol 1.25mg IM/ IV/ IO** Or consider **Metoclopramide 5-10mg IV/IO/IM** Or consider **Prochlorperazine 10mg IV / IO / IM** Or consider **Promethazine 12.5mg IV / IO / IM**
	Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3, ***if indicated***

NO ↓

A	**Normal Saline IV TKO / Saline Lock**
P	**Ondansetron** **Adult: 4 mg IV/ IO/ODT/ IM** **Peds: 0.2 mg/kg IV / IO / PO / ODT, max 4mg** ***Do not give if age < 3 mos ,*** May repeat x 1 in 15 min
	<u>In ADULTS ONLY,</u> If no response to Ondansetron or Ondansetron not available (see pearls): **Droperidol 1.25mg IM/ IV/ IO** Or consider **Metoclopramide 5-10mg IV/IO/IM** Or consider **Prochlorperazine 10mg IV / IO / IM** Or consider **Promethazine 12.5mg IV / IO / IM** *(if age > 65, Promethazine 6.25mg IV/IO/IM)*

	Monitor and Reassess

Notify Destination or Contact Medical Control

Universal Protocol Section

Abdominal Pain
Vomiting and Diarrhea

Universal Protocol Section

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.**
- **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 > 50, diabetics and / or women especially with upper abdominal complaints.**

- **Repeat vital signs after each fluid bolus.**
- The use of metoclopramide (Reglan) may worsen diarrhea and should be avoided in patients with this symptom.
- Document mental status and vital signs prior to administration of Droperidol, Prochlorperazine, Promethazine.
- Isolated vomiting may be caused by pyloric stenosis (in pediatrics), bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures)

- **Promethazine (Phenergan) may cause sedative effects in elderly patients (give half-dose in elderly patients) or those with other sedating medications already administered. Be very careful giving promethazine and avoid it in combination with opioids when possible. The preferred parenteral route is a deep IM injection- be SURE you are in the muscle as it can be very caustic in subcutaneous tissue. When giving promethazine IV, dilute with 10 mL of normal saline and administer slowly as extravasations can severely damage tissue.**

- **Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.**

- Beware of vomiting only in children. 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, carbon monoxide poisoning, acute MI, new onset diabetes, diabetic ketoacidosis (DKA), and organophosphate poisoning. Maintain a high index of suspicion and utilize other protocols as indicated.

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
A	IV / IO Procedure
	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 Appopriate 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

CAPACITY/REFUSAL CHECKLIST:

- ❑ Is the patient age > 17 or an emancipated minor?
- ❑ Can the patient retain and comprehend relevant information?
- ❑ Can the patient believe information?
- ❑ Can the patient use information to make a choice?
- ❑ Is the patient NOT DANGEROUS to self or others (i.e. no suicidal or homicidal ideation)?

If all are "YES" then the patient has capacity to decline further care/transport. If any are "NO" then the patient does not have capacity to make his or her own medical decisions. Document these concepts clearly in your narrative- simply stating "alert and oriented" is not sufficient. Don't hesitate to request an APP or contact medical control if there are questions about capacity.

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 in emergency medicine.
  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.

- **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 may lead to hypoglycemia.
  More serious underlying medical and trauma conditions may be the cause, sometimes in addition to alcohol.

- **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 the restraint 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

B Consider Cardiac Etiology 12 Lead ECG Procedure ***if indicated***

P Cardiac Monitor ***if indicated***

Age Appropriate Cardiac Protocol(s) ***if indicated***

Injury or Traumatic Mechanism — YES → Spinal Motion Restriction Procedure / Protocol TB 8 ***If indicated***

NO

Shock Hemodynamic Instability — YES →

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

A
Normal Saline Bolus
Adults: 500 mL IV
Titrate to SBP ≥ 90
2 L Maximum

Peds: 20 mL/kg IV / IO
Titrate age appropriate
SBP ≥ 70 + 2 x Age
Maximum 60 mL/kg

Age Appropriate Hypotension / Shock Protocol(s) AM 5 / PM 3 ***if indicated***

Multiple Trauma Protocol TB 6 ***if indicated***

NO

Pain Control Protocol UP 11 ***if indicated***

Monitor and Reassess

Notify Destination or Contact Medical Control

Universal Protocol Section

Back Pain

Universal Section

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Neuro, Lower extremity perfusion**
- **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 > 50, 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. Suspicion for this condition requires immediate medical evaluation in the ED. Symptoms include:**
  - Saddle anesthesia
  - 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 can be associated with serious infections:**
  - Fever / chills.
  - IV Drug user (consider spinal epidural abscess)
  - 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.**

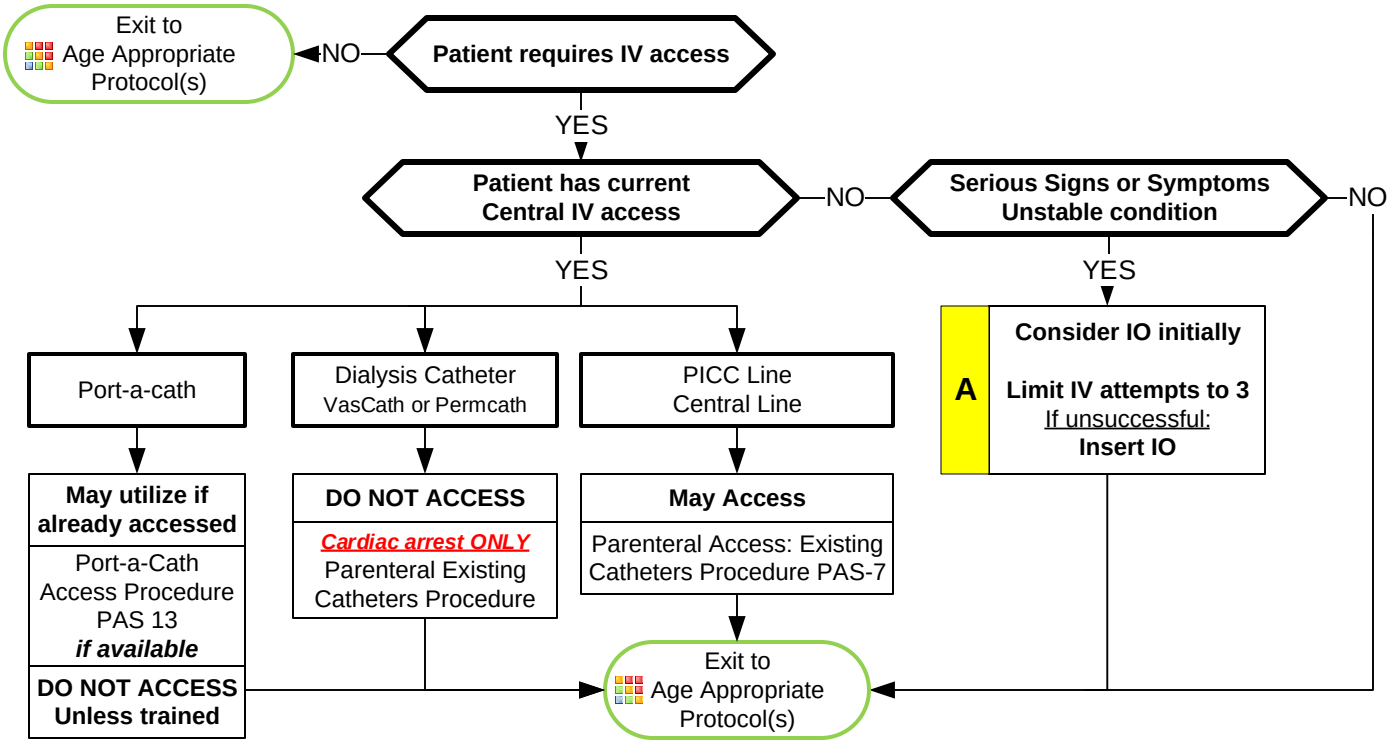
- Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.

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

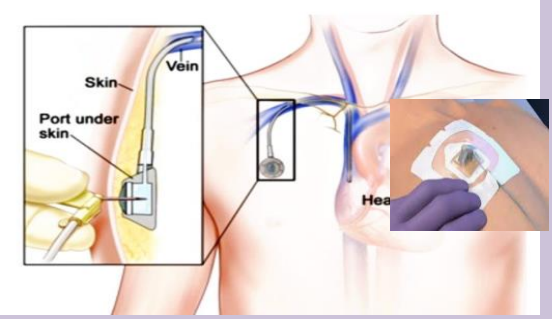
Pearls
- **Frequent encounter of patients with IV access devices and confusion as to which device can be accessed and used by EMS providers.**
- **If unclear about device use, always ask "Is this device used for dialysis?"**
- **When accessing central catheter, always ensure sterility of catheter connection 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:

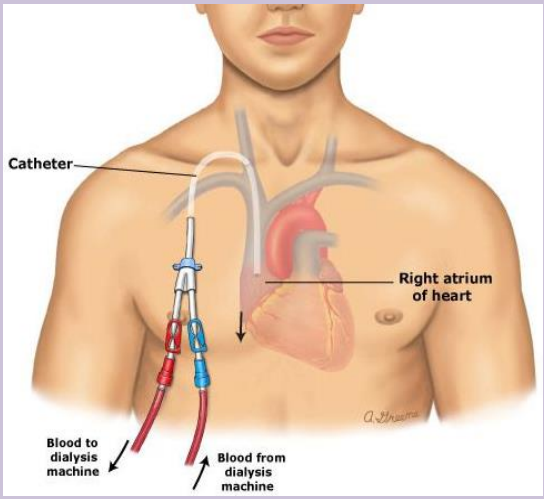
Port-a-Cath® :

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.



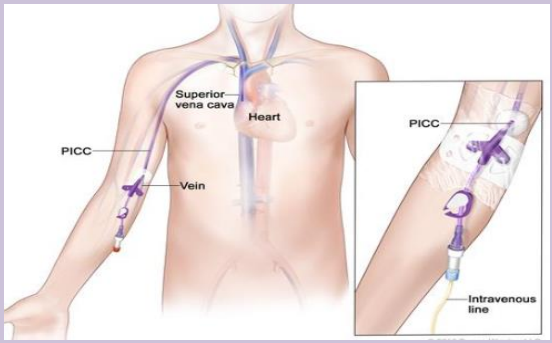
Dialysis Catheter:

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.)



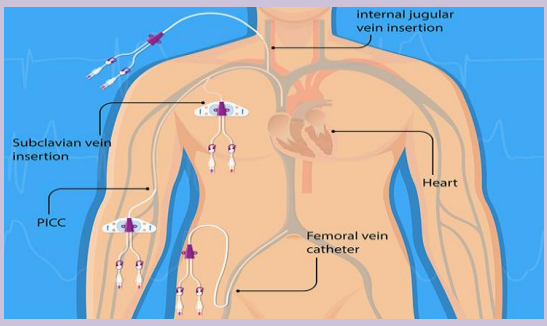
PICC (Peripherally Inserted Central Catheters):

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.



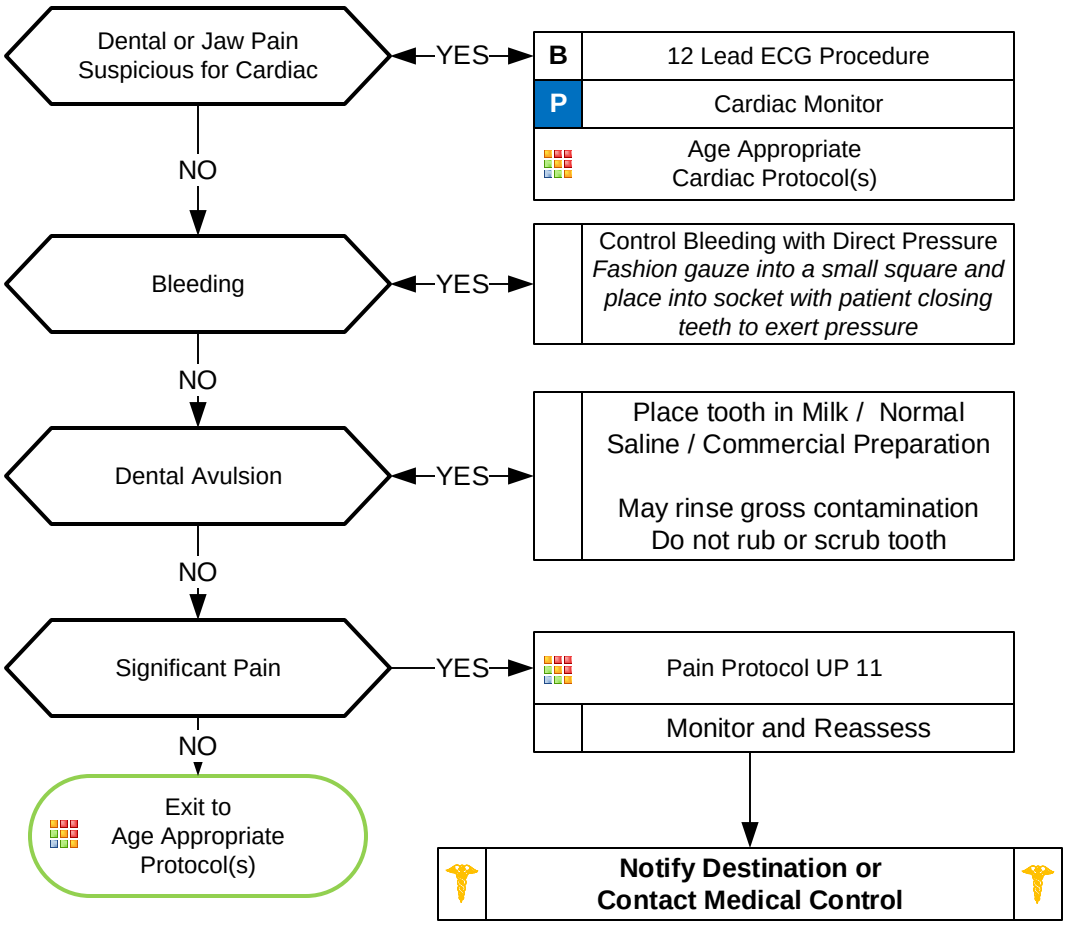
Universal Protocol Section

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.
- Occasionally cardiac chest pain can radiate to the jaw.
- All pain associated with teeth should be associated with a tooth which is tender to tapping or touch (or sensitivity to cold or hot).

Emergencies Involving Indwelling Central Lines

History

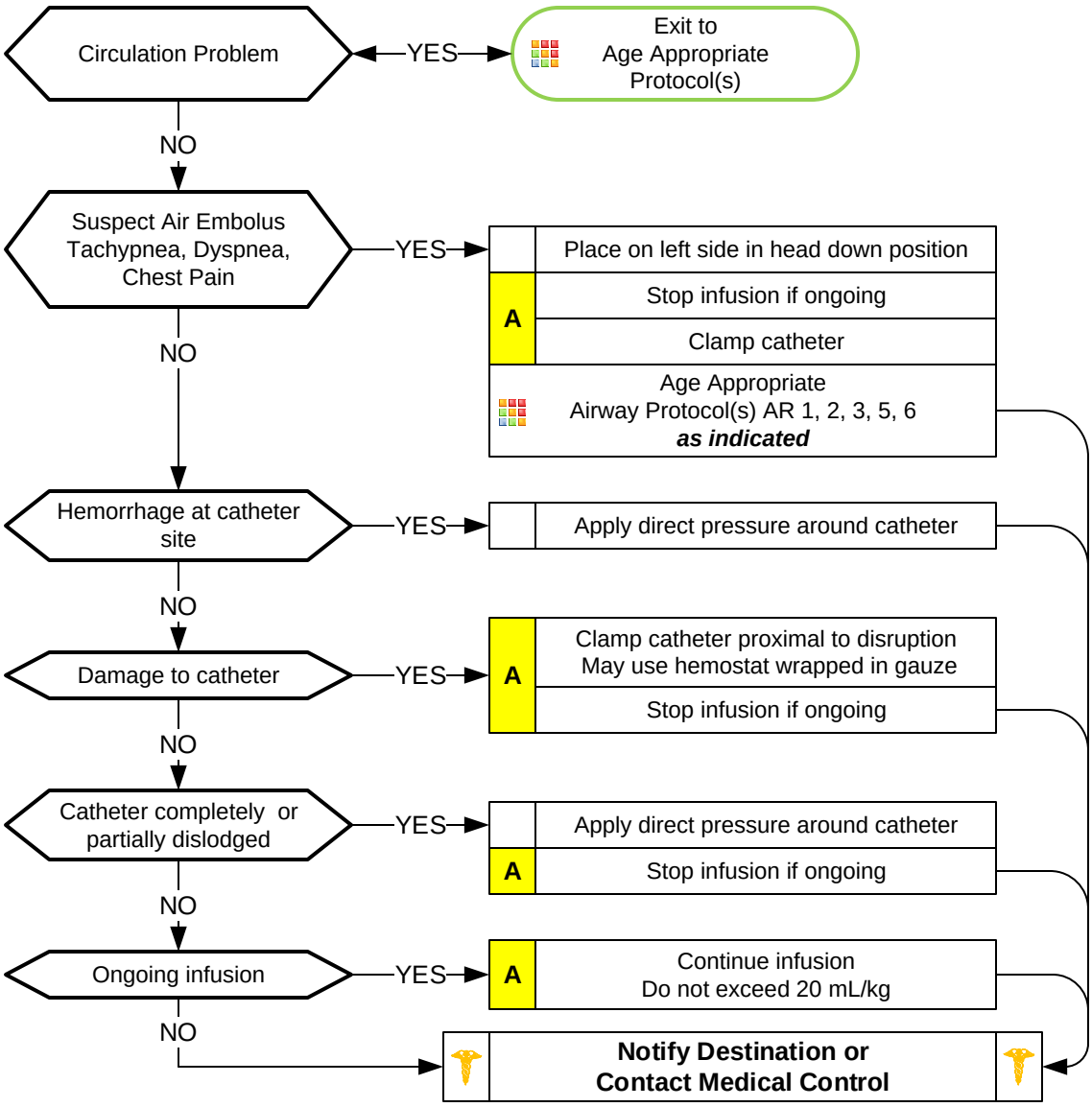
- Central Venous Catheter Type
  - Tunneled Catheter (Broviac / Hickman)
  - PICC (peripherally inserted central catheter
  - Implanted catheter (Mediport / Hickman)
- Occlusion of line
- Complete or partial dislodge
- Complete or partial disruption

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

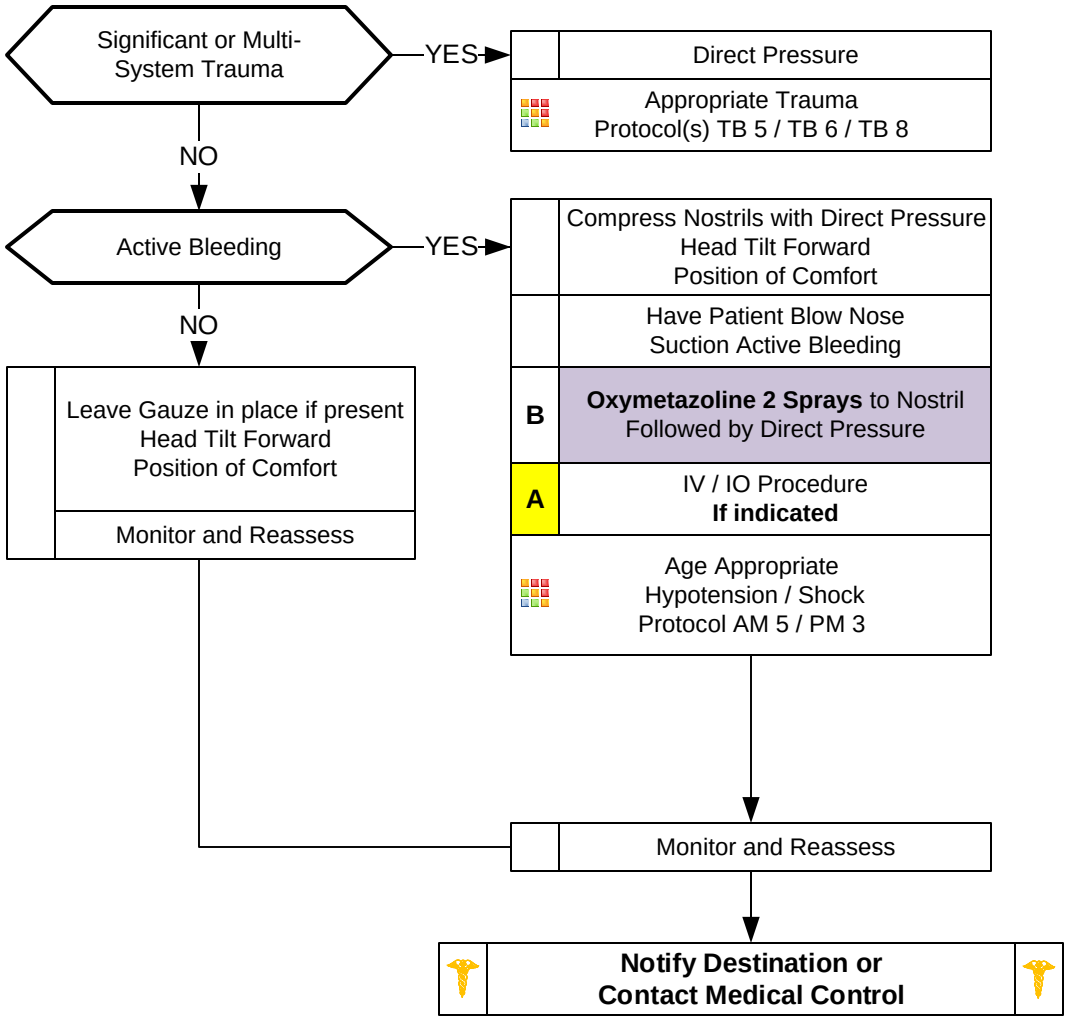
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **Use strict sterile technique when accessing / manipulating an indwelling catheter.**
- **Cardiac arrest: May access central catheter and utilize if functioning properly.**
- Do not place a tourniquet or BP cuff on the same side where a PICC line is located.
- 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



Universal Protocol Section

Pearls
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Age specific hypotension: 0 – 28 days < 60 mmHg, 1 month – 1 year < 70 mmHg, 1 year – 10 years < 70 + (2 x age)mmHg, 11 years and greater < 90 mmHg.**
- 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.
- For severe epistaxis that has not been stopped by any other method, providers may consider using a small amount of topical hemostatic gauze if an anterior bleeding site can be identified.

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/or Airborne Precautions, as indicated

Temperature Measurement Procedure ***if available***

Take a thorough and complete history of any recent travel or sick contacts; follow any/all current EMS system guidance based on this history.

IV / IO Protocol UP 6 ***If indicated***

Temperature ≥ 100.4° F (38° C)

NO → Exit to Age Appropriate Protocol(s) ***as indicated***

YES →

Ibuprofen 10 mg / kg PO (if age > 6 months)
Adult Ibuprofen 400 – 600 mg PO
And / Or
Acetaminophen 15 mg / kg PO
Adult Acetaminophen 325 – 1000 mg PO

A **Ketorolac <u>Adult ONLY</u>: 15 mg IV/IO/IM**
***Ketorolac not indicated for fever alone, but may be used to treat severe aches/myalgias associated with fever**

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.
- Rehydration with fluids increases the patient's ability to sweat and improves heat loss.
- Patients with a history of liver failure should not receive acetaminophen.
- **UTILIZE STANDARD UNIVERSAL PRECAUTIONS FOR ALL PATIENTS WITH SUSPECTED INFECTION**
- **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 the common cold, 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).

- All patients should have allergies documented prior to administering pain medications. 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.
- **Do not** give aspirin to a child, age ≤ 15 years, or NSAIDs to a pregnant woman.

- NSAIDs should not be used in the setting of environmental heat emergencies. **NSAIDs (Ketorolac (Toradol)** and **Ibuprofen)** should not be used in patients with known renal disease or renal transplant, in patients who have known drug allergies to NSAID's (non-steroidal anti-inflammatory medications), with active bleeding, severe headaches in which intracranial bleeding is suspected, abdominal pain when GI bleeding is suspected, stomach ulcers or in patients who may need acute surgical intervention such as open fractures or fracture deformities.
- **Ketorolac (Toradol)** as per the pain control protocol can be used for patients with fever/body aches instead of Ibuprofen in the fever protocol. Do not use Ketorolac and Ibuprofen together.

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)

Enter from **Protocol** based on **Specific Complaint**

Assess Pain Severity
Use combination of Pain Scale, Circumstances, MOI, Injury or Illness severity

Mild Pain (Scale 0-6)

Ibuprofen 10 mg/kg PO (if age >6 months)
(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 only)

If no improvement
Consider IV Protocol UP 6
if indicated

Monitor and Reassess

Moderate to Severe (Scale>6)

IV / IO Protocol UP 6

A

Ketorolac Adult: 15 mg IV/IO/IM
Ketorolac Peds: 0.5 mg/kg IV/IO/IM, max 15mg

Cardiac Monitor

P

Fentanyl IV/IO/IM/IN

75 kg Ideal Body Weight Adult:
Severe Pain = 75mcg, Moderate Pain/Chest Pain = 50mcg
After 10 min, may repeat 25 mcg every 5-10 minutes

100 kg Ideal Body Weight Adult:
Severe Pain = 100mcg, Moderate Pain/Chest Pain = 50mcg
After 10 min, may repeat 25 mcg every 5-10 minutes

***Always give **SLOW over 2-3min;** Max total dose 200mcg

Pediatric: 1 mcg/kg initial dose
Max initial dose 75mcg, give SLOW over 2-3min
May repeat 0.5 mcg/kg every 5 min; Max total dose 150mcg

***Or use* Morphine IV/IO/IM:**

75 kg Ideal Body Weight Adult:
Severe Pain = 7.5mg, Moderate Pain = 5 mg
After 10 min, may repeat 2.5 mg every 5-10 minutes

100 kg Ideal Body Weight Adult:
Severe Pain = 10mg, Moderate Pain = 5 mg
After 10 min, may repeat 2.5 mg every 5-10 minutes

***Always give **SLOW over 2-3min;** Max total dose 20mg

Pediatric: 0.1 mg/kg initial dose
Max initial dose 5mg, give SLOW over 2-3min
May repeat 0.1mg/kg every 5 min, Max total dose 10 mg

Monitor and Reassess Every 5 minutes following sedative

Notify Destination or Contact Medical Control

Universal Protocol Section

Pain Control

Universal

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 and/or respiratory depression.**
- **USE EXTREME CAUTION in administering opioids to patients less than 10kg**
- **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.**

- **Patients may display a wide variation of response to opioid pain medication (Morphine and Fentanyl, aka "narcotics"). Consider the patient's age, weight, clinical condition, other recent drugs or alcohol, and prior exposure to opiates when determining initial opioid dosing. Weight-based dosing may provide a standard means for dose calculation, but does NOT predict patient response. For example, minimal doses of opioids may be effective for pain management and/or cause respiratory depression in the elderly, opiate naïve, and possibly intoxicated patients. <u>It is often appropriate to start with LESS THAN the weight-based dose, consider:</u>**
  - **A "typical" initial dose of fentanyl for an adult may be 50 - 75mcg, depending on condition**
  - **A "typical" initial dose of morphine for an adult may be 5 - 7.5mg, depending on condition**

- **Consider attempts at non-opiate based pain control (tylenol, NSAIDS including ketorolac) for chronic and or non-acute, non-traumatic sources of pain. Always consider whether a patient may have a care plan if there is evidence of recurrent high utilization of opioid medications.**

- **DO NOT administer opioids together with benzodiazepines; this combination results in a deeper level of anesthesia with a significant risk for airway and respiratory compromise.**

- **<u>Pediatrics:</u>**
  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 any oral medications for patients who may need surgical intervention such as open fractures or significant fracture deformities, acute-onset severe headaches, or abdominal pain.
- Do not administer **Acetaminophen** to patients with a history of liver disease.

- **Ketorolac (Toradol)** and **Ibuprofen** should not be used in patients with known renal disease or renal transplant. Also regarding the kidneys, toradol and other NSAIDs may be effective for renal colic but should NOT be administered to patients who have had recent (in the last 2-3 days) lithotripsy due to bleeding risk. Toradol should also be avoided in:
  - pregnant patients
  - patients who have known drug allergies to NSAID's (non-steroidal anti-inflammatory medications),
  - patients with active bleeding
  - patients with severe headaches in which intracranial bleeding is suspected,
  - abdominal pain when GI bleeding is suspected, stomach ulcers
  - patients who may need acute surgical intervention such as open fractures or significant fracture deformities.
  - patients who meet trauma criteria.

- Burn patients may require higher than usual opioid doses to effect adequate pain control. IF AN ADULT PATIENT HAS SUFFERED BURNS THAT REQUIRE TRANSPORT TO THE BURN CENTER, **<u>THE MAXIMUM TOTAL DOSE OF FENTANYL is 300mcg AND THE MAXIMUM TOTAL DOSE OF MORPHINE IS 50mg</u>**. Do not hesitate to contact medical control regarding the pain management strategy for patients in severe pain despite medications or with significant burns

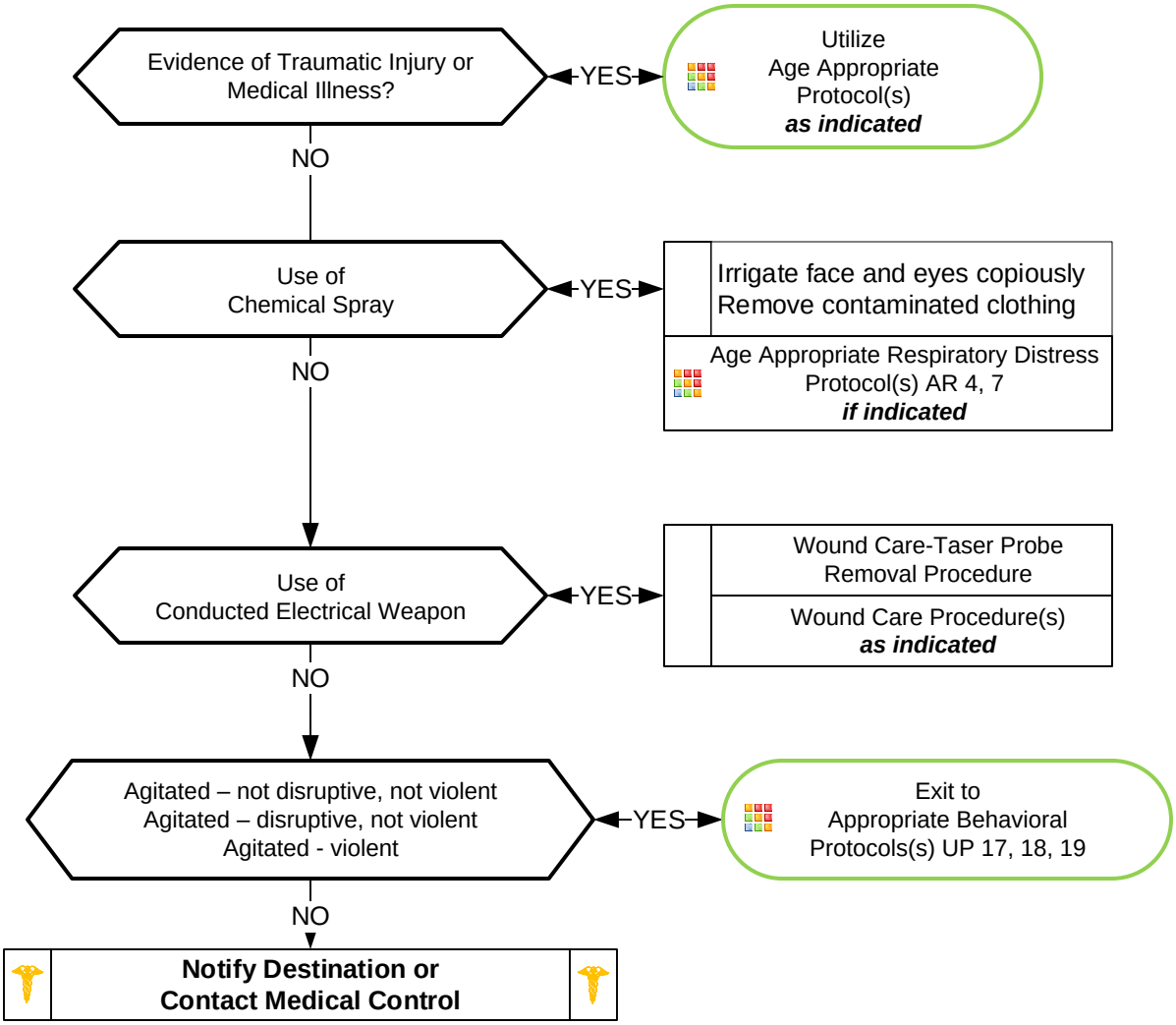
- Consider giving anti-nausea medications as per the abdominal pain, vomiting, and diarrhea protocol if a patient has nausea, or a history of having nausea, with opioid pain medications.

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

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neurologic status**
- **Patient does not have to be in police custody or under arrest to utilize this protocol.**
- **EMS agency should formulate a policy with local law enforcement agencies concerning patients requiring EMS and Law Enforcement involvement simultaneously.**
- **Agencies should work together to formulate a disposition in the best interest of the patient.**

- **Law Enforcement:**
  - **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS, must be accompanied by law enforcement during transport capable of removing the devices.**
  - **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.**
- **Medications are not to be used solely to aid in placing an individual into police custody. Physical and/or chemical restraints are reserved for a medical emergency in order to prevent imminent injury to a patient and/or providers.**

- **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.**
  - **However, when EMS providers have utilized medical physical restraints in accordance with the Restraint Procedure, the law enforcement agent may follow behind the ambulance during transport.**
- 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 pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/difficulty breathing occurs.
- Patients exposed to chemical spray, with or without history of respiratory disease, may develop respiratory complaints up to 20 minutes post exposure.
- 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 Restraint Procedure.

- **Hyperactive Delirium with Severe Agitation (Agitated and Violent):**
  - 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.
  - **If patient suspected of HDSA suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early.**

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

Loosen any constrictive clothing
Protect patient

Blood Glucose Analysis Procedure

Altered Mental Status Protocol UP 4 ***if indicated***

Behavioral Protocol UP 6 ***if indicated***

A IV / IO Procedure ***if indicated***

P Cardiac Monitor ***if indicated***

Active Seizure Activity

YES

NO

Consider Altered Mental Status Protocol ***if indicated***

CONSIDER
Postictal State
Monitor and Reassess

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

Obstetrical Emergency Protocol AO 3
Childbirth Protocol AO 1 ***if indicated***

P

If <u>ADULT</u> patient is <u>UNCONSCIOUS AND CONVULSING</u> upon EMS Arrival, give <u>Midazolam 10mg IM</u>; do not wait for IV/IO. If age > 65, give 5mg IM.

If <u>ADULT</u> patient begins having a new seizure with EMS (either a first seizure or a repeat seizure) or is awake and seizing (partial/focal seizure) <u>and treatment is indicated</u>, give <u>Midazolam 2.5 mg IV/IM/IN/IO</u>

<u>Adult</u>: may repeat 2.5mg midazolam every 3-5 minutes for continued seizure activity **to Max 20mg**

<u>Adult:</u> If Midazolam not available, initial dose:
Diazepam 4 mg IV/IO or Lorazepam 4mg IM/IV/IO
Repeat **2 mg** every 3 to 5 minutes for continued seizure activity, **Max 10mg**

P

If <u>Peds</u> patient is <u>UNCONSCIOUS AND CONVULSING</u> upon EMS Arrival, give <u>Midazolam 0.2 mg/kg IM</u> (or indicated fixed dose; follow Handtevy guide by age); do not wait for IV/IO

If <u>Peds</u> patient begins having a new seizure with EMS (either a first seizure or a repeat seizure) or is awake and seizing (partial/focal seizure) <u>and treatment is indicated</u>, give: <u>Midazolam 0.1 mg/kg IV/IM/IN/IO</u> (follow Handtevy guide)

Repeat every 5 min as needed until seizure stops or until you reach **<u>adult maximum</u>** as above.

<u>Or, If Midazolam unavailable</u>
<u>Peds</u>: Diazepam 0.2 mg/kg IV / IO
***<u>Or</u>* pediatric rectal: 0.5 mg/kg**
<u>Max 4mg initial dose</u>

Active Seizure in Known or Suspected Pregnancy > 20 Weeks

P **Magnesium Sulfate 4 g IV / IO**
Slow IV Push; 2 – 3 minutes
For persistent seizure after 5-10 minutes, May repeat 2g.

Monitor and Reassess

Notify Destination or Contact Medical Control

Universal Protocol Section

Seizure

Universal Section

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**

- Simple Febrile Seizures are most common in ages 6mos – 5 years. They are by definition generalized seizures with no seizure history in the setting of any grade of fever, with an otherwise normal neurologic and physical exam and recent history. It may be reasonable to observe these seizures, while treating fever with acetaminophen or ibuprofen and passive cooling measures (i.e. undressing), for up to five minutes. Any seizure confirmed to last for more than five minutes should be treated with medication.

- **Midazolam 0.2 mg/kg (to Max 10 mg, which is the adult dose) intramuscular (IM) is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**

- **For any seizure that begins in the presence of EMS, if the patient was previously conscious, alert, and oriented, take time to assess and protect the patient and providers and CONSIDER THE CAUSE. The seizure may stop, especially in patients who have prior history of self-limiting seizures. However, do not hesitate to treat recurrent or prolonged (> 1 minute) seizure activity.**

- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This is a broad term that covers many different seizure types. It is often an emergency requiring airway management, treatment, and transport.

- **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.

- **ECLAMPSIA** - is seizures occurring in the context of preeclampsia. Remember, women may not have been diagnosed with preeclampsia; first presentation may be an eclamptic seizure. Pre-eclampsia/Eclampsia may occur up to six weeks after childbirth.

- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse.
- In an infant, a seizure may be the only evidence of a closed head injury.
- 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.
- Midazolam and Lorazepam are well absorbed when administered IM.

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

If signs and symptoms consistent with possible stroke, perform Prehospital Stroke Screen – refer to Procedure ASP 8 – BOTH PAGES

Stroke Screen results Consistent with Acute Stroke, i.e. initial mLAPSS Prehospital Stroke Screen is POSITIVE as per Procedure ASP 8

YES

Time Last Known Well (last known normal) < 22 Hours

YES

Utilize STROKE SCREENING TOOLS (mLAPSS and VAN) as per Procedure ASP 8

Use Time Last Known Well and the Stroke Screen Results to determine transport location. Refer to Stroke Triage and Destination plan:

Transport based on:
STROKE
EMS Triage and Destination Plan
Keep Scene Time as short as possible; ideal ≤ 10-15 Minutes
Immediate Notification of Facility
****CODE STROKE is for age>17 only. Pediatric patients with positive stroke screen should follow the pediatric triage and destination plan. See Pearls****

NO

YES

NO

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

Diabetic Protocol ***if indicated***

Blood Glucose Analysis Procedure

Altered Mental Status Protocol UP 4 ***if indicated***

B **12 Lead ECG Procedure**

IV / IO Protocol UP 6
Preferably 2 Sites

A **Venous Access Blood Draw Procedure for Stroke Labs**

P Cardiac Monitor

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***

P **Persistent Hypertension**
If SBP ≥ 220 or DBP ≥ 120
After 3 readings all 5 minutes apart

YES

Contact Receiving Facility Concerning POSSIBLE Treatment of Hypertension

Notify Destination or Contact Medical Control

Universal Protocol Section

Suspected Stroke

For further education regarding current recommendations regarding stroke care, including the rationale to treat or not treat hypertension in the setting of possible stroke, and thrombolytic and endovascular treatment considerations, see the current version of:

"Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association"

Free access: https://www.ahajournals.org/doi/10.1161/STR.0000000000000211

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used in the EMS Acute Stroke Care Toolkit.**
- **Acute Stroke care is evolving rapidly. Ensure you are following the MOST UPDATED Stroke: EMS Triage and Destination Plan, as in this protocol set.**

- **"Last Known Well" or Time of Onset or Last Seen Normal:**
  - **One of the most important items the pre-hospital provider can obtain, of which all treatment decisions are based.**
  - **Be very 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 may not be able to receive thrombolytics or intervention at facility.**
  - **Wake up stroke: Time starts when patient last awake or symptom free.**

- **You (EMS) are often in the best position to determine the actual "Last Known Well" 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.**

- **If possible place 2 IV sites.**
- **Blood Draw: Draw blood lab tubes for patients with positive stroke screens as per current procedure. This information allows faster return of lab information in the hospital and may influence thrombolytic decision.**
- The differential listed on the 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 Stroke Screen results in the PCR.

- **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.

For the utilization of the stroke screen in the Wake County EMS System, there is no age cutoff; consider any age patient as "yes" for possible stroke. HOWEVER, there is no "CODE STROKE" process for pediatric (age less than 18) patients. If a pediatric patient screens positive for possible stroke, take the patient to a pediatric specialty facility and give this information during your usual call-in, but there is NOT an in-hospital "code stroke" response for pediatrics.

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
A	IV / IO Procedure ***If indicated***
P	Cardiac Monitor

SEPSIS SCREEN:
Obvious or suspected source of infection **AND** any of these SIRS criteria:

- SBP < 90 mmHg
- Heart rate > 90/min
- Respiratory Rate > 20
- GCS < 15
- Temperature ≥ 100.4° F or < 96.0° F

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

Sepsis Screen Positive?

YES

NO

Exit to Age Appropriate Condition Appropriate Protocol(s)

IV/IO Protocol UP 6

A

****Use LifeFlow for Fluid Delivery****
Normal Saline Bolus IV/IO
Adult: 500 mL
Repeat as needed, **Max 2 L**
Peds: 20 mL/kg
Repeat as needed, **Max 60 mL/kg**

Reassess SIRS criteria and re-examine after initial bolus. Repeat bolus as long as any SIRS criteria present, unless concern for fluid overload. *(see pearls)*

P

If SBP < 90 or age-appropriate hypotension after max bolus, begin Norepinephrine.

Adult: Norepinephrine IV/IO 1-10mcg/min
Titrate to SBP > 90
Peds: Norepinephrine IV/IO 0.1 - 2 mcg/kg/min
Titrate to age appropriate BP:
SBP ≥ 70 + 2 x Age

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3

Monitor ETCO2. Is the ETCO2 < 26 on at least two consecutive measurements 5 min apart?

NO

YES

SEPSIS ALERT
Notify Receiving Facility during transport

Notify Destination or Contact Medical Control

Universal Protocol Section

Suspected Sepsis

Universal Section

- **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.**

- Early recognition of Sepsis allows for attentive care and early administration of antibiotics.
- Quantitative waveform capnography can be a reliable surrogate for lactate monitoring in detecting metabolic acidosis in sepsis patients. $EtCO_2$ < 25 mm Hg are associated with serum lactate levels > 4 mmol/L.
- Aggressive IV fluid therapy is the most important prehospital treatment for sepsis. Suspected septic patients should receive repeated fluid boluses while being checked frequently for signs of pulmonary edema, especially patients with known history of CHF or ESRD on dialysis. STOP fluid infusion in the setting of pulmonary edema.

- **Supplemental oxygen should be given and titrated to oxygenation saturation ≥ 94%.** Septic patients are especially susceptible to traumatic lung injury and ARDS. If artificial ventilation is necessary, avoid ventilating with excessive tidal volumes.

- Attempt to identify source of infection (skin, respiratory etc.) and relay previous treatments and related history to ED physician.

- **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.**

- 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.
- 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).

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 / IO 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***

Serious Signs / Symptoms Hypotension, poor perfusion, shock

YES → **A**

IV / IO Protocol UP6
Consider 2 Large Bore sites

Normal Saline 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 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. Transport should be encouraged.**

- **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

- **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.**

- **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 > 50, diabetics and / or women especially with upper abdominal complaints.**
- **Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, unlikely to be significantly dehydrated if heart rate is close to normal.**

- 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.
- Syncope 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 / Violent
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. The patient is agitated and disruptive, but not violent

7 – The patient is VIOLENT, and requires restraint. The patient is agitated and violent.

P

If indicated:

Evaluation and Screening for Mental Health and Substance Use Patients
request Wake EMS APP if available

Utilize Together:
Policy Medical 22 – Screening and Transport for Mental Health and Substance Abuse Patients

Procedure ASP 22 – Request for Alternative Destination

Protocol UP 23 – Medical Clearance for Mental Health/Substance Abuse Patients

Notify Destination or Contact Medical Control

Universal Protocol Section

Behavioral Health Crisis

CAPACITY/REFUSAL CHECKLIST:

- ❑ Is the patient age > 17 or an emancipated minor?
- ❑ Can the patient retain and comprehend relevant information?
- ❑ Can the patient believe information?
- ❑ Can the patient use information to make a choice?
- ❑ Is the patient NOT DANGEROUS to self or others (i.e. no suicidal or homicidal ideation)?

If all are "YES" then the patient has capacity to decline further care/transport. If any are "NO" then the patient does not have capacity to make his or her own medical decisions. Document these concepts clearly in your narrative- simply stating "alert and oriented" is not sufficient. Don't hesitate to request an APP or contact medical direction if there are questions about capacity.

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 and restraint.**
- **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)**

- **Consider antipsychotics (e.g. Haldol) for patients with history of psychosis or extreme alcohol intoxication, or a benzodiazepine for patients with other presumed substance abuse. While benzodiazepines may be indicated for patients with alcohol intoxication, consider that alcohol and benzodiazepines together may lead to respiratory depression.**
- **Haldol is acceptable treatment in pediatric patients ≥ 12 years old. Safety and efficacy is not established in younger ages. Consider medical direction consultation for pediatric patients already prescribed haloperidol.**

- **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 Haldol 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

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
- Suicidal / homicidal thoughts

Differential
- Altered Mental Status
- Alcohol Intoxication / Toxin / Substance abuse
- Medication effect / overdose / withdrawal
- Depression /Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders

Behavioral Activity Rating Scale (BARS) from Behavioral Health Crisis Protocol UP 17

Behavioral Activity Rating Scale
BARS scoring: 1 – 4
*Patient is normal or already sedated

YES → No sedation required → Exit to Age Appropriate Protocol(s)

NO

BARS scoring: 5
Agitated but not disruptive
Able to calm and redirect

YES →
- Verbal De-escalation Procedure ASP 11
- *consider* IV / IO Protocol UP 6
- P:
  - **CONSIDER Medication**
  - ***patient may take own oral med(s) if approved by medical direction. Otherwise consider:**
  - **Midazolam IV/IO/IN/IM**
  - **Adult: 2.5 mg, for Age ≥ 65: 1 – 2.5 mg**
  - May Repeat Midazolam 1-2.5mg every 5min to effect, **Max 5mg**
  - **Peds: 0.1 mg/kg**
  - Max initial dose 2.5mg
  - Repeat 0.1 mg/kg every3-5 min as needed to **Max 5mg**
  - **Haloperidol IM**
  - **Age ≥ 12: 2 - 5 mg, for Age ≥ 65: 2.5 mg**
  - May repeat q 5 min as needed, **Maximum 10 mg**

NO

BARS scoring: 6
Agitated and disruptive
Not violent

NO ← Condition Improving? → YES → Exit to Age Appropriate Protocol(s)

YES →
- Verbal De-escalation Procedure ASP 11
- IV / IO Protocol UP 6
- P:
  - **Medication for agitation RECOMMENDED**
  - ***patient may take own oral med(s) if approved by medical direction.**
  - **Midazolam IV/IO/IN/IM**
  - **Adult: 2.5 mg, for Age ≥ 65: 1 – 2.5 mg**
  - May Repeat Midazolam 1-2.5mg every 5min to effect, **Max 5mg**
  - **Peds: 0.1 mg/kg**
  - Max initial dose 2.5mg
  - Repeat 0.1 mg/kg every3-5 min as needed to **Max 5mg**
  - **Haloperidol IM**
  - **Age ≥ 12: 2 - 5 mg, for Age ≥ 65: 2.5 mg**
  - May repeat q 5 min as needed, **Maximum 10 mg**
- Consider Restraint Physical Procedure USP 5 ***if indicated***

NO

NO ← Condition Improving? → YES → Exit to Age Appropriate Protocol(s)

BARS scoring: 7

AGITATED and VIOLENT → Exit to Protocol UP 19 Hyperactive Delirium with Severe Agitation / Violent

Universal Protocol Section

Behavioral - Hyperactive Delirium with Severe Agitation / Violent

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
- Suicidal / homicidal thoughts

Differential
- Altered Mental Status
- Alcohol Intoxication / Toxin / Substance abuse
- Medication effect / overdose / withdrawal
- Depression /Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders

Behavioral Activity Rating Scale (BARS) from Behavioral Health Crisis Protocol UP 17

Call for help & additional resources
Stage prior to arrival *or*
Withdraw from scene until safe

Behavioral Activity Rating Scale
BARS scoring: 7
AGITATED and VIOLENT

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.**

P

Adult (age ≥ 12): Midazolam 10 mg IM
* For age ≥ 65, initial dose Midazolam 5 mg IM
* If IV/IO already established, initial dose Midazolam 5mg IV/IO
***Repeat 2.5mg IM/IV/IO/IN every 5 min prn, to Max 20mg**

Pediatrics (age < 12): Midazolam 0.1 mg/kg IM/IV/IO/IN
*Max initial dose 2.5mg
***Repeat 0.1mg/kg IM/IV/IO/IN every 5 min prn, to Max 10mg**

IN ADULTS (Age ≥ 12) ONLY,
ADDITIONALLY CONSIDER:
Haloperidol 5 mg IM
or Droperidol 5mg IM/IV
In 5 min, repeat x1 as needed

IV / IO Protocol UP 6
Preferably 2 large bore

A

Normal Saline Bolus IV/IO

Adult: 1 L, May repeat 500 mL Bolus
as needed, **Maximum 2 L**

Peds: 20 mL/kg IV / IO
May repeat x 2 as needed to Maximum 60 mL/kg

Restraint Physical Procedure USP 5
Monitor per restraint procedure
if indicated

Hyperthermia Protocol TE 4, *if indicated*

P

Cardiac Monitor

consider Sodium Bicarbonate 50 mEq IV/IO
See pearls re: possible Wide Complex Tachycardia

Notify Destination or
Contact Medical Control

Universal Protocol Section

Behavioral - Hyperactive Delirium with Severe Agitation / Violent

CAPACITY/REFUSAL CHECKLIST:

- ❑ Is the patient age > 17 or an emancipated minor?
- ❑ Can the patient retain and comprehend relevant information?
- ❑ Can the patient believe information?
- ❑ Can the patient use information to make a choice?
- ❑ Is the patient NOT DANGEROUS to self or others (i.e. no suicidal or homicidal ideation)?

If all are "YES" then the patient has capacity to decline further care/transport. If any are "NO" then the patient does not have capacity to make his or her own medical decisions. Document these concepts clearly in your narrative- simply stating "alert and oriented" is not sufficient. Don't hesitate to request an APP or contact medical control if there are questions about capacity.

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neuro**
- **Crew / responders safety is the main priority. SEE RESTRAINT PROCEDURE.**
- **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.**

- **Hyperactive Delirium with Severe Agitation / Violent:** A true medical emergency: Treat with benzodiazepines and IV fluids, watch closely for cardiac collapse/dysrythmia. For tachycardia with PVCs, give 50meq Sodium Bicarbonate IV x 1 dose; if patient is in a wide complex tachycardia, repeat sodium bicarb dosing x 2-3 or until QRS narrows, and consider contacting medical direction for persistent wide complex tachycardia. Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. 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 HDSA suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early**

- **Restraint use:**
  Physical restraints are not contraindicated in Hyperactive Delirium with Severe Agitation, 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.
  Use a team approach for sedation and Restraint Procedure USP-5: 1 provider for each limb. 1 provider to lead restraint, maintain airway and control head. 1 Provider to administer medication.
  Do not position prone with restraints as this can impede respiration and ventilation

- Hyperthermia: Assess for and treat hyperthermia.

- **Patients suffering from Delirium Tremens/Severe Alcohol Withdrawal may be treated as per the Hyperactive Delirium with Severe Agitation Protocol, with an initial dose of 5-10mg of Midazolam. Focus on Benzodiazepines (Midazolam) and Fluids for these patients.**

- **Consider antipsychotics (Haldol, Ziprasidone, Droperidol) for patients with history of psychosis or extreme alcohol intoxication, or a benzodiazepine for patients with other presumed substance abuse. While benzodiazepines may be indicated for patients with alcohol intoxication, consider that alcohol and benzodiazepines together may lead to respiratory depression.**

- **Haldol is acceptable treatment in pediatric patients ≥ 12 years old. Safety and efficacy is not established in younger ages. Consider medical direction consultation for pediatric patients already prescribed haloperidol.**
- **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.

Universal Protocol Section

Patient Safety

Follow the Universal Patient Care Protocol

Utilize the length-based tape to estimate the weight of pediatric patients. For all patients (adult and pediatric) receiving Weight-Based Drug Administrations, utilize the WCEMS Weight based Drug Dose References supplied with these protocols (NOT the length-based tape) to verify correct dose prior to administration

For all medication administrations, confirm the "5 RIGHTS" of medication administration with your partner and VERIFY THE CORRECT ANSWER to each of the 5 rights before administration:

- **RIGHT patient (no allergies)**
- **RIGHT medication**
- **RIGHT time (right place in the protocol?**
- **RIGHT dose (and verified volume?)**
- **RIGHT route**

Document at least once per shift the presence of all equipment, medications, and supplies listed on the Wake County EMS System Ramp Inspection Form

If supplies fall below required levels, restock at the nearest appropriate location. If dispatched to a call that may require depleted supplies, respond and call for next near unit.

If massive depletion of supplies (e.g, post-cardiac arrest) and/ or contamination, remain out-of-service until resupplied and clean

If there is an equipment failure, utilize the equipment failure procedure and complete the Wake EMS System Clinical Unusual Event Report

If medication error, clinical misadventure, or other adverse patient outcome, contact medical director via policy below.

Appropriate protocol

M Patient doesn't fit a protocol? **Contact Medical Control** M

Transport Patient per Transport Policy 3 and Patient Evaluation, Treatment, and Transport (Transport Policy 21). Notify destination via radio call-in or telephone per usual practice.

Universal Protocol Section

Medical Director Notification Policy:

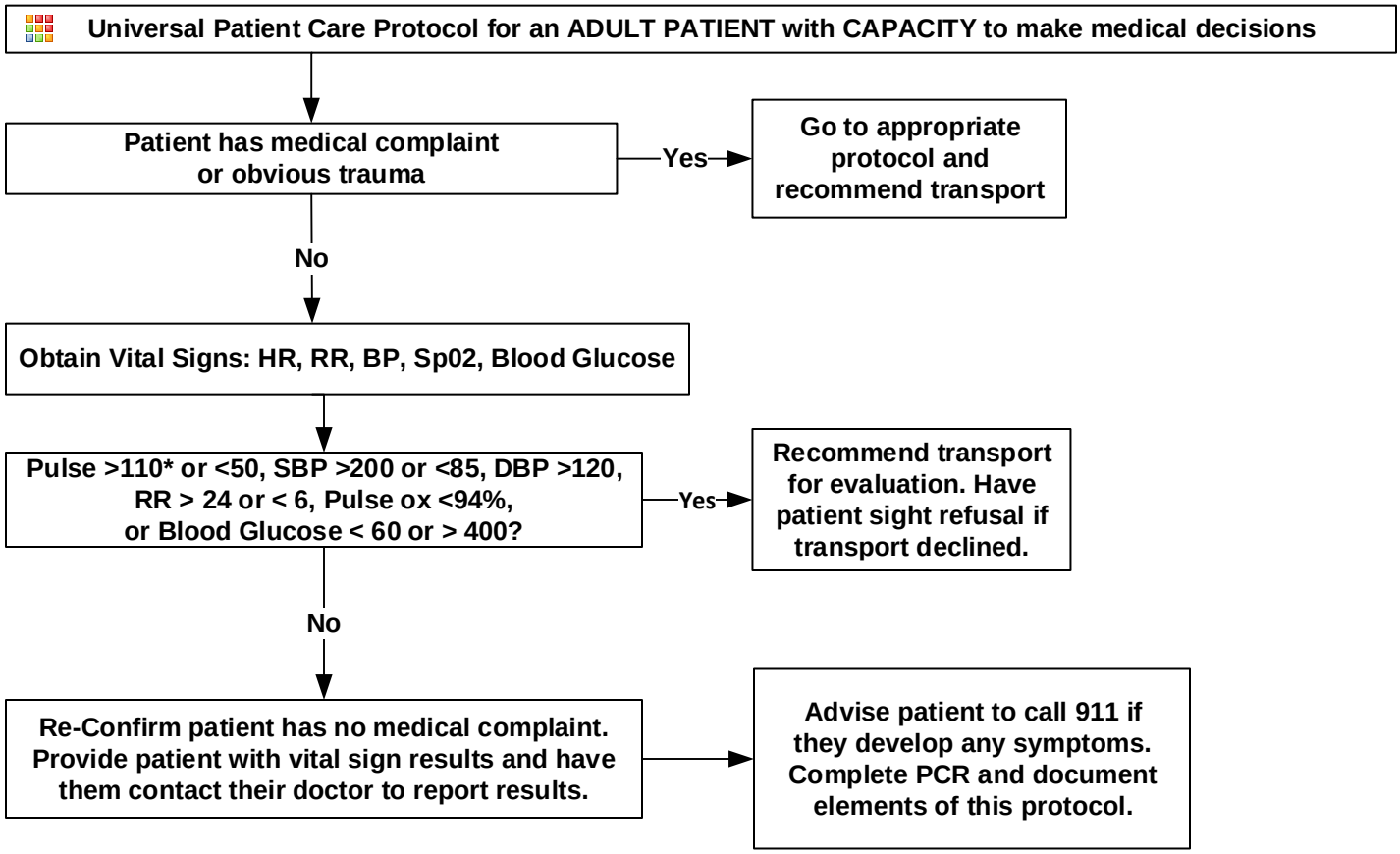
- Utilize the Automatic Medical Director Notification section of the Foundations of Practice to determine when immediate notification of the Medical Director by phone must occur. If no answer, contact RWCC/Rescom for assistance.
- For other adverse clinical outcomes, notify the Medical Director or Deputy Medical Director as soon as possible via email and/or cell phone. The probability of utilization of the Disciplinary Procedure is greatly diminished if a provider with a misadventure contacts the Medical Director directly.
- If an error occurs without adverse patient outcome and/or a "near miss" occurs, complete the Wake County EMS System Clinical Unusual Event Report, and contact the Deputy Director for Medical Affairs, Medical Director, or Deputy Medical Director via email or cell phone.

Well Person Check

History:
- Patient presents requesting "blood pressure check"
- EMS responds to "assist invalid"
- Someone else called 911; patient did not request
- Other situation in which patient does not have a medical complaint or obvious injury

Signs and Symptoms:
- Assess for medical complaint
- For patients with hypertension, particularly check for chest pain, shortness of breath, and/or neurologic changes
- For assist invalid calls, particularly check for syncope, trauma from fall, or inability to ambulate

Differential:
- Hypertensive urgency
- Hypertensive emergency
- Syncope
- Cardiac ischemia
- Cardiac dysrhythmia
- Fracture
- Head trauma



Universal Protocol Section

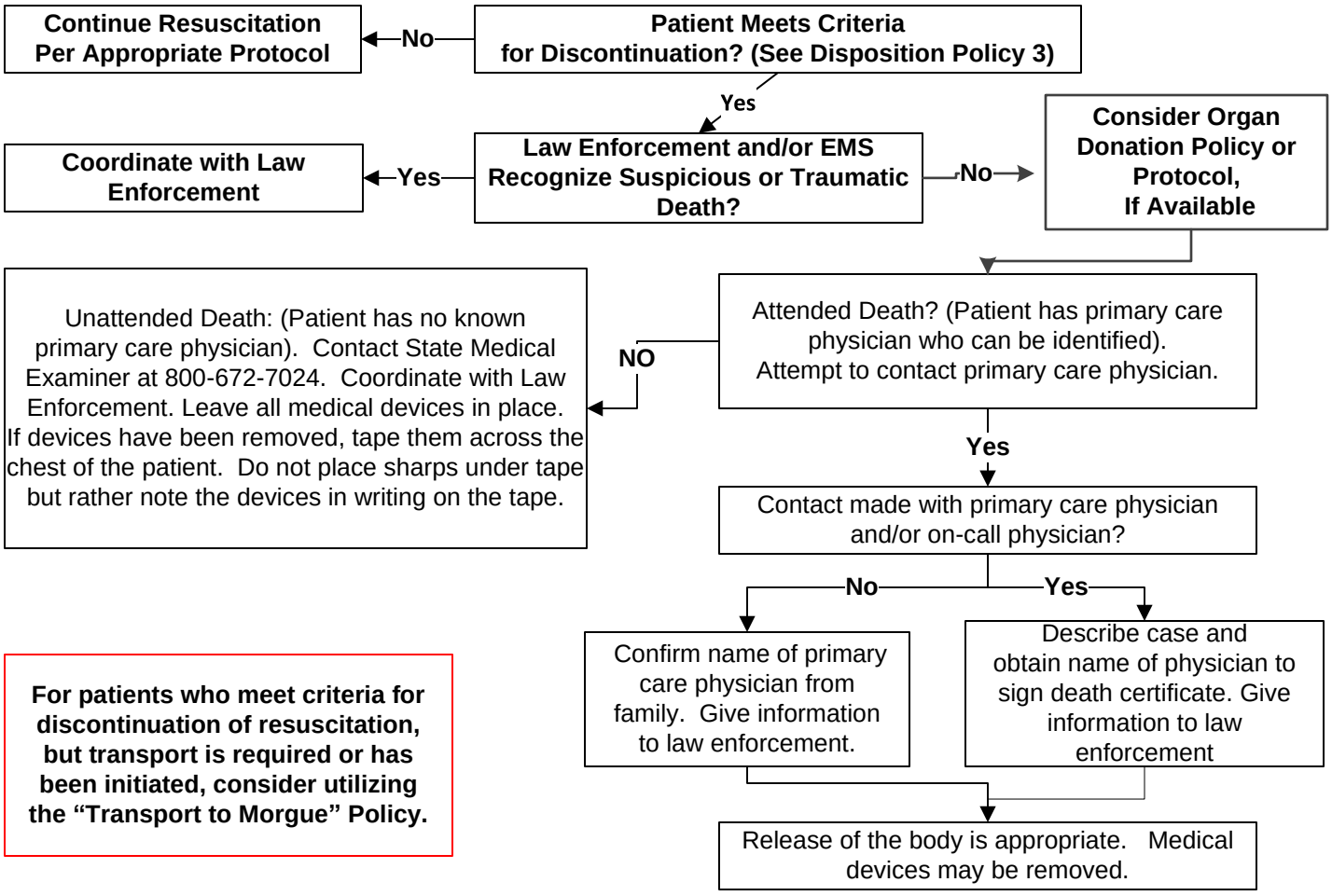
Pearls:
- **This protocol applies to ALL responders**
- *** Patients undergoing evaluation for alternative destination for Mental Health/Substance Abuse may have a pulse up to 120 and still "pass" the well person check.**
- **Patients who are denying more severe symptoms may initially present for a "routine check". Please confirm with the patient at least twice that they have no medical complaints.**
- **All persons who request medical evaluation or treatment are considered patients and shall have a PCR completed. See Pearls of Universal Patient care protocol for a discussion on assessing capacity.**
- **For these patients, the PCR may be brief but must include vital signs and documentation of the lack of a medical complaint. Additionally, patients with a potential mechanism for trauma should have a trauma exam completed.**
- **Should a patient refuse evaluation and/or decline further evaluation once begun, document as much as you can. Even patients who refuse vital signs can be observed and respirations measured. The PCR narrative is key in these and all cases, and must accurately and thoroughly describe the patient encounter.**

Deceased Persons

History:
- Person encountered by EMS who meets criteria for obvious death
- Patient with DNR in place who is pulseless and apneic
- Patient with other approved advanced directive requiring no CPR be administered who is pulseless and apneic
- Patient for whom resuscitative efforts are ceased on scene

Key Information:
- Name of primary care physician
- Known medical conditions
- Last time known to be alive

Differential:
- Attended Death (a patient with a primary care physician who apparently died of natural causes (aka "natural death))
- Unattended Death (a patient without a primary care physician who apparently dies of natural causes (aka "natural death))
- Suspicious Death (Law enforcement)

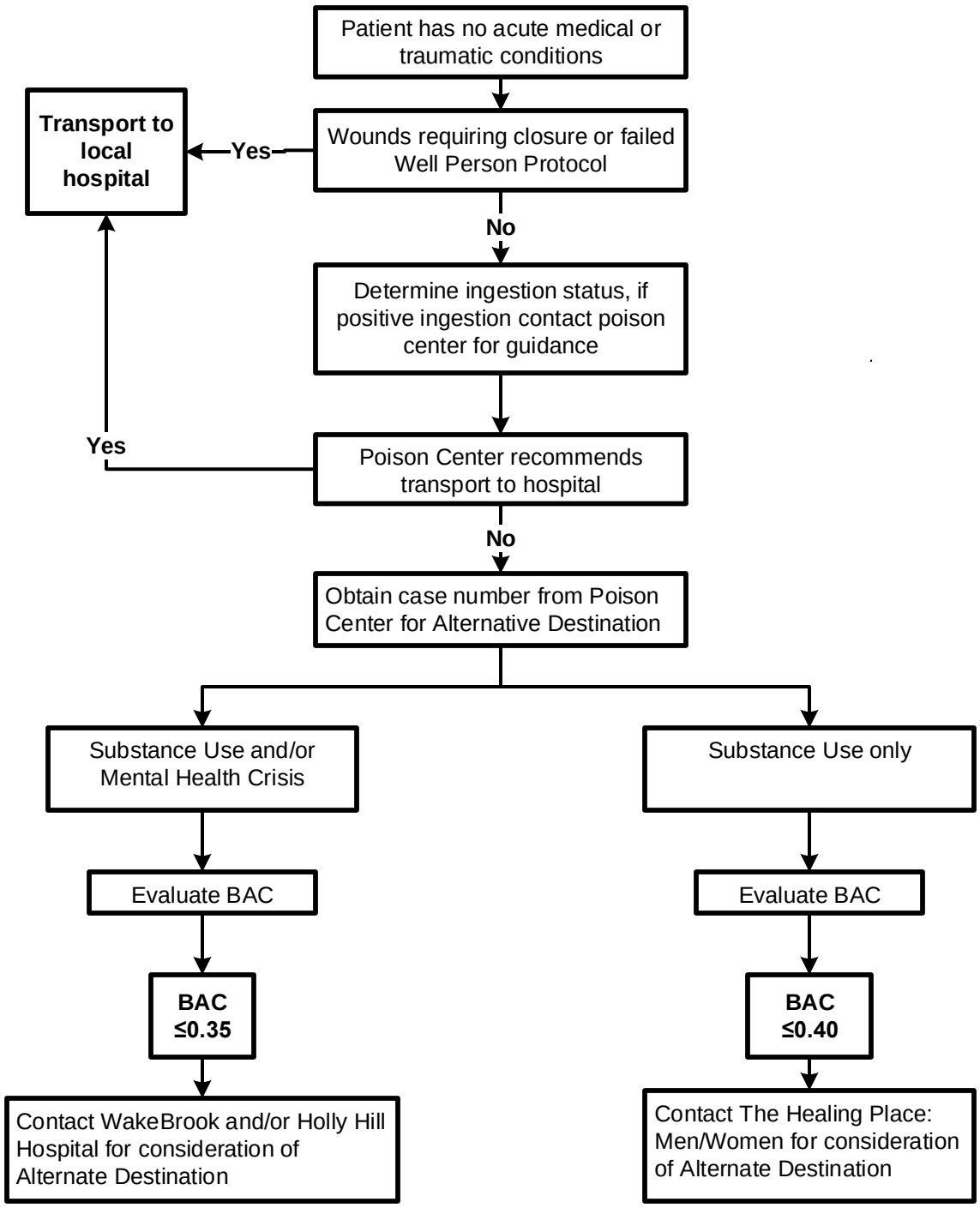


For patients who meet criteria for discontinuation of resuscitation, but transport is required or has been initiated, consider utilizing the "Transport to Morgue" Policy.

Universal Protocol Section

Pearls:
- **The body of a deceased person may be released to the funeral home if the death is attended (the patient has a primary care physician) and law enforcement confirms the death is non-suspicious. It is preferred (but not mandatory) to communicate directly with the primary care physician prior to releasing the body. All reasonable attempts should be made to contact the primary care physician prior to releasing the body.**
- **All out-of-hospital traumatic deaths, whether recent or remote, must be referred to the medical examiner.**
- **If there is no primary care physician, the State Office of the Chief Medical Examiner must be contacted.**
- **A patient has a primary care physician if there are in-date prescriptions from the physician, the family knows the name of the physician and can verify the patient still is seen by that physician, or other methods as approved by medical control.**

Medical Clearance for Mental Health/ Substance Use Patients



Universal Protocol Section

Pearls:

- Patient preference may still be honored if the patient wishes to be taken to the hospital instead of mental health or substance use facility.

- Use this protocol in conjunction with the Wake County EMS System Policy "**Transport and Screening for Mental Health and Substance Abuse Patients"**

Low Acuity Conditions for ET3: Alternative Care Options

History:

- NO chest pain within the last 24 hours
- NO neuro changes or change in ambulatory status in the last 24 hours
- NO severe pain
- NO significant respiratory distress
- NO current mental health or substance use complaint

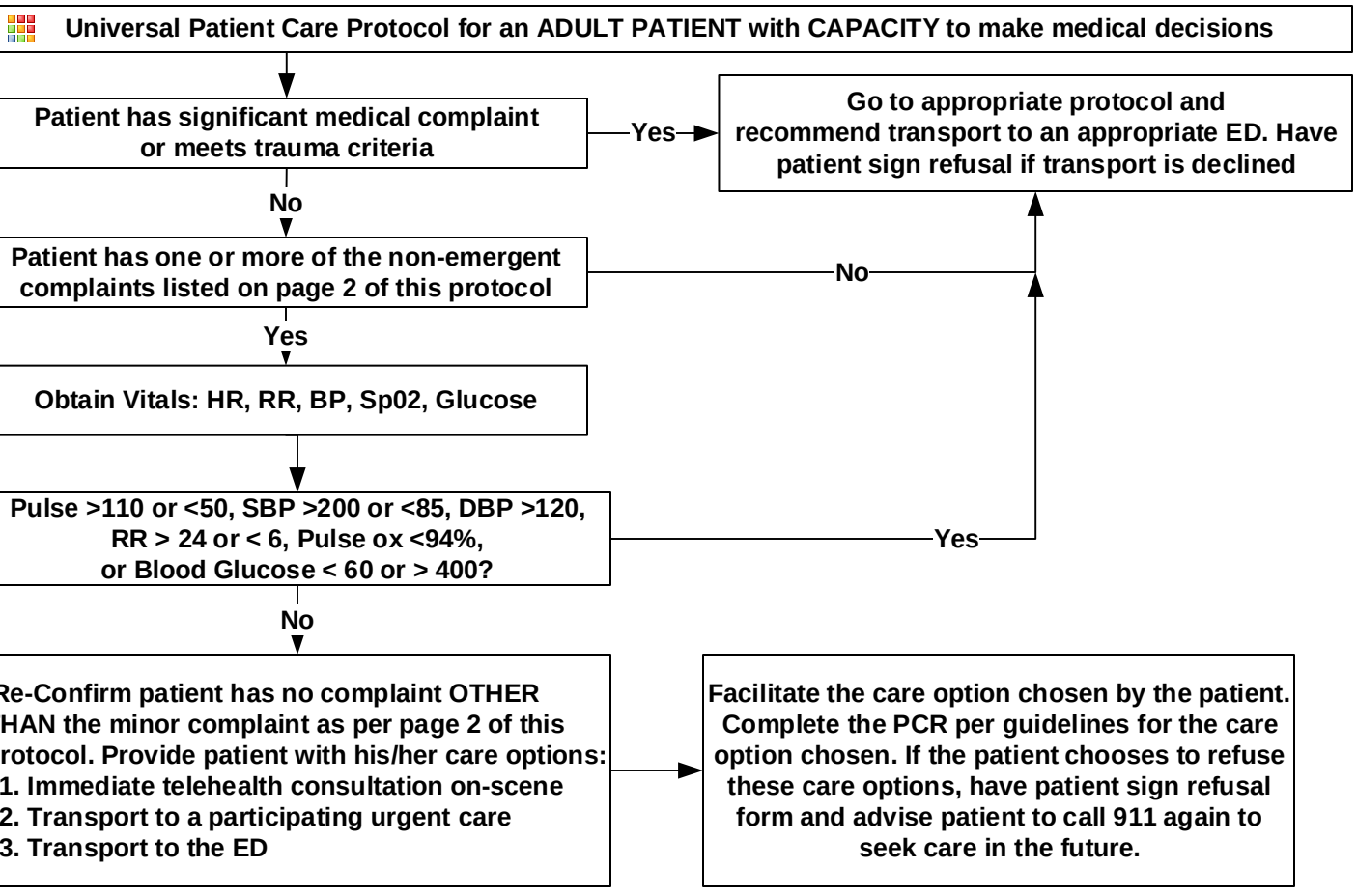
Signs and Symptoms- the patient has one or more of the non-emergent complaints listed IN THIS PROTOCOL

- See page two of this protocol

Differential/Disposition:

- No significant acute medical/trauma complaint per usual EMS protocols
- No significant traumatic injury
- No emergent need for ALS care

*** After reassuring brief evaluation including vital signs, these patients MAY be candidates for alternative care, including telehealth consultation or transport to urgent care***



Universal Protocol Section

Pearls:

- **This protocol applies to ALL responders**
- **Patients who are denying more severe symptoms may initially present asking to be "checked out." Please confirm with the patient at least twice that they have no medical complaints (other than those listed on page 2) before using this protocol.**
- **All persons who request medical evaluation or treatment are considered patients and shall have a PCR completed. See Pearls of Universal Patient care protocol for a discussion on assessing capacity.**
- **For these patients, the PCR may be brief but must include vitals and appropriate documentation of history/exam.**
- **Should a patient refuse evaluation and/or decline further evaluation once begun, document as much as you can. Even patients who refuse vital signs can be observed and respirations measured. The PCR narrative is key in these and all cases, and must accurately and thoroughly describe the patient encounter.**

Low Acuity Conditions for ET3: Alternative Care Options

Signs and Symptoms- the patient has one or more of THESE non-emergent complaints

*** If the patient chooses transport to urgent care, they must arrive at urgent care no later than **6pm**, and they are **REQUIRED** have a ride home from urgent care arranged PRIOR to transport to urgent care. This could be a ride from family/friends, taxi or ride service, etc, but the patient **MUST** articulate their secured ride plan prior to EMS taking the patient to urgent care.***

1. Motor Vehicle Crash (PATIENTS UNDER AGE 55 ONLY) – low speed, belted, ambulatory at the scene, no complaint or "wants to be checked out" or minor musculoskeletal complaint. Think parking-lot fender bender or rear-ended at a stoplight. NOT crashes on roads with speed limit 45 or greater.

2. Flu-like illness or "common cold" - One or minor upper respiratory complaints, +/- fever with or without malaise, aches, chills, minor respiratory symptoms. Patient must NOT meet sepsis screen per our usual sepsis protocol.

3. Cough – with or without MILD shortness of breath. No hypoxia, no respiratory distress. May be "common cold," bronchitis, sinus infection, "walking pneumonia," etc

4. Wheezing – history of asthma/COPD, improved after 1 neb, no hypoxia, no increased respiratory effort, ran out of MDI, etc

5. Eye, ear, nose, throat complaints (e.g. conjunctivitis, ear pain, minor epistaxis not on blood thinners, sore mouth/throat)

6. Nausea, Vomiting, Diarrhea WITHOUT severe abdominal pain or tenderness (minor cramping ok). N,V,D must be limited to 1-2 days, patient must be able to ambulate, not orthostatic. Patient must be likely to tolerate po intake.

7. Mild dehydration

8. Animal bite or insect bite – If animal, Cat or dog bite only, with minor injury that may/may not need stitches (no involvement of joint, tendon). Transport to ED if possible need for rabies prophylaxis (unknown animal) or patient bitten while in LE custody.

9. Musculoskeletal injuries - including minor lacerations and deformities that may or may not need Xrays or stitches. Patients should be able to bear weight with the extremity and use the extremity. Any bleeding must be controlled (no tourniquet).

10. Minor burns – e.g. sunburn or first/second degree burns with minimal BSA involvement, no face, no circumferential burns, no fingers, toes, or genitalia

11. Minor ground level falls – as per "Falls" protocol for DMHC/Eventus patients. No change in ambulatory status, No syncope, No LOC, No intoxication, No obvious significant injury. Cervical spine can be clinically cleared per usual EMS protocol.

12. Low back pain (Patients under age 40 only) – acute exacerbation or subacute. Patient is ambulatory, no extremity weakness no difficulty with bowel or bladder function. Chronic back pain is not appropriate for the urgent care environment.

13. Allergic reaction – In the "mild" category per usual EMS protocol, i.e. no epi before arrival and no epi from responders.

14. Rash or mild cellulitis on extremity without fever (e.g. poison ivy, shingles, "diaper" rash)

15. Dental pain - no telemedicine or urgent care if patient is requesting opioids. There should not be an expectation that urgent care will prescribe opioids, regardless of complaint.

16. Medication questions/refills - (no controlled substance refills, e.g. no opioids or benzodiazepines for telemedicine or urgent care). Telemedicine may be a good option for patients with isolated medication questions, as urgent cares will typically refer patients back to their usual prescriber. Patients should also not expect to receive Opioids for pain complaints at urgent cares (e.g. dental pain).

Adult 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

Altered Mental Status Protocol UP 4
if indicated

Respiratory Distress with a
Tracheostomy Tube
Protocol AR 10
if indicated

Protocols AR 1 and 2 should be utilized together as they both contain useful information for airway management.

Airway Obstructed

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

NO

Breathing / Oxygenation
Support needed?

YES →
- Supplemental Oxygen
  BVM
  Maintain
  Oxygen Saturation ≥ 90 %
  Preferably ≥ 94 %
- **B** Consider Airway CPAP Procedure
- **B** Airway BIAD Procedure ***if indicated***
- **A** Oral / Nasotracheal Intubation Procedure
- **P** Chest Decompression Procedure ***if indicated***
- **P** Post-intubation / BIAD Management Protocol AR 8 ***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 intubation attempts .
or
Anatomy inconsistent with continued attempts.
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

Always weigh the risks and benefits of endotracheal intubation in the field against transport. All prehospital endotracheal intubations are considered high risk. If ventilation / oxygenation is adequate, transport may be the best option. The most important airway device and the most difficult to use correctly and effectively is the Bag Valve Mask (not the laryngoscope).

Few prehospital airway emergencies cannot be temporized or managed with proper BVM techniques.

***** If an effective airway is being maintained by BVM and/or basic airway adjuncts (e.g. nasopharyngeal airway) with continuous pulse oximetry values of ≥ 90% or values expected based on pathophysiologic condition with otherwise reassuring vital signs (e.g. pulse oximetry of 85% with otherwise normal vitals in a post-drowning patient), it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation. Consider CPAP as indicated by protocol and patient condition. *****

Pearls

- **Also see Pearls section of protocol AR 2. For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **Intubation Attempt is passing the laryngoscope blade past the teeth or ETT inserted into the nasal passage.**
- **Continuous capnography (EtCO2) is mandatory with all methods of intubation, including BIAD and ETT.**
- **Ventilatory rate should be 8-10 per minute to maintain a EtCO2 of 35-45. Avoid hyperventilation.**

- **Anticipating the Difficult Airway and Airway Assessment**
  - **Difficult BVM Ventilation (MOANS): M**ask seal difficulty (hair, secretions, trauma); **O**bese, obstruction, OB – 2d and 3d trimesters; **A**ge ≥ 55; **N**o teeth; **S**tiff lungs or neck
  - **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**estricted mouth opening; **O**bese, obstruction, OB – 2d and 3d trimesters; **D**istorted or disrupted airway; **S**tiff lungs or neck
  - **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.

- **Nasotracheal intubation: Procedure requires spontaneous breathing and may require considerable time, exposing patient to critical desaturation. Contraindicated in combative, anatomical disrupted or distorted airways, increased ICP, severe facial trauma, basal skull fracture, and head injury. Orotracheal route is preferred, or CPAP/BVM when indicated.**

- Maintain spinal motion restriction for patients with suspected spinal injury.
- 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

Protocols AR 1 and 2 should be utilized together, as they contain useful information for airway management.

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

Failed Airway ↔ Call for additional resources if available

BVM
Adjunctive Airway NP / OP
Maintains
Oxygen Saturation ≥ 90 %
Preferably ≥ 94 %

YES → Continue BVM
Supplemental Oxygen

Exit to
Appropriate Protocol(s)

NO

B	Attempt Airway Blind Insertion Airway Device Procedure
A	Utilize Airway Video Laryngoscopy Device Procedure, ***if available***
P	<u>If anatomical obstruction, facial trauma, swelling prevents other methods of management:</u> Airway Cricothyrotomy Surgical Procedure
	Supplemental oxygen BVM with Airway Adjuncts Maintain Oxygen Saturation ≥ 90 % Preferably ≥ 94 %
	Post-intubation BIAD Management Protocol AR 8

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Adult, Failed Airway

A failed airway occurs when a provider begins a course of airway management by endotracheal intubation and identifies that intubation by that method will not succeed.

It should be noted that a patient with a "failed airway" is one who is near death or dying, not stable or improving. Patients who cannot be intubated or who do not have an Oxygen Saturation greater than 90% do not necessarily have a failed airway. Many patients who cannot be intubated easily may be sustained by basic airway techniques and BVM, with stable if not optimal Oxygen Saturation, i.e. stable (not dropping) SpO2 values as expected based on pathophysiologic condition with otherwise reassuring vital signs (e.g. consistent pulse oximetry of 85% with otherwise normal or near-normal vitals in a post-drowning patient)

The most important way to avoid a failed airway is to identify patients with expected difficult airway, difficult BVM ventilation, difficult BIAD, difficult laryngoscopy and / or difficult cricothyrotomy. .

Position of patient: In the field, improper position of the patient and rescuer are responsible for many failed and difficult intubations. Often this is dictated by uncontrolled conditions present at the scene and we must adapt. However many times the rescuer does not optimize patient and rescuer position. The sniffing position or the head simply extended upon the neck are probably the best positions. The goal is to align the ear canal with the suprasternal notch in a straight line.

In the **obese or late pregnant patient** elevating the torso by placing blankets, pillows or towels will optimize the position. This can be facilitated by raising the head of the cot.

Use of cot in optimal patient / rescuer position: The cot can be elevated and lowered to facilitate intubation. With the patient on the cot raise until the patients nose is at the level of your umbilicus which will place you at the optimal position.

Trauma: Utilize in-line cervical stabilization during intubation, BIAD or BVM use. During intubation or BIAD the cervical collar front should be open or removed to facilitate translation of the mandible / mouth opening.

Cricothyrotomy / Surgical Airway Procedure: Use in patients 12 years of age and greater only. Percutaneous transtracheal jet ventilation is used in younger patients if available. Relative contraindications include: Pre-existing laryngeal or tracheal tumors, or infections or abscess overlying the cricoid area or hematoma or anatomical landmark destruction / injury.

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.**

- **Anticipating the Difficult Airway and Airway Assessment**
  - **Difficult BVM Ventilation (MOANS): M**ask seal difficulty (hair, secretions, trauma); **O**bese, obstruction, OB – 2d and 3d trimesters; **A**ge ≥ 55; **N**o teeth; **S**tiff lungs or neck
  - **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**estricted mouth opening; **O**bese, obstruction, OB – 2d and 3d trimesters; **D**istorted or disrupted airway; **S**tiff lungs or neck
  - **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.

- **If first intubation attempt fails, make an adjustment and then consider:**
  - Different laryngoscope blade / Video or other optical laryngoscopy devices
  - Gum Elastic Bougie, Different ETT size, change/optimize patient positioning to "sniffing position"
- 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.
- Continuous pulse oximetry and waveform capnography should be utilized in all patients with inadequate respiratory function.
- **Notify Medical Control AS EARLY AS POSSIBLE concerning the patient's difficult / failed airway.**
- **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

A IV/ IO Procedure

P Cardiac Monitor

Following Assessment

WHEEZING

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

STRIDOR

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

A **Epinephrine Nebulizer 1 mg (1:1000) / 2 mL NS** May repeat x 3

Adult Airway Protocol(s) ***as indicated***

B Airway CPAP Procedure

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

If not improving, consider **Epinephrine 1:1000 0.3 mg IM**

P **Methylprednisolone 125 mg IV / IO / IM**

P **Magnesium Sulfate 2g IV / IO** Infuse over 10 – 20 minutes, per drug label instructions

P *Or,* **Prednisone 60mg po** May be considered for mild asthma exacerbations

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**
- **A silent chest in respiratory distress is a pre-respiratory arrest sign.**
- **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.**

- **Combination nebulizers containing albuterol and ipratropium:**
  Patients may receive more than 3 nebulizer treatments, treatments should continue until improvement. Following 3 combination nebulizers, it is acceptable 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 impending respiratory failure and no improvement.**
- Epinephrine may precipitate cardiac ischemia. When considering INTRAMUSCULAR administration, the following patients should receive half the dose of epinephrine (0.15 mg of 1:1000) for the initial dose and any repeated doses:
  - Patient has history of coronary artery disease, MI, stents, CHF, cardiac surgery OR
  - Patient takes Beta-Blockers or Digoxin OR
  - A patient 50 years or older AND has a heart rate ≥ 150

- **Pulse oximetry and waveform capnography should be monitored continuously for any patient with respiratory distress.**

- **CPAP or Non-Invasive Positive Pressure Ventilation:**
- **May be used with COPD, Asthma, Allergic reactions, CHF, drowning, pneumonia, as needed to assist with oxygenation/ventilation and delay worsening of distress. Consider early in treatment course.**
- **Consider removal of CPAP if SBP remains < 90 mmHg and not responding to other treatments.**
- **Consider Midazolam 1-2mg IV to assist with CPAP compliance. Benzodiazepines may precipitate respiratory depression or may actually worsen compliance with CPAP in patients who are already tired, already with altered mental status, or who have recent history of alcohol or drug ingestion. All efforts at verbal coaching should be utilized prior to giving benzodiazepines for patients in respiratory distress.**

- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.**

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 UP 13 ***if indicated***

Airway Obstructed

YES → Airway Foreign Body Obstruction Procedure

A — Video or Direct Laryngoscopy for Foreign Body Removal

NO

Breathing / Oxygenation Support needed

YES →
Supplemental Oxygen
BVM
Maintain
Oxygen Saturation ≥ 90 %
Preferably ≥ 94 %

B — Airway BIAD Device Procedure ***if indicated***

A — Oral / Tracheal Intubation Procedure

P — If strong suspicion for tension pneumothorax, consider: Chest Decompression Procedure ***if indicated***

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

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

Exit to Pediatric Failed Airway Protocol AR 6

NO

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

Exit to Appropriate Protocol(s)

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Pediatric Airway

Pearls

- **For this protocol, pediatric is defined as any patient which can be measured within the approved length-based tape.**
- **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% or stable/improving values consistent with clinical condition (e.g. pulse oximetry in the mid 80s post-drowning), it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
- **An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Continuous Waveform capnography is mandatory with all methods of airway management. Document results.**
- **Continuous capnography (EtCO2) is mandatory with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).**
- **Ventilatory rate for patients with a pulse: 40-60 for newly born, 30 for Infants, 20 for Toddlers/School Age, and for Adolescents the normal Adult rate of 8 - 10 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**

- 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.
- It is important to secure the endotracheal tube well; utilize commercial holder if available 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.

Pediatric Failed Airway

Unable to Ventilate and Oxygenate ≥ 90% during
or after one (1) or more unsuccessful intubation attempts.
or
Anatomy inconsistent with continued attempts.
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
appropriate for clinical
condition (usually ≥ 90 %)
Preferably ≥ 94 %

YES → Continue BVM
Supplemental Oxygen

Exit to
Appropriate
Protocol(s)

NO

A Airway Video Laryngoscopy
Device Procedure
if available

B Attempt
Airway Blind Insertion Airway
Device Procedure

BIAD Successful
Or
Oxygenation / Ventilation
Adequate

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

NO

Supplemental oxygen
BVM with Airway Adjunts
Maintain Oxygen Saturation
≥ 90 %
Preferably ≥ 94 %

Notify Destination or
Contact Medical Control

Airway Respiratory Protocol Section

Pediatric Failed Airway

Pearls

- **For this protocol, pediatric is defined as any patient which can be measured with a Length-Based Resuscitation tape.**
- **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% or stable/improving values consistent with clinical condition (e.g. pulse oximetry in the mid 80s post-drowning), it is acceptable to continue with basic airway measures instead of using a BIAD or Intubation.**
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- **Continuous Waveform capnography is mandatory with all methods of airway management. Document results.**
- **Continuous capnography (EtCO2) is mandatory with BIAD or endotracheal tube use though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended).**
- **Ventilatory rate for patients with a pulse: 40-60 for newly born, 30 for Infants, 20 for Toddlers/School Age, and for Adolescents the normal Adult rate of 8 - 10 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**

- **If first intubation attempt fails, make an adjustment and then try again:** Different laryngoscope blade; Gum Elastic Bougie; Different ETT size; Change cricoid pressure; Apply BURP; Change head positioning
- 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.
- It is important to secure the endotracheal tube well and utilize tube holder 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.

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) 5 - 7
as indicated

Pediatric
Reaction / Anaphylaxis
Protocol PM 1
as indicated

B 12 Lead ECG Procedure

A IV / IO Procedure
if indicated

P Cardiac Monitor

Following Assessment

WHEEZING / Asthma

B **Albuterol Nebulizer 5 mg**

STRIDOR / Croup

B **Albuterol Nebulizer 5 mg**

A **Epinephrine Nebulizer**
1 mg (1:1000) in 2 mL NS
May repeat x 3

Pediatric Airway Protocol(s) 5 - 7
as indicated

A No response: Consider
Epinephrine 1:1000
0.01 mg / kg IM
Maximum 0.3 mg

Albuterol Nebulizer
5 mg
+/- Ipratropium 0.5 mg
Repeat as needed x 3

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

Magnesium Sulfate 40 mg/kg IV / IO
Infuse over 10 – 20 minutes
(Magnesium only indicated for WHEEZING/Asthma, do not give for STRIDOR/Croup)

P ***or* Prednisone po**
***or* Prednisolone po**
(Orapred) 2mg/kg po
Maximum 60mg

Oral meds only for mild asthma exacerbations

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.**
- **Pulse oximetry and continuous waveform capnography should be monitored continuously in the patient with respiratory distress.**
- **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.**
- **CONSIDER THE CHILD'S ABILITY TO SWALLOW PILLS OR LIQUIDS WELL, based on age, prior to administering any po medication for respiratory distress.**

- **Combination nebulizers containing albuterol and ipratropium:**
  Patients may receive more than 3 nebulizer treatments, treatments should continue until improvement. Following 3 combination nebulizers, it is acceptable 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 epi for impending respiratory failure and no improvement with other therapies**

- **Consider IV access when Pulse oximetry remains ≤ 92 % after first beta agonist treatment. Also consider saline bolus of 20 mL/kg in pediatric patients in respiratory distress; these patients are often dehydrated.**
- **Do not force a child into a position, allow them to assume position of comfort. They will protect their airway by their body position.**

- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to 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 if available or by parental request.

- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.**

Post-intubation / BIAD Management

Protocols AR 1, 2, 5, and 6 should be utilized together as they contain useful information for airway management.

Capnography Monitoring

- **End-tidal (EtCO2) monitoring is mandatory following placement of an endotracheal tube or BIAD.**

ETT or Blind Insertion Airway Device Successful

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

YES

B	12 Lead ECG Procedure ***as indicated***
A	IV / IO Procedure (preferably 2 sites)
	Continue Airway Adjuncts Maintain SpO2 ≥ 90 % Preferably ≥ 94 % EtCO2 35 – 45 Ventilate 8 – 10 breaths / minute Pediatrics may require faster rate See Pearls
P	Cardiac Monitor
P	Transport Ventilator Procedure ***If available***

Awakening or Moving after Intubation / BIAD Placement Evidence of Anxiety / Agitation

NO → Notify Destination or Contact Medical Control

YES

P

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

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

If Fentanyl OR Midazolam ineffective, *consider:*
Etomidate 0.2mg/kg IV/IO
max 10-20mg (normal adult dose)

Or Consider: **Ketamine 1.5 – 2.0 mg/kg IV / IO** *if available*

If patient movement threatens secure airway despite sedatives above, consider long term paralytic:

Rocuronium 1 mg/kg IV/IO, max 70mg (normal adult)
Paralytics 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.**
- **Intubated/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.**

- **Ventilation strategies will need to be tailored to individual patient presentations, usually based on age. Ventilatory rate for patients with a pulse: 40-60 for newly born, 30 for Infants, 20 for Toddlers/School Age, and for Adolescents the normal Adult rate of 8 - 10 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**

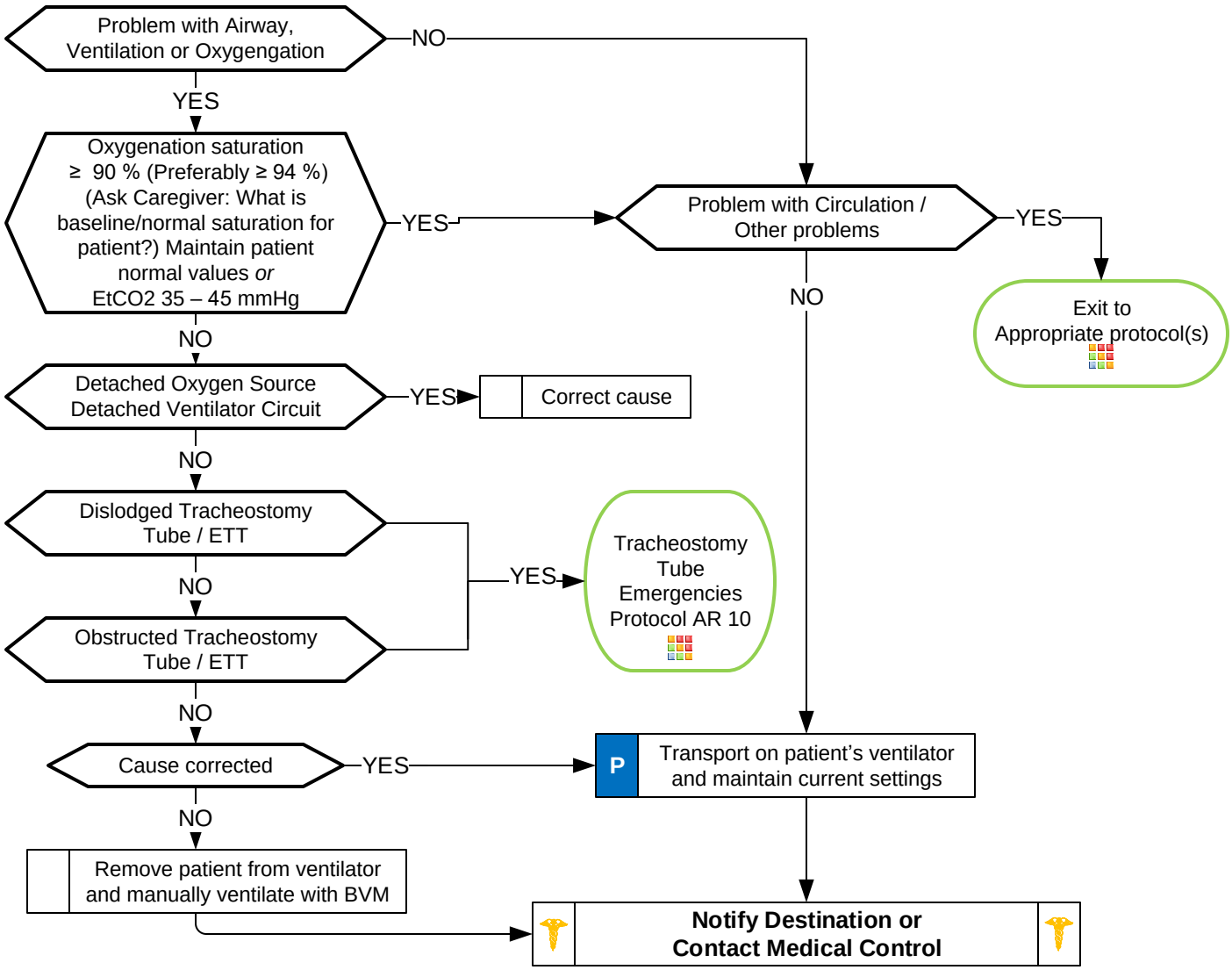
- In general ventilation with BVM should cause chest rise. With mechanical ventilation a reasonable tidal volume should be about 6 mL/kg and peak pressures should be < 30 cmH20.
- Continuous pulse oximetry and capnography should be maintained during transport for monitoring.
- Head of bed should be maintained at least 10 – 20 degrees of elevation when possible to decrease aspiration risk.
- With abrupt clinical deterioration, if mechanically ventilated, disconnect from ventilator to assess lung compliance. Search for dislodged ETT or BIAD, obstruction in tubing or airway, pneumothorax, or ETT balloon leak.
- **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

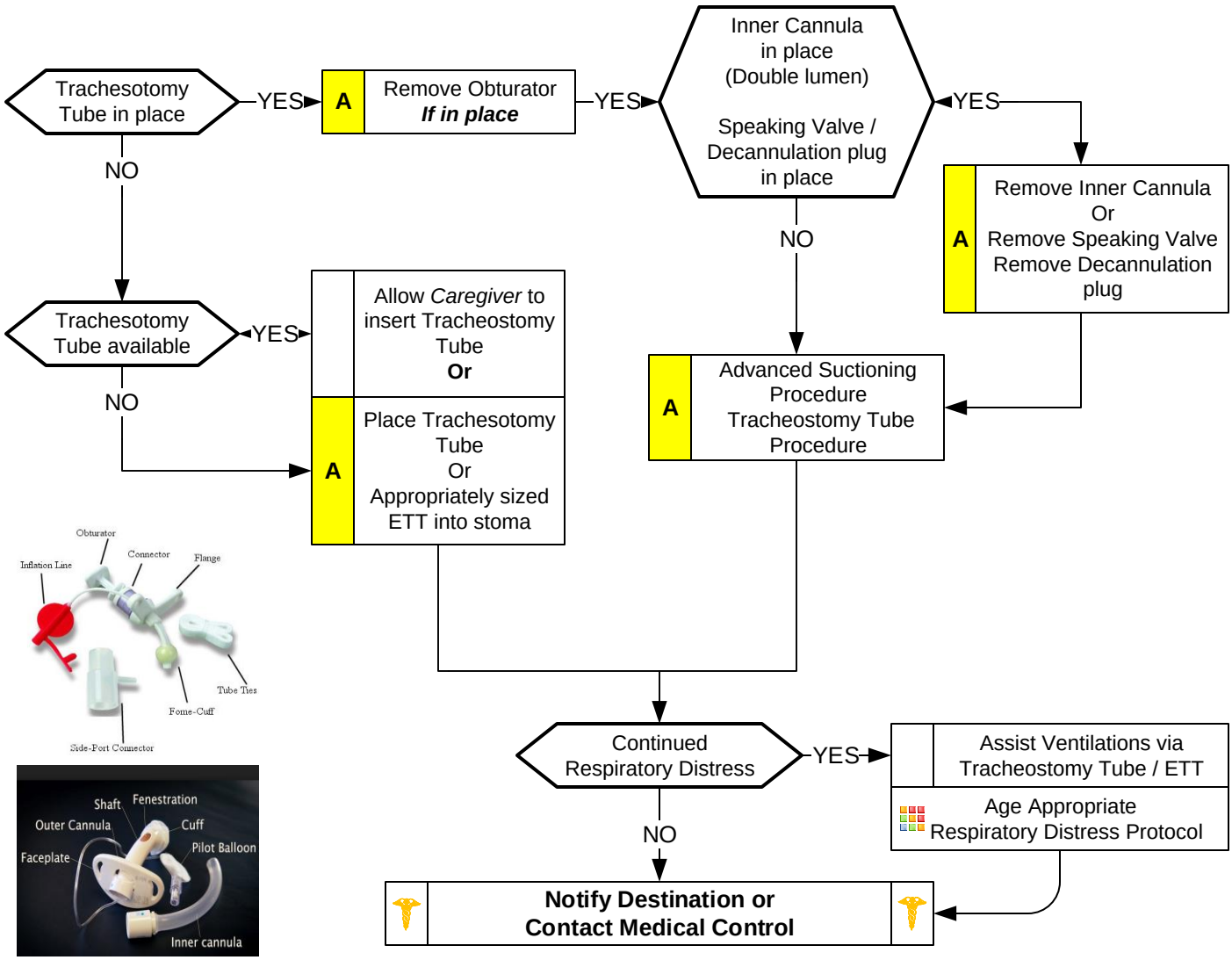
Pearls
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **If using the patient's ventilator bring caregiver knowledgeable in ventilator operation during transport.**
- Always use patient's equipment if available and functioning properly.
- Continuous pulse oximetry and end tidal CO2 monitoring must be utilized during assessment and transport.
- Unable to correct ventilator problem: Remove patient from ventilator and manually ventilate using BVM. Take patient's ventilator to hospital even if not functioning properly.
- 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. SEE TRACHEOSTOMY TUBE CHANGE PROCEDURE.
- 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.

Adult Asystole / Pulseless Electrical Activity

History
- SAMPLE
- Estimated downtime
- Medications
- Events leading to arrest
- 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
- Suspected hypothermia, ESRD
- Suspected overdose
  - Tricyclic
  - Digitalis
  - B-blockers, Ca-channel blockers

Cardiac Arrest Protocol AC 3

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES

Decomposition
Rigor mortis
Dependent lividity

Injury incompatible with life, traumatic arrest with Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches)
Push Fast (120 / min)
Change Compressors every 2 minutes (sooner if fatigued)
(Limit changes / pulse checks ≤ 5 seconds)

Ventilate 1 breath every 6-8 seconds
Continuous Compressions; pause every 2 minutes to check rhythm
Monitor EtCO2

AED Procedure, ***if available***

Consider specific treatments early, search for Reversible Causes of PEA/Asystolic Cardiac Arrest

P
- Consider Chest Decompression Procedure
- Cardiac Monitor

IV / IO Protocol UP 6

A
- **Epinephrine (1:10,000) 1 mg IV / IO**
  Repeat every 3 to 5 minutes,
  paramedic may use drip if available
- **Normal Saline Bolus 500 mL IV / IO**
  May repeat as needed
  Max 2 L, unless hypovolemia is likely cause of arrest

Adult Rhythm Appropriate Protocol(s)
as indicated

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

Consider Early for PEA
1. Repeated Saline Boluses for possible hypovolemia
2. Dextrose IV/IO
3. Naloxone 2mg IV/IO
4. Glucagon 4mg IV/IO/IM for suspected beta blocker or calcium channel blocker overdose.
5. Calcium Chloride 1 g IV/IO for suspected hyperkalemia, hypocalcemia
6. Sodium Bicarbonate 50meq IV/IO for possible overdose, hyperkalemia, renal failure
7. Consider Epinephrine drip
8. Consider Dopamine drip
9. Atropine 1mg IV ONLY for organized PEA with rate < 60.
10. Chest Decompression

Reversible Causes

Hypovolemia (AAA)
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hyperkalemia (ESRD)
Tension pneumothorax
Tamponade/Trauma
Toxins (TCA overdose)
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Criteria for Discontinuation?

NO

YES

Discontinuation of Prehospital Resuscitation Policy Disposition 3
as indicated

Notify Destination or Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

Adult Cardiac Protocol Section

Adult Asystole / Pulseless Electrical Activity

Pearls

- SURVIVAL FROM PEA OR ASYSTOLE is based on identifying and correcting the CAUSE: consider a broad differential diagnosis, with early and aggressive treatment of possible causes.
- **Use Pit-Crew Approach; assign incoming responders to pit crew positions in order.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **Utilize passive oxygenation (non-rebreather or nasal cannula) as resources arrive. Breathing / Airway management should occur after 2 rounds of compressions (2 minutes each round.)**

- **DO NOT HYPERVENTILATE: Ventilate 8-10 breaths per min with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- 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**.
- Return of spontaneous circulation after Asystole / PEA requires continued search for underlying cause of cardiac arrest. Treatment of hypoxia and hypotension are important after resuscitation from Asystole / PEA.
- **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 post cardiac arrest center that is also an obstetrical center. 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.

  Sodium bicarbonate - no longer recommended as a standard cardiac arrest drug. Consider in the dialysis / renal patient, known hyperkalemia or tricyclic overdose at 50 mEq IV / IO.

  Opioid Overdose – If early in arrest, consider Naloxone 2 mg IM / IV / IO / IN. EMT may administer naloxone via IN route only. May give from EMS supply.

  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 proper planning and execution. Procedures require space and 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

Suspected Beta-Blocker or Calcium Channel Blocker

Also utilize Overdose / Toxic Ingestion Protocol

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

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

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

B
- Search for Reversible Causes
- 12 Lead ECG Procedure

IV / IO Protocol UP 6

P Cardiac Monitor

A
Normal Saline Fluid Bolus
500 mL – 2 L NS IV / IO
(Unless Acute CHF)
Maximum 2 L

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

Epinephrine 1 - 10 mcg/min IV / IO
Titrate to SBP ≥ 90 mmHg
or
Dopamine 5 – 20 mcg/kg/min IV / IO

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

Pacing should be considered first-line therapy for symptomatic bradycardia due to cardiac ischemia (e.g. STEMI, 3rd degree heart block)

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

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

P

Consider Sedation
Midazolam 2.5 mg
IV / IO / IM / IN
May repeat as needed
Maximum 10 mg

Fentanyl is an ALTERNATIVE to Midazolam for pain/sedation for pacing, especially in the hypotensive patient. DO NOT give BOTH Fentanyl and Midazolam.

Fentanyl 1 mcg/kg
IV/IO/IM/IN
Max dose 100 mcg, give SLOW over 2-3 mins

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Bradycardia; Pulse Present

Pearls

- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- **Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.**
- **Bradycardia causing symptoms is typically < 50/minute. Rhythm should be interpreted in the context of symptoms and pharmacological treatment given ONLY when symptomatic, otherwise monitor and reassess**

- Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)
- **Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.**
- **Hypoxemia is a common cause of bradycardia. Ensure oxygenation and support respiratory effort.**

- **<u>Atropine</u>**
  Do NOT delay Transcutaneous Pacing to administer Atropine in bradycardia with poor perfusion.
  Caution in setting of acute MI. Elevated heart rate can worsen ischemia.
  Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.

- **<u>Transcutaneous Pacing Procedure (TCP)</u>**
  Utilize TCP early if no response to atropine. 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.

Cardiac Arrest; Adult

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES

- Decomposition
- Rigor mortis
- Dependent lividity

Injury incompatible with life, traumatic arrest with Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches)
Push Fast (120 / min)
Change Compressors every 2 minutes (sooner if fatigued)
(Limit changes / pulse checks ≤ 5 seconds)

Ventilate 1 breath every 6-8 seconds
Continuous Compressions; pause every 2 minutes to check rhythm
Monitor EtCO2

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 10

ALS Available

NO

- AED Procedure ***if available***
- Shockable Rhythm
  - NO
  - YES
    - AED Procedure
- Continue CPR 2 Minutes
- Repeat and reassess
- Airway Protocol(s) AR 1, 2

YES

- P Cardiac Monitor
- Shockable Rhythm
  - NO
    - Asystole / PEA Protocol AC 1 ***as indicated***
    - Airway Protocol(s) AR 1, 2
  - YES
    - VF / VT Protocol AC 8
    - Tachycardia Protocol AC 6, 7 ***as indicated***
    - Airway Protocol(s) AR 1, 2

Discontinuation of Prehospital Resuscitation Policy Disposition 3 ***as indicated***

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Cardiac Arrest; Adult

Pearls

- SURVIVAL FROM PEA OR ASYSTOLE is based on identifying and correcting the CAUSE: consider a broad differential diagnosis, with early and aggressive treatment of possible causes.
- **Use Pit-Crew Approach; assign incoming responders to pit crew positions in order.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **Utilize passive oxygenation (non-rebreather or nasal cannula) as resources arrive. Breathing / Airway management should occur after 2 rounds of compressions (2 minutes each round.)**

- **DO NOT HYPERVENTILATE: Ventilate 8-10 breaths per min with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- 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**.
- Return of spontaneous circulation after Asystole / PEA requires continued search for underlying cause of cardiac arrest. Treatment of hypoxia and hypotension are important after resuscitation from Asystole / PEA.
- **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 post cardiac arrest center that is also an obstetrical center. 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.
  Sodium bicarbonate - no longer recommended as a standard cardiac arrest drug. Consider in the dialysis / renal patient, known hyperkalemia or tricyclic overdose at 50 mEq IV / IO.
  Opioid Overdose – If early in arrest, consider Naloxone 2 mg IM / IV / IO / IN. EMT may administer naloxone via IN route only. May give from EMS supply.
  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 proper planning and execution. Procedures require space and access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Chest Pain: Cardiac and STEMI

History

- Age
- Medications (Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- **P**alliation / **P**rovocation
- **Q**uality (crampy, constant, sharp, dull, etc.)
- **R**egion / **R**adiation / **R**eferred
- **S**everity (1-10)
- **T**ime (onset /duration / repetition)

Signs and Symptoms

- **CP (pain, pressure, aching, vice-like tightness)**
- **Shortness of breath**
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Nausea, vomiting, dizziness
- **Time of Onset**
- Women:
  - More likely to have dyspnea, N/V, weakness, back or jaw pain, atypical symptoms

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**
	Aspirin 81 mg x 4 PO (chewed) Or **325 mg PO**
	Nitroglycerin 0.3 / 0.4 mg Sublingual Repeat every 5 minutes x 3 ***if prescribed to patient and (BP ≥ 100)***
P	Cardiac Monitor

Acute MI / STEMI
(STEMI is ≥ 1 mm ST Segment Elevation ≥ 2 Contiguous Leads)

YES →

Transport based on:
STEMI
EMS Triage and Destination Plan
Immediate Notification of Facility
Immediate Transmission of ECG
if capable
Keep Scene Time as short as possible; ideal ≤ 10-15 Minutes

	IV / IO Protocol UP 6
A	**Nitroglycerin 0.3 / 0.4 mg SL** Repeat every 5 minutes as needed for ongoing chest pain
A	**Nitroglycerin Paste** **SBP > 100 1 inch** **SBP > 150 1.5 inch** **SBP > 200 2 inch**
P	**If pain not improved with Nitro, consider Fentanyl:** **Fentanyl 50 mcg IV / IO** Repeat 25 mcg every 20 minutes as needed **Maximum 200 mcg**
	Hypotension / Shock Protocol AM 5 ***if indicated***
	CHF / Pulmonary Edema Protocol AC 5 ***if indicated***

Notify Destination or Contact Medical Control

Acute MI / STEMI

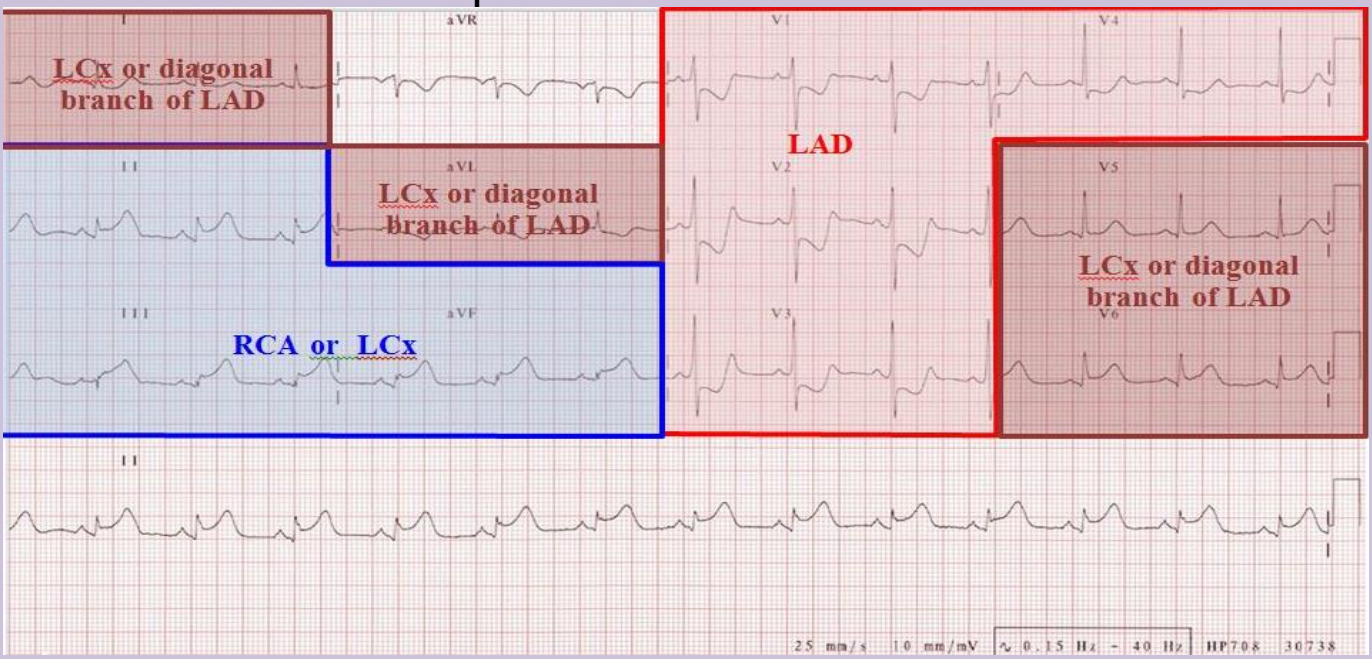
STEMI Definitions:
***Notify hospital of "CODE STEMI" or "Send for Consult," as indicated in procedure CSP 1, if these are present:**

- **≥ 1 mm ST Segment elevation in ≥ 2 contiguous leads (includes the scenarios below)**
- **≥ 2 mm ST/J point elevation in V2 and V3 for men. This degree of elevation is less likely to be an imposter.**
- **≥ 1.5 mm ST/J point elevation in V2 and V3 for women. This degree of elevation is less likely to be an imposter.**
- **ECG software diagnoses Acute MI (symptomatic). At minimum send this for consult if not CODE STEMI.**

Adult Cardiac Protocol Section

Chest Pain: Cardiac and STEMI

STEMI/Culprit Vessel Localization Aid:



*** SEE 12-LEAD/CODE STEMI CATH LAB ACTIVATION PROCEDURE FOR CRITERIA TO CALL "CODE STEMI" AND ACTIVATE CATH LAB VS. SEND EKG FOR CONSULT.**

ST Elevation in 2 or more leads: II, III, aVF = Inferior wall MI (vessel likely RCA or LCx)
ST Elevation in 2 or more leads: I, aVL, V5, V6 = Lateral wall MI (vessel likely LCx or LAD branch)
ST Elevation in 2 or more leads: V1, V2, V3, V4 = Septal/Anterior wall MI (vessel likely LAD)

**Look for ST DEPRESSION in reciprocal leads (opposite wall) to confirm diagnosis. In this example ekg there is ST Elevation in this INFERIOR wall MI, and ST Depression in the Antero-Septal leads.

** Isolated ST elevation in aVR, with ST depression EVERYWHERE ELSE is concerning for a possible proximal LAD or Left Main lesion. Not STEMI criteria, but EKG should be sent for consult and ED notified early.

Adult Cardiac Protocol Section

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are the key performance indicators**
- **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.**
- **Any EKG concerning for Acute MI may be transmitted for CONSULT at the discretion of the paramedic.**
- **STEMI (ST-Elevation Myocardial Infarction)**
  - **Consider placing 2 IV sites in the left arm: Many PCI centers use the right radial vein 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.**
- **If CHF / Cardiogenic shock resulting from inferior MI (II, III, aVF), consider Right Sided ECG (V3 or V4) while transporting to the hospital. If ST elevation noted, Nitroglycerin and / or opioids may cause hypotension requiring fluid boluses.**
- If patient has taken his own nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and opioids.
- Diabetic, geriatric and female patients often have atypical pain, or only generalized complaints. Have a low threshold to perform a 12 lead EKG in these patients.
- Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).
- **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

Airway
Protocol(s) AR 1, 2
as indicated

Chest Pain and STEMI
Protocol AC 4
if indicated

B 12 Lead ECG Procedure

B **Nitroglycerin 0.3 / 0.4 mg Sublingual**
Repeat every 5 minutes x 3
if prescribed to patient and (BP >100)

P Cardiac Monitor

IV / IO Protocol UP 6

Assess Symptom Severity

MILD
Normal Heart Rate
Elevated or Normal BP

A **Nitroglycerin 0.3 / 0.4 mg SL**
Repeat every 5 minutes

A **Nitroglycerin Paste if available**
SBP > 100 1 inch
SBP > 150 1.5 inches
SBP > 200 2 inches

Improving — NO → (B) Airway NIPPV/CPAP Procedure

YES

MODERATE / SEVERE
Elevated Heart Rate
Elevated BP

B **Airway NIPPV/CPAP Procedure**

A **Nitroglycerin 0.3 / 0.4 mg SL**
Repeat every 5 minutes

A **Nitroglycerin Paste if available**
SBP > 100 1 inch
SBP > 150 1.5 inches
SBP > 200 2 inches

P **Enalaprilat 1.25mg IV**
ONLY if SBP > 120

CARDIOGENIC SHOCK
Tachycardia followed by bradycardia
Hypertension followed by hypotension

B Remove CPAP, but ***only while hypotensive (SBP < 90)***

Adult Hypotension / Shock
Protocol AM 5
if indicated

P **Norepinephrine 1-10 mcg/min**
IV Infusion titrate to SBP >90

or
Dopamine
5 – 20 mcg/kg/min IV / IO
Titrate to SBP > 90

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Revised
4/1/2022

AC 5

This protocol has been altered from the original NCCEP Protocol by the local EMS Medical Director

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**
- **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.**
- **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.**
- **Carefully monitor the level of consciousness, BP, and respiratory status with the above interventions.**
- **If CHF / Cardiogenic shock resulting from inferior (II, III, aVF) MI, consider Right Sided ECG. If ST elevation is noted in transposed V3 or V4, Nitroglycerin and / or opioids may cause hypotension requiring fluid boluses.**
- Nitroglycerin SL is typically faster acting and higher dose than nitro paste. For patients with significant hypertension, try to utilize SL nitro prior to using paste. If Nitro-paste is used, only re-dose SL nitro with extreme caution, for extremely elevated blood pressure .
- If patient has taken his own nitroglycerin without relief, consider potency of the medication.
- Consider myocardial infarction in all of these patients. Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.
- Allow the patient to be in a position of comfort to maximize their breathing effort.
- Document CPAP application using the CPAP procedure in the PCR. Document 12 Lead ECG using the 12 Lead ECG procedure.
- **EMT-B may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply**.

- Consider Midazolam 1-2mg IV to assist with CPAP compliance. Benzodiazepines may precipitate respiratory depression or may actually worsen compliance with CPAP in patients who are already tired, already with altered mental status, or who have recent history of alcohol or drug ingestion. All efforts at verbal coaching should be utilized prior to giving benzodiazepines for patients in respiratory distress..

Adult Tachycardia
Narrow Complex (< 0.12 sec) REGULAR RHYTHM

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

Signs and Symptoms
- Heart Rate > 150
- Systolic BP < 90
- Dizziness, CP, SOB, AMS, Diaphoresis
- CHF
- Potential presenting rhythm
  - Atrial/Sinus tachycardia
  - AV nodal re-entry Tachycardia
  - Ventricular Tachycardia

Differential
- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Fever, Pain, Emotional stress
- Hypoxia, Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus

Unstable / Serious Signs and Symptoms
HR Typically > 150
Hypotension/no radial pulse, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES → Synchronized Cardioversion Procedure

Narrow and Regular: 360 J
Narrow and Irregular: 360 J

May repeat if needed; check pulse and eval for cardiac arrest if no conversion

Consider Sedation Prior to Cardioversion

P
Midazolam 2.5 mg IV / IO or 5mg IM
May repeat as needed; Max 10 mg

Fentanyl is an ALTERNATIVE to Midazolam for pain/sedation for cardioversion, especially in the hypotensive patient. DO NOT give BOTH Fentanyl and Midazolam.

Fentanyl 1 mcg/kg IV/IO/IM/IN
Max dose 100 mcg,
give SLOW over 2-3 mins

Exit to Appropriate Protocol(s) ***if rhythm converts***

NO

B 12 Lead ECG Procedure

IV / IO Protocol UP 6

Cardiac Monitor

Attempt Vagal Maneuvers Procedure

Adenosine 12 mg IV / IO
Rapid push with flush
May repeat **12 mg IV / IO x 1 dose if needed**

P

<u>If no rhythm change with Adenosine</u>:
Diltiazem 20 mg IV / IO drip
INFUSE PER DRUG LABEL
If age ≥ 60 give **10 mg** then repeat **10 mg** in 5 minutesif SBP ≥ 100
<u>If rate not controlled:</u> repeat bolus in 15 minutes if SBP ≥ 100:
Diltiazem 25 mg IV / IO drip
INFUSE PER DRUG LABEL
If age ≥ 60 give **15 mg t**hen repeat **10 mg** in 5 minutes if SBP ≥ 100

If diltiazem not available:
Metoprolol 5mg IV / IO slow push over 2 min
May repeat 5mg q 5 min as needed for rate control to max dose 15mg

If contraindication to diltiazem and/or metoprolol, or history of WPW, instead use:

Amiodarone 150mg IV / IO in D5W
Infuse over 10 minutes
May repeat if tachycardia recurs

Single lead ECG able to diagnose and treat arrhythmia

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

RHYTHM CONVERTS

YES → B 12 Lead ECG Procedure; Monitor and Reassess

NO → Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Revised 4/1/2022

AC 6

This protocol has been altered from the original NCCEP Protocol by the local EMS Medical Director

Adult Tachycardia

Narrow Complex (< 0.12 sec) IRREGULAR RHYTHM

History

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

Signs and Symptoms

- Heart Rate > 150
- Systolic BP < 90
- Dizziness, CP, SOB, AMS, Diaphoresis
- CHF
- Potential presenting rhythm
  Atrial/Sinus tachycardia
  AV nodal re-entry Tachycardia
  Ventricular Tachycardia

Differential

- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Fever, Pain, Emotional stress
- Hypoxia, Hypovolemia or Anemia
- Drug effect / Overdose (see HX)
- Hyperthyroidism
- Pulmonary embolus

Unstable / Serious Signs and Symptoms
HR Typically > 150
Hypotension/no radial pulse, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES → Synchronized Cardioversion Procedure

P

Narrow and Regular: 360 J
Narrow and Irregular: 360 J

May repeat if needed; check pulse and eval for cardiac arrest if no conversion

Consider Sedation Prior to Cardioversion

Midazolam 2.5 mg IV / IO or 5mg IM
May repeat as needed; Max 10 mg

Fentanyl is an ALTERNATIVE to Midazolam for pain/sedation for cardioversion, especially in the hypotensive patient. DO NOT give BOTH Fentanyl and Midazolam.

Fentanyl 1 mcg/kg IV/IO/IM/IN
Max dose 100 mcg,
give SLOW over 2-3 mins

Exit to Appropriate Protocol(s) ***if rhythm converts***

NO

B 12 Lead ECG Procedure

IV / IO Protocol UP 6

P

Cardiac Monitor

Attempt Vagal Maneuvers Procedure

Diltiazem 20 mg IV / IO drip
INFUSE PER DRUG LABEL
If age ≥ 60 give **10 mg** then repeat **10 mg** in 5 minutesif SBP ≥ 100

<u>If rate not controlled:</u> repeat bolus in 15 minutes if SBP ≥ 100:
Diltiazem 25 mg IV / IO drip
INFUSE PER DRUG LABEL
If age ≥ 60 give **15 mg t**hen repeat **10 mg** in 5 minutes if SBP ≥ 100

If diltiazem not available:

Metoprolol 5mg IV / IO slow push over 2 min
May repeat 5mg q 5 min as needed for rate control to max dose 15mg

If contraindication to diltiazem and/or metoprolol, or history of WPW, instead use:

Amiodarone 150mg IV / IO in D5W
Infuse over 10 minutes
May repeat if tachycardia recurs

Single lead ECG able to diagnose and treat arrhythmia

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

RHYTHM CONVERTS

YES → B 12 Lead ECG Procedure; Monitor and Reassess

NO → Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Adult Tachycardia
Narrow 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.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **For ASYMPTOMATIC PATIENTS (or those with only minimal symptoms, such as palpitations) and any tachycardia with rate approximately 100-120 and a normal blood pressure, consider CLOSE OBSERVATION and/or fluid bolus rather than immediate treatment with an anti-arrythmic medication. A patient's "usual" atrial fibrillation, for example, may not require emergent treatment.**
- Typical sinus tachycardia is in the range of 100 to (220 - patient's age) beats per minute.

- **Symptomatic tachycardia usually occurs at rates of 120 -150 and typically ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms include: Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**

- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Ca Channel Blocker (e.g. Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**

- **Regular Narrow-Complex Tachycardias:**
  - Vagal maneuvers and adenosine are preferred. Vagal maneuvers may convert up to 25 % of SVT.
  - Adenosine should be pushed rapidly via proximal IV site followed by 20 mL Normal Saline rapid flush.
- **Irregular Tachycardias:**
  - **First line agents** for rate control are calcium channel blockers. As per protocol, Adenosine may be considered to assist with diagnosis or if patient has history of Adenosine conversion, but Adenosine is NOT mandated.
  - Consider Calcium Chloride 1 gram IV/IO (ensure IV patency; CaCl is caustic) prior to administration of Ca Channel blockers (Diltiazem) for patients with tenuous BP (SBP < 100). Calcium may mitigate hypotensive effects of peripheral vasculature smooth muscle relaxation while not preventing wanted cardiac rate control effects.
  - DO NOT give both calcium channel blockers and beta blockers to a patient sequentially without contacting Medical Control. This may lead to heart block, profound bradycardia, and/or hypotension.
  - Adenosine may not be effective in atrial fibrillation / flutter, yet is not harmful and may help identify rhythm.
- **Synchronized Cardioversion:**
  Recommended to treat UNSTABLE Atrial Fibrillation, Atrial Flutter and Monomorphic-Regular Tachycardia (SVT.)
- **Amiodarone** may also be used to treat narrow complex tachycardias, either regular or irregular, as a second line agent if there is an allergy or contraindication to adenosine or diltiazem or other primary agent. Refer to dosing in the wide complex tachycardia protocol.

Monitor for hypotension after administration of Calcium Channel Blockers or Beta Blockers.
Monitor for respiratory depression and hypotension associated with Midazolam.
Continuous pulse oximetry is required for all SVT patients.

- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Adult Tachycardia
Wide Complex (≥0.12 sec) - Monomorphic

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
- Pericarditis, pulmonary embolism
- Aortic dissection or aneurysm
- Overdose: Stimulants

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

Unstable / Serious Signs and Symptoms
HR Typically > 150
Hypotension/no radial pulse, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES

P	Cardiac Monitor
P	Cardioversion Procedure
P	**Consider Sedation Prior to Cardioversion** **Midazolam 2.5 mg IV / IO or 5mg IM** **May repeat as needed; Max 10 mg**
P	Fentanyl is an ALTERNATIVE to Midazolam for sedation for cardioversion, especially if hypotensive patient. Don't give BOTH Fentanyl and Midazolam. **Fentanyl 1 mcg/kg IV/IO/IM/IN** **Max dose 100 mcg,** **give SLOW over 2-3 mins**
P	**Wide and Regular: 360J** **Wide and Irregular: 360J** **(Attempt to Sync, if no sync and unstable patient, defibrillate)** *May repeat if needed; check pulse and eval for cardiac arrest if no conversion*

NO

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

Regular Rhythm?

NO

YES

P	Attempt Vagal Maneuvers Procedure ***Only if regular monomorphic complex***
P	**If patient has history of SVT with aberrancy, or prior conversion with Adenosine, may attempt Adenosine. Do not assume conversion with Adenosine rules out VT:** **Adenosine 12 mg IV / IO** Rapid push with flush; May repeat **12 mg IV / IO** X 1 dose *if needed*

P	**Amiodarone is a first-line agent for WCT:** **Amiodarone 150 mg IV / IO in D5W** **Infuse over 10 minutes** May repeat if no response or if wide complex tachycardia recurs Or, if Amiodarone not available: **Procainamide 20 – 50 mg / min IV / IO** **Maximum 17 mg / kg** Or, if Amiodarone not available: **Lidocaine 100mg 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 Tachycardia
Wide Complex (≥0.12 sec) - Monomorphic

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.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **For ASYMPTOMATIC PATIENTS (or those with only minimal symptoms, such as palpitations) and any tachycardia with rate approximately 100-120 and a normal blood pressure, consider CLOSE OBSERVATION and/or fluid bolus rather than immediate treatment with an anti-arrythmic medication. A patient's "usual" atrial fibrillation with aberrancy, for example, may not require emergent treatment.**

- **Symptomatic tachycardia usually occurs at rates of 120 – 150 and typically ≥ 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.**

- **DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem, Verapamil) for WCT.**

- Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.

Regular Wide-Complex Tachycardias:

Unstable condition:

- Immediate cardioversion or pre-cordial thump if cardioverter-defibrillator not available.

Stable condition:

- Typically VT or SVT with aberrancy. Adenosine may be given if regular and monomorphic and if defibrillator available.
- Arrhythmias with suspicion of WPW should be treated with Amiodarone or Procainamide.

Irregular Tachycardias:

- Wide-complex, irregular tachycardia: Do not administer calcium channel or beta blockers or adenosine as this may cause paradoxical increase in ventricular rate. Will usually require cardioversion. Consider medical control.

Polymorphic / Irregular Wide- Complex Tachycardia:

- This situation is usually unstable and immediate cardioversion or defibrillation is warranted.
- When associated with prolonged QT this may be Torsades de pointes: Give 2g of Magnesium Sulfate IV/IO over 2-3 minutes via drip infusion or slow push if administration bag/label not available. Without prolonged QT, likely related to ischemia and Magnesium may not be helpful.

Monitor for respiratory depression and hypotension associated with Midazolam.
Continuous pulse oximetry is required for all Wide Complex Tachycardia Patients.
Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Adult Tachycardia
Wide Complex (≥0.12 sec) – Polymorphic (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
HR Typically ≥ 150
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to tachycardia

YES → P

NO

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

Pulse Present?

NO → Exit to Cardiac Arrest Protocol AC 3

YES → **Evaluate QT interval on 12 lead EKG**

QT Interval < 500 msec

P
- **Amiodarone is a first-line agent for WCT:**
  Amiodarone 150 mg IV / IO in D5W
  Infuse over 10 minutes
  May repeat if no response or if wide complex tachycardia recurs
  Or, if Amiodarone not available:
  Lidocaine 100mg IV / IO
  May repeat x1 if refractory
  Lidocaine 100mg IV / IO
- **If patient has a pulse and WCT refractory, consider consultation with medical control. If no pulse, follow cardiac arrest protocols.**
- Monitor and Reassess

QT Interval > 500 msec

P
- *Consider*
  Magnesium 2 g IV / IO
  May repeat x 1 to
  Maximum 4 g
- **If WCT refractory to Magnesium, consider Amiodarone as per QT < 500 pathway**
- **If patient has a pulse and WCT refractory, consider consultation with medical control. If no pulse, follow cardiac arrest protocols.**
- Monitor and Reassess

P
- Cardioversion or Defibrillation Procedure
- **Consider Sedation Prior to Cardioversion**
  Midazolam 2.5 mg IV / IO or 5mg IM
  May repeat as needed; Max 10 mg
- Fentanyl is an ALTERNATIVE to Midazolam for pain/ sedation for cardioversion, especially in the hypotensive patient. DO NOT give BOTH Fentanyl and Midazolam.
  Fentanyl 1 mcg/kg IV/IO/IM/IN
  Max dose 100 mcg,
  give SLOW over 2-3 mins
- **Wide and Regular: 360J**
  Wide and Irregular: 360J
  ***Attempt to Sync, if no sync, defibrillate**
  ***** Polymorphic QRS will likely need defibrillation**
  May repeat if needed; check pulse and eval for cardiac arrest if no conversion

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

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Adult Tachycardia
Wide Complex (≥0.12 sec) – Polymorphic (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.**
- **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **For ASYMPTOMATIC PATIENTS (or those with only minimal symptoms, such as palpitations) and any tachycardia with rate approximately 100-120 and a normal blood pressure, consider CLOSE OBSERVATION and/or fluid bolus rather than immediate treatment with an anti-arrythmic medication. A patient's "usual" atrial fibrillation with aberrancy, for example, may not require emergent treatment.**

- **Symptomatic tachycardia usually occurs at rates of 120 – 150 and typically ≥ 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.**

- **DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem, Verapamil) for WCT.**

- Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.

Regular Wide-Complex Tachycardias:

Unstable condition:

- Immediate cardioversion or pre-cordial thump if cardioverter-defibrillator not available.

Stable condition:

- Typically VT or SVT with aberrancy. Adenosine may be given if regular and monomorphic and if defibrillator available.
- Arrhythmias with suspicion of WPW should be treated with Amiodarone or Procainamide.

Irregular Tachycardias:

- Wide-complex, irregular tachycardia: Do not administer calcium channel or beta blockers or adenosine as this may cause paradoxical increase in ventricular rate. Will usually require cardioversion. Consider medical control.

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 or Pulseless Ventricular Tachycardia

Cardiac Arrest Protocol AC 3

P **Defibrillate 360 Joules without delay (SHOCK#1)**

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches), Push Fast (120 / min)
Change Compressors every 2 minutes (sooner if fatigued)
Limit changes / pulse checks ≤ 5 seconds
Ventilate 1 breath every 6-8 seconds
Monitor EtCO2

At the end of each 2 minute cycle
Check AED / precharged ECG Monitor
If shockable rhythm, deliver shock and immediately continue chest compressions

Search for Reversible Causes throughout code

IV / IO Protocol UP 6

A **Epinephrine (1:10,000) 1 mg IV / IO**
Repeat every 3 to 5 minutes, Paramedics may utilize epinephrine drip if available

Continue CPR, fill pit crew, precharge monitor, pause for rhythm check at 2 minutes and Defibrillate 360 Joules if indicated (SHOCK#2)

After second shock, resume compressions:
1. Continue CPR, give meds during compressions.
2. Place second set of Defib Pads at new location (A-L or A-P) during brief post-shock pause.
3. Begin therapeutic temperature management, unless contraindicated

P **Amiodarone 300 mg IV / IO**
May repeat if no rhythm change:
Amiodarone 150 mg IV / IO

P **Pre-charge monitor. After 2 minutes of CPR, rhythm check. If VF/VT, Defibrillate 360J with new pads at new location/new vector (SHOCK#3)**

For RECURRENT VF/VT or REFRACTORY VF/VT:

After at least 3 total 2 min cycles of CPR since start of code and defibrillation with new pads and new vector (SHOCK#3), consider:

Magnesium Sulfate 2g IV / IO

Sodium Bicarb 50 meq IV/IO

Lidocaine 100 mg IV / IO
May repeat if refractory
Lidocaine 75 mg IV / IO
Or
Procainamide 1.5g IV / IO over 15 minutes

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins/TCA/Overdose
Thrombosis; pulmonary (PE) or coronary (MI)

Torsades de Pointes
Low Magnesium States (Malnourished / alcoholic)
Suspected Digitalis Toxicity

P Defibrillate 360 J

P Magnesium Sulfate 2g IV / IO

CONTINUE CPR for 2 min, prepare for possible DOUBLE SEQUENTIAL DEFIBRILLATION. At next rhythm check, did Rhythm change? If YES, go to Appropriate Protocol. If NO, proceed with **DOUBLE SEQUENTIAL DEFIBRILLATION** (SHOCK#4)

There may be persistent, or multiple, episodes of VF/VT during a cardiac arrest. Determine whether VF/VT has been RECURRENT or REFRACTORY (see Pearls next page) and follow that pathway.

VF/VT is RECURRENT

P **Continue 2 min CPR cycles, pause for rhythm check every 2 min with PRECHARGED MONITOR and DEFIBRILLATE 360J if indicated. If rhythm has changed or ROSC, go to appropriate protocol.**

Consider meds for recurrent/refractory VF/VT as above

VF/VT is REFRACTORY

P **Continue 2 min CPR cycles, pause for rhythm check every 2 min with PRECHARGED MONITOR(S) and perform DOUBLE SEQUENTIAL DEFIBRILLATION if indicated. If rhythm has changed or ROSC, go to appropriate protocol.**

Consider meds for recurrent/refractory VF/VT as above

Continue high-quality 2 minute CPR cycles, pause for rhythm check every 2 minutes with PRECHARGED MONITOR(S) and perform DEFIBRILLATION if indicated at JOULE SETTING THAT CONVERTED VF. DO NOT consider field termination while the patient has Recurrent or Refractory VF/VT. Consider contacting Medical Direction for persistent VF/VT.

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Pearls

- **Recommended Exam: Mental Status**
- **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: Ventilate 8 – 10 breaths per minute or as guided by EtCO2, with continuous, uninterrupted compressions.**

- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Consider Breathing / Airway management after second shock and / or 2 rounds of compressions (2 minutes each round.)**
- **Initiate intra-arrest therapeutic temperature management as soon as cold fluids are available, unless contraindicated.**

- **Avoid Procainamide in CHF or prolonged QT.**
- Effective CPR and prompt defibrillation are the keys to successful resuscitation.
- If no IV / IO, drugs that can be given down ET tube should have dose doubled and then flushed with 5 ml of Normal Saline followed by 5 quick ventilations. IV / IO is the preferred route when available.
- Reassess, document endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- Do not stop CPR to check for placement of ET tube or to give medications.
- If BVM is ventilating the patient successfully, intubation should be deferred until rhythm has changed or 4 or 5 defibrillation sequences have been completed.
- Return of spontaneous circulation: Heart rate should be > 60 when initiating anti-arrhythmic infusions.
- Sodium bicarbonate no longer recommended as a standard cardiac arrest medication. Consider in the dialysis / renal patient, extended down-time, known hyperkalemia or suspected overdose at 50 mEq IV / IO.

- **Recurrent** ventricular fibrillation/tachycardia is defined as SUCCESSFULLY CONVERTED to another rhythm at next rhythm check by standard defibrillation techniques (i.e. 360 J), but subsequently returns at a subsequent rhythm check. It should not be treated by double sequential external defibrillation. It is managed by treatment of correctable causes and use of anti-arrhythmic medications in addition to standard defibrillation.

- **Refractory** ventricular fibrillation/tachycardia is defined as NOT CONVERTED by standard defibrillation (i.e. **VF/VT remains present after at least 3 rhythm checks/defibrillations in a row during a code** (including a defib with new pads/vector). It is also managed by treating correctable causes and with antiarrhythmic medications. If these methods fail to produce a response, double sequential external defibrillation may be utilized by an approved ALS provider.

Prior to double sequential defibrillation, providers should verify that pads are well-adhered, not damaged, and not touching; refer to the double sequential external defibrillation procedure for instructions.

- Prolonged cardiac arrests may lead to tired providers and decreased compression quality. Ensure compressor rotation, summon additional resources as needed, and ensure provider rest and rehab during and post-event.

Post Resuscitation

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

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

Return of Spontaneous Circulation

Repeat Primary Assessment

B — **Optimize Ventilation and Oxygenation**
- Maintain SpO2 = 90-99%
- ETCO2 ideally 35 – 45 mm Hg, do not hyperventilate to correct
- Respiratory Rate 8-10 / minute
- DO NOT HYPERVENTILATE

Airway Protocol(s) AR 1, 2, 4 ***if indicated***

B — 12 Lead ECG Procedure

IV / IO Protocol UP 6, establish secondary access

P — Cardiac Monitor

Monitor Vital Signs / Reassess

P — PREPARE for possible rearrest; PREPARE to take care of a critically ill patient:
1. One provider should maintain a finger on the pulse at all times.
2. Wait ~10 minutes after ROSC to initiate transport, with the possible exception of STEMI patients
3. Prepare Pressor drips and have them ready to treat potential hypotension or bradycardia.
4. Place mechanical CPR device, if available, in anticipation of possible re-arrest during transport.

Chest Pain and STEMI Protocol AC 4 ***if indicated*** → STEMI EMS Triage and Destination Plan

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

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

P — **Optimize Systolic BP and MAP using Pressors/Protocol AM 5**
- Systolic BP > 90-100 mmHg
- Mean Arterial Pressure > 65-80 mmHg

P — **Norepinephrine 1-10mcg/min IV/IO and/*or***
Epinephrine 1–10 mcg/min IV/IO *or*
Dopamine 5-20mcg/kg/min IV/IO *or*
Phenylephrine 100mcg IV/IO every 10min, max total dose 500mcg

Titrate any pressor drugs to SBP ≥ 90

Dysrhythmia Protocol(s) AC 2, 6, 7 ***as indicated***

Targeted Temperature Management Protocol AC 13

Post Intubation BIAD Management Protocol AR 8, ***as indicated***

Dysrythmias are common and usually self limiting after ROSC and may not need further treatment, especially atrial dysrythmias. Providers SHOULD treat worsening bradycardia, as it may precede re-arrest.

If Dysrhythmia Persists follow Rhythm Appropriate Protocol

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Post Resuscitation

Post ROSC Cardiac Arrest Checklist

- ❑ ASSESS C02 (should be >20 with good waveform)
- ❑ FINGER on pulse maintain, for 10 minutes. DO NOT TRANSPORT; prepare for transport during the 10 minute waiting period.
- ❑ Continuous visualization of cardiac monitor rhythm
- ❑ Check O2 supply and pulse Ox to TITRATE to Sa02 94-99%
- ❑ Do not try to obtain a "normal" ETCO2 by increasing respiratory rate
- ❑ Obtain 12 lead EKG, Send for Consult or CODE STEMI if possible concern for MI causing arrest. If STEMI on EKG, expedite CONTROLLED movement towards transport; prepare for transport during the 10 minute waiting period.
- ❑ Assess for & TREAT bradycardias < 60 bpm
- ❑ Obtain B/P -- Pressor agent indicated for SBP < 90-100
- ❑ Pre-mix pressors in preparation for hypotension
- ❑ Evaluate for post-resuscitative airway placement (eg, ETT). Strongly consider bougie use if airway change is indicated.
- ❑ Unless patient is following verbal commands, continue/initiate hypothermia therapy
- ❑ Place mechanical CPR device on patient before movement, in anticipation of possible re-arrest during transport.
- ❑ When patient is moved, perform CONTINUOUS PULSE CHECK and continuous monitoring of cardiac rhythm
- ❑ Mask is available for BVM in case advanced airway fails
- ❑ Once in ambulance, confirm pulse, breath sounds, SpO2, EtCO2, and cardiac rhythm
- ❑ Appropriate personnel and number of personnel for transport in case of re-arrest

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 at all costs. Titrate FiO2 to maintain SpO2 of ≥ 94%.**

- **Initial End tidal CO2 may be elevated immediately post-resuscitation, but will usually normalize. While goal is 35 – 45 mmHg avoid hyperventilation to achieve.**
- Most patients immediately post resuscitation will require ventilatory assistance.

- **Titrate fluid resuscitation and vasopressor administration to maintain SBP of 90 – 100 mmHg or Mean Arterial Pressure (MAP) of 65 – 80 mmHg.**
- Consider utilizing multiple pressors together as necessary to maintain blood pressure and HR. While transcutaneous pacing may otherwise be indicated in the ischemic heart, consider the danger of missed re-arrest while pacing. In general titrate pressors as needed, and only attempt pacing if indicated in the post ROSC patient if mechanical capture can absolutely be verified (i.e. finger on the pulse with good blood pressure) and constantly monitored.

- **STEMI: Transport per STEMI Triage and Destination plan if evidence of STEMI on 12 Lead ECG.**

- **Targeted Temperature Management: Maintain core temperature between 32 - 36°C.**

- **Transport following the post-cardiac arrest triage and destination plan.**
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may be planned in consultation with medical control.

Team Focused CPR
(Pit Crew CPR)

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES

Decomposition
Rigor mortis
Dependent lividity

Injury incompatible with life or Traumatic Arrest with extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches), Push Fast (120 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
(Limit changes / pulse checks ≤ 5 seconds)
Ventilate 1 breath every 6-8 seconds
Monitor EtCO2

First Arriving First Responders
Initiate Compressions Only CPR, CPR TRIANGLE
Initiate Defibrillation Automated Procedure
Ensure code response has been dispatched

First Arriving EMS Crew / Responder
Fill Pit Crew Positions 1 and 2
1 = Cardiac monitor analysis, defibrillation
2 = CPR Triangle Team Leader, focus on CPR quality, airway is secondary

Second Arriving EMS Crew / Responder
Fill Pit Crew Positions 3 and 4
3 = IV/IO Access, meds, fluids
4 = Checklist, History, Family

Third Arriving EMS Crew / Responder
Ensure Pit Crew positions 1-4 have been filled and that CPR triangle is working effectively/has enough people for good ongoing CPR quality. Fill in position 5 as "helper" with meds, fluids, setups, checklist, rotate positions as necessary.

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

Arriving Responder Duties
BLS or ALS

BLS

Establish CPR Triangle, Timekeeper
Fire Department Squad or Squad Officer
EMT
First Arriving Responder

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

Subsequent Arriving Responders
Take direction from Team Leader

Continue Cardiac Arrest Protocol AC 3

ALS

A

Establish CPR Triangle Team Leader
Ensure High Quality CPR
EMS ALS or BLS 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 if not in place

P

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

Continue Cardiac Arrest Protocol AC 3

Patient Care Leader / Pit Crew Leader / "Code Commander"
EMS Position #1 (Paramedic), Responsible for patient care
With CPR Team Leader, Ensures high-quality resuscitation
With Position 4, responsible for overall patient care effort

Scene Leader / Incident Commander
Fire Department / First Responder Officer
Team Leader until ALS arrival, Manages Scene / Bystanders
Responsible for briefing family prior to ALS arrival

Adult Cardiac Protocol Section

Team Focused CPR (Pit Crew CPR)

Pre-ROSC Cardiac Arrest Checklist

- ❑ Pit Crew positions have been filled in order
- ❑ Monitor is visible and a provider (position #1) is viewing the rhythm with all leads attached
- ❑ Monitor is in PADS mode
- ❑ Metronome at 120 beats per minute
- ❑ Blinking light for ventilation rate is activated
- ❑ Identify and shock V-Fib / V-Tach every 2 minutes (limit pre-shock pause)
- ❑ Change compressors every 2 minutes (Ensure a dedicated time keeper)
- ❑ Pause at compressor switch to identify rhythm (no more than 5 seconds)
- ❑ O2 cylinder with oxygen in it is attached to BVM
- ❑ Airway is managed using basic to advanced procedures
- ❑ ETCO2 waveform is present and value is being monitored
- ❑ IV or IO access with cold fluids (max 2 liters of cold fluid, 1 liter in shockable rhythm)
- ❑ Underlying cause has been considered and treated early in arrest
- ❑ Place gastric tube to prevent gastric distention
- ❑ Tension PTX has been considered
- ❑ Family is receiving care and is at the patient's side

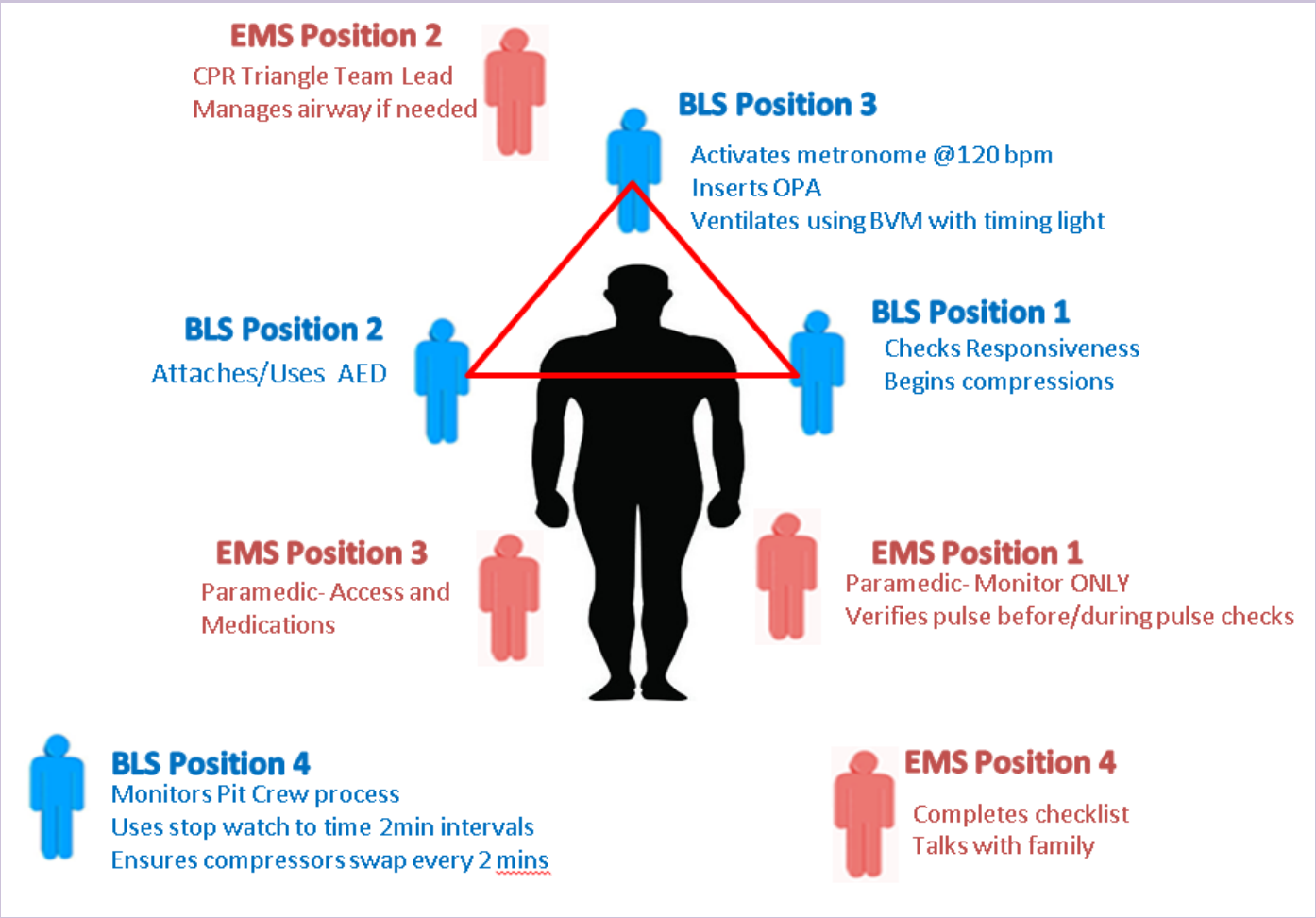
Post ROSC Cardiac Arrest Checklist

- ❑ ASSESS C02 (should be >20 with good waveform)
- ❑ FINGER on pulse, maintain for 10 minutes. DO NOT TRANSPORT; prepare for transport during the 10 minute waiting period.
- ❑ Continuous visualization of cardiac monitor rhythm
- ❑ Check O2 supply and pulse Ox to TITRATE to Sa02 94-99%
- ❑ Do not try to obtain a "normal" ETCO2 by increasing respiratory rate
- ❑ Obtain 12 lead EKG, Send for Consult or CODE STEMI if possible concern for MI causing arrest. If STEMI on EKG, expedite CONTROLLED movement towards transport.
- ❑ Assess for & TREAT bradycardias < 60 bpm
- ❑ Obtain B/P -- Pressor agent indicated for SBP < 90-100
- ❑ Pre-mix pressors in preparation for hypotension
- ❑ Evaluate for post-resuscitative airway placement (eg, ETT). Strongly consider bougie use if airway change is indicated.
- ❑ Unless patient is following verbal commands, continue/initiate hypothermia therapy
- ❑ Place mechanical CPR device on patient before movement in anticipation of possible re-arrest during transport
- ❑ When patient is moved, perform CONTINUOUS PULSE CHECK and monitoringof cardiac rhythm
- ❑ Mask is available for BVM in case advanced airway fails
- ❑ Once in ambulance, confirm pulse, breath sounds, SaO2, EtCO2, and cardiac rhythm
- ❑ Appropriate personnel and number of personnel for transport in case of re-arrest

Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: Ventilate generally 8 – 10 breaths per minute or as guided by EtCO2**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation should be utilized until resources arrive for BVM, and may continue during the code.**
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Success is based on proper planning and execution. Procedures require space and access; Make room to work.
- Consider possible CAUSE of arrest early: For example, resuscitated Vfib may be STEMI and more rapid transport is indicated. Consider traditional ACLS "Hs and Ts" for PEA: Hypovolemia, Hypoxia, Hydrogen ions (acidosis), Hyperkalemia, Hypothermia, Hypo/Hyperglycemia, Tablets/Toxins/Tricyclics, Tamponade, Tension pneumothorax, Thrombosis (MI), Thromboembolism (Pulmonary Embolism), Trauma

Pit Crew Positions Reference- Wake County EMS System



Pearls

- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: Ventilate generally 8 – 10 breaths per minute or as guided by EtCO2**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Passive oxygenation should be utilized until resources arrive for BVM, and may continue during the code.**
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Success is based on proper planning and execution. Procedures require space and access; Make room to work.
- Consider possible CAUSE of arrest early: For example, resuscitated Vfib may be STEMI and more rapid transport is indicated. Consider traditional ACLS “Hs and Ts” for PEA: Hypovolemia, Hypoxia, Hydrogen ions (acidosis), Hyperkalemia, Hypothermia, Hypo/Hyperglycemia, Tablets/Toxins/Tricyclics, Tamponade, Tension pneumothorax, Thrombosis (MI), Thromboembolism (Pulmonary Embolism), Trauma

Targeted Temperature Management
Adult and Pediatric

History
- Non-traumatic cardiac arrests (drownings and hanging / asphyxiation are permissible in this protocol.)
- All presenting rhythms are permissible in this protocol
- All ages of patients

Signs and Symptoms
- Cardiac arrest
- Return of Spontaneous Circulation post-cardiac arrest

Differential
- Continue to address specific differentials associated with the arrhythmia

Cardiac Arrest AND/OR
Return of Spontaneous Circulation (ROSC)

Criteria for Induced Hypothermia
Initial field temperature
≥ 93.2 F (34C)

NO → Exit to Post Resuscitation Protocol AC 9

YES

B	**Advanced Airway (includes BIAD) in place** with EtCO2 > 20 mmHg
	Perform Neurological Assessment
	Expose and apply ice packs to axilla and groin areas
	IV / IO Protocol UP 6
	Hypotension / Shock Protocol AM 5 ***as indicated***
A	**Cold Normal Saline slow drip: 20 mL/kg IV / IO,** **For Initial Rhythm PEA/Asystole- max 2 Liters** **For Initial Rhythm Vfib/VTach- <u>max 1 ONE LITER</u>**

Airway Protocol(s) AR 1, 2 ***as indicated*** ↔ NO

Reassess Temperature
<u>Target: 89.6 – 96.8 °F</u>
(Range 32 – 36C)

≤ 89.6° F (32° C) → Stop cooling measures Until temperature increases

Reassess temperature every 10 minutes

Continue Post Resuscitation Care

≥ 89.6° F (32° C) → Continue Cooling

Exit to Post Resuscitation Protocol AC 10

Shivering noted

NO

YES

P Consider Etomidate 0.2mg/kg

Normal Adult dose: 10-20mg IV/IO

P **Midazolam 0.1 – 0.2 mg/kg IV / IO, max dose 2.5mg**
May repeat in 3 -5 minutes as needed- watch for hypotension
or
Fentanyl 1 mcg/kg IV / IO bolus, max initial dose 75mcg
May repeat 1 mcg/kg every 20 minutes as needed
Maximum 200 mcg

P If Shivering uncontrolled after opioid, benzo, etomidate

Consider Rocuronium 1 mg/kg IV/IO

max 70mg (normal adult)

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section – This protocol also applies to Pediatrics

Targeted Temperature Management
Adult and Pediatric

Pearls

- <u>Criteria for Induced Hypothermia:</u>
  - **Cardiac Arrest or Return of spontaneous circulation not related to blunt / penetrating trauma or hemorrhage, including intracranial hemorrhage.**
  - **Temperature greater than 93 degrees (34 C).**
- **Advanced airway (including BIAD) in place with no purposeful response to verbal commands**

- **Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.**
- **Titrate FiO2 to maintain SpO2 of ≥ 94%.**
- **Initial End tidal CO2 may be elevated immediately post-resuscitation, but will usually normalize. While goal is 35 – 45 mmHg avoid hyperventilation to achieve.**
- Most patients immediately post resuscitation will require ventilatory assistance.
- If no advanced airway in place obtained, cooling may only be initiated on order from medical control.
- **Titrate fluid resuscitation and vasopressor administration to maintain SBP of 90 – 100 mmHg or Mean Arterial Pressure (MAP) of 65 – 80 mmHg.**

- <u>STEMI</u>
  Transport to a primary cardiac catheter facility with evidence of STEMI on 12 Lead ECG.
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiac catherterization and intensive care service.**
- **Utilization of this protocol mandates transport to facility capable of managing the post-arrest patient and continuation of induced hypothermia therapy.**
- Maintain patient modesty. Undergarments may remain in place during cooling.

- No evidence suggests improved survival with prehospital cooling.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring.

Mechanical Circulatory Support
LVAD, RVAD, and Bi-VAD

History
- SAMPLE – End-Stage Heart Failure
- Bridge to transplant or Destination therapy
- Estimated downtime, DNR, MOST, or Living Will
- LVAD, RVAD, Bi-Vad, TAH
- Patient has surgically implanted device that assists the action of one or both ventricles.
- 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
- Device Problem
- Infection/Sepsis
- Hypovolemia
- Cardiac arrest
- Stroke
- 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
- Relevant phone numbers and plan will be with device

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 ***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 **Assess LVAD function** Look and listen for alarms **LVAD Alarming?**

NO

Place stethoscope over heart

Whirring/Humming sound present?

YES ▶ **Go to Page 3**

◀ YES **Whirring/Humming sound present?**

NO

Airway Protocol(s) AR 1, 2 ***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

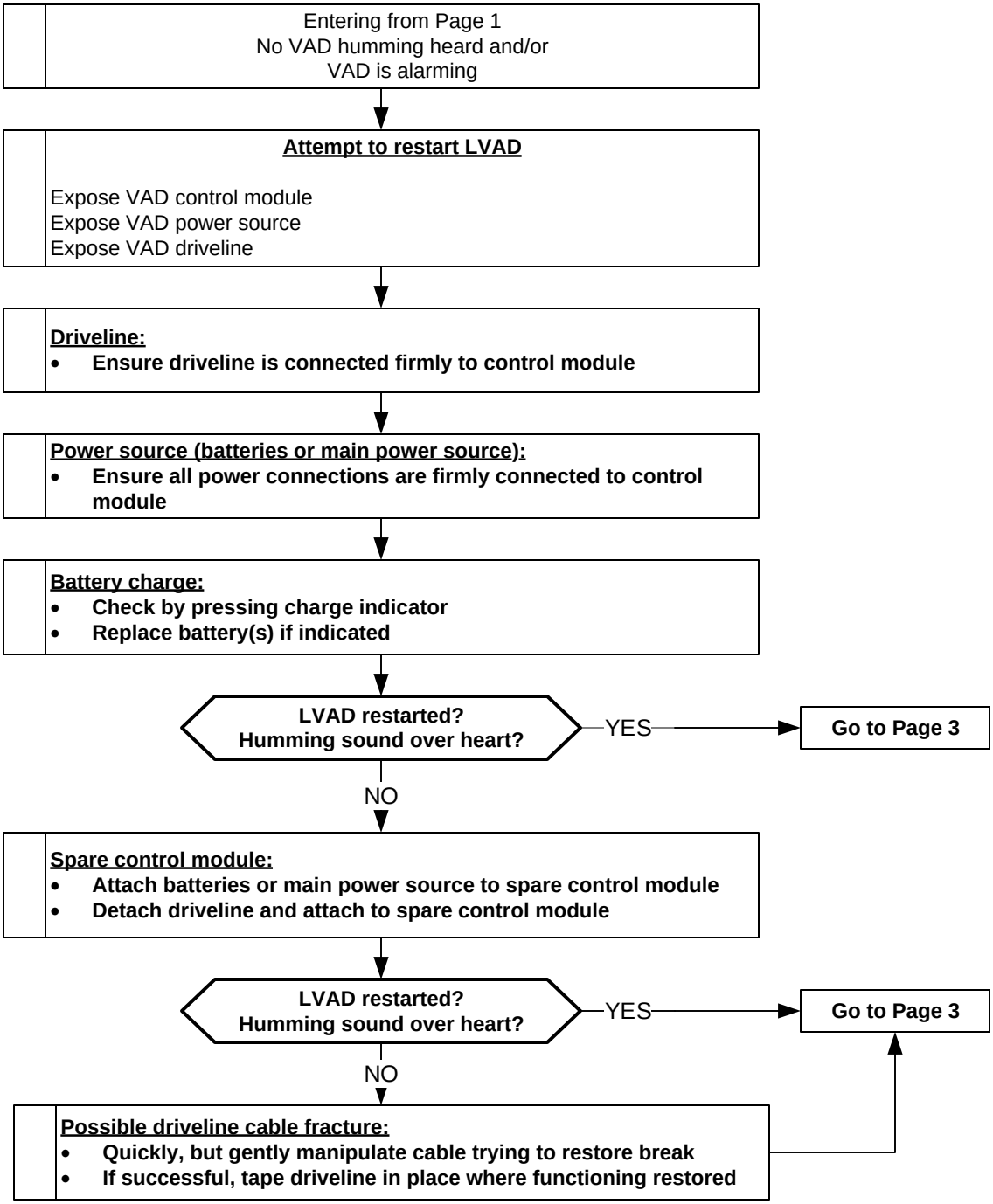
Adult Cardiac Protocol Section

Mechanical Circulatory Support
LVAD, RVAD, and Bi-VAD

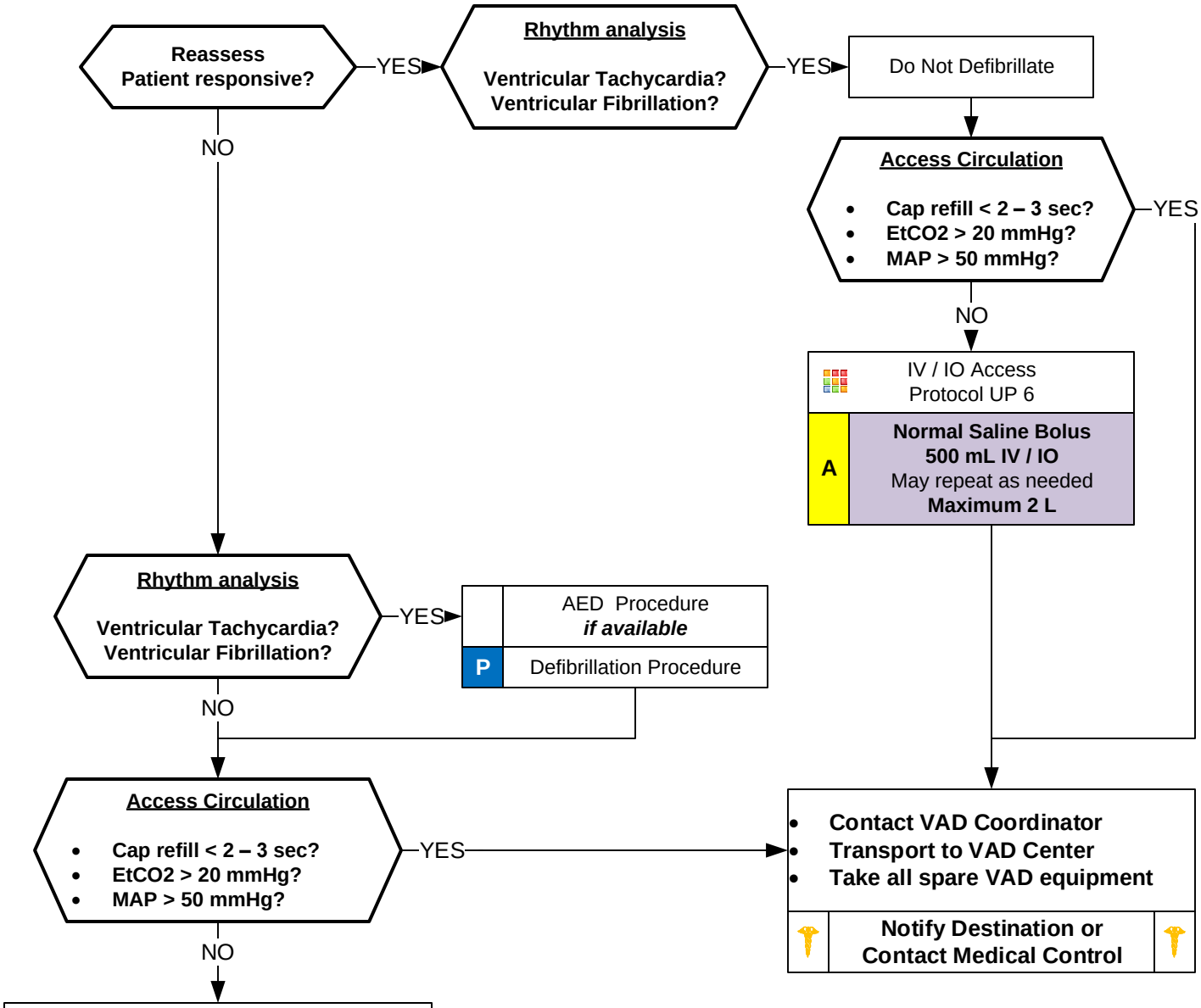
History
- SAMPLE
- Bridge to transplant
- Destination therapy
- Estimated downtime
- LVAD, RVAD, Bi-Vad, TAH
- DNR, MOST, or Living Will
- Contact with LVAD coordinator

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



Mechanical Circulatory Support
LVAD, RVAD, and Bi-VAD



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

Mechanical Circulatory Support
LVAD, RVAD, and Bi-VAD

Pearls

- **Recommended exam: Mental status, skin color, capillary refill, peripheral pulses, blood pressure.**
- **ALWAYS talk to family / caregivers as they have specific knowledge and skills. CALL THE VAD COORDINATOR EARLY as per patient / family instructions or as listed on the device. They are available 24 / 7 and should be an integral part of the treatment plan.**
- **QUESTIONS TO ASK: DOES THE PATIENT HAVE A DNR? Can the patient be cardioverted or defibrillated if needed? Can CHEST COMPRESSIONS be performed in case of pump failure?**
- **Deciding when to initiate Chest Compressions is very difficult. Consider that chest compressions may cause death by exsanguination if the device becomes dislodged. However, if the pump has stopped the heart will not be able to maintain perfusion and the patient will likely die. Ideally, plan the decision in advance with a responsive patient and the VAD coordinator. If a VAD patient is unresponsive and pulseless with a non-functioning pump and has previously indicated a desire for resuscitative efforts, begin compressions. Contact the VAD coordinator and medical control.**
- **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 ***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 — **Furosemide 40 mg IV / IO** ***if available***
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 ***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

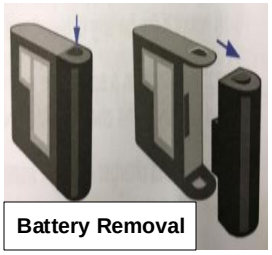
Leave Vest in Place and Operational

Exit to Age Appropriate Protocol(s)

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Wearable Cardioverter Defibrillator Vest


Battery Removal

Response button

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:**
  - **Common 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

B	**Diphenhydramine 50 mg PO**
A	IV Procedure ***if indicated***
A	**Diphenhydramine 50 mg PO / IV / IM / IO**
A	**Famotidine 20-40mg PO / IV / IO**
B	Monitor and Reassess Monitor for Worsening Signs and Symptoms

MODERATE
2 + Body Systems

	Epinephrine 1:1000 IM 0.3 mg *Autoinjector if available*
B	**Diphenhydramine 50 mg PO**
B	**Albuterol Nebulizer 5 mg** Repeat as needed x 3 ***if indicated***
A	**Diphenhydramine 50 mg IV / IM / IO *if not already given PO***

SEVERE
2 + Body Systems + hypotension
Or Isolated Hypotension

	Epinephrine 1:1000 IM 0.3 mg *Autoinjector if available*
B	**Albuterol Nebulizer 5 mg** Repeat as needed x 3 ***if indicated***
A	**Diphenhydramine 50 mg IV / IM / IO *if not already given PO***
	Airway Protocol(s) AR 1 - 4 ***if indicated***
	Hypotension / Shock Protocol AM 5 ***if indicated***

A	**Epinephrine 1:1000 0.3 mg IM** Repeat in 5 minutes if no improvement
A	IV / IO Procedure
A	**Albuterol Nebulizer 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated***
A	**Famotidine 20-40mg IV / IO**
A	**Normal Saline Bolus 500 mL IV / IO** Repeat as needed **Maximum 2 Liters**
P	**Methylprednisolone 125 mg IV / IO**
P	**For refractory/peri-arrest Anaphylaxis, consider Epinephine 1:10,000 0.1mg IV/IO, may repeat to max 0.3mg**

P: **For Moderate reactions, po predisone may be given. Severe reactions should receive IV corticosteroids.**

Methylprednisolone 125 mg IV/IO
or
Prednisone 60mg po

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 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 as this may cause choking, nausea and / or vomiting.

- **To improve patient safety, *Use an autoinjector to deliver IM epinephrine any time one is available.***
- **Peri-arrest Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration**

- **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 GI symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.

  Severe symptoms:

  Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or GI 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.**

- Epinephrine may precipitate cardiac ischemia. The following patients should receive half the dose of epinephrine (0.15 mg of 1:1000) for the initial dose and any repeated doses:
  - Patient has history of coronary artery disease, MI, stents, CHF, cardiac surgery OR
  - Patient takes Beta-Blockers or Digoxin OR
  - A patient 50 years or older AND has a heart rate ≥ 150
- **12 lead ECG and cardiac monitoring should NOT delay administration of epinephrine.**

- **EMR / EMT may administer Epinephrine IM and may administer from EMS supply.**
- **EMR / EMT may administer Epinephrine IM via AutoInjector or manual draw-up**
- **EMT may administer diphenhydramine by oral route only and may administer from EMS supply**.
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.**
- 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) Only if pt able to swallow/ protect airway

A — If no improvement

Dextrose Infusion
D10W Premixed 250mL Bag

Titrate to patient condition and response.

Blood Sugar 70 – 249 mg / dl

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

Exit to Appropriate Protocol(s)

Blood Sugar ≥ 250 mg / dl

A — **Normal Saline 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

See Pearls Next page for disposition recommendations

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 my not respond to glucagon.**
- Response to Glucagon can take 15-20 minutes. Consider the entire clinical picture when treating hypoglycemia, including a patient's overall clinical condition and other vital signs. It may be safe to wait for some time for Glucagon to work, instead of pursuing the more aggressive course of performing IO access to give faster acting IV/IO Dextrose solution. Diabetics may have poor wound healing, and IO access may present a greater risk for infection or poor wound healing in diabetic patients. Consider IO access to give Dextrose early in patients who are critically ill or peri-arrest and hypoglycemic.
- **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.**

- **Insulin-dependent patients with isolated hypoglcemia and NO OTHER COMPLAINTS may not need transport recommended, per these guidelines:**
  1. **Pt must return to baseline mental status in the presence of EMS (after food/juice or dextrose) and must have a normal neurologic exam with no new neurologic deficits.**
  2. **Pt must not be taking oral diabetic medications OR have taken long-acting insulin in the last 24 hours (for example, long acting insulins including, but are not limited to: Glargine/Lantus, Detemir/ Levemir, Degludec/Tresiba, etc)**
  3. **An adult must be present to remain with the patient.**
  4. **Blood glucose must improve to >100**
  5. **The patient must eat a meal (ideally complex carbohydrates + protein) in the presence of EMS**
  6. **The patient must have a known history of diabetes and not have any other complaints.**

  ***** If ALL of criteria 1-6 are met, then transport need not be recommended.**

  ***** If ANY of criteria 1-6 are NOT met, then transport should be recommended or conduct refusal procedure if indicated.**

  ***** Consider contacting medical control to discuss the case if a patient is taking a novel/new insulin or diabetic medication that you are unfamiliar with.**

- **Patients refusing transport to medical facility after treatment of hypoglycemia:**
  - Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol UP-1. Otherwise contact medical control.
  - All patient who refuse care should be instructed to contact their physician immediately and consume a meal.
- **Hypoglycemia with Oral Agents:**
  Patients taking oral diabetic medications should be 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.
- **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.
- **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, dextrose solutions can be administered rectally.

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 Chloride 1 gm IV / IO** *or* **Calcium Gluconate 3 gm IV / IO** *If calcium chloride not available*; **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; If direct pressure and pressure dressing not effective and significant hemorrhage, apply tourniquet to affected extremity at least 3 inches proximal to the bleeding shunt or fistula site.

NO ↓

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

NO ↓

Systolic Blood Pressure < 90 — YES → A: **Normal Saline 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 Chloride 1 gm IV / IO** *or* **Calcium Gluconate 3 gm IV / IO** *If calcium chloride not available*; **Sodium Bicarbonate 50 mEq IV / IO**; **Albuterol Nebulizer 5mg May repeat x 3 or until IV medications are given**

NO ↓

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Dialysis / Renal Failure

Pearls

- **Recommended exam: Mental status. Neurological. Lungs. Heart.**
- **Consider transport to 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 or dialysis catheter indicated in the dead or near-dead patient only with no IV or IO access. Utilize IO if available.**
- **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 PD 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

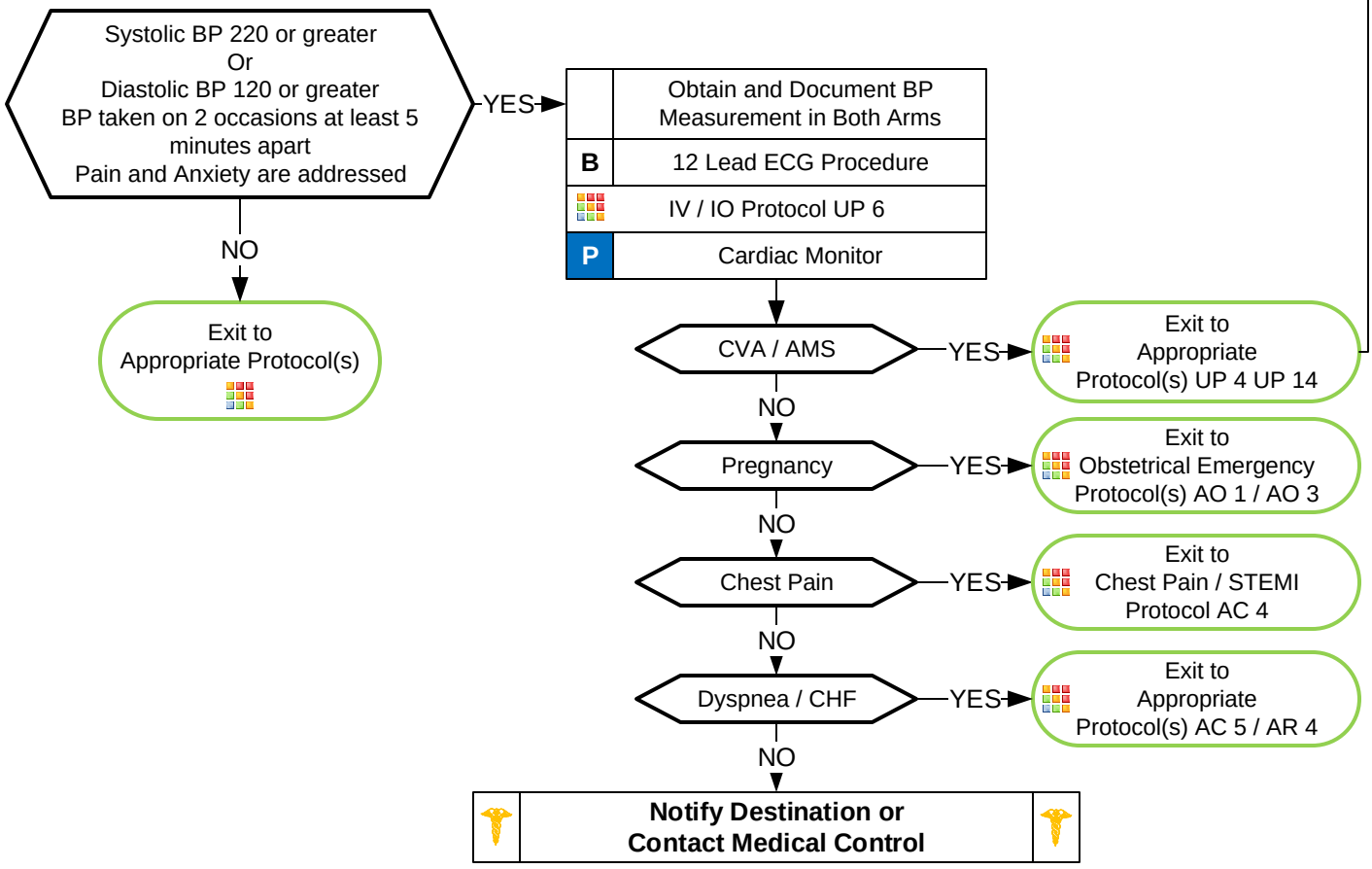
Signs and Symptoms

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

Diabetic Protocol ***if indicated***

	Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure
	IV / IO Protocol UP 6
P	Cardiac Monitor
	Airway Protocol(s) ***if indicated***
	Diabetic Protocol AM 2 ***if indicated***

Cardiac / Arrhythmia Protocol ***if indicated***

History and Exam Suggest Type of Shock

Cardiogenic

Chest Pain: Cardiac and STEMI Protocol AC 4
Appropriate Cardiac Protocol(s) ***if indicated***

Hypovolemic

Allergy Protocol AM 1 ***if indicated***

Suspected Sepsis Protocol UP 15 ***if indicated***

Multiple Trauma Protocol TB 6 ***if indicated***

Distributive

Obstructive

P — Chest Decompression-Needle Procedure ***if indicated***

A	**Normal Saline Bolus 500 mL IV** Repeat to effect SBP > 90, **2 L Maximum**
P	**Caution with excess fluids in cardiogenic shock; consider the presence of pulmonary edema; utilize pressors early:** **Norepinephrine 1-10mcg/min IV/IO** *or* **Dopamine 5 – 20 mcg/kg/min IV / IO** To effect SBP ≥ 90
P	**For non-cardiogenic shock, consider pressors after 2 L fluid bolus:** **Norepinephrine 1-10mcg/min IV/IO** *or* **Dopamine 5-20mcg/kg/min IV/IO** *or* **Phenylephrine 100mcg IV/IO every 10min, max total dose 500mcg** *Titrate any pressor drugs to SBP ≥ 90*

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Hypotension / Shock

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. 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.**
- For non-cardiac, non-trauma hypotension, consider vasopressor when hypotension unresponsive to fluid resuscitation.
- **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:**
  Sepsis
  Anaphylactic
  Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
  Toxins
- **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 recently stopped suddenly without tapering a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain.

***** If Acute Adrenal Insufficiency is suspected, Paramedic should give Methylprednisolone 125 mg IM / IV / IO or Dexamethasone 10 mg IM / IV / IO. 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.**

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

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Pediatric Pulseless Arrest Protocol

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES → Decomposition
Rigor mortis
Dependent lividity
Trauma with Injury incompatible with life

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

Search for Reversible Causes

Blood Glucose Analysis Procedure

P — Cardiac Monitor

IV / IO Protocol UP 6

A — **Epinephrine1:10,000**
0.01 mg/kg IV / IO Maximum Single Dose 1mg
Repeat every 3 – 5 minutes, paramedic may consider epinephrine drip if available, per drug label instructions

Or, if no IV/IO access
Epinephrine 1:1000 0.1 mg / kg ETT Maximum 2.5 mg

COLD Normal Saline Bolus 20 mL/kg IV / IO
May repeat as needed
Maximum 60 mL/kg

P — Consider
Norepinephrine 0.1 – 2 mcg/kg/min IV / IO

Consider Chest Decompression-Needle Procedure
only if high suspicion for tension pneumothorax

Consider Early for PEA
1. Repeated Saline Boluses for possible hypovolemia
2. Dextrose IV/IO
3. Naloxone IV/IO
4. Glucagon IV/IO/IM, OD protocol for suspected beta blocker or calcium channel blocker overdose.
5. Calcium Chloride IV/IO for suspected hyperkalemia, hypocalcemia
6. Sodium Bicarbonate IV/IO for possible overdose, hyperkalemia, renal failure
7. Consider Epinephrine drip
8. Consider Dopamine drip
9. Atropine IV for organized PEA with rate < 60.
10. Chest Decompression

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

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

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Asystole / PEA

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 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).

- **Use AED or apply ECG monitor / defibrillator as soon as available.**

- 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.
- 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.

- **Vasopressor agents: FOLLOW CURRENT AGE/IDEAL BODY WEIGHT DOSING GUIDE (HANDTEVY)**
  Epinephrine 0.05 – 5 mcg / kg / min IV / IO
  Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
  Dopamine 5 – 20 mcg / kg / min IV / IO

  Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)

- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (**Maximum 2.5 mg**)

Pediatric Bradycardia With Poor Perfusion

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
Causing Hypotension / AMS
Poor Perfusion / Shock
Typically HR < 50/min

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

Identify underlying cause

Blood Glucose Analysis Procedure

→ Exit to Appropriate Pediatric Protocol(s)

P Cardiac Monitor

Search for reversible causes

IV / IO Protocol UP 6

A **Normal Saline Bolus**
20 ml / kg IV / IO
Repeat as needed x 3, **Max 60 mL / kg**

Suspected Beta-Blocker or Calcium Channel Blocker

Follow Pediatric Toxicology Protocol

P

Epinephrine 1:10,000
0.01 mg/kg IV/IO (max 0.5mg)

or, epinephrine drip if available:
0.05 – 5 mcg / kg / min IV / IO
Titrate to age appropriate
SBP ≥ 70 + 2 x Age

Or
Dopamine 5 – 20 mcg / kg/ min IV / IO

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

P Consider Cardiac Pacing Procedure

P

Sedation For Pacing:

Midazolam 0.1-0.2 mg/kg IV/IO/IM/IN
To max **2.5mg** initial dose
May repeat in 5-10 minutes as needed to **max 5mg**

or

Fentanyl 1-2 mcg/kg IV/IO/IM/IN (max initial dose 75 mcg)
May repeat 0.5 mcg/kg every 5 minutes as needed
Max total dose 150 mcg

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

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

Bradycardia / Heart Rate < 60 Persists
AND
Poor Perfusion / Shock
Consider PEA Cardiac arrest?

YES → Exit to Pediatric Cardiac Arrest Protocol(s)

NO

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Bradycardia With Poor Perfusion

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Use Length-based Resuscitation Tape and then pediatric drug guide for drug dosages if applicable.**
- **Ensure patent airway, breathing, and circulation as needed. Administer oxygen. Reassess if bradycardia persists after adequate oxygenation and ventilation.**
- **Bradycardia with adequate pulses, perfusion, and respirations requires no emergency intervention. Monitor and continue evaluation with reassessments.**
- **With HR < 60 / min and poor perfusion despite adequate ventilation and oxygenation, begin CPR immediately.**

- **Age appropriate SBP = 70 + (2 x Age in Years)**

- **Epinephrine is first drug choice for persistent, symptomatic bradycardia.**
- **Atropine is second choice, unless there is evidence of increased vagal tone or a primary AV conduction block, then given Atropine first.**

- **Transcutaneous pacing:**
  Indicated if bradycardia is due to complete heart block or other AV blocks which are not responsive to oxygenation, ventilation, chest compressions, or medications. Indicated with known congenital or acquired heart disease.
  Transcutaneous pacing is not indicated for asystole or bradycardia due to postarrest hypoxic / ischemic myocardial insult or respiratory failure.

- **Do not delay therapy when bradycardia is evident and no ECG monitor is available.**

- **Vasopressor agents:**
  Dopamine 5 – 20 mcg / kg / min IV / IO
  Epinephrine 0.05 – 5 mcg / kg / min IV / IO
  Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
  Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)

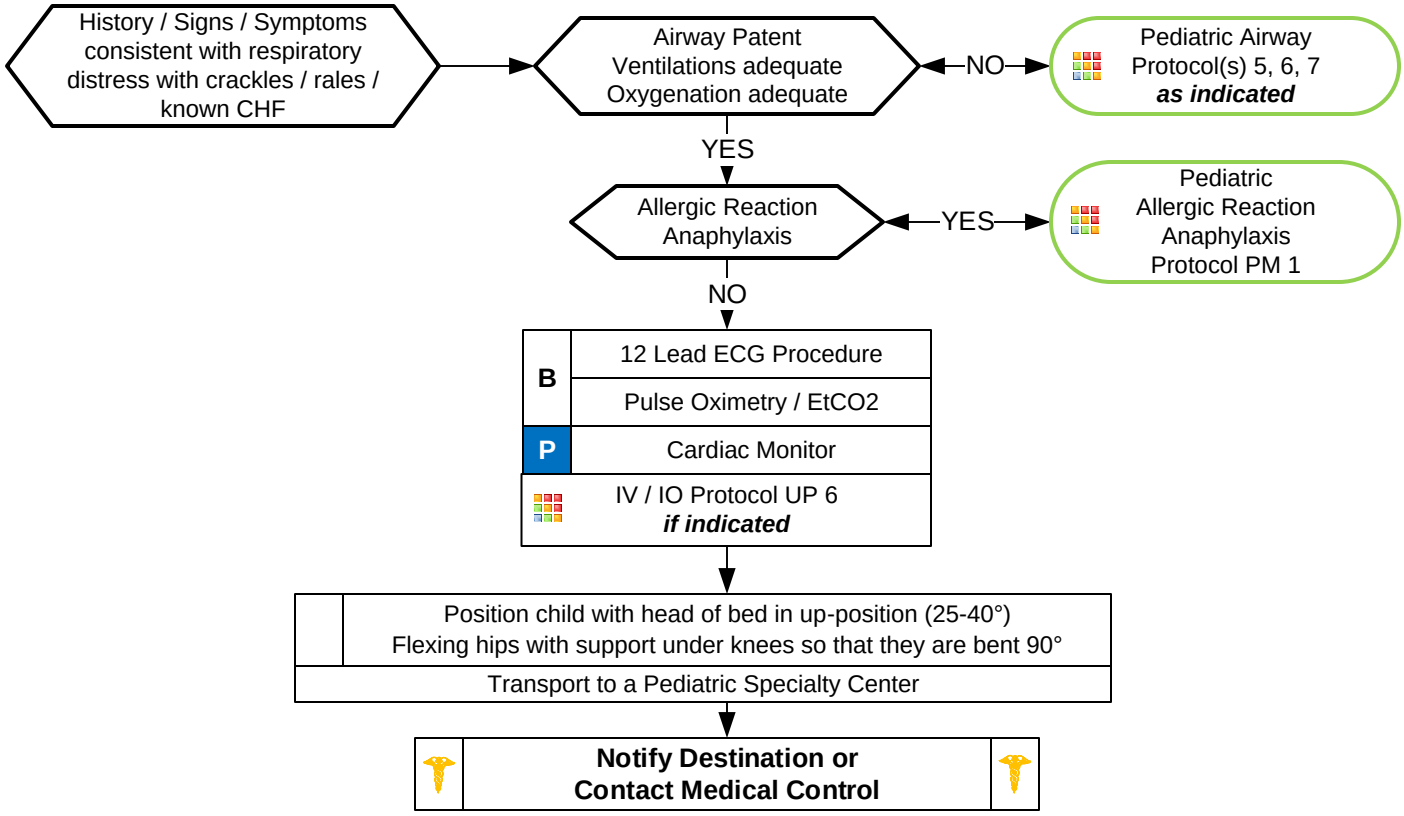
- The majority of pediatric arrests are due to airway problems.
- Most maternal medications pass through breast milk to the infant so maintain high-index of suspicion for OD-toxins.
- Hypoglycemia, severe dehydration and opioid effects may produce bradycardia. Many other agents a child ingests can cause 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



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 Direction as needed:**
  Morphine Sulfate: 0.1 mg/kg IV / IM/ IO for patients having a "tet spell." Max single dose 5mg/dose
  Fentanyl: 1 mcg/kg IV / IM / IO. Max single dose 50 mcg.
  Norepinephrine 0.1- 2 mcg/kg/min IV/IO

- Do not assume all wheezing is pulmonary, especially in a cardiac child. Avoid albuterol in a child with prior history of congenital heart disease who is in distress unless there is a strong history of recurrent wheezing secondary to asthma/pulmonary etiology (consider a discussion with Medical Direction or pediatric receiving facility regarding treatment plan)

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

Criteria for Death / No Resuscitation
Review DNR / MOST Form
YES → Do not begin resuscitation Follow Deceased Subjects Policy

NO

Newly Born / ≤ 31 days old
YES → Exit to Newly Born Protocol AO 2

NO

≥ 16 years old
YES → Exit to Adult Cardiac Arrest Protocol AC 3

NO

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

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

Defibrillation Automated
if available

Arrest due to Opioid OD?
Consider Naloxone EARLY

Naloxone 0.4 – 2 mg IN / IM
Peds: 0.1 mg/kg IN
Maximum 4 mg

A **Naloxone 0.4 – 2 mg**
Peds: 0.1 mg/kg
IV / IO / IM / IN
Maximum 4 mg

ALS Available
NO → Shockable Rhythm
NO → Continue CPR 5 Cycles / 2 Minutes Repeat and reassess; Pediatric Airway Protocol(s) 5, 6
YES → Defibrillation Automated

YES → Shockable Rhythm
NO → Pediatric Asystole / PEA Protocol PC 1; Pediatric Airway Protocol(s) 5, 6
YES → Pediatric VF / VT Protocol PC 6; Pediatric Tachycardia Protocol PC 5; Pediatric Airway Protocol(s) 5, 6

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Cardiac Arrest

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.
- 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.
- 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.

- **Defibrillation: First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks at Maximum 10 J/kg or adult dose (360J)**

- **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 post cardiac arrest center that is also an obstetrical center. 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.
  Opioid Overdose - If suspected, administer Naloxone EARLY IN ARREST 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.

- **Transcutaneous Pacing:** Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival

- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (**Maximum 2.5 mg**)

- **Vasopressor agents:**
  Epinephrine 0.05 – 5 mcg / kg / min IV / IO
  Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
  Dopamine 5 – 20 mcg / kg / min IV / IO

- **Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)**

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

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

YES →

P	
	Cardiac Monitor
	Cardioversion Procedure
	1 J / kg for shock#1, increase to 2 J/kg, repeat if needed. **If needed, Increase to 4 J/kg (max 360 J) and repeat shock**
	Consider Sedation: **Midazolam 0.1 mg/kg IV/IO/IM/IN** **Max 2.5mg initial dose** May repeat if needed to **Maximum 5 mg IV/IO/IM/IN**
	Fentanyl is an ALTERNATIVE to Midazolam for cardioversion, especially with hypotension. DO NOT give BOTH drugs. **Fentanyl 2 mcg/kg IV/IO/IM/IN** **Max dose 75 mcg, give SLOW over 2-3 mins**

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 → Consider Sinus Tachycardia, Atrial Fibrillation/ Flutter, SVT with aberrancy. Identify and Treat Underlying Cause, consider fluid bolus 20cc/kg

Contact Medical Control

Expert consultation recommended for further medication management. Call pediatric specialty center as necessary for medical direction.

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, Max 6 mg May repeat **Adenosine 0.2 mg / kg IV / IO, Max 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)
- 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

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

YES →

P
Cardiac Monitor
Cardioversion Procedure
1 J / kg for shock#1, increase to 2 J/kg, repeat if needed. **If needed, Increase to 4 J/kg (max 360 J) and repeat shock**
Consider Sedation: **Midazolam 0.1 mg/kg IV/IO/IM/IN** **Max 2.5mg initial dose** May repeat if needed to **Maximum 5 mg IV/IO/IM/IN**
Fentanyl is an ALTERNATIVE to Midazolam for cardioversion, especially with hypotension. DO NOT give BOTH drugs. **Fentanyl 2 mcg/kg IV/IO/IM/IN** **Max dose 75 mcg, give SLOW over 2-3 mins**

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**
Expert consultation recommended for further medication management. Call pediatric specialty center as necessary for medical direction.

YES ↓

Probable Ventricular Tachycardia

P	
	<u>If QRS Regular and monomorphic</u> **Adenosine 0.1 mg / kg IV / IO, Max 6 mg** May repeat **Adenosine 0.2 mg / kg IV / IO, Max 12 mg**
	Cardioversion Procedure, if unstable/AMS/ Hypotension/poor perfusion
	<u>If no response</u> **Amiodarone** **5 mg/kg IV / IO** over 20 Minutes **Maximum 150 mg**
	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, 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
- **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; Sudden collapse with rapid, weak pulse
  AMS
- **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.

- **Torsades 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.
  Administer **Magnesium Sulfate 40 mg / kg IV / IO over 10 minutes**. In cardiac arrest give over 2 minutes.
  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

P Defibrillation Manual Procedure **2 J / Kg**

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

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), *Monitor EtCO2*
Utilize NEWLY BORN protocol if applicable

IV / IO Protocol UP 6

A
Epinephrine1:10,000
0.01 mg/kg IV / IO Maximum Single Dose 1mg
Repeat every 3 – 5 minutes, paramedic may consider epinephrine drip if available, per drug label instructions

Or, if no IV/IO access
Epinephrine 1:1000 0.1 mg / kg ETT Maximum 2.5 mg

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

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

COLD Normal Saline Bolus 20 mL/kg IV / IO, May repeat to **Max total 40 mL/kg**

P
Defibrillate 10 J/kg (360J max)
Subsequent shocks at rhythm checks (if VF/VT persists) 10 J/kg not to exceed 360J max.
Change pads/vector for subsequent shocks.

P
Resume Continuous CPR Compressions
If VF/VT persistent:
Continue CPR and give Anti-arrhythmics / 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
Persistent 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

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 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 to max 360J**

- **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 no 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

Age-Appropriate Ventilation Rates for patients with a pulse:

Newly born: 40-60/min, or once every 1-2 seconds

1 month-1 year: 25-30/min, or once every ~2 seconds

1-5 years: 20/min, or once every 3 seconds

5-12 years: 15/min, or once every 4 seconds

>12 years: 8-10/min, or once every 6-7 seconds

Arrhythmias are common and usually self limiting after ROSC

If Arrhythmia Persists follow Rhythm Appropriate Protocol

	Pediatric Airway Protocol(s) AR 5 - 7 ***as needed***
	Monitor Vital Signs / Reassess
B	Blood Glucose Analysis Procedure
B	**Optimize Ventilation and Oxygenation** • Maintain SpO2 ≥ 90% • Preferably SpO2 ≥ 94% • Advanced airway if indicated • ETCO2 ideally 35 – 45 mm Hg • Age-Appropriate Ventilation Rate, titrate to oxygen saturation of 94-99% DO NOT HYPERVENTILATE
B	12 Lead ECG Procedure
	IV / 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 ***if indicated***

Hypotension Age Based

0 – 31 Days
< 60 mmHg

1 Month to 1 Year
< 70 mmHg

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

NO

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 / recurrence of cardiac arrest in post resuscitation phase and must be avoided.**

- **Target oxygenation to ≥ 94 %. 100 % FiO2 is not necessary, titrate oxygen accordingly.**
- **EtCO2 should be continually monitored.**
- **Administer resuscitation fluids and vasopressor agents to maintain SBP at targets listed on the first page of this protocol. This table represents minimal SBP targets.**
- **Targeted Temperature Management is recommended in pediatrics, transport per triage and destination plans**

- **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 (with a pulse) give over quickly over 2-10 minutes. Max 2 g.**

Procainamide 15 mg / kg IV / IO over 30 – 60 minutes. Monitor for increased QRS and increased QT.

- **Vasopressor agents:**
  - **Dopamine 5 – 20 mcg / kg / min IV / IO**
  - **Epinephrine 0.05 – 5 mcg / kg / min IV / IO**
  - **Norepinephrine 0.1 – 2 mcg / kg / min IV / IO**
  - **Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)**

- Utilize pediatric drug guide for fluid and med dosing. Use actual body weight if known to determine medication dosages as per the guide. If unknown then use a body length tape system.
- Contact medical direction as needed for post-resuscitation management.

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

- B: **Diphenhydramine 1 mg / kg mg PO**
- A: IV Procedure ***If indicated***
- A: **Diphenhydramine 1 mg / kg IV / IM / IO / PO**
- A: **Famotidine 0.25 mg/kg IV/IO Maximum 40mg**
- B: Monitor and Reassess Monitor for Worsening Signs and Symptoms

MODERATE
2+ Body Systems

- **Epinephrine 1:1000 IM ≥ 30 kg 0.3 mg IM < 30 kg 0.15 mg IM *or* 0.15 mg IM autoinjector**
- B: **Diphenhydramine 1 mg / kg PO** *See Pearls*
- B: **Albuterol Nebulizer 5 mg** Repeat as needed x 3 ***if indicated***
- A: **Diphenhydramine 1 mg / kg IV / IM / IO / PO *if not already given PO***

SEVERE
2 + Body Systems + hypotension
Or Isolated Hypotension

- **Epinephrine 1:1000 IM ≥ 30 kg 0.3 mg IM < 30 kg 0.15 mg IM *or* 0.15 mg IM autoinjector**
- B: **Albuterol Nebulizer 5 mg** Repeat as needed x 3 ***if indicated***
- Airway Pediatric Protocol(s) ***if indicated***
- Pediatric Hypotension / Shock Protocol PM 3 ***if indicated***

- A: **Epinephrine 1:1000 IM ≥ 30 kg 0.3 mg IM < 30 kg 0.15 mg *or* 0.15 mg IM autoinjector** Repeat in 5 minutes if no improvement
- IV / IO Protocol UP 6
- A: **Normal Saline Bolus 20 mL/kg IV / IO** Repeat as needed to effect age appropriate SBP **Maximum 60 mL/kg**
- A: **Albuterol Nebulizer 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3, ***if indicated***
- A: **Diphenhydramine 1 mg/kg (max 50mg) IV / IM / IO *if not already given PO***
- A: **Famotidine 0.25 mg/kg IV/IO, max 40mg**
- P: **Methylprednisolone 2 mg/kg IV, max 125mg**

30 kilograms = 66 pounds = Approx 9 yo

P: **For Moderate reactions, po prednisone or prednisolone may be given. Severe reactions should receive IV corticosteroids.**

Prednisone po *or* Prednisolone po (Orapred) 2mg/kg po Maximum 60mg

- P: Worsening despite multiple doses of IM Epinephrine **Epinephrine 1:10,000 drip IV / IO 0.05 – 5 mcg/kg/min** If available, Per drug label instructions

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.**
- **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 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 medications such as Diphenhydramine or Prednisone should NOT be given to a patient with decreased mental status as this may cause choking, nausea and / or vomiting.**

- **To improve patient safety, *Use an autoinjector to deliver IM epinephrine any time one is available.***
- **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion.**

- **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 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.**
- **EMT may administer diphenhydramine by oral route only and may administer from EMS supply.**
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.**

- **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***

IV / IO Protocol UP 6

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.

Consider Oral Glucose Solution *if available*

Blood Sugar ≤ 69 mg / dl

Oral Glucose ½ to 1 Tube
If age appropriate, consider ability to swallow

Consider Oral Solution (Juices / Food)

A **Dextrose Infusion IV/IO**
Use D10W Premixed solution if available

For patients under 50 kg (110lbs)
D10W 5 mL/kg IV / IO
Repeat as needed, titrate to patient condition and effect

For patients 50kg (110lbs) or greater
D10W Premixed 250mL Bag, Titrate to patient condition and response. 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 **Normal Saline Bolus 10 mL/kg IV / IO**

Max one liter initial bolus during transport. Consider DKA, goal 10cc/kg over the first hour. Exit to Pediatric Hypotension/Shock Protocol if patient is hypotensive. Contact Medical Direction or receiving pediatric specialty center for suspicion of DKA with hypotension.

Monitor and Reassess Every 5 minutes Until Blood Glucose ≥ 70 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 Preparation if necessary:**

- 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.

- **Hyperglycemia** in pediatrics, especially with no history of diabetes, may indicate a (first) episode of diabetic ketoacidosis, a life-threatening condition. Recognition of the possibility of the condition and SLOW volume replacement are goals of prehospital care. Rapid or excessive volume replacement could cause cerebral edema. Consider monitoring EtCO2 to detect metabolic acidosis, and consultation with the receiving pediatric specialty receiving center for any hypotension (normal pediatric BP = 70 + 2x age in years) or patient in extremis.

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

Blood Glucose Analysis Procedure

IV / IO Protocol UP 6

P — Cardiac Monitor

Pediatric Airway Protocol(s) ***if indicated***

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

History and Exam Suggest Type of Shock

Cardiogenic

Chest Pain: Cardiac and STEMI Protocol AC 4

Appropriate Pediatric Arrhythmia Protocol(s) ***if indicated***

A — **Normal Saline Bolus 5 – 10 mL / kg IV / IO**
Titrate to age appropriate SBP ≥ 70 + 2 x Age
Maximum 10 mL / kg

Hypovolemic / **Distributive**

Pediatric Allergy Protocol PM 1 ***if indicated***

Pediatric Sepsis Protocol ***if indicated***

Multiple Trauma Protocol TB 6 ***if indicated***

A — **Normal Saline Bolus 20 mL / kg IV / IO**
Repeat as needed to Maximum 60 mL / kg
Titrate to age appropriate SBP ≥ 70 + 2 x Age

Obstructive

P — Chest Decompression-Needle Procedure ***if indicated***

P

Caution with excess fluids in cardiogenic shock; consider pulmonary edema; utilize pressors early:
Norepinephrine 0.1- 2 mcg/kg/min IV/IO
To effect SBP ≥ 70 + 2 x Age

For non-cardiogenic shock, consider pressors after 60 mL/kg liter fluid bolus:

Titrate any pressor drugs to age appropriate BP:
SBP ≥ 70 + 2 x Age
Norepinephrine 0.1- 2 mcg/kg/min IV/IO *or*
Epinephrine 0.05 – 5 mcg/kg/min IV/IO *or*
Dopamine 5 – 20 mcg/kg/min IV/IO *or*
Phenylephrine 5mcg/kg IV/IO every 10min, max single dose 100mcg, max total dose 500mcg

Notify Destination or Contact Medical Control

Pediatric Medical Protocol Section

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 suddenly stopped a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain.
- **If Adrenal Insufficiency suspected, Paramedic should give:**
  Methylprednisolone 2 mg/kg IV / IO (Maximum 125mg) or
  Dexamethasone 0.3 mg/kg (Maximum 10 mg) IV / IO.
  May administer prescribed steroid carried by patient IM / IV / IO. Patient may have Hydrocortisone (Cortef or Solu-Cortef). Use patient's prescribed dose, or: < 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

Place patient in Left lateral recumbent position

Abnormal Vaginal Bleeding / Hypertension / Hypotension

YES → Obstetrical Emergency Protocol AO 3 ***as indicated***

NO

Inspect Perineum (No digital vaginal exam)

No Crowning

Monitor and Reassess

Document frequency and duration of contractions

Crowning >36 Weeks Gestation

IV / IO Protocol UP 6

Childbirth Procedure

Priority symptoms:
Crowning
<36 weeks gestation
Abnormal presentation
Severe vaginal bleeding
Multiple gestation

Expedite Transport

Prolapsed Cord
Shoulder Dystocia

Hips Elevated Knees to Chest

Insert fingers into vagina to relieve pressure on cord

Saline Dressing Over cord

Breech Birth

Transport Unless delivery imminent

Encourage Mother to refrain from pushing

Support Presenting Parts Do Not Pull

Place 2 fingers along nose and push tissue from face

Delivery

Go to Newly Born Protocol AO 2

<u>Unable to Deliver</u>

Create air passage by supporting presenting part of infant.

Place 2 fingers along side nose and push away from face

Transport in Knee to Chest Position or Left Lateral Position

High Flow Oxygen to Mother

Monitor and Reassess

Notify Receiving Facility Immediately

Notify Destination or Contact Medical Control

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.**
- **After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.**
- Document all times (delivery, contraction frequency, and length).
- **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.
- **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. 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.

- 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
  - Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia, Hypoglycemia, Hypothermia
- Congenital heart disease

Breathing or Crying?
Term Gestation?
Good Muscle Tone?

ALL YES →
- Infant with mother if possible
- Provide warmth / Dry infant
- Maintain normal temperature
- Clear airway if necessary
- Monitor and Reassess

ANY NO ↓
- Warm, Dry and Stimulate
- Clear airway if necessary

Agonal breathing or Apnea?
Heart Rate < 100 / min
Labored breathing or Persistent cyanosis

YES →
- Position and clear airway of meconium or mucous if necessary
- Supplemental Oxygen
- BVM Ventilations; rate 40-60 per minute
- **B** Pulse Oximetry Right Hand
- **P** Cardiac Monitor / 3 – Lead

Heart Rate < 100

YES →
- Check chest movement
- Change airway position
- Change BVM Technique
- Pediatric Airway Protocol(s) AR 5, 6 ***if no improvement***

NO ↓
- Supplemental Oxygen
- Maintain SpO2 ≥ 94 %
- Maintain warmth
- Monitor and Reassess

Heart Rate < 60

YES →
- Chest Compressions, rate 120/minute, with ventilations between compressions, rate 30-40 per minute (CPR ratio 3:1)
- Pediatric Airway Protocol(s) AR 5, 6
- **A** IV / IO Procedure
- **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
  May repeat x 1

NO ↓

Notify Destination or Contact Medical Control

Adult Obstetrical Protocol Section

Newly Born

Obstetrical Protocol Section

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- **Document 1 and 5 minute Apgars in PCR**

- **Most newborns requiring resuscitation respond to ventilations / BVM to deliver positive pressure.**
- **If newborn not responding to BVM, compressions, and/or epinephrine, consider hypovolemia, pneumothorax, and/or hypoglycemia (< 40 mg/dL).**

- **Term gestation, strong cry / breathing and with good muscle tone generally will need no resuscitation. Routine suctioning is no longer recommended.**

- **Most important vital signs in the newly born are respirations / respiratory effort and heart rate.**
- **Maintain warmth of infant following delivery; cap, plastic wrap, thermal mattress, radiant heat.**

- **Meconium staining:**
  Infant born through meconium staining who is not vigorous: Positive pressure ventilation is recommended, direct endotracheal suctioning is no longer recommended.

- **Expected Pulse Oximetry readings immediately following birth:**

1 minute	**60 – 65%**
2 minutes	**65 – 70%**
3 minutes	**70 – 75%**
4 minutes	**75 – 80%**
5 minutes	**80 – 85%**
10 minutes	**85 – 95%**

- Heart rate is critical during the first few moments of life and is best assessed by 3-lead ECG.
- Pulse oximetry should be applied to the right upper arm, wrist, or palm.

- **Rescue Breathing (pt with pulse > 60) in the newly born should initially be at a rate of 40-60 per minute to achieve and/or sustain a heart rate >100**

- **CPR in neonates (pt without a pulse or pulse < 60) should be at a rate of 100-120 compressions/minute with a 3:1 compression to ventilation ratio (ventilation rate of 30-40 per minute). In neonates, effective ventilations are just as important as compressions, therefore time ventilations between compressions so that they are delivered effectively. For compressions, 2-thumbs encircling chest and supporting the back is recommended. Limit interruptions of chest compressions.**

- Maternal sedation or narcotics will sedate infant (Naloxone NO LONGER recommended-supportive care only).
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)

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 Monitor
- Abdominal Pain, Vomiting and Diarrhea Protocol UP 3, **if indicated**
- Diabetic Protocol AM 2 / PM 2 **if indicated**
- Hypotension / Shock Protocol AM 5 / PM 5 **if indicated**

NO

Exit to Appropriate Protocol(s)

Seizure Activity

NO

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

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 Midaz

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**

If Midazolam not available, initial dose:
Diazepam 4 mg IV/IO *or* Lorazepam 4mg IM/IV/IO
Repeat **2 mg** every 3 to 5 minutes for continued seizure activity, **Max 10mg**

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 usually 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.**

- A patient who is pregnant and seizing should be presumed to have eclampsia, a true medical emergency. Magnesium administration should be a priority in these patients. However, IM benzodiazepines may be given first due to rapidity of IM administration. For crews with two ALS providers, one provider should administer IM benzodiazepine while the other provider establishes IV access for Magnesium.

- The preferred route of administration of Magnesium loading dose for eclampsia or pre-eclampsia is via IV (or IO in the case of eclampsia/seizure). However, if an IV cannot be obtained, and a patient is suspected of currently having an eclamptic seizure, Magnesium may be given IM if the appropriate concentration is available (e.g. 5g/10ml):
  5g IM via multiple IM injections deep in the upper outer quadrant of the buttock, not to exceed 2.5-3cc per injection

- Severe headache, vision changes, or RUQ pain may indicate preeclampsia. For a pregnant patient with these symptoms, or a known diagnosis of pre-eclampsia and/or current hypertension, consider slow magnesium drip infusion: Magnesium Sulfate 2g IV over 10-20 minutes as per drug label guidelines.

- **Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Pregnant patients with even minor blunt trauma are at risk for placental abruption: see trauma protocol. Greater than 20 weeks generally require several hours of fetal monitoring. DO NOT suggest the patient needs 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 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; first presentation may be an eclamptic seizure. Pre-eclampsia/Eclampsia may occur up to six weeks after childbirth.
- 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.

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

If Needed
Carolinas Poison Control
1-800-222-1222

- General Wound Care Procedure
- Immobilize Injury
- Remove any constricting clothing / bands / jewelry
- IV / IO 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
- Keep bite at level of heart ***if able***
- Apply Ice Packs
- **P**
  - **<u>Consider for Muscle Spasm</u>**
  - **Midazolam 2 – 2.5 mg IV/IM/IN/IO**
  - Over 2 to 3 minutes
  - **Maximum 5 mg**
  - **Pediatrics:**
  - **Midazolam 0.1 – 0.2 mg / kg**
  - **IV / IO / IM / IN**
  - Over 2 to 3 minutes
  - **Maximum 5 mg**

Snake Bite
- 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 and animal or insect for identification purposes.**
- **Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.**

- **DO NOT PLACE A TOURNIQUET FOR SNAKE OR SPIDER BITES OR ANY STINGS; TOURNIQUET PLACEMENT FOR AN ENVENOMATION MAY WORSEN LOCAL TISSUE DAMAGE.**

- **Human bites:**
  Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- **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.
  If no pain or swelling, envenomation is unlikely. About 25 % of snake bites are “dry” bites.
- **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).

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/ IO Protocol UP 6

P — Cardiac Monitor / CO Monitor

Measure COHb % (SpCO)

Altered Mental Status Protocol UP 4 ***if indicated***

Age Appropriate Diabetic Protocol AM 2 / PM 2 ***if indicated***

Multiple Trauma Protocol TB 6 Head Injury TB 5 ***if indicated***

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***

SpCO 0% to 5 % → No further medical evaluation or treatment of SpCO required. If monitoring responders at fire scene, Ok to proceed with Scene Rehabilitation Protocol

SpCO < 15 **and SpO2 > 90 %** → Symptoms of CO and/or Hypoxia?

- **No** →
  - No specific treatment for CO exposure required
  - Recommend that smokers seek smoking cessation treatment.
  - Recommend eval of home/ work environment for presence of CO
- **Yes** →

SpCO > 15% or SpO2 < 90 % → 100% Oxygen by NRB and transport to ED

If cardiac/respiratory/ neurological symptoms are also present, go to appropriate protocol

High Suspicion of Cyanide

- YES → P — **Hydroxocobalamin 70 mg / kg IV / IO Maximum 5 g**
- NO →

Continue Care
Continue High Flow Oxygen
Monitor and Reasses

→ **Notify Destination or Contact Medical Control**

Toxin-Environmental Protocol Section

Pearls
- **Scene safety is priority. Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- Consider CO and Cyanide with any product of combustion.
- Normal environmental CO level does not exclude CO poisoning. The absence (or low detected levels of) of COHb is not a reliable predictor of firefighter or victim exposure to other toxic byproducts of fire.
- **Fetal hemoglobin has a greater attraction for CO than maternal hemoglobin. Females who are known to be or possibly pregnant should be advised that EMS-measured SpCO levels reflect the adult's level, and that fetal COHb levels may be higher. Recommend Hospital eval for any CO exposed pregnant person.**
- Symptoms present with lower CO levels in pregnancy, children and the elderly. The differential list for CO Toxicity is extensive. Attempt to evaluate other correctable causes when possible
- In obtunded fire victims, consider Cyanide treatment protocol
- Continue high flow oxygen regardless of pulse ox readings.
- Chronic CO exposure is clinically significant; therefore advice on smoking cessation is important medical instruction

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 Motion 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 / IO Protocol UP 6 ***if indicated***
- P Cardiac Monitor ***as indicated***

Awake but with AMS

- 5 Breaths via BVM ***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 / IO Protocol UP 6
- P Cardiac Monitor

→ Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***

Unresponsive

- 5 Breaths via BVM ***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***

Notify Destination or Contact Medical Control

Dive Accident / Barotrauma
Divers Alert Network
1-919-684-9111

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

B 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***

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 / IO Protocol UP 6
- **P** Cardiac Monitor
- **A** **Normal Saline Bolus 500 mL IV / IO**
  Repeat to effect SBP > 90, **Max 2 L**

  PED: Normal Saline Bolus 20 mL/kg IV / IO
  Repeat to effect Age appropriate SBP ≥ 70 + 2 *x* Age
  Maximum 60 mL/kg

  ****For HEAT STROKE (usually Temp > 104), immerse in ice-water bath and use COLD NORMAL SALINE bolus (*See Pearls for heat stroke*)**
- 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. young and old).**
- **Obtain and document patient temperature if able.**
- 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.

- **FOR HEAT STROKE 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 30 minutes. Stirring the water aids in cooling.
  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

B 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

Systemic Hypothermia

Localized Cold Injury

Awake with / without AMS

Unresponsive

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

YES — Pulse

NO

Exit to
Age Appropriate
Cardiac
Protocol(s)
See Pearls

Altered Mental Status
Protocol UP 4
as indicated

Active warming measures

B 12 Lead ECG Procedure

IV / IO 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.)**
- **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/CARDIAC ARREST:**
  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 most experienced person.

  Below 86°F (30° C) antiarrhythmics may not work and if given should be given at increased intervals. Contact medical control for direction. Epinephrine / Vasopressin 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 to 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 Envenomations / 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

If Needed
Carolinas Poison Control
1-800-222-1222

- General Wound Care Procedure
- IV / IO Protocol UP 6 ***if indicated***
- P: Cardiac Monitor ***if indicated***
- Drowning Protocol TE 3, ***if indicated***
- Age Appropriate Allergy / Anaphylaxis Protocol AM 1 / PM , ***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
- Apply Vinegar Rinse
  If available
  Otherwise wash with clean seawater
  DO NOT
  use fresh water or ice
- P: ***Consider*** **Calcium Chloride (or Gluconate) 1 g IV / IO**
  Peds: 20 mg/kg IV / IO
  Over 3 minutes for severe muscle spasms

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
- P: ***Consider*** **Calcium Chloride (or Gluconate) 1 g IV / IO**
  Peds: 20 mg/kg IV / IO
  Over 3 minutes for severe muscle spasms

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 Envenomations / Injury

Pearls

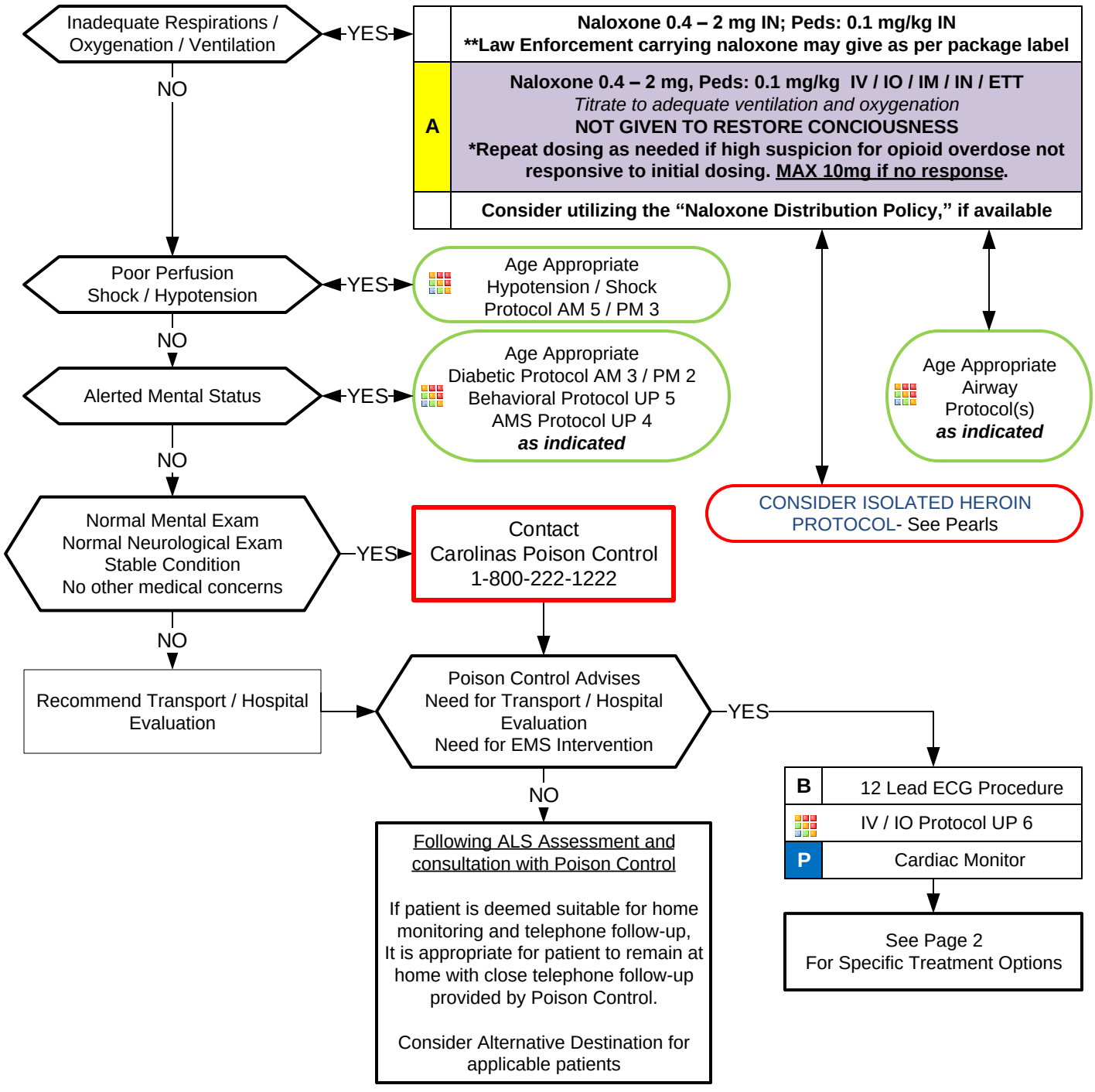
- **Ensure your safety: Avoid the organism or fragments of the organism as they may impart further sting / injury.**
- **Priority is removal of the patient from the water to prevent drowning.**
- **Coral:**
  - Coral is covered by various living organisms which are easily dislodged from the structure.
  - Victim may swim into coral causing small cuts and abrasions and the coral may enter to cuts causing little if any symptoms initially.
  - 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), has recently been shown to be 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 the home as they 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 degrees 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 advise.
  - 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 envenomations.
- 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)



Toxin-Environmental Protocol Section

Overdose / Toxic Ingestion

Acetaminophen
Tylenol®
APAP Containing Product

YES → **B** Record time of Ingestion as this may dictate hospital therapy

NO

Aspirin
Salicylate Containing Product

YES → **B** Record time of Ingestion as this may dictate hospital therapy

NO

Beta Blocker or
Calcium Channel Blocker

YES → **B** Record time of ingestion as this may dictate hospital therapy.

A **Glucagon 4 mg IV / IO / IM**
Peds: 0.1 mg/kg IV / IO / IM
May repeat in 15 minutes as needed

P Consider
Cardiac External Pacing Procedure for Severe Cases

P **Calcium Gluconate 3 g IV / IO**
Or
(Calcium Chloride 1 g IV / IO)
Pediatric: 20 mg / kg IV / IO
Over 2- 3 minutes

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** Record time of ingestion as this may dictate hospital therapy.

P **<u>QRS ≥ 0.12 sec or Peds: 0.09 sec</u>**
Sodium Bicarbonate
50 mEq IV / IO
Peds: 1 mEq/kg IV / IO
Repeat in 5-10 minutes as needed

P **<u>If QRS remains wide:</u>**
Sodium Bicarbonate 50 mEq IV / IO
Peds: 1 mEq/kg IV / IO
Repeat every 3-5 minutes
Until QRS narrows to < 0.12sec

Symptomatic Care
as needed

Monitor and Reassess

Notify Destination or
Contact Medical Control

Toxin-Environmental Protocol Section

Overdose / Toxic Ingestion

Multiple observational studies have indicated that no short-term deaths were found in subsets of opioid overdose patients who received naloxone treatment in the field. Therefore the following protocol is in effect:

Wake County EMS System Isolated Heroin Overdose Protocol

1. To have the protocol applied, a patient must be age 18 or older and be suffering from an isolated IV opioid overdose, i.e. with depressed mental status or respiratory distress/arrest from opioid overdose. Patients are treated as per page 1 of this protocol: Overdose/Toxic Ingestion.

2. The following conditions must be true:
   a. The patient must never have been in cardiac arrest during this incident.
   b. The patient must regain a normal mental and respiratory status after naloxone administration of up to 2mg via IM, IV, or IN route.
   c. Once "awake" the patient must admit to isolated IV opioid/heroin overdose, and must not also have overdosed on any oral narcotics such as oxycontin, methadone, etc.
   d. The patient must consent to, and the paramedic must administer, another 2mg dose of Naloxone by the IM route

3. If conditions a,b,c, and d are all met, and there is no other acute medical or traumatic condition requiring care, the patient is considered "medically clear" for consideration for alternate destination referral. Any EMS patient with capacity to make medical decisions may refuse care or consent to transport. If the patient refuses alternate destination or further care/transport, he or she still may be offered the additional 2mg of Naloxone as per "d" above.

4. If the patient was ever in cardiac arrest, does not regain normal mental or respiratory status or requires more than 2mg of Naloxone to do so, does not consent to an additional 2mg of IM Naloxone, or there is evidence of opioid overdose by any other route (oral, transdermal, etc), then the patient should be transported to an appropriate local emergency department. Transport to the Emergency Department should also be provided for patients who request it, and assistance should be provided to those patients who wish to be assessed and treated for substance abuse.
Consider utilizing the Naloxone Distribution policy, if kits are available.

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. If a patient has not responded to 10mg total of naloxone, consider another cause of altered mental status. If the patient is intermittently responding or shows some response, continue naloxone as indicated.**
- Overdose or Toxin patients with significant ingestions/exposures should be monitored very closely and aggressively treated as indicated. Do not hesitate to contact medical control for advice as certain critically ill overdose patients may quickly overwhelm medication supplies. For example, patients with a tricyclic overdose with a wide QRS and altered mental status should receive multiple sodium bicarbonate boluses until QRS narrowing and clinical improvement; patients with organophosphate toxicity with SLUDGE syndrome may require more atropine than is usually carried on the ambulance.
- **Time of Ingestion:**
  1. Most important aspect is the **TIME OF INGESTION** and the substance and amount ingested and any co-ingestants.
  2. Every effort should be made to elicit this information before leaving the scene.
- **Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is still not carrying other medications or has any weapons.**
- **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 route only and may administer from EMS supply.**
- **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.

Nerve Agent (includes WMD) Protocol

History

- Exposure to chemical, biologic, radiologic, or nuclear hazard
- Potential exposure to unknown substance/hazard
- **Farmer or farm-worker/harvester with exposure to pesticide**

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.

Seizure Activity
Go to
Seizure Protocol

Symptom Severity

Asymptomatic

Monitor and Reassess
Every 15 minutes for symptoms
Initiate Treatment per Appropriate Arm

Minor Symptoms:
Respiratory Distress + SLUDGEM

IV / IO Protocol UP 6

Nerve Agent Kit IM
2 Doses Rapidly, *if available*

P

Atropine
Adult: 2 mg IV / IO / IM
Peds: 0.02 mg/kg IV / IO / IM
Repeat every 3 to 5 minutes until symptoms resolve (see pearls)

Pralidoxime (2PAM)
Adult: 600 mg IV / IO / IM
Peds: 15 – 25 mg / kg IV / IO / IM
Over 30 minutes

Major Symptoms:
Altered Mental Status, Seizures, Respiratory Distress, Respiratory Arrest

IV / IO Protocol UP 6

Nerve Agent Kit IM
3 Doses Rapidly, *if available*

P

Atropine
Adult: 6 mg IV / IO / IM
Peds: 0.05 mg/kg IV / IO / IM
Repeat every 3 to 5 minutes until symptoms resolve (see pearls)

Pralidoxime (2PAM)
Adult: 600 mg IV / IO / IM
Peds: 15 – 25 mg / kg IV / IO / IM
Over 30 minutes

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

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 and adult 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 not from exposure to another agent (e.g., narcotics, vesicants, etc.)
- The main symptom that the atropine addresses is excessive secretions so atropine should be given until salivation improves.
- EMS personnel, public safety officers and EMR / EMT may carry, self-administer or administer to a patient atropine / pralidoxime by protocol.

Scene Rehabilitation: General
May be used for Special Events with Approval

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

Initial Process
1. Individuals/Personnel logged into General Rehabilitation Section
2. VS Assessed / Recorded (If HR > 110 then obtain Temp)
   Carbon Monoxide monitoring if indicated
3. Individuals/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 or other appropriate 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 individual after 20 Minutes in General Rehabilitation Section
Reassess VS

HR ≥ 110 → YES → Any Responder Cannot Wear Protective Gear
Extend Rehabilitation Time Until VS Improve
Consider Transport

NO

Temp ≥ 100.6 → YES → Any Responder Cannot Wear Protective Gear
Extend Rehabilitation Time Until VS Improve
Consider Transport

NO

Temp ≥ 100.6 → YES → Extend Rehabilitation Time Until VS Improve
Consider Transport

NO

HR ≥ 110 → YES → Extend Rehabilitation Time Until VS Improve
Consider Transport

NO

Discharge Individual from General Rehabilitation Section

May Report for Reassignment

VITAL SIGN CAVEATS

Blood Pressure:
Prone to inaccuracy on scenes. Must be interpreted in context.

Firefighters and/or athletes or other individuals at special events may have elevated blood pressure due to physical exertion and is not typically pathologic.

Individuals with Systolic BP ≥ 160 or Diastolic BP ≥ 100 may need extended rehabilitation. However this does not necessarily prevent them from returning to duty or the event.

Temperature:
Firefighters, other responders, athletes, or other individuals at special events may have increased temperature during rehabilitation.

Special Operations Section

Scene Rehabilitation: General
May be used for Special Events with Approval

Special Operations Section

Pearls

- **This protocol should be utilized for evaluating professional or public safety personnel, or patrons, of special events.. Individuals may or may not otherwise meet the definition of a patient.**
- **Paramedic on-scene has full authority in deciding when individuals meet the definition of a patient and/or require further treatment or transport.**
- **Paramedic on-scene has full authority in deciding when any responders may return to duty and may adjust rest / rehabilitation time frames depending on existing conditions.**

- **Regarding documentation under this protocol, individuals who are evaluated only at the rehabilitation center require a narrative-based patient log entry under one PCR for all of these individuals. However, if a patient receives ALS care more than over-the-counter medications and/or is transported to an emergency department, the patient requires a separate run number and full PCR like any other patient.**

- **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-min self-rehab 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 or ANY Altered Mental Status.
  - Abnormal Vital Signs per protocol

- **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 Rehab Section
2. VS Assessed and Recorded / Orthostatic Vital Signs
3. Pulse oximetry and SPCO (if available)
4. Personnel assessed for signs / symptoms

Use for Responders in conjunction with General Rehabilitation Protocol

20 Minute Rest Period
Firefighters should consume at least 8 ounces of fluid between SCBA change-out

Pulse Rate > 85 % NFPA Age Predicted Maximum — YES → **A**

A
Normal Saline Bolus
500 mL IV / IO
Maximum 2 L
Titrate to HR ≤ 110
And
SBP ≥ 100 mmHg

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

No improvement after 30 minutes of additional rehabilitation; consider transport

Mandatory Rest Period
Rehydration is Most Important
Re-evaluate in 10 minutes

Notify Destination or Contact Medical Control

Special Operations Section

Pearls

- **This protocol is to be utilized for public safety responders, usually firefighters, on the scene of an incident.**
- **Paramedic Rehabilitation officer has full authority in deciding when responders may return to duty.**
- **Utilize this protocol in conjunction with the rehab steps and guidance in the 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.

High Consequence Pathogens
(Respiratory Diseases, SARS, MERS-CoV, COVID-19)

Raleigh-Wake Emergency Communications Center and Cary Communications

1. Use Emerging Infectious Disease Surveillance (EIDS) Tool as enacted by the Wake County EMS Medical Director. Use the tool with the following chief complaints:
   ** All medical complaints (non-trauma) as per current Medical Director guidance

2. Use MPDS/Pro-QA EIDS Card with the following MPDS protocols:
   **** All EMD cards (except 27 and 29). On the 9 card, give PAIs then ask EIDs questions.**

3. Ask the following questions:
   1. Do you (does the patient) have a fever, cough, shortness of breath, runny nose, nausea/vomiting/diarrhea, sore throat, or new loss of taste or smell?
   2. In the past 14 days have you (has the patient) tested positive for coronavirus or come into close contact with someone who has?

** If either of the EIDS questions are "yes" then the screen is positive **

Evolving Protocol:

Protocol subject to change at any time dependent on changing outbreak locations. Monitor for protocol updates.

911 Screening is POSITIVE

Follow Current Guidance for Notification of all Responding Personnel

911 Screening is NEGATIVE

EMS should not rely solely on EMD to identify potential exposure patients:
- EMD may be constrained by time and caller information
- Stand 6 feet away and perform quick screening. If patient screens positive for possible COVID-19 symptoms or is a close contact with someone with confirmed COVID-19, consider the patient an exposure risk.
- Limit scene to number of providers necessary, to limit potential exposures
- Patients in the back of an ambulance should wear a face covering if able based on their medical condition. Place a department provided facemask on patients who screen positive for possible COVID-19 symptoms or exposure to a known COVID positive patient.

Possible COVID-19 Symptoms:
- Fever or Chills
- Cough, Sore Throat
- Shortness of Breath or difficulty breathing
- Fatigue, headache
- New loss of taste or smell
- Muscle or body aches
- Congestion or runny nose
- Nausea, Vomiting or Diarrhea

(EMD is not expected to ask callers for every symptom. They are listed here for EMS/EMD reference. If discovered, patient should be considered to screen POSITIVE for possible COVID-19 for this protocol)

EMS Screening is POSITIVE

EMS Screening is NEGATIVE

Exit to Appropriate Protocol(s)
EMS should Use *new* Universal Precautions (gloves, department provided facemask, eye protection for ALL PATIENTS

EMS Personal Protective Equipment

Providers should utilize:
- **Contact/Droplet precautions (facemask provided by department)** for most patients, unless aerosolizing procedures are indicated (see pearls)
- **Airborne precautions (N95 Mask or higher)** if there is a need for an aerosolizing procedure (see below)
- Create negative pressure in care compartment if available (See Pearls)
- Personnel in the ambulance cab should utilize a facemask provided by the department for the driver/passenger.

EMS General Treatment Considerations

Aerosol generating procedures:
(NIPPV / Nebulizer therapy / Intubation / BIAD /Suctioning)
- Limit Aerosolizing procedures when possible
- **Use Airborne precautions as listed above**
- Notify receiving facility of type of precautions in use prior to arrival (e.g. airborne or contact/droplet)

Notify Destination or Contact Medical Control

Special Circumstances Section

High Consequence Pathogens

(Respiratory Diseases, SARS, MERS-CoV, COVID-19)

Special Circumstances

PPE Supply Chain Disruptions- when stock is low:

- Prioritize Respirators/N95 Masks to be used ONLY with aerosol-generating procedures until supply chain restored.
- Prioritize Gowns to be used with aerosol-generating procedures and situations where significant blood, bodily fluids, or secretions is anticipated.
- Providers should wear a single department issued facemask throughout their duty-shift (i.e. when not on calls) and change only when soiled or damaged, when not able to socially distance, per current department policy. Adjust use based on supply chain.

Pearls

- **Place department provided facemask on any patient complaining of respiratory problems with or without a fever.**
- **Close Contact Definition: Healthcare provider exposure is defined as being within 6 feet for≥ 15 minutes with a patient with suspected illness and/or unprotected (no or incorrect PPE) direct contact with body fluids, including respiratory droplets or respiratory-generated body fluids.**
- **Transport: Riders should be discouraged per the current "sterile cab" policy; any rider should wear a facemask. Limit number of providers in vehicle required to provide patient care in order to limit exposures**

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.

"new" Universal Precautions:

During the COVID-19 pandemic, all providers involved on any patient encounter shall use a minimum of gloves, department provided facemask and eye protection when inside the 6ft "hot zone" of any patient. These are utilized mainly when a patient is compliant with wearing a facemask, and the patient does not have any COVID-like symptoms (e.g. fever and/or any respiratory symptom).

Contact precautions:

Standard PPE with utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level is utilized in non-pandemic times 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. During the COVID-19 pandemic, all providers involved on a patient encounter with a patient non-compliant with wearing a mask or where significant blood, bodily fluids, or secretions is anticipated shall wear a minimum of the "new" Universal Precautions with department provided facemask and don a reusable/disposable gown if available. Any patient that would have required contact/droplet precautions pre-pandemic should still require these precautions (e.g. bloody trauma patients, GI patients with copious vomiting/diarrhea, possibly infectious rash, concern for meningitis, etc per protocol).

Droplet precautions:

Standard PPE plus a department provided facemask for providers who accompany patients in the treatment compartment and a department provided facemask or NRB O2 mask for the patient. This level is utilized in non-pandemic times when Influenza, Meningitis, Mumps, Streptococcal pharyngitis, Pertussis, Adenovirus, Rhinovirus, and/or undiagnosed rashes are suspected. During the COVID-19 pandemic, all providers involved on a patient encounter with a patient non-compliant with wearing a mask or where significant blood, bodily fluids, or secretions is anticipated shall wear a minimum of the "new" Universal Precautions with department provided facemask and don a reusable/disposable gown if available. Any patient that would have required contact/droplet precautions pre-pandemic should still require these precautions (e.g. bloody trauma patients, GI patients with copious vomiting/diarrhea, possibly infectious rash, concern for meningitis, etc per protocol).

Airborne precautions:

Contact/Droplet PPE plus fit-tested N95 mask (or higher respirator, e.g. elastomeric with p100 filter, CAPR, PAPR) and utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level is utilized with Aspergillus, Tuberculosis, SARS/novel coronavirus with aerosolizing procedure, Measles (rubeola), Chickenpox (varicella-zoster), Smallpox, disseminated herpes zoster.

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:

http://www.cdc.gov/coronavirus/2019-nCoV/clinical-criteria.html

High Consequence Pathogens
(Respiratory Diseases, SARS, MERS-CoV, COVID-19)

Decontamination Recommendations

EMS Personnel Decontamination

Crew:

- Attendant should doff gown and gloves after patient transfer, and perform hand hygiene. Put on new gloves as needed to facilitate cleaning of PCR computer, obtaining facility signatures (or ask a RN with PPE on to sign "dirty" device- whatever is appropriate for the situation). Driver should stay in PPE for decon and go directly to vehicle and/or equipment that requires decon, and avoid touching other surfaces in transit in the ED.
- Remove all PPE, except N95 mask (or higher) or PAPR and perform hand hygiene prior to entering cab of vehicle to prevent contamination of driver's compartment. **Cab occupants only need to wear simple/surgical masks if N95 not already used. Wash hands with soap and water** thoroughly after transferring patient care and/or cleaning ambulance.
- All prehospital providers possibly exposed to a known positive patient at the scene or during ambulance transport should self-monitor for symptoms for 14 days. This 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 current SOPs for the containment and disposal of regulated medical waste and containing/processing 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.

EMS Provider Exposure Risk and Monitoring Recommendations

The latest CDC guidance for possibly exposed health care personnel (HCP) and return to work criteria are available at:

- https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assesment-hcp.html
- https://www.cdc.gov/coronavirus/2019-ncov/hcp/return-to-work.html

These guidelines should be referenced, in conjunction with local department policy and local occupational health, when making exposure risk assessments and return to work decisions. General recommendations are:

- Symptomatic HCPs should not work regardless of known exposure. Symptomatic HCPs may undergo testing per current local practice. HCPs positive for COVID-19 and/or symptomatic without testing should remain out of work per current local occupational health guidelines.
- In general a test-based strategy for return to work is no longer recommended. HCPs with extenuating circumstances (e.g. recovering from critical illness and/or immunocompromised) should consult their physician and occupational health team regarding their return to work status.

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

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

NO

Do not administer:

- Refer to local public health department providers/ officials for further care and instructions.

Allergic Reaction or Complications

- Exit to age appropriate Protocol(s)
- Notify appropriate local public health department provider/ official

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.

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 PenetratingTrauma.

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

< 5% TBSA 2nd/3rd Degree Burn	**5-15% TBSA 2nd/3rd Degree Burn**	**>15% TBSA 2nd/3rd Degree Burn**
No inhalation injury, Not Intubated, Normotensive GCS 14 or Greater Minor 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	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, 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.

For lightning strikes and other significant electrical burns (such as from overhead power lines or transformers), consider the presence of other significant trauma (e.g. from falls or being thrown by the event). These patients may have cardiac arrest and/or be in extremis from both a medical (dysrythmia) and traumatic cause. In many cases, the correct action is to attempt to immediately correct any life threatening dysrythmia (example: defibrillate VF and initiate CPR) and also initiate transport to a trauma center with ongoing high quality resuscitation.

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, 2, 4, 5, 6, 7 ***as indicated***

B 12 Lead ECG Procedure

IV / IO 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***

Scene Safe? YES / NO

Call for help / additional resources
Stage until scene safe

P
Consider
Midazolam 1 – 2 mg IV / IO / IN, total Max 5mg

Pediatric: 0.1 – 0.2 mg / kg IV / IO / IN
Pediatric total maximum 2 mg
Over 2 – 3 minutes as needed

*Do not mix opioids and benzodiazepines due to unpredictable side effects of hypoxia, respiratory depression, and hypotension.

Entrapped < 2 hours

A **Normal Saline Infusion IV/IO**
Adult: 1 Liter per hour
Pediatric:10 mL/kg per hour

Entrapped > 2 hours

A **Normal Saline Bolus IV/IO**
Adult: 2 Liters
Pediatric: 20 mL/kg

After bolus, decrease NS infusion
Adult: 500 mL per hour IV / IO
Pediatric: Maintenance fluid rate (see Pearls)

Immediately Prior to Extrication from large-muscle entrapment

P **Sodium Bicarbonate**
50 mEq IV / IO
Peds: 1 mEq/kg IV / IO

Abnormal ECG at any time
Peaked T Waves
QRS ≥ 0.12 seconds
QT ≥ 0.46 seconds
Loss of P wave
Or
Hemodynamically Unstable
Or
Asystole / PEA / VF / VT

P
Sodium Bicarbonate
50 mEq IV / IO
Pediatric: 1 mEq / kg IV / IO

Calcium Gluconate 3 g IV / IO
Or
(Calcium Chloride 1 g IV / IO)
Pediatric: 20 mg / kg IV / IO
Over 2- 3 minutes

Albuterol Nebulizer
5 mg
May repeat x 3

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 pose hazards to rescuers. Call for appropriate resources.**
- **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.**
- **Pediatric IV Fluid maintenance rate: 4 mL per first 10 kg of weight + 2 mL per second 10 kg of weight + 1 mL for every additional kg in weight.**
- **Crush syndrome typically manifests after 2 – 4 hours of crush injury, but may present in < 1 hour.**

- **Fluid resuscitation:**
  If access to patient and initiation of IV 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.

- **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.**
- **Patients may become hypothermic even in warm environments.**

- 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.

- **The combination of opioids and benzodiazepines represents a significantly increased level of anesthesia from either medication alone. Do not administer them together.**

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

IV / IO Protocol UP 6
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

P **If no allergy to Cephalosporins or Penicillins, For adults (18 and older) only, Cefazolin 2g IV x 1**

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, 5, 6
if indicated, consider GCS

Obtain and Record GCS

Supplemental oxygen
Maintain SpO2 ≥ 90%
Preferably ≥ 94%

Prevent Oxygen desaturation events < 90%

Maintain EtCO2
35 – 45 mmHg

Blood Glucose Analysis Procedure

IV / IO Protocol UP 6
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.**
- **PREVENT HYPOTENSION AND HYPOXIA. 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.**

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

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

Control External Hemorrhage
Consider Pelvic Binding
Splint Suspected Fractures

P — Chest Decompression-Needle Procedure ***if indicated***

Obtain and Record GCS

IV / IO Protocol UP 6

P — Cardiac Monitor

Head Injury Protocol TB 5 ***if indicated***

Altered Mental Status Protocol UP 4 ***if indicated***

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

Pain Control Protocol UP 11 ***if indicated***

VS / Perfusion / GCS

Normal

Repeat Assessment Adult Procedure

Monitor and Reassess

Abnormal

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***

Monitor and Reassess

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan
Limit Scene Time ≤ 10 minutes
Provide Early Notification

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Multiple Trauma

TRAUMA CENTER CRITERIA: Patients with a traumatic injury who meet the following criteria should be transported to a trauma center, as per the Trauma Triage and Destination plan. As much as possible, assess for the criteria in order, as the first boxes attempt to identify the most seriously injured patients. Start by measuring vital signs and level of consciousness:

WAKE EMS SYSTEM LEVEL 1 CRITERIA

1. GCS ≤ 13
2. Systolic Blood Pressure < 90 mmHg
3. Respiratory Rate < 10 or > 29 Breaths/min (<20 in infant < 1 year), or need for ventilatory support.
4. All penetrating injuries to the head, neck, torso, and extremities proximal to elbow or knee
5. Chest Wall instability or deformity (e.g. flail chest)
6. Two or more proximal long bone fractures (Suspected or Obvious)
7. Crushed, degloved, mangled, or pulseless extremity
8. Amputation proximal to the wrist or ankle
9. Pelvic Fractures (Suspected or Obvious)
10. Open or depressed skull fracture
11. Paralysis or extremity weakness possibly due to spinal cord injury
12. Falls in pediatrics > 10 feet or 2-3 times the height of the child.

**** In our system, a Level I trauma center is mandated for ALL pediatric (age <18) trauma patients due to destination capabilities. ****

If any of these criteria are met, Transport the patient to a Level 1 Trauma Center:

- **WakeMed New Bern Avenue**
- **Duke in Durham**
- **UNC Chapel Hill**

If none of the above are present, assess next:

WAKE EMS SYSTEM LEVEL 3 CRITERIA

14. Falls in adults > 20 feet (one story is equal to 10 feet)
15. High risk auto crash, including:
    - Intrusion, including roof, of >12 inches at occupant site or > 18 inches at any site in the passenger compartment
    - Ejection (partial or complete) from the automobile
    - Death in the same passenger compartment
16. Auto vs. pedestrian or bicyclist thrown, run over, or with significant (> 20mph) impact
17. Motorcycle crash > 20 mph
18. PREGNANCY > 20 weeks with even minor blunt trauma should be transported to a trauma center due to the need for trauma service evaluation and prolonged fetal monitoring.

** If a pregnant patient meets LEVEL 1 CRITERIA as above, transport to a Level 1 Trauma Center**

If any of these criteria are met, Transport to the closest trauma center:

- **WakeMed New Bern Avenue**
- **WakeMed Cary**
- **Duke in Durham**
- **UNC Chapel Hill**

If no criteria are present, consider:

18. **EMS PROVIDER JUDGMENT** ("Box 4" of the CDC field triage criteria) is a key part of "calling a trauma" (or **upgrading** transport to a Level I center versus a Level III center) and transporting to a trauma center when suspicion for serious injury is high even if none of the other above criteria are present.

- EMS Provider judgment especially applies to **geriatric patients** (> age 55 for trauma purposes).
- Have a low threshold using "provider judgment" to transport older adults to a trauma center. Even low impact mechanisms (e.g. ground level falls) may result in severe injury, especially in patients who are taking anticoagulants

Pearls:

Reference for further info: www.cdc.gov/fieldtriage – The 2011 Guidelines for Field Triage of Injured Patients

- **Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient to the appropriate facility is the goal.**
- **Clear communication between providers and hospitals is important, especially in a multiple-patient incident. If a patient's status changes en-route, treat the patient appropriately, consider mode of transportation (i.e. hot vs. cold) and communicate updated findings to the trauma center.**
- **Trauma Triad of Death: Metabolic acidosis / Coagulopathy / Hypothermia. Appropriate resuscitation measures, hemorrhage control, and keeping patient warm regardless of ambient temperature helps to mitigate Triad of Death.**
- **Bag valve mask is an acceptable method of managing the airway if pulse oximetry can be maintained ≥ 90%**
- **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.
- **Pediatric Trauma: Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age)mmHg and 11 years and older > 90 mmHg.**
- **Geriatric Trauma:**
  - Evaluate patients > age 55 with a high index of suspicion. Often occult injuries are more difficult to recognize and patients can decompensate unexpectedly with little warning. Risk of death with trauma increases after age 55.
  - SBP < 110 may represent shock / poor perfusion in patients over age 65.
  - Low impact mechanisms, such as ground level falls might result in severe injury especially in age over 65.
- 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** → **< 5% TBSA 2nd/3rd Degree Burn**
  No inhalation injury, Not Intubated, Normotensive
  GCS 14 or Greater
- **Serious 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)
- **Critical 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, 4, 5, 6, 7
if indicated

Decontamination Procedure
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

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

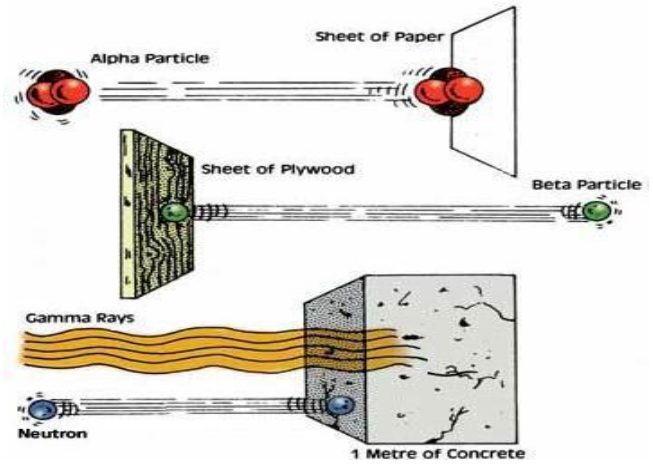
Collateral Injury: Most all injuries immediately seen will be a result of collateral injury, such as heat from the blast, trauma from concussion, treat collateral injury based on typical care for the type of injury displayed.·

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 the source
  - 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

B **N**euro Exam: Any focal deficit? — YES ▶

NO ▼

B **S**ignificant mechanism of injury? Includes High-energy events such as ejection,high falls, and abrupt deceleration crashes. Consider that patients with age>65 or<5 are at higher risk for cord injury with lesser mechanisms. — YES ▶

NO ▼

B **A**lertness: Alteration in mental status? — YES ▶

NO ▼

B **I**ntoxication: Any evidence of intoxication? Includes Drugs or Alcohol — YES ▶

NO ▼

B **D**istracting Injury: ANY painful injury that might distract the patient from the pain of a c-spine injury? — YES ▶

NO ▼

B **S**pinal Exam: Point tenderness over the spinous process(es) or pain with neck motion? — YES ▶

NO ▼

B **Spinal Motion Restriction Not Required** ▶ Exit to Appropriate protocol(s)

Apply Cervical Immobilization Device

Restrict Spinal Movement by having the patient lie FLAT and secured to the stretcher.

Follow Spinal Precautions Procedure

IF PATIENT IS AMBULATORY

Bring stretcher to patient, assist patient onto stretcher with minimal spinal movement, and secure patient to stretcher

IF PATIENT IS NON-AMBULATORY

Use Long Spine Board (OR any of the multiple equivalent devices) to transfer patient to stretcher with minimal spinal movement, then secure to stretcher.

May use multiple providers to transfer patient to stretcher using in-line spinal techniques such as log roll / straddle slide to maintain spinal precautions without a device, then secure to stretcher.

Recognize that PATIENT EXAM MAY CHANGE. PARAMEDIC is responsible for performing an assessment and determining if Spinal Precautions / Spinal Motion Restriction is required for transport, if a paramedic is on scene. If no paramedic is on scene and providers disagree on exam findings, the patient should have spinal precautions for transport.

Trauma and Burn Protocol Section

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients without all the above criteria do not require spinal motion restriction. However, patients who fail one or more criteria above require spinal motion restriction, but do NOT require use of the long spine board for immobilization.**
- Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes and may indicate the need for spinal motion restriction. Consider also the "change of plane fall" mechanism in which a patient strikes his head while falling, causing sudden deceleration and hyperextension of the cervical spine.

- **Long spine boards are NOT considered standard of care in most cases of potential spinal injury. Spinal motion restriction while padding all void areas is appropriate. Spinal motion restriction is always utilized in at-risk patients.**
- **Spinal Motion Restriction is defined as cervical collar, securing FLAT to stretcher unless anatomy prevents, 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, including any prior spinal surgery or fusion.**

- 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 pain. ROM should NOT be assessed if patient has any spinal tenderness. Patient's range of motion should not be assisted.

- **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.
- **Other 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, or Motorcycle, bicycle, other mobile device, or pedestrian-vehicle crash**
  - **Diving injury or axial load to spine such as something heavy hitting the top of the head, or jumping from height.**
  - **Significant Electric shock**

Thermal Burn

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and 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
(Consider Transport to a Burn Center)

5-15% TBSA 2nd/3rd Degree Burn
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
(Transport to a Burn Center)
Serious Burn

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
(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 / IO Protocol UP 6
  Consider 2 IV sites if ≥ 15 % TBSA

TBSA estimate at ≥ 20%

NO → **A** **Normal Saline**
0.25 mL/kg *X* (TBSA%)/hr

YES → **A** **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

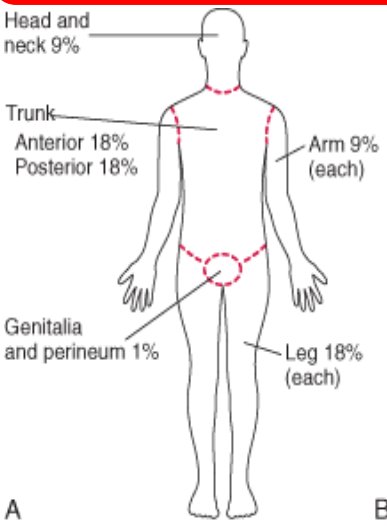
Formula example:
70 kg patient with 15% TBSA

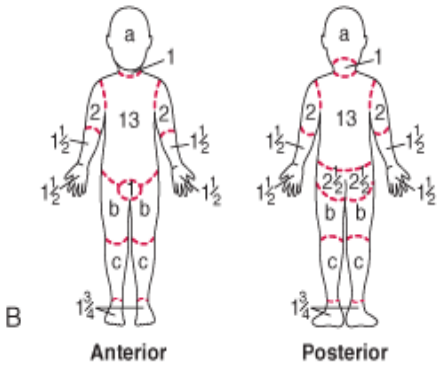
0.25 *x* 70 kg = 17.5
17.5 *x* 15 = 263 mL/hr

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 %

Trauma and Burn Protocol Section

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:**

-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.

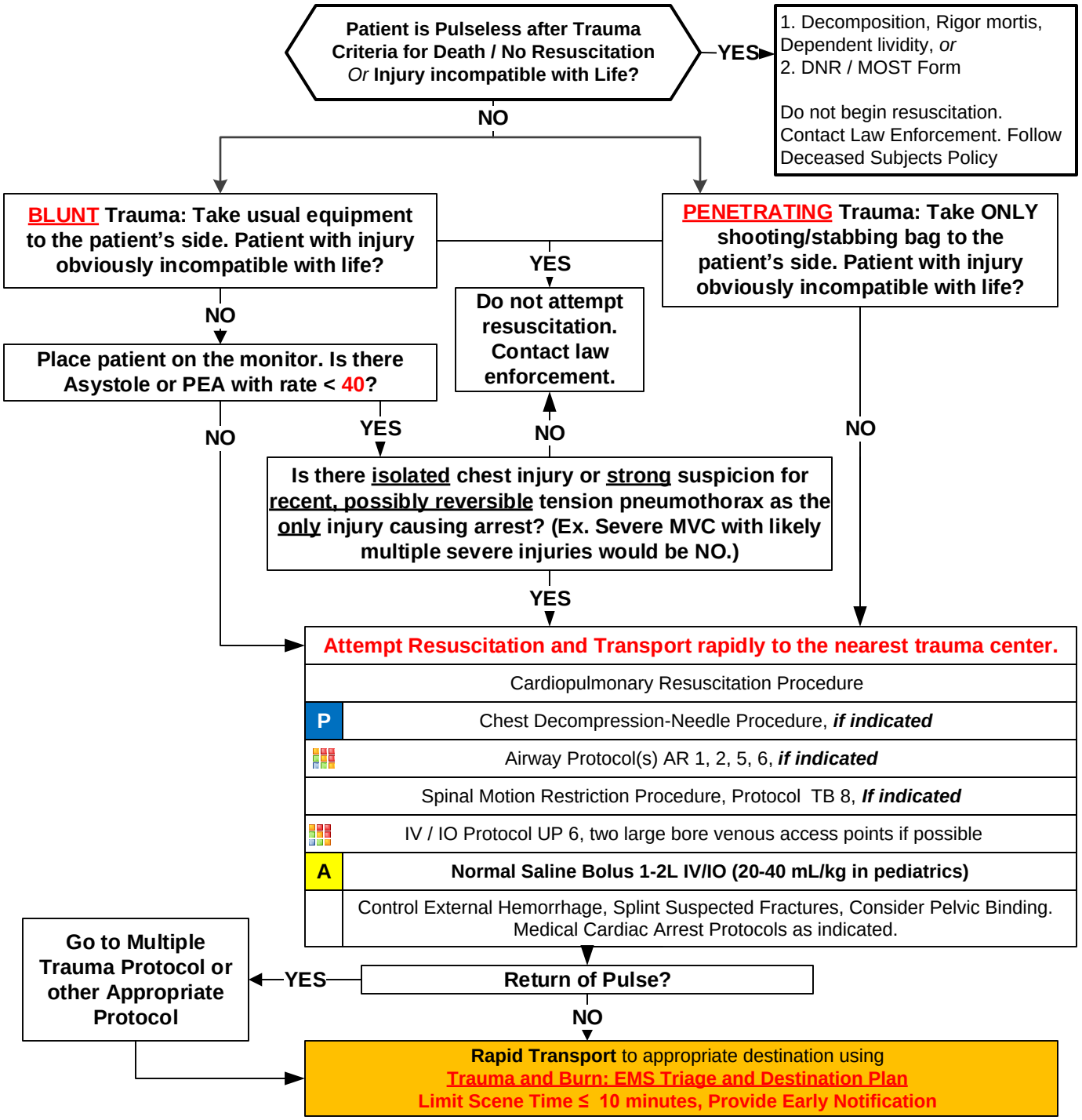
- **Critical or Serious Burns should be transported directly to the burn center:**

  > 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

  Critical or Serious burns should be transported directly to a Burn Center if possible. Consider whether a patient meets trauma criteria as per multiple trauma protocol and Trauma/Burn Triage and Destination Plan. Transport to a Trauma Center or the CLOSEST EMERGENCY DEPARTMENT as necessary in the event of any airway management complication in a burn patient. Consider remaining at the ED if possible in order to resume transport to burn center once airway secured, if patient condition permits.

- 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.
- Never administer IM pain injections to a burn patient.

Traumatic Cardiac Arrest



Pearls:

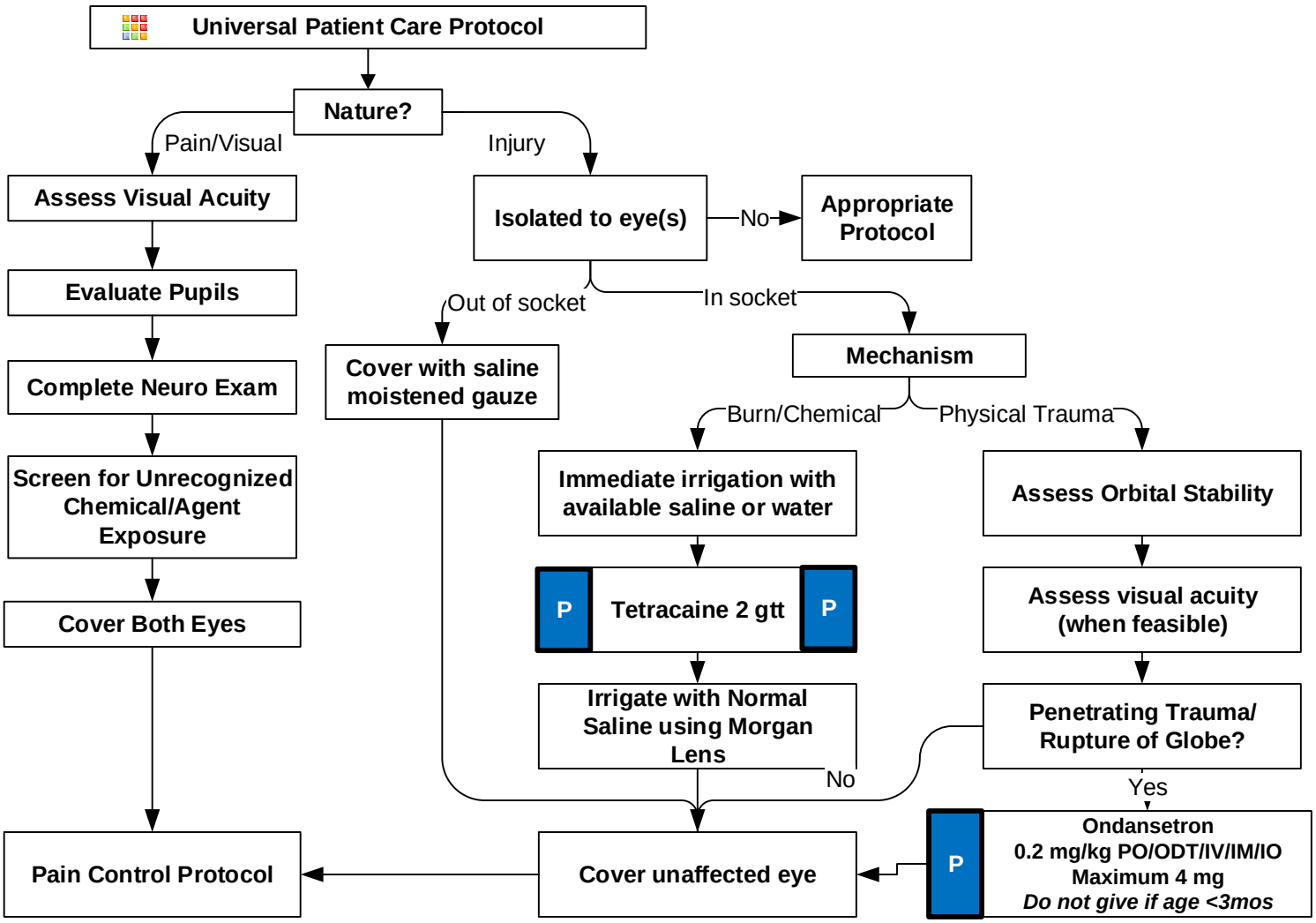
- **Injuries obviously incompatible with life include: decapitation, massively deforming head or chest injuries, dependent lividity, rigor mortis, extended downtime with skin cold.**
- **In general, resuscitation should be attempted for traumatic cardiac arrest patients with "signs of life" for any professional responders, especially in cases with short transport times to the trauma center (< 15 minutes)**
- **"Signs of Life" include any pulse or blood pressure, any spontaneous respirations or movement, reactive pupils**
- **Consider medical cardiac arrest protocols if uncertainty exists regarding medical or traumatic cause of arrest.**
- **As with all major trauma patients, transport should not be delayed and scene times should be minimal.**
- **In extenuating circumstances, or if injury incompatible with life is discovered after resuscitation and/or transport is initiated, consider contacting medical control for guidance regarding possible termination of resuscitation vs. continuation of efforts.**

Eye Injury / Complaint

History:
- Time of injury/onset
- Blunt/penetrating/chemical
- Open vs. closed injury
- Involved chemicals/MSDS
- Wound Contamination
- Medical History
- Tetanus status
- Normal visual acuity
- Medications

Signs and Symptoms:
- Pain, swelling, blood
- Deformity, contusion
- Visual deficit
- Leaking aqueous/vitreou s humor
- Upwardly fixed eye
- "Shooting" or "streaking" light
- Visible contaminants
- Rust ring
- Lacrimation

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



Trauma and Burn Protocol Section

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

Multiple Person Incident Rapid Evacuation

History:

- Number of patients
- Cause of Incident
- Chemical, Biological, or Radiolical contaminanation
- Secondary devices

Signs and Symptoms:

- SLUDGE for chemical exposure
- Respiratory distress for narcotic exposure
- Nausea/vomiting for radiation

Differential:

- Blast response
- Active Threat scenario with multiple patients
- MPI penetrating trauma
- MPI blunt trauma/MVC

Scene safety
If blast, wear N-95 mask and full turnout gear until advised to remove

↓

Provide scene size-up on assigned channel; activate MPI plan if more than 5 patients

↓

If not already accomplished, establish incident command, staging, and triage (utilize task cards)

↓

Move all ambulatory patients to safe area in cold zone

← Consider public transportation to alternative receiving facility for ambulatory patients

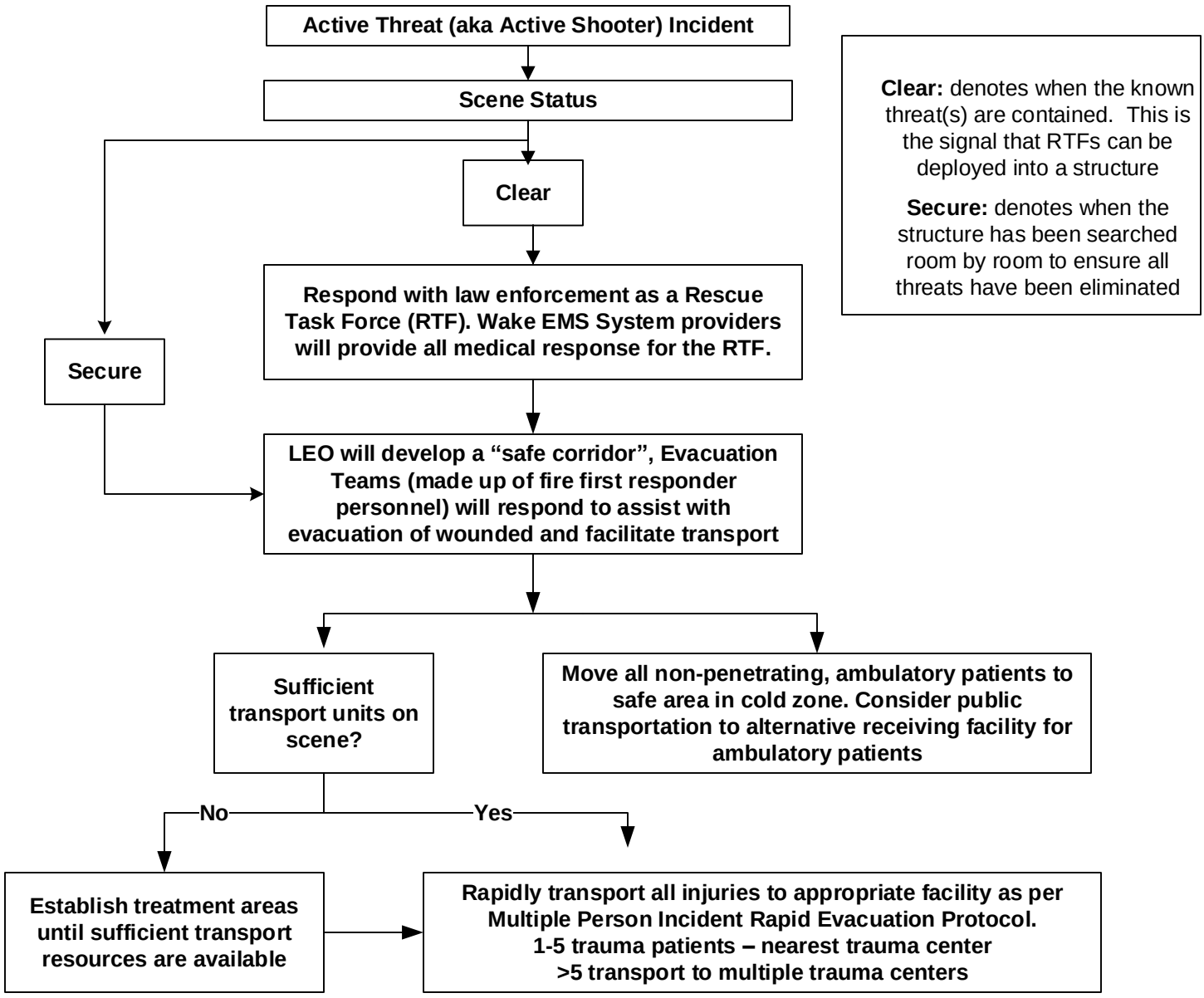
↓

Move non-ambulatory patients to transportation as rapidly as possible. Establish treatment areas only if there are insufficient transport resources available for rapid transport.

Pearls:

- In the absence of guidance from RESCOM, utilize the following communications assisgnments:
  1) Contact Medical Branch on MC-Alpha
  2) Transport/Hospital destination on MC-Hotel
- Task cards and job vests should be utilized by all personnel involved in an MPI
- If MCI with more than 5 patients meeting trauma criteria, consider rotation of trauma centers: 5 trauma patients to closest trauma center, 5 to next-closest, 5 to next closest and repeat rotation as needed. Patients with SBP <90 and/or obvious external trauma to 4 or more body surface areas should go to a Level I trauma center. Others may be considered for Level II or III trauma centers or community hospital transport.
- If 800 MHz system failure, all responding units should utilize VHF channel 155.280 (State Rescue) to regroup.
- Multiple patients may be transported in the same EMS unit if needed. When possible, patients of similar acuity should be transported in the same unit to assist with appropriate transport destination.
- Clear communication between providers and hospitals is important, especially in a multiple-patient incident. If a patient's status changes en-route, treat the patient appropriately, consider mode of transportation (i.e. hot vs. cold) and communicate updated findings to the trauma center.

Active Threat



Clear: denotes when the known threat(s) are contained. This is the signal that RTFs can be deployed into a structure

Secure: denotes when the structure has been searched room by room to ensure all threats have been eliminated

Pearls:

- Make notification to RESCOM and all local hospitals as soon as possible with the projected number of patients.
- Level 1 trauma centers can manage up to 5 penetrating trauma patients per hour. If more than 5 penetrating trauma patients, consider multiple trauma centers.
- If MCI with more than 5 patients meeting trauma criteria, consider rotation of trauma centers: 5 trauma patients to closest trauma center, 5 to next-closest, 5 to next closest and repeat rotation as needed. Patients with SBP <90 and/or obvious external trauma to 4 or more body surface areas should go to a Level I trauma center. Others may be considered for Level II or III trauma centers or community hospital transport.
- If more than 30 patients require Level One trauma care, then transport of trauma patients to Level II or III trauma centers or non-trauma center local hospitals may be required
- The penetrating trauma equipment bag or "active shooter bag" is the only equipment initially required. If a casualty collection point is established and additional equipment is required, a cache of supplies should be requested.
- Please refer to Unified Command and the MPI protocol as warranted for proper radio communication and channel assignments. Task cards and job vests should be utilized by all personnel involved in an MPI when possible
- Multiple patients may be transported in the same EMS unit if needed. When possible, patients of similar acuity should be transported in the same unit to assist with appropriate transport destination.

Falls in Assisted Living Eventus (formerly DMHC) patients

Resident Falls

Yes

911 Dispatches
APP and EMS unit

- Fall is ground level
- Patient is an Eventus (formerly Doctors Making House Calls or DMHC) client
- Facility is participating in "Falls" program

No → Follow appropriate Wake EMS protocol

Yes

*** This protocol is for use by APPs to assist with Eventus Falls patients' evaluation and disposition. Ambulance crews should respond and not delay transport if any acute medical or traumatic condition is found (Tier 1). Communication between APPs, ambulance crews, and Eventus providers as necessary is critical for protocol safety and success.**

Tier 1 Criteria

- Uncontrolled hemorrhage
- Acute neck pain or inability to clear the spine due to MOI
- Pulse rate>120 and/or SBP<90 with consideration for patient's baseline vitals and medications
- Mental status Altered from patient's baseline
- Laceration requiring repair
- Patient has acute emergency medical condition (e.g. stroke, STEMI, syncope, seizure)
- Hip pain without full range of motion, shortening/rotation and/or change in ambulatory status

Tier 2 Criteria

- Fall while taking anti-coagulant or anti-platelet excluding ASA
- Borderline vitals or orthostatic
- Acute pain or need for pain management not already in patient medication regimen
- Patient's mental status prevents exam
- Isolated abnormal lab value
- Extremity injury requiring splinting
- Presence of obvious injury more severe than simple contusion or skin tear

Tier 3 Criteria

- Simple contusion or skin tear
- No complaint
- No obvious injury
- No hip pain, has full range of motion, no shortening and/or change in ambulatory status

Transport to the ED

Transport to ED possibly required. Use TELMEDIQ app to contact Eventus provider for consultation about transport and possible immediate telemedicine visit (if transport not required). If unable to contact provider by video or phone, transport the patient to the ED.

No Transport immediately recommended by protocol. Eventus would like to conduct immediate followup. Use TELMEDIQ app to contact Eventus provider.

No Transport Recommended

Document visit in our PCR as per Eventus template. Document per ET3 guidelines if patient has Medicare FFS. If contact was made with an Eventus provider (Tier II or Tier III), no need to document in the Eventus chart. Eventus will schedule future followup as needed.

Trauma and Burn Protocol Section

Pediatric

EMS Triage and Destination Plan

Pediatric Patient

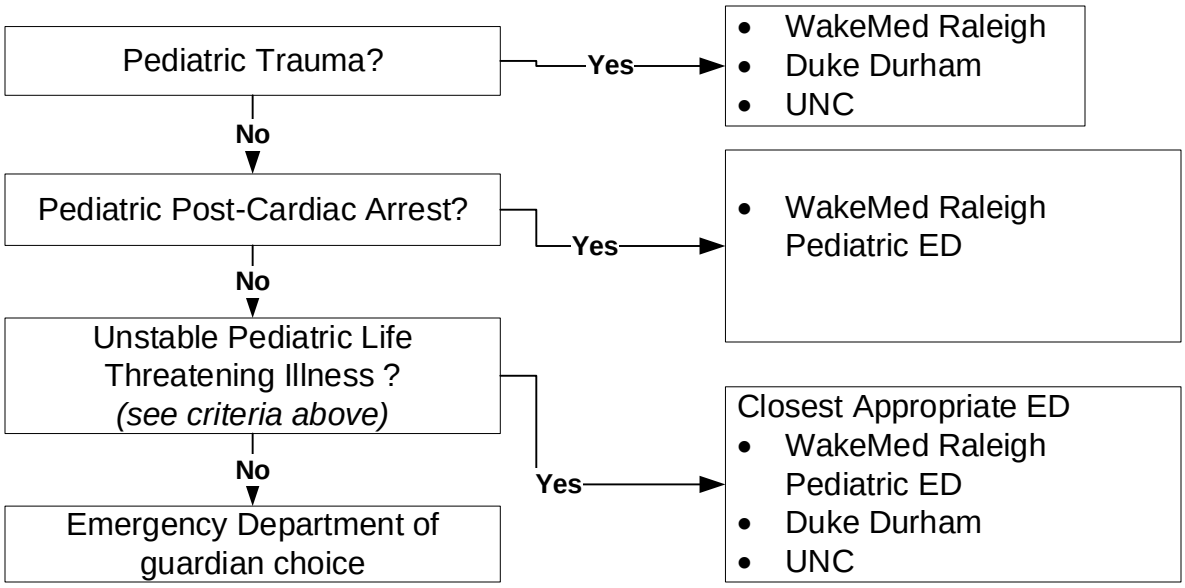
* **Any patient less than 18 years of age with a life-threatening illness**

Unstable Pediatric Life Threatening Illness

* **Decreased Mental Status (GCS<14)**
* **Non-Responsive Respiratory Distress or Intubation**
* **Suspected Stroke or atypical seizure/AMS**
* **Post Cardiac Arrest**
* **Non-Responsive Hypotension**
* **Severe Hypothermia or Hyperthermia**
* **Status Epilepticus**
* **Potential Dangerous Envenomation**
* **Life Threatening Ingestion/Chemical Exposure**

The Purpose of this plan is to:

* Rapidly identify pediatric patients who call 911 or present to EMS with a life-threatening illness
* Minimize the time from EMS contact to definitive care
* Quickly diagnose patients with pediatric life-threatening illness for EMS treatment and stabilization
* Rapidly identify the best hospital destination based on symptom onset time, vital signs, response to treatment, and predicted transport time
* Early activation/notification to the hospital prior to patient arrival
* Minimize scene time with a “load and go” approach
* Provide quality EMS service and patient care to the EMS community
* Continuously evaluate the EMS System based on North Carolina’s EMS performance measures



EMS Triage and Destination Plan

Pearls and Definitions

* **All Pediatric Patients with a life-threatening illness must be triaged and transported using this plan. This plan is in effect 24/7/365. All Patient Care is based on the appropriate Pediatric Protocol**
* **Pediatric Capable Hospital** = a hospital with an emergency and pediatric intensive care capability including but not limited to:
  * Emergency Department staffed 24 hours per day with board certified Emergency Physicians
  * An inpatient Pediatric Intensive Care Unit (with a physician pediatric intensivist)
  * Accepts all EMS patients regardless of bed availability
  * Provides outcome and performance measure feedback to EMS including case review
* **Community Hospital** = a local hospital within the EMS System’s service area which provides emergency care but does not meet the criteria of a Pediatric Capable Hospital
* **Pediatric Specialty Care Transport Program** = an air or ground based specialty care transport program that has specific pediatric training and equipment addressing the needs of a pediatric patient that can assume care of a pediatric patient fromEMS or a Community Hospital and transport the patient to a Pediatric Capable Hospital.

Cardiac Arrest

EMS Triage and Destination Plan

Cardiac Arrest Patient

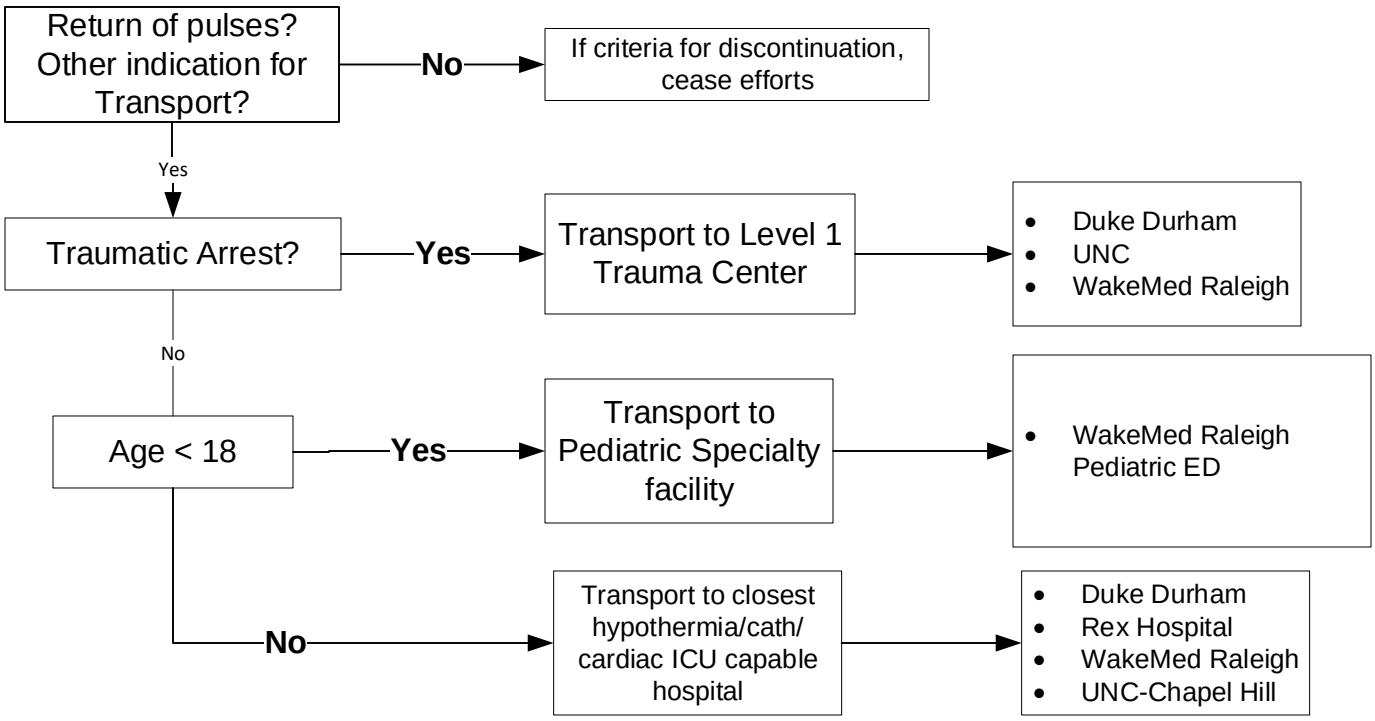
* Resuscitation was attempted by 911 responder

AND/OR

* CPR performed prior to EMS arrival and pulses restored

The Purpose of this plan is to:

* Transport cardiac arrest and post resuscitation patients to the appropriate receiving facility



EMS Triage and Destination Plan

Pearls and Definitions

* **All Cardiac Arrest Patients who are being transported must be triaged and transported using this plan, except under direct order from EMS system medical control. This plan is in effect 24/7/365**
* **All Patient Care is based on the appropriate protocol.**
* **This protocol and the destinations in it have been approved by the Wake County EMS System Peer Review Committee.**

STEMI

EMS Triage and Destination Plan

STEMI Patient
(ST Elevation Myocardial Infarction)

* **Acute cardiac symptoms**
  And
* **12 lead ECG criteria of 1mm ST elevation in 2 or more leads**

(SEE BELOW or CHEST PAIN/STEMI PROTOCOL or CODE STEMI Procedure for CODE STEMI Criteria)

The Purpose of this plan is to:

* Rapidly identify STEMI patients who call 911 or present to EMS
* Minimize the time from onset of STEMI symptoms to coronary reperfusion
* Quickly diagnose a STEMI by 12 lead ECG
* Rapidly identify the best hospital destination based on symptom onset time and predicted transport time
* Early activation/notification to the hospital prior to patient arrival
* Minimize scene time to 15 minutes or less (including a 12 lead ECG)
* Provide quality EMS service and patient care to the EMS System's citizens
* Continuously evaluate the EMS System based on North Carolina's STEMI EMS performance measures

Active Symptoms of Cardiac Chest Pain and
12 Lead ECG Findings = STEMI

↓

Early STEMI Notification/Activation of closest PCI capable Hospital (unless patient expresses preference) with transmission of 12 lead when possible

- Duke Durham
- Rex Hospital
- UNC-Chapel Hill
- WakeMed Raleigh

EMS Triage and Destination Plan

Pearls and Definitions

* **All STEMI Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
* **All Patient Care is based on the EMS Chest Pain and STEMI Protocol**
* **This protocol and the destinations in it have been approved by the Wake County EMS System Peer Review Committee.**

* Obtain the following information *before* your radio call in: Patient age and gender, Patient cardiologist and preferred STEMI hospital (if present), Clinical presentation, history, symptoms that suggest this is an acute cardiac event, What are the 2 or more anatomically contiguous leads with 1 + mm ST elevation, (SEE CHEST PAIN PROTOCOL for STEMI localization tool), Is there a **LBBB not known to be old?,** Absence or **presence of LVH,** Absence or **presence of profound tachycardia (heart rate >129),** Absence or **presence of pacemaker activity,** Was the patient **resuscitated from cardiac arrest but does not have obvious STEMI?**
* If patient has 1+ mm of ST elevation in two anatomically contiguous leads and none of the characteristics in red above, call a CODE STEMI to the hospital. If any of the characteristics in red above are present do NOT call "Code STEMI." Instead, transmit the 12-lead for physician consultation; be sure to communicate the need for physician consult due to concern for possible STEMI.

Revised
4/1/2022

TDP-STEMI

This document is unique to the Wake County EMS System

STROKE

EMS Triage and Destination Plan

STROKE Patient

* **A Patient with symptoms of an acute Stroke as identified by the EMS Stroke Screen(s)**

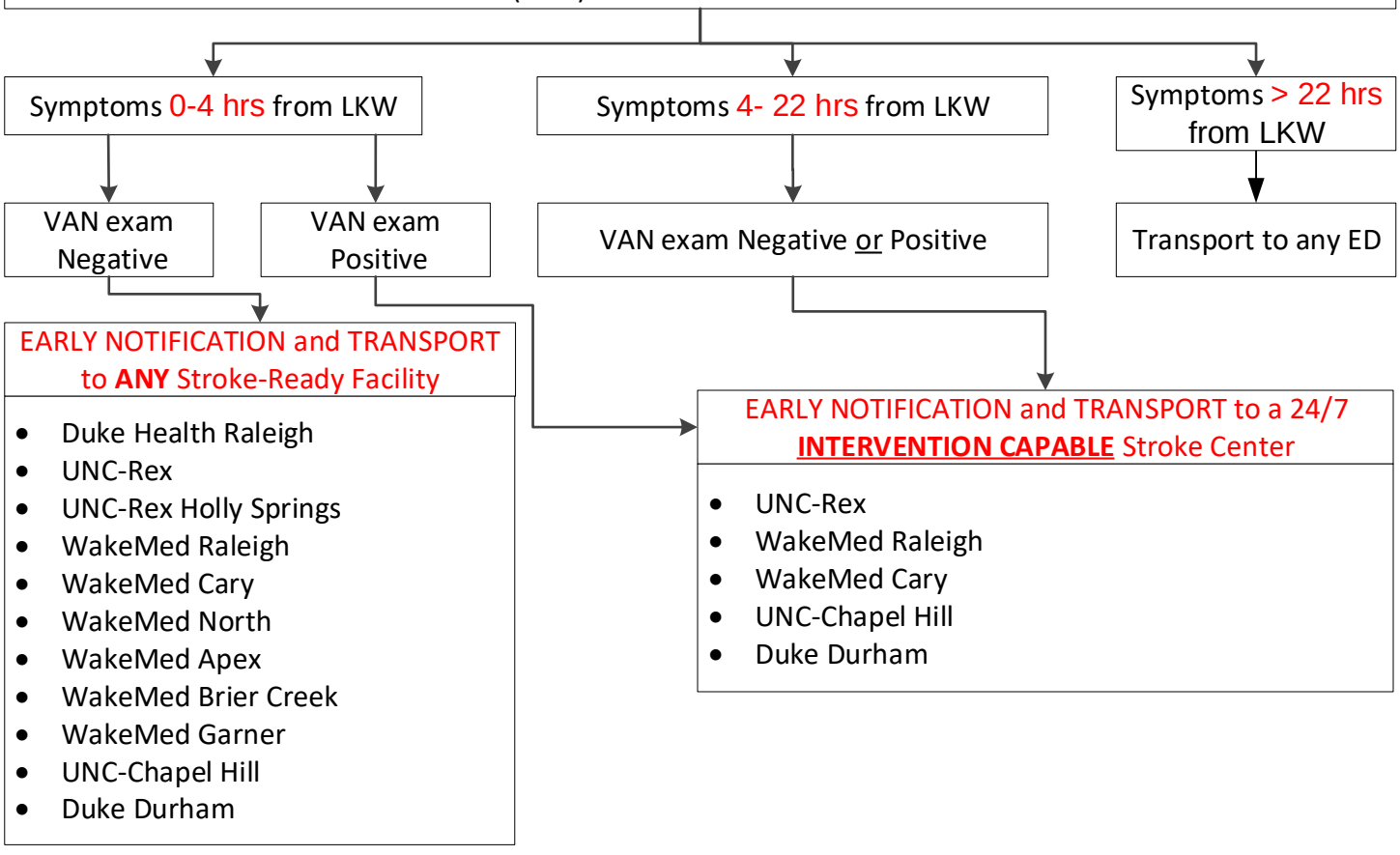
Time Of Symptom Onset, aka "LAST KNOWN WELL" (LKW)

* **Defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom free)**

The Purpose of this plan is to:

* Rapidly identify acute Stroke patients who call 911 or present to EMS
* Minimize the time from onset of Stroke symptoms to definitive care
* Quickly diagnose a Stroke using validated EMS Stroke Screen
* Rapidly identify the best hospital destination based on symptom onset time, reperfusion checklist, and predicted transport time
* Early activation/notification to the hospital prior to patient arrival
* Minimize scene time to 10-15 minutes or less
* Provide quality EMS service and patient care to the EMS System's citizens
* Continuously evaluate the EMS System based on North Carolina's Stroke EMS performance measures
* Per original NCCEP document: Agencies may reconfigure this document to align with EMS and regional stroke care resources.

From Protocol UP 14: Patient has symptoms of Acute Stroke AND Positive initial Stroke Screen (mLAPSS):
1. Determine ACCURATE time "Last Known Well" and 2. Perform VAN exam (LVO screening tool)
Use "Last Known Well" (LKW) and VAN results to determine best destination:



EMS Triage and Destination Plan

Pearls and Definitions

* **All Stroke Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
* **All Patient Care is based on the EMS Suspected Stroke Protocol**
* **This protocol and the destinations in it have been approved by the Wake County EMS Peer Review Committee.**
* **Stroke-Ready Facility** = an emergency department that is capable 24/7 of providing initial treatment for an acute stroke, to include administration of thrombolytics, and that has a pre-established pathway for rapid patient transfer as indicated, as authorized by the Wake EMS System Peer Review Committee,
* **INTERVENTION-CAPABLE Stroke Center** = a hospital that is capable 24/7 for caring for an acute stroke with an endovascular procedure if indicated, as authorized by the Wake EMS System Peer Review Committee

Revised 4/1/2022

TDP- Stroke

This document is unique to the Wake County EMS System

Trauma and Burn

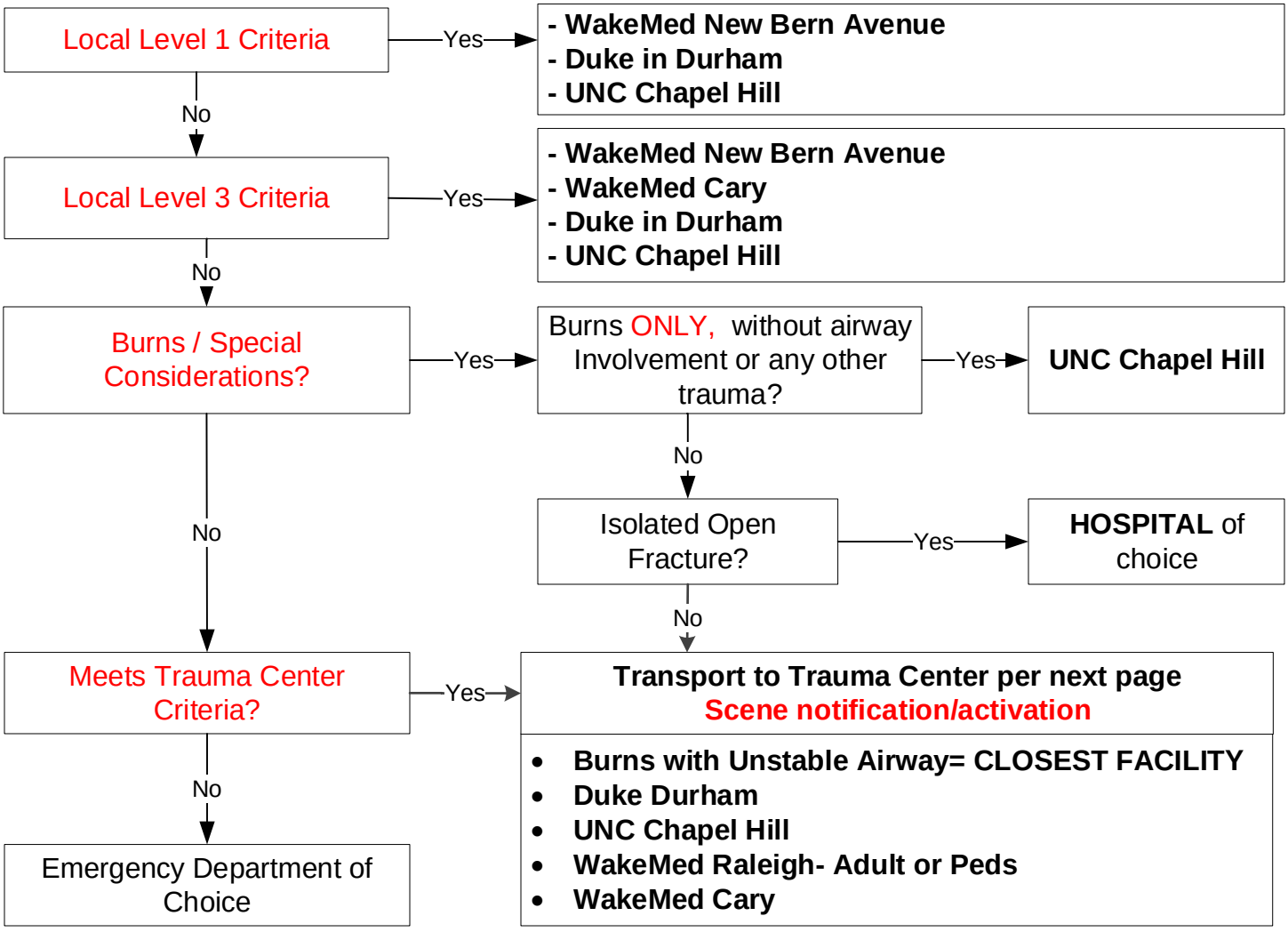
EMS Triage and Destination Plan

Trauma or Burn Patient

* **Any patient (regardless of age) with a significant injury or burn**

The Purpose of this plan is to:

* Rapidly identify injured or burned patients who call 911 or present to EMS
* Minimize the time from injury to definitive care for critical injuries or burns
* Quickly identify life or limb threatening injuries for EMS treatment and stabilization
* Rapidly identify the best hospital destination based on time of injury, severity of injury, and predicted transport time
* Early activation/notification to the hospital of a critically injured or burned patient prior to patient arrival
* Minimize scene time to 10 minutes or less with a "load and go" approach
* Provide quality EMS service and patient care to the EMS System's citizens
* Continuously evaluate the EMS System based on North Carolina's EMS performance measures



EMS Triage and Destination Plan

Pearls and Definitions

- **All Trauma Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- Critical or Serious burns should be transported directly to a Burn Center if possible. Consider whether a patient meets trauma criteria as per multiple trauma protocol and Trauma/Burn Triage and Destination Plan. Transport to a Trauma Center or the CLOSEST EMERGENCY DEPARTMENT as necessary in the event of any airway management complication in a burn patient. Consider remaining at the ED if possible in order to resume transport to burn center once airway secured, if patient condition permits.
- Reference for further info: www.cdc.gov/fieldtriage - The 2011 Guidelines for Field Triage of Injured Patients

Revised 4/1/2022

TDP-TRM/BRN

This document is unique to the Wake County EMS System

Trauma and Burn

EMS Triage and Destination Plan

Trauma or Burn Patient

* **Any patient (regardless of age) with a significant injury or burn**

TRAUMA CENTER CRITERIA: Patients with a traumatic injury who meet the following criteria should be transported to a trauma center, as per the Trauma Triage and Destination plan. As much as possible, assess for the criteria in order, as the first boxes attempt to identify the most seriously injured patients. Start by measuring vital signs and level of consciousness:

WAKE EMS SYSTEM LEVEL 1 CRITERIA

1. GCS ≤ 13
2. Systolic Blood Pressure < 90 mmHg
3. Respiratory Rate < 10 or > 29 Breaths/min (<20 in infant < 1 year), or need for ventilatory support.
4. All penetrating injuries to the head, neck, torso, and extremities proximal to elbow or knee
5. Chest Wall instability or deformity (e.g. flail chest)
6. Two or more proximal long bone fractures (Suspected or Obvious)
7. Crushed, degloved, mangled, or pulseless extremity
8. Amputation proximal to the wrist or ankle
9. Pelvic Fractures (Suspected or Obvious)
10. Open or depressed skull fracture
11. Paralysis or extremity weakness possibly due to spinal cord injury
12. Falls in pediatrics > 10 feet or 2-3 times the height of the child.

**** In our system, a Level I trauma center is mandated for ALL pediatric trauma patients (age < 18) due to destination capabilities.**

If any of these criteria are met, Transport the patient to a Level 1 Trauma Center:

- WakeMed New Bern Avenue

- Duke in Durham

- UNC Chapel Hill

If none of the above are present, assess next:

WAKE EMS SYSTEM LEVEL 3 CRITERIA

14. Falls in adults > 20 feet (one story is equal to 10 feet)
15. High risk auto crash, including:
    - Intrusion, including roof, of >12 inches at the occupant site or > 18 inches at any site in the passenger compartment
    - Ejection (partial or complete) from the automobile
    - Death in the same passenger compartment
16. Auto vs. pedestrian or bicyclist thrown, run over, or with significant (> 20mph) impact
17. Motorcycle crash > 20 mph
18. PREGNANCY > 20 weeks with even minor blunt trauma should be transported to a trauma center due to the need for trauma service evaluation and prolonged fetal monitoring.

** If a pregnant patient meets LEVEL 1 CRITERIA as above, transport to a Level 1 Trauma Center**

If any of these criteria are met, Transport to the closest trauma center:

- WakeMed New Bern Avenue
- WakeMed Cary
- Duke in Durham
- UNC Chapel Hill

If no criteria are present, consider:

18. **EMS PROVIDER JUDGMENT** ("Box 4" of the CDC field triage criteria) is a key part of "calling a trauma" (or **upgrading** transport to a Level I center versus a Level III center) and transporting to a trauma center when suspicion for serious injury is high even if none of the other above criteria are present.
- EMS Provider judgment especially applies to **geriatric patients** (> age 55 for trauma purposes).
- Have a low threshold using "provider judgment" to transport older adults to a trauma center. Even low impact mechanisms (e.g. ground level falls) may result in severe injury, especially in patients who are taking anticoagulants

EMS Triage and Destination Plan

Pearls and Definitions

- **All Trauma Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- Critical or Serious burns should be transported directly to a Burn Center if possible. Consider whether a patient meets trauma criteria as per multiple trauma protocol and Trauma/Burn Triage and Destination Plan. Transport to a Trauma Center or the CLOSEST EMERGENCY DEPARTMENT as necessary in the event of any airway management complication in a burn patient. Consider remaining at the ED if possible in order to resume transport to burn center once airway secured, if patient condition permits.
- Reference for further info: www.cdc.gov/fieldtriage - The 2011 Guidelines for Field Triage of Injured Patients

Revised 4/1/2022

TDP-TRM/BRN

This document is unique to the Wake County EMS System

FREE-STANDING EDs

EMS Triage and Destination Plan

Adult and Pediatric Patients may be transported to Free-Standing EDs; exceptions are outlined in this plan

The Purpose of this plan is to:

* Transport patients to the closest appropriate receiving facility of their choice, unless otherwise indicated by their clinical condition

Patient requests or requires transport to an emergency department ⟷ In all cases, Follow the WCEMSS "Transport and Care Plans" Policy

Yes

Patient requests transport to a Free-Standing ED

NO, the patient requests another local hospital → Transport the patient to the appropriate facility of his or her choice

Yes

Does the patient have any of the following:

* 1. Suspected Pregnancy-related complaint or Active Labor at > 20 weeks gestation
2. An open fracture
3. A condition covered by another triage and destination plan (e.g. STEMI, Stroke, Trauma/Burn, Peds, OHCA)

YES → Politely inform the patient that his or her condition cannot be treated properly at a FED; strongly suggest that the patient choose another appropriate facility. Does the patient choose another appropriate facility?

YES → Transport the patient to the appropriate facility of his or her choice

No → Ask the patient to sign a refusal, transport the patient to the ED of his or her choice, including the FED, and **NOTIFY THE FED EARLY**

No

Transport the patient to the Emergency Department of his or her choice, including any Free-Standing ED

EMS Triage and Destination Plan

Pearls and Definitions

*** A free-standing Emergency Department (FED) is a full-service Emergency Facility that is bound by EMTALA and affiliated with a local hospital system. Patients may be admitted directly to a hospital room from these facilities; the only difference between these facilities and a "regular" ED is that the hospital beds are not necessarily at the same location as the emergency department.**

*** An urgent care center is NOT a FED**

*** This protocol and the destinations in it have been approved by the Wake County EMS System Peer Review Committee.**

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

Los Angeles Prehospital Stroke Screen (LAPSS)

1. Patient Name: _____ (last name) _____ (first name)

2. Information/History from: [ ] Patient [ ] Family Member [ ] Other

_____ (name - if other than patient) _____ (phone)

3. Last known time patient was at baseline or deficit free and awake:

_____ (military time) _____ (date)

SCREENING CRITERIA

	Yes	Unknown	No
4. Age > 45	[ ]	[ ]	[ ]
5. History of seizures or epilepsy absent	[ ]	[ ]	[ ]
6. Symptom duration less than 24 hours	[ ]	[ ]	[ ]
7. At baseline, patient is not wheelchair bound or bedridden	[ ]	[ ]	[ ]
8. Blood glucose between 60 and 400	[ ]	[ ]	[ ]

9. Exam: **LOOK FOR OBVIOUS ASYMMETRY**

	Normal	Right	Left
Facial smile/grimace	[ ]	[ ] Droop	[ ] Droop
Hand grip	[ ]	[ ] Weak	[ ] Weak
		[ ] No grip	[ ] No grip
Arm strength	[ ]	[ ] Drifts dn	[ ] Drifts dn
		[ ] Falls fast	[ ] Falls fast

Based on exam, patient has only unilateral (not bilateral) weakness: [ ] **YES** [ ] **NO**

10. **Items 4, 5, 6, 7, 8, 9 all YES's (or unknown) --- LAPSS screening criteria met**:

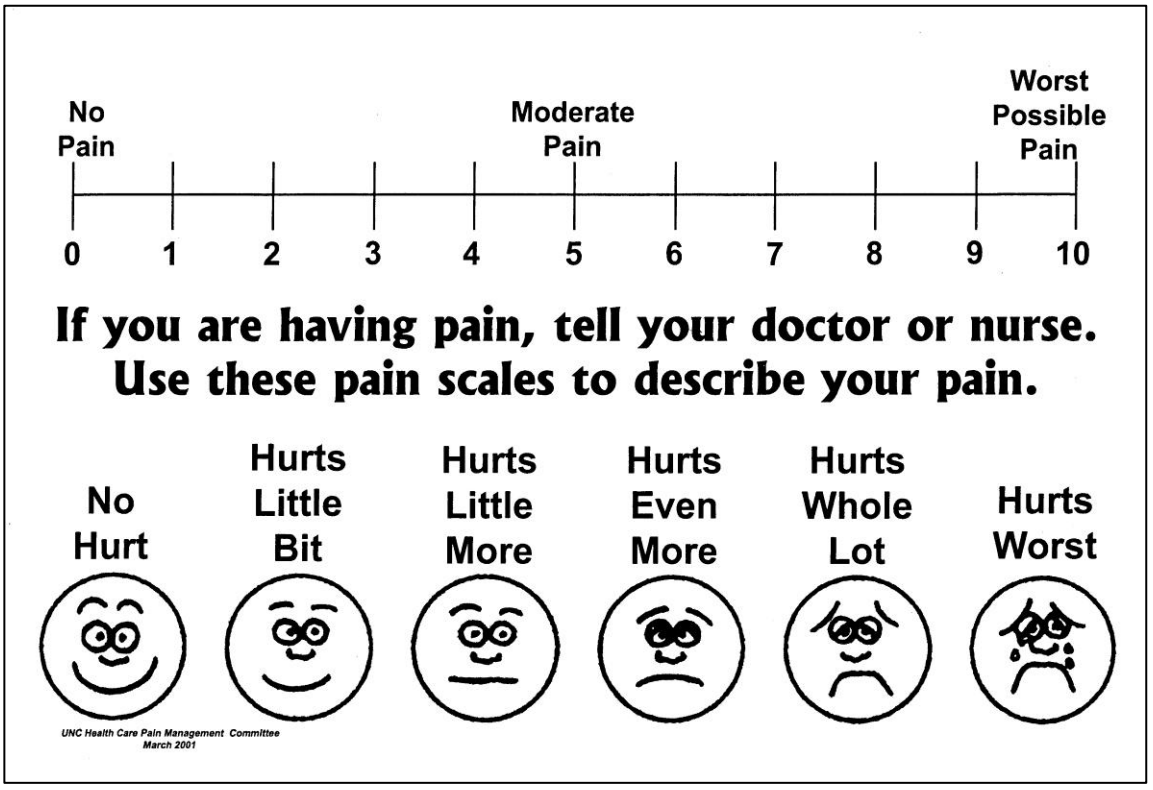
[ ] **YES** [ ] **NO**

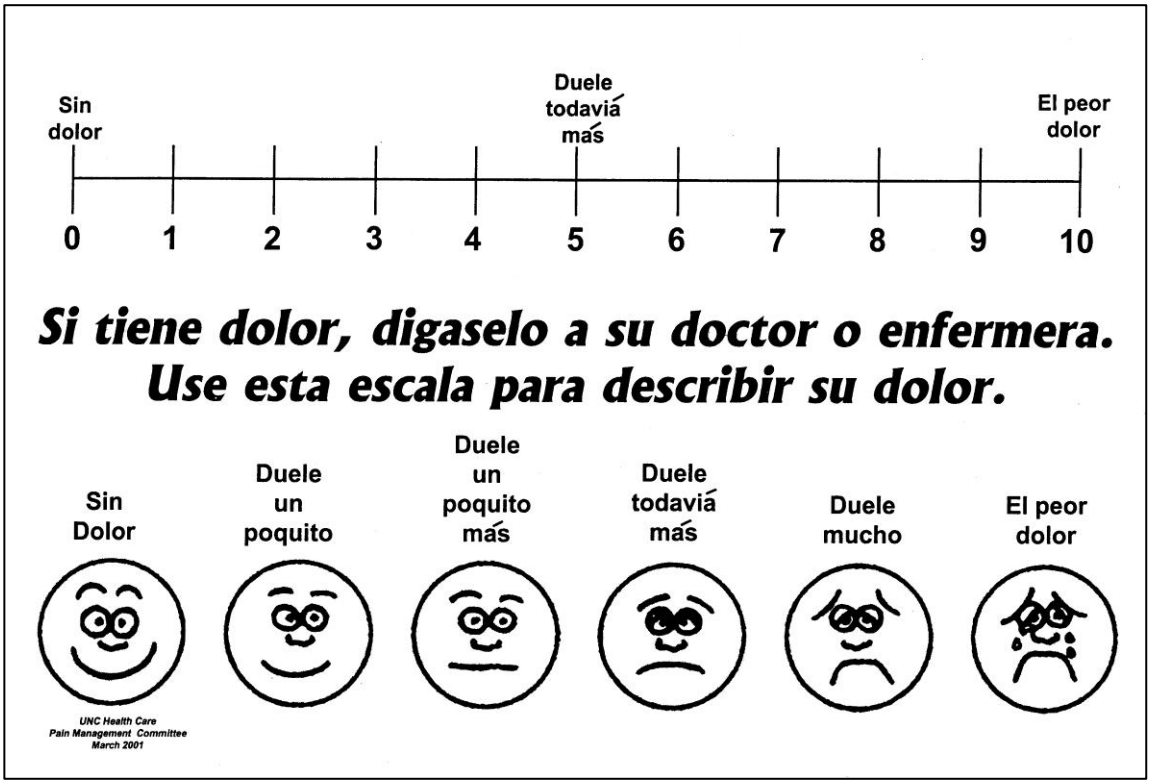
11. If LAPSS criteria for stroke are met, alert the receiving hospital of a possible stroke patient. If not, then return to the appropriate treatment protocol.

(Note: the patient may be experiencing a stroke even if the LAPSS criteria are not met.)

12. Time LAPSS Exam Performed: Military Time:_____

13. Form Completed by:_____





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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

$\overline{\uparrow}$	- upper (increased)
$\overline{a}$	- before
$\overline{p}$	- after
$\overline{c}$	- with
s	- without
Δ	- change
L	- left
R	- right
$\downarrow$	- lower (decreased)
1°	- primary
2°	- secondary

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

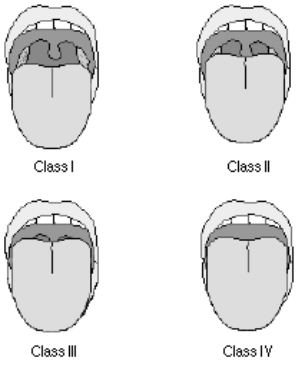
External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, extreme cachexia, edentulous mouth, facial trauma, obesity, large front teeth or "buck teeth", high arching palate, receding mandible, short bull neck.

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.

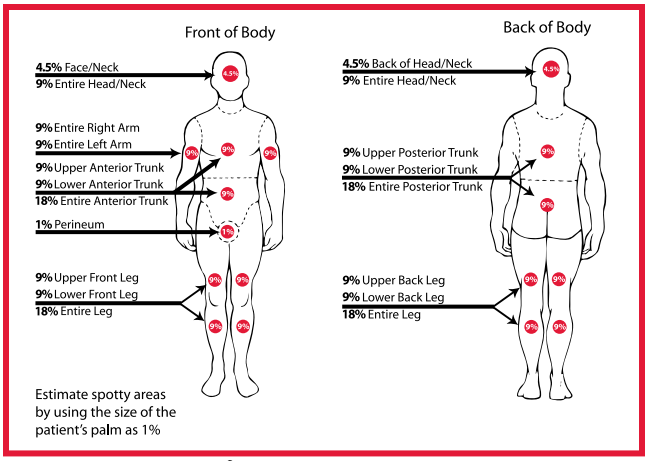
Example, 80 kg patient with 50 %TBSA x 0.25 cc = 1000 cc/hr.

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)

Weight Conversion Table

(1 - 250) Pounds to Kilograms (0.5 - 113)

Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg	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	126	57.2	151	68.5	176	79.8	201	91.2	226	102.5
2	0.9	27	12.2	52	23.6	77	34.9	102	46.3	127	57.6	152	68.9	177	80.3	202	91.6	227	103.0
3	1.4	28	12.7	53	24.0	78	35.4	103	46.7	128	58.1	153	69.4	178	80.7	203	92.1	228	103.4
4	1.8	29	13.2	54	24.5	79	35.8	104	47.2	129	58.5	154	69.9	179	81.2	204	92.5	229	103.9
5	**2.3**	**30**	**13.6**	**55**	**24.9**	**80**	**36.3**	**105**	**47.6**	**130**	**59.0**	**155**	**70.3**	**180**	**81.6**	**205**	**93.0**	**230**	**104.3**
6	2.7	31	14.1	56	25.4	81	36.7	106	48.1	131	59.4	156	70.8	181	82.1	206	93.4	231	104.8
7	3.2	32	14.5	57	25.9	82	37.2	107	48.5	132	59.9	157	71.2	182	82.6	207	93.9	232	105.2
8	3.6	33	15.0	58	26.3	83	37.6	108	49.0	133	60.3	158	71.7	183	83.0	208	94.3	233	105.7
9	4.1	34	15.4	59	26.8	84	38.1	109	49.4	134	60.8	159	72.1	184	83.5	209	94.8	234	106.1
10	**4.5**	**35**	**15.9**	**60**	**27.2**	**85**	**38.6**	**110**	**49.9**	**135**	**61.2**	**160**	**72.6**	**185**	**83.9**	**210**	**95.3**	**235**	**106.6**
11	5.0	36	16.3	61	27.7	86	39.0	111	50.3	136	61.7	161	73.0	186	84.4	211	95.7	236	107.0
12	5.4	37	16.8	62	28.1	87	39.5	112	50.8	137	62.1	162	73.5	187	84.8	212	96.2	237	107.5
13	5.9	38	17.2	63	28.6	88	39.9	113	51.3	138	62.6	163	73.9	188	85.3	213	96.6	238	108.0
14	6.4	39	17.7	64	29.0	89	40.4	114	51.7	139	63.1	164	74.4	189	85.7	214	97.1	239	108.4
15	**6.8**	**40**	**18.1**	**65**	**29.5**	**90**	**40.8**	**115**	**52.2**	**140**	**63.5**	**165**	**74.8**	**190**	**86.2**	**215**	**97.5**	**240**	**108.9**
16	7.3	41	18.6	66	29.9	91	41.3	116	52.6	141	64.0	166	75.3	191	86.6	216	98.0	241	109.3
17	7.7	42	19.1	67	30.4	92	41.7	117	53.1	142	64.4	167	75.8	192	87.1	217	98.4	242	109.8
18	8.2	43	19.5	68	30.8	93	42.2	118	53.5	143	64.9	168	76.2	193	87.5	218	98.9	243	110.2
19	8.6	44	20.0	69	31.3	94	42.6	119	54.0	144	65.3	169	76.7	194	88.0	219	99.3	244	110.7
20	**9.1**	**45**	**20.4**	**70**	**31.8**	**95**	**43.1**	**120**	**54.4**	**145**	**65.8**	**170**	**77.1**	**195**	**88.5**	**220**	**99.8**	**245**	**111.1**
21	9.5	46	20.9	71	32.2	96	43.5	121	54.9	146	66.2	171	77.6	196	88.9	221	100.2	246	111.6
22	10.0	47	21.3	72	32.7	97	44.0	122	55.3	147	66.7	172	78.0	197	89.4	222	100.7	247	112.0
23	10.4	48	21.8	73	33.1	98	44.5	123	55.8	148	67.1	173	78.5	198	89.8	223	101.2	248	112.5
24	10.9	49	22.2	74	33.6	99	44.9	124	56.2	149	67.6	174	78.9	199	90.3	224	101.6	249	112.9
25	**11.3**	**50**	**22.7**	**75**	**34.0**	**100**	**45.4**	**125**	**56.7**	**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	Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg	Pound	Kg
251	113.9	264	119.8	276	125.2	289	131.1	301	136.5	314	142.4	326	147.9	339	153.8	351	159.2	364	165.1
252	114.3	**265**	**120.2**	277	125.6	**290**	**131.5**	302	137.0	**315**	**142.9**	327	148.3	**340**	**154.2**	352	159.7	**365**	**165.6**
253	114.8	266	120.7	278	126.1	291	132.0	303	137.4	316	143.3	328	148.8	341	154.7	353	160.1	366	166.0
254	115.2	267	121.1	279	126.6	292	132.5	304	137.9	317	143.8	329	149.2	342	155.1	354	160.6	367	166.5
255	**115.7**	268	121.6	**280**	**127.0**	293	132.9	**305**	**138.3**	318	144.2	**330**	**149.7**	343	155.6	**355**	**161.0**	368	166.9
256	116.1	269	122.0	281	127.5	294	133.4	306	138.8	319	144.7	331	150.1	344	156.0	356	161.5	369	167.4
257	116.6	**270**	**122.5**	282	127.9	**295**	**133.8**	307	139.3	**320**	**145.2**	332	150.6	**345**	**156.5**	357	161.9	**370**	**167.8**
258	117.0	271	122.9	283	128.4	296	134.3	308	139.7	321	145.6	333	151.0	346	156.9	358	162.4	371	168.3
259	117.5	272	123.4	284	128.8	297	134.7	309	140.2	322	146.1	334	151.5	347	157.4	359	162.8	372	168.7
260	**117.9**	273	123.8	**285**	**129.3**	298	135.2	**310**	**140.6**	323	146.5	**335**	**152.0**	348	157.9	**360**	**163.3**	373	169.2
261	118.4	274	124.3	286	129.7	299	135.6	311	141.1	324	147.0	336	152.4	349	158.3	361	163.7	374	169.6
262	118.8	**275**	**124.7**	287	130.2	**300**	**136.1**	312	141.5	**325**	**147.4**	337	152.9	**350**	**158.8**	362	164.2	**375**	**170.1**
263	119.3			288	130.6			313	142.0			338	153.3			363	164.7		

Standardized Medication Delivery

STOP
DO NOT
Resuscitate

Effective Date: _____

Expiration Date, if any _____

☐ Check box if no expiration

DO NOT RESUSCITATE ORDER

SAMPLE

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

SAMPLE

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!

SAMPLE

NCDHHS/DHSR/OEMS
112

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