Principles of Effective Pre-hospital Practice

Introduction

The following clinical operating guidelines describe the methods and modalities that we will use to evaluate and treat our patients. These protocols, coupled with the various policies and procedures, provide the basis and the infrastructure for evaluating and treating the majority of patient encounters. We likewise use our knowledge and experience but these protocols provide the framework within which we exercise our medical judgment.

Foundations of Practice

Definition of a Patient

Any person who requests or potentially needs medical evaluation and treatment is considered a patient. The patient-provider relationship may be established by telephone, radio, or personal contact. It is the provider's duty to ensure that all potential patients at an incident are offered evaluation, treatment and transport if necessary. If a potential patient refuses evaluation a refusal form for that patient should be completed and signed by that patient.

Patient Rights

Every patient's medical information is private. This confidentiality pertains not only to written information but also to verbal communication. Be sure that medical information is only transmitted to other providers who have a direct responsibility in the care of the patient.

Patients with intact mental capacity have the right to accept or refuse medical care. If a patient refuses medical care (even if that refusal might result in harmful consequences) we should always:

- Be polite
- Offer transport without some (or all) of recommended treatments (document carefully)
- Obtain refusal documentation
- Clearly advise the patient of possible consequences of refusing care
- Advise the patient to call back if they subsequently desire care and/or transport
- Document all components of the patient encounter

Consent

The following situations require special attention:

1. Minors

a) Patients under 18 usually cannot consent to medical treatment. The following groups of can provide consent for treatment of an minor:

i. Mother or father.
ii. Legal guardian.
iii. An individual standing in *loco parentis* (stepparent, school administrator, etc.)
iv. Leader of a group of children in possession of written permission from parents (school field trip or church trip, etc.).

b.) In the following situations no parental consent is required prior to starting 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 of 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 situation

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 the 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 a supervisor, medical control, or the medical director.
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 for adverse outcomes

Any incident which potentially has an adverse or negative impact on the patient or the System must be immediately reported to their supervisor as soon as possible after the completion of the call. The supervisor will accordingly report this up the chain of command. Events that require this notification include:

- Cardiac and/or respiratory arrest occurring after administration of midazolam (Versed), morphine, or fentanyl.
- Cardiac arrest occurring 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 (excessive amount, wrong dose, etc.).
- System provider operating outside of scope of practice. The scope or practice is defined not only by the state credential 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.
- Unrecognized cardiac arrest.

Guidelines for the Use of Protocols

The medical protocols are divided into essentially three sections. The upper sections 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. It is not expected that every historical element or sign/symptom be recorded for every patient; it is, however, expected that those elements pertinent to your patient will be included in the patient evaluation.

The center section describes the essentials of patient care which are presented in flow chart style. The Protocol Committee, the System Peer Review Committee, and the North Carolina College of Emergency Physicians 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. Certainly exceptions will exist; the rationale for any deviation should be clearly explained in 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 (so long as the patient's condition is stable).

Finally, the pearls section at the bottom of the protocols provides suggestions for patient care based on experience and common medical knowledge. Not every patient will require every element under the pearls section. It is anticipated that this section will be used as a practical guide for the implementation of the essentials of patient care section.

Protocol Clarifications for Johnston County EMS System Use

This protocol set is based largely on the North Carolina College of Emergency Physicians statewide protocol side, over which we had significant input. As with any protocol set that covers multiple jurisdictions, there are some elements of this set that will not apply to our system due to equipment, training, etc. The following components of the protocol set need clarification for our System:

1) In all protocols, the instructions statement "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 contact 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 CO_2 readings, respiratory rates, and SpO_2 readings, 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 $EtCO_2$ value greater than 20 mm Hg with a good waveform is a satisfactory substitute for an SpO_2 value. As soon as possible, an SpO_2 value should be obtained, but it is understood that certain patient conditions preclude such a reading.

b. The respiratory rate should be guiding the $EtCO_2$ only when the rate is too low for the patient. In other words, for a patient with a pulse and blood pressure with assisted ventilations, the $EtCO_2$ should be greater than 35 mm Hg. 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 $EtCO_2$ except as directed in the Head Injury protocol for pending herniation.

3) On the intravenous access protocol, 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 EMT’s who are assigned to transport ambulances and have completed the Training and Clinical Affairs in-service on BIAD use or received this training in their original credentialing education program. This also applies to EMT’s who are affiliated with fire departments who are providing care at the EMT level and have completed the necessary training.

In summary, these protocols describe the proven practices that are the foundation of our care. The additional information coupled with your clinical 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 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 Dr. Ed Racht, the 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 Emergency Medical Responder to Medical Director, constantly strives to remain a comprehensive, clinically sophisticated, and compassionate EMS System”.

Our System provides a unique and evolving practice of medicine. I’m proud of our System and proud to be your medical director. Together we will all fulfill the mission of our system: **“To provide excellent care and quality service.”**

Sincerely,

Edwin L. Hartman, M.D.
Medical Director
Johnston County EMS

Johnston County EMS System
Standards and Practice Document

Policies

Air Transport

Policy:

Air transport can be utilized whenever patient care can be **clinically** improved by the use of air medical evacuation. It should be kept in mind that due to the proximity of Johnston County to area trauma and burn centers, there is a very low likelihood of clinically significant time savings, and a higher likelihood of longer total transport times via air than by ground. Over-utilization also takes this resource away from areas more remote from specialty care centers.

Indications:

A medical evacuation helicopter may be considered when ALL of the following criteria are present:

1. Patient meets criteria for trauma and/or burn center evaluation, and...
2. Patient is entrapped/pinned and extrication time is expected to be greater than **40** minutes, and...
3. Estimated ground transport time is greater than **60** minutes, and...
4. Patient is **not** in traumatic cardiac arrest.

A medical evacuation helicopter may also be considered when any of the following is present:

1. A situation approved by the medical director or medical control physician.
2. Multiple Patient Incident (MPI) with ≥5 patients meeting with 'red' and/or 'yellow' criteria triage criteria.

Procedure:

1. The Incident Commander or highest credentialed medical provider on scene will determine that a helicopter may be needed for the patient. This request will be relayed to JC911 through the incident commander.
2. Upon notification JC911 will contact a medical air transport service for a scene transport. JC911 will determine which medical air transport is nearest and utilize this service. Information as to which air medical provider is responding, the location they are responding from, and their estimated ETA will be relayed to the incident commander to be relayed to EMS personnel on scene.

The minimum information that should be provided to the air medical transport service(s) includes:

a. Number of patients
b. Age of patient(s)
c. Sex of patient(s)
d. Estimated weight of patient(s)
e. Mechanism of injury or complaint (MVC, burn, etc.)

3. A safe landing zone will be established and that location relayed to the air transport crew.

4. If the helicopter does not arrive prior to the extrication of the patient, the patient should be placed in an ambulance and transport initiated to the nearest trauma/ burn center.

5. Transport of a patient will not be delayed to use a helicopter. If the patient is packaged and prepared for transport and the medical evacuation helicopter is not on the ground with a crew prepared to accept the patient, ground transport will be initiated to the proper destination.

6. The highest ranking EMS officer on scene may cancel a medical evacuation helicopter at any time. This decision should always be relayed to JC911 through the Incident Commander. Utilization of the air transport resource is at the sole discretion of EMS.

7. If upon extrication the patient is determined to be conscious and alert, with stable vital signs and no apparent serious injuries, transport via ground ambulance will be initiated regardless of the presence of a helicopter on scene. **Air transport will only be utilized when there is a clinical need as evidenced by the patient assessment.**

8. An EMS ambulance may meet an air medical helicopter at the Johnston County Airport and transfer care as long as the following conditions exist:

a. The air medical helicopter is physically at the Johnston County Airport at the time of the request, and...
b. The aircrew is prepared to receive the patient from the EMS crew immediately upon the ambulance's arrival at the Johnston County Airport.
c. Under no circumstances shall a Johnston County EMS unit divert and wait at the airport, or any other location, for the arrival of an air medical helicopter.

Radio Communication:

During the response of a helicopter to the scene, a radio channel should be assigned for communication between the aircraft and the on-scene paramedic. A radio report that includes the following information, at a minimum, should be provided to the air transport crew-

1. Age and sex of the patient
2. Level of consciousness and current vital signs, including blood pressure, heart rate, respiratory rate, and pulse oximetry (if available)
3. Physical assessment summary of significant findings to include injuries, lung sounds, etc.
4. Treatment(s) provided thus far, to include airway management, vascular access, fluid administration, splinting, etc.
5. Estimated time of injury or incident (should be provided as a specific time and not "minutes or hours ago").
6. Estimated time of extrication/ access (should be provided as a specific time and not "minutes or hours from now")
7. Specific needs that can be provided by air crew, if any.

Times and rationale:

Any time air transport is utilized, the following times and information will be recorded in the patient call report/record. Request that the incident commander contact JC911 to have these intervals time stamped in the CAD record:

1. Time that air transport was requested
2. Provider who requested air transport and the clinical rationale
3. Time that air transport arrived on scene
4. Time that patient was extricated
5. Time that patient was turned over to the air transport crew
6. Time that air transport helicopter departed the scene.

These times must be recorded in the patient call report of the patient transported via air.

Destination record:

* The destination hospital that the patient was transported to must be documented in the patient care report / record.

Patient Follow-up:

* For all patients transported by an air medical resource, a follow-up report will be requested by the Office of the Medical Director or designee, from the receiving medical facility that includes the patient's course of treatment and disposition.

Child Abuse Recognition and Reporting

Policy:

Child abuse is the physical and mental injury, sexual abuse, negligent treatment, 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 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 excessively 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 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 agency responsible for Social Services in the county. After office hours, the child protective services worker on call can be contacted by the EMS System's 911 communications 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.
5. Johnston County Department of Social Services contact numbers
   - Monday – Friday, 08:00 – 17:00 (919) 989-5300
   - After hours, weekends, holidays (919) 989-5000

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.

Criteria for Death / Withholding Resuscitation

Policy:

CPR and ALS treatment are to be withheld only if the patient is obviously dead or a valid North Carolina ***MOST and/or Do Not Resuscitate*** form (see separate policy) is present.

Purpose:

The purpose of this policy is to:

- Provide EMS providers with guidance as to when it is appropriate to withhold resuscitative efforts
- Honor those who have obviously expired prior to EMS arrival.

Procedure:

1. If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated:
   - Body decomposition
   - Rigor mortis
   - Dependent lividity
   - Blunt force trauma
   - Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction)

   Extended downtime with asystole on the ECG
2. If a bystander or first responder has initiated CPR or automated defibrillation prior to an EMS paramedic's arrival and any of the above criteria (signs of obvious death) are present, the paramedic may discontinue CPR and ALS therapy. All other EMS personnel levels must communicate with medical control prior to discontinuation of the resuscitative efforts.
3. If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:

   a) Resuscitation efforts meet the criteria for implementing the **Discontinuation of Prehospital Resuscitation Policy** (see separate policy)
   b) Patient care responsibilities are transferred to the destination hospital staff.

Deceased Persons

Policy:

EMS will handle the disposition of deceased subjects in a uniform, professional, and timely manner, and provide the necessary family care to assist in their time of grief.

Purpose:

The purpose of this policy is to:

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

Procedure:

1. Once death is determined, notify central and confirm the time is recorded.

2. If the death appears natural, unsuspicious and does not meet any criteria listed in #4 below, our objective is to contact the patient's physician, physician assistant or nurse practitioner to review the details of the case and agree to sign the death certificate.

2a. If contact cannot be made with the patient's physician or physician group, consider making contact with the on duty Johnston County Medical Examiner. Contact should be made by requesting Johnston County 911 Communications to have the on duty Medical Examiner contact you. Once the Medical Examiner agrees to work with the physician to obtain the signature, the body can be released from the scene.

2b. In the event that a Medical Examiner must be contacted because of the case meeting criteria in item #4 below, contact should be coordinated through the local law enforcement agency having jurisdiction.

2c. If all attempts to make contact with the Johnston County Medical Examiner are unsuccessful, the local law enforcement agency having jurisdiction should be contacted. This should only be performed once all other means of contacting the Johnston County Medical Examiner have been exhausted. Times of unsuccessful attempts of contact should be documented in the supervisor's call report from the incident.

3. Once the physician agrees to sign the death certificate, transport arrangements should be made in coordination with the family wishes. This will usually involve contacting a local funeral home.

4. Under the circumstances below, law enforcement should be contacted. We will coordinate with law enforcement to make contact with the medical examiner:

- Suspected Homicide or Suicide
- Accidental Death
- Traumatic Death
- Disaster
- Violence
- Unnatural or suspicious circumstances

4. (continued):

- In police custody, jail or prison
- In state-operated mental health facilities
- Poisoning or suspicion of poisoning
- Public health hazard (contagious disease or epidemic)
- Deaths during surgical or anesthetic procedures
- Sudden unexpected deaths not reasonably related to known previous disease
- Deaths in which the patient does not have a personal physician
- Deaths in a hotel or motel
- Deaths in which the patient resides in another state

5. In situations listed in #4 notify the law enforcement agency with jurisdiction. The responsible Law Enforcement Officer (LEO) and agency will be notified by Johnston County 911 Communications and will be requested to respond.

6. In cases involving law enforcement and the medical examiner, contact to 911 for a transport unit to transport the body to the morgue will be handled by the LEO.

7. If the patient's destination is the morgue, any intravenous and/or intraosseous access line(s) or airway devices placed by EMS should remain in place. If the patient is not transported to the morgue, any intravenous and/or intraosseous access line(s) or airway devices should be removed.

8. Document the situation, name of medical provider contacted, the agency providing transport of the deceased subject, and the destination in the PCR.

9. If you respond to a crime scene with obvious death, the LEO will allow one EMS provider to enter the scene to confirm death. Document specifics of the case including observations of the scene and the name of LEO(s) accompanying you into the scene in the PCR.

10. If the death/discontinuation occurs during transport, this policy applies. If any items in #4 above are involved contact should be made with the law enforcement agency having jurisdiction where the call originated. The patient will then be transported to the Johnston Health morgue.

11. If the death/discontinuation occurs during transport, and no items in #4 are involved, coordinate with the family on any pre-arranged wishes (this may include transportation to a funeral home). Follow #2 for obtaining a signature for the death certificate. If this is not possible, transport the patient to the Johnston Health morgue. Make contact with the charge nurse and arrange any needed family viewing or family care.

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 prehospital resuscitation after the delivery of adequate and appropriate ALS therapy.

Procedure:

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

- Patient must be 18 years of age or older
- Adequate CPR has been administered.
- Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, nasotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy.
- IV or IO access has been achieved.
- No evidence or suspicion of any of the following:

-Drug/toxin overdose **-Active internal bleeding**
-Hypothermia **-Preceding trauma**

- Rhythm appropriate medications and defibrillation have been administered according to local EMS Protocols for a total of three (3) cycles of drug therapy without return of spontaneous circulation (palpable pulse).
- All EMS paramedic personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate.

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

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

4. If a cardiac arrest occurs during transport and a discontinuation is implemented the following must occur:

- Family care
- Follow the Deceased Persons Policy (Policy 5) procedure #10 and #11.

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

Policy:

All patient encounters responded to by EMS will result in the accurate and timely completion of:

- The Patient Care Report (PCR) for all patients transported by EMS
- The Patient Disposition Form for all patients not transported by EMS

Purpose:

To provide for the documentation of:

- The evaluation and care of the patient
- The patient's refusal of the evaluation, treatment, and/or transportation
- The patient's disposition instructions
- The patient's EMS encounter to protect the local EMS system and its personnel from undue risk and liability.

Procedure:

1. All patient encounters, which result in some component of an evaluation, must have a Patient Care Report (PCR) completed.

2. All patients who refuse any component of the evaluation or treatment, based on the complaint, must have a Disposition Form completed.

3. All patients who are NOT transported by EMS must have a Disposition (patient instruction) Form completed including the Patient Instruction Section.

4. A copy of the Patient Disposition Form should be maintained with the PCR.

5. Any call in which no patient presenting with a medical complaint or request is found, or when all parties on a scene indicate that they did not call for EMS, may be listed as a "no patient found" in the PCR.

6. Any call in which a patient requests EMS for a specific intervention, i.e. lift assist, and does not request a medical treatment, nor present with a medical complaint, may be listed as an "assist" in the PCR and no disposition form shall be required.

DNR, MOST, Advanced Directives

Policy:

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

Purpose:

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

Procedure:

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

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

- Form signed by physician, physician's assistant, or nurse practitioner

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

3. When confronted with a seriously ill patient who is not in cardiac arrest and has a MOST form, the **MOST form Section B** shall be utilized as follows:

- Full Scope of Treatment box is checked: Use all appropriate measures included in System Protocols to stabilize/resuscitate the patient

- Limited Scope of Treatment box is checked: The maximum airway intervention is nonrebreather mask and airway suctioning. All appropriate IV medications may be utilized. No electrical therapies are to be provided.

- Comfort Measures is checked: The maximum airway intervention is non-rebreather mask and airway suctioning. IV pain medications may be administered. Medical control may be contacted reference appropriate treatment.

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

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

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

7. For patients residing in a skilled nursing facility, a DNR order entered into the patient's records is acceptable, however, a copy of this order must be provided to responding EMS personnel.

EMS Documentation and Data Quality

Policy:

The complete EMS documentation associated with an EMS events service delivery and patient care shall be electronically recorded into a Patient Care Report (PCR) within 24 hours of the completion of the EMS event with an average EMS Data Score of 5 or less.

Definition:

The 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 and EMS Toolkit Reports. 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)
- Data collected by the cardiac monitor, i.e. ECG strips, vital signs, procedure markers, etc., should be imported directly into the PCR.

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.

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Patient Care Report (PCR) shall be completed within two (2) hours of the completion of the call, unless call volume prevents the crew from completing it within that limit. In that case, it must be completed as soon as possible and no later than the end of the shift.

   a. After each patient encounter, all data from the cardiac monitor, if equipped to do so, will be uploaded and imported into the PCR.

2. Receiving facilities will access PCRs electronically after the completion of the report. This does not preclude the transporting crew of providing a turnover report at the time care of the patient iss transferred to the receiving facility staff.

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

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

5. Specific policies, procedures, and protocols will direct certain aspects of completion of the PCR.

Documentation of Vital Signs

Policy:

Every patient encounter will be documented. Vital signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives some assessment component.

Purpose:

To insure:

- Evaluation of every patient's volume and cardiovascular status
- Documentation of a complete set of vital signs

Procedure:

1. An **initial** complete set of vital signs includes:

   - Pulse rate
   - Systolic **AND** diastolic blood pressure
   - Respiratory rate
   - Pain / severity (when appropriate to patient complaint)
   - GCS for Injured Patients

2. When no ALS treatment is provided, palpated blood pressures are acceptable for **REPEAT** vital signs.

3. Based on patient condition and complaint, vital signs may also include:

   - Pulse Oximetry (SpO_2)
   - Temperature
   - End Tidal CO_2 ($EtCO_2$)
   - Breath Sounds
   - Level of Response

4. If the patient refuses this evaluation, the patient's mental status and the reason for refusal of evaluation must be documented. A patient disposition form must also be completed.

5. Document situations that preclude the evaluation of a complete set of vital signs.

6. Record the time vital signs were obtained. Vital signs recorded with a capable cardiac monitor should be imported directly into the PCR.

7. Any abnormal vital sign should be repeated and monitored closely.

8. Vital signs provided by other healthcare providers and first responders on the scene should be recorded in the PCR and listed as Prior to Arrival (PTA) of EMS.

Domestic Violence (Disabled, Elder, and/or Partner 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 or disabled abuse is the physical and/or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior and/or disabled citizen 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.

Purpose:

Assessment of an abuse case 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:

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. Immediately report any suspicious findings to both the receiving hospital (if transported). If an elder or disabled adult is involved, also contact the Department of Social Services (DSS) or equivalent in the county. After office hours, the adult social services worker on call can be contacted by the 911 communications center.

- Contact number for DSS during normal office hours, Monday – Friday, non-holidays, 08:00 – 17:00 is (919) 989-5300.
- Contact number for DSS outside of normal office hours (nights, weekends, and holidays) is (919) 989-5000.

5. EMS personnel should attempt in private to provide the patient with the phone number of the local domestic violence program, or the **National Hotline, 1-800-799-SAFE**.

This policy has been altered from the original NCCEP Policy by the Johnston County EMS System Medical Director

EMS Back in Service Time

Policy:

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

Definition:

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

Purpose:

The purpose of this policy is to:

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

Procedure:

The following procedures shall be implemented to assure policy compliance:

1. The EMS Unit's priority upon arrival at the medical facility will be to transfer the care of the patient to the appropriate medical facility staff as soon as possible. This includes STEMI patients transferred to the cath lab and Stroke patients to CT Scan, for which extended time may be warranted.

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

3. EMS personnel will provide an interim (PreMIS Preliminary Report or equivalent) or final Patient Care Report (PCR) to the receiving medical facility staff, prior to leaving the facility, that documents at a minimum the patient's evaluation and care provided by EMS prior to arrival at the medical facility. A complete PCR should be completed as soon as possible but should not cause a delay in the EMS Back in Service Time.

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 as an addendum in the Patient Care Report (PCR) as an "EMS Turn-Around Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

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

EMS Dispatch Center Time

Policy:

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

Definition:

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

Purpose:

The purpose of this policy is to:

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

Procedure:

The following procedures shall be implemented to assure policy compliance:

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

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

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

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

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

6. EMS Units dispatched with a non-emergent response, will not upgrade to an emergent response **UNLESS**:

- Public Safety personnel on-scene requests an emergent response.
- Communications Center determines that the patient's condition has changed, and requests the responding unit to upgrade to a emergent response.

EMS Dispatch Center Time

7. An EMS Unit may divert from a current non-emergent call to a higher priority emergent call **ONLY IF:**

- The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
- The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
- The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
- Once a call has been diverted, the next EMS Unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.

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

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

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 (with lights and siren) response.

Definition:

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

Purpose:

The purpose of this policy is to:

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

Procedure:

The following procedures shall be implemented to assure policy compliance:

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

2. The EMS Unit Wheels Rolling (Turn-out) time will be less than 90 seconds from time of dispatch, 90% of the time. If a unit fails to check en route within 2:59 (mm:ss), the next available EMS unit will be dispatched.

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

4. An EMS Unit may divert from a current cold (no lights and sirens) call to a higher priority hot (with lights and sirens) call **ONLY IF:**

- The EMS Unit can get to the higher priority call before it can reach the lower priority call. Examples of High Priority Calls: Chest Pain, Respiratory Distress, CVA, etc.
- The diverting EMS Unit must notify the EMS Dispatch Center that they are diverting to the higher priority call.
- The diverting EMS Unit ensures that the EMS Dispatch Center dispatches an EMS Unit to their original call.
- Once a call has been diverted, the next EMS unit dispatched must respond to the original call. A call cannot be diverted more than one (1) time.

5. Any EMS Wheels Rolling (Turn-out) Time delay resulting in a prolonged EMS Response Time for emergent hot (with lights and sirens) events will be documented in Patient Care Report (PCR) as an "EMS Response Delay" as required and defined in the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards Document.

6. All EMS Response Delays will be reviewed regularly within the EMS System Peer Review Committee.

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.

Atypical Protocol Utilization and Online Medical Direction

Purpose:

The purpose of this policy is to:

- Provide excellent clinical care and quality service to the citizens of Johnston 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 (OLMD).

2. Patients (b) requiring OLMD shall contact medical control via as described in steps 4 and 5 below. The provider requesting OLMD 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 district supervisor 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 district supervisor may be contacted on EMSCOMM and then coordinate the movement to an appropriate OPS channel with Central.

4. If the request is for OLMD contact the Johnston County Medical Director (JCMD) or Johnston County Assistant Medical Director (JCAMD) via phone.

   a. If the JCMD/ JCAMD is not available, request OLMD from a physician at the **receiving hospital** via radio or phone. Only physicians may provide medical direction. Other staff, including PAs and nurses, may not provide online medical direction. In all cases, contact should first be attempted with the JCMD and/or JCAMD.

5. In the patient care report (PCR) , the **name** of the individual (and unit number if applicable) providing OLMD and/or APU will be documented in the narrative section.

6. Additionally, the district supervisor for the region may take any calls in which immediate notification of the JCMD is required when the JCMD cannot be reached.

7. In all instances, until guidance is received from a district supervisor or JCMD, follow the Universal Patient Care Protocol.

Physician on Scene

Policy:

The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the state of 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 prehospital care
- To minimize the liability of the EMS system as well as the on-scene physician

Procedure:

1. When a non medical-control physician offers assistance to EMS or the patient is being attended by a physician with whom they do not have an ongoing patient relationship, EMS personnel must review the On-Scene Physician Form with the physician. All requisite documentation must be verified and the physician must be approved by on-line medical control.

2. When the patient is being attended by a physician with whom they have an ongoing patient relationship, EMS personnel may follow orders given by the physician if the orders conform to current EMS guidelines, and if the physician signs the PCR. Notify medical control at the earliest opportunity. Any deviation from local EMS protocols requires the physician to accompany the patient to the hospital.

3. EMS personnel may accept orders from the patient's physician over the phone with the approval of medical control. The paramedic should obtain the specific order and the physician's phone number for relay to medical control so that medical control can discuss any concerns with the physician directly.

Poison Control Center

Policy:

The North Carolina State Poison Center may be utilized by the 911 centers and the responding EMS services to obtain assistance with the pre-hospital 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 pre-hospital 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 pre-hospital 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 re-contact the 911center 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 Haz-Mat, includes:

- Substance(s) involved
- Signs and symptoms
- Time of exposure
- Any treatment given

Safe Transport of Pediatric Patients

Policy:

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

Purpose:

To provide:

- 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. Insure that all pediatric patient less than 40 lbs. are restrained with an approved child restraint device secured appropriately to the stretcher or captains chair.
3. Insure 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. **If at all possible, in all circumstances, a parent or caregiver should not be permitted to hold a pediatric patient during transport. Pediatric patients shall be transported in a safe manner and shall be restrained.**

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 establish a uniform protocol for the transportation of sick and/or injured patients, and to provide:

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

Procedure:

All sick or injured persons requesting transport should be transported without delay to an appropriate local emergency department **of the patient's preference. Generally, any hospital located within Johnston County, as well as any hospital located in a contiguous county, acceptable destination. The only exceptions to this rule are found below.**

1. An "appropriate local emergency department" includes **ALL** JOHNSTON COUNTY EMERGENCY DEPARTMENTS (ED), as well as those located in contiguous counties **and** the Veterans Administration Medical Center in Durham, NC (for eligible patients). If the unit availability status of the system is a concern, contact the appropriate district supervisor prior to initiating the patient-requested out-of-county transport. If a patient requests to be transported to a facility that is not located within Johnston County or a contiguous county, contact the district supervisor for guidance.

2. All non-specialty 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.) 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. 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 Rex Healthcare cardiologist, for example, the patient should generally be taken to Rex Healthcare 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.

6. Specialty patients (i.e. LVAD, transplant, etc.) who are experiencing a condition related to their condition should be transported to the appropriate specialty facility when reasonably possible. Discuss any transport-related concerns with the district supervisor.

7. Scene times, while generally not a clinically significant factor in patient outcomes, should generally be kept to within certain guidelines for specific patient populations:

- All patients meeting trauma notification criteria should be transported as soon as possible while striving to maintain a scene time of 10 minutes or less after patient contact.
- All acute ST-Elevation Myocardial Infarction patients will be transported as soon as possible while striving to maintain a scene time of 10 minutes or less, with 12-lead ECG being acquired within the first 5 minutes after patient contact.
- All acute stroke patients will be transported as soon as possible while striving to maintain a scene time of 10 minutes or less after patient contact.
- All other 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. Unless otherwise noted, scene times should generally be limited to 20 minutes.
- Variances to the above referenced scene times should be clearly documented in the patient call report.

9. While patients will, under normal circumstances, be transported to a hospital emergency department, unusual circumstances may indicate that transport to an alternate destination is in the best interests of the patient. These situations will be assessed on an individual basis and a system precedent will not be considered as having been established.

10. Exceptions to this policy may be issued on a case-by-case basis. These may include weather concerns or other situations as determined by the Johnston County EMS System Medical Director or his designee. These notifications will be made via radio, paging system, email, or other means as deemed appropriate.

Hospital Diversion

This Policy applies to all credential levels

Purpose: The Johnston County EMS System has adopted a Diversion Policy to be implemented when a hospital facility has reached or exceeded the capacity to care for patients and assure that all reasonable options to safely accommodate patients have been explored. Inasmuch as Johnston County EMS System ambulances transport patients to hospitals outside of Johnston County per Policy 20 Transport, it is important that we try and accommodate these situations as much as possible.

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 most common status conditions for outside of Johnston County hospitals are listed below. Each hospital regulates their diversion policy and their requirements to meet diversion status may vary between hospitals. As hospitals go on diversion, they should contact the 911 center, who will then send that information out to our EMS units via CAD notification. If needed, To determine if a particular hospital is on a diversion status, contact the Johnston County Communications Center (preferably via radio) and request the diversion status of the hospital the patient is requesting to be transported to.

Statuses:

GREEN status is “business as usual” and normal transport procedures are in effect. All ambulance personnel should assume each hospital is in this condition until notified otherwise.

YELLOW status may be initiated by a hospital when the emergency department is unable to safely and 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 should continue to be transported to the hospital by EMS. Exceptions are listed on the next page.

RED status may be initiated by the emergency department when the department cannot safely accept and adequately care for any patients, except as listed on the next page.

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. If a facility has declared BLACK diversion, no patients may be transported under any circumstances.

Exceptions:

Certain exceptions can be made when a facility declares YELLOW or RED diversion. Those include:

1. Respiratory arrests are transported to the closest hospital.
2. Obstetrical patients in active labor are transported to the hospital of their choice.
3. STEMI/ROSC patients are transported to the STEMI receiving/ PCI center of their choice.
4. Stroke/ CVA patients are transported to the stroke receiving facility of their choice.
5. Patients who meet trauma triage criteria are transported to the nearest trauma center. For those patients not transported via air, the nearest receiving facility is normally WakeMed Raleigh Campus.

Patient's Right of Refusal:

After being informed that a specific hospital is on a diversionary status, the EMS crew should politely explain to the patient what the diversionary status means-

1. That the receiving facility of their choice is operating at or above a safe capacity,

2. That their care may be delayed by an unknown amount of time due to exhausted resources at the facility of their choice. Tell the patient "it may take hours for you to be seen."

If the patient, after receiving this explanation, still insists upon transport to that facility, the EMS crew should obtain a refusal form from the patient with documentation of the hospitals diversion status and the patient's signature on the refusal form. The EMS unit should then initiate transport to the requested facility. If the patient cannot sign, then the exchange between the EMS crew and the patient should be thoroughly documented in the PCR.

Additionally, the EMS crew should make every effort to contact the receiving facility as early as possible, and if needed, explain to the receiving facility staff that they are aware that the facility is on a diversionary status, the patient has been informed, and that they still insist upon transport to that facility.

During the exchange between the EMS crew and the patient (or patient's family), EMS crew members are expected to maintain a high level of professionalism.

The patient's refusal and insistence upon transport to the facility that is on a diversionary status should be thoroughly documented in the PCR.

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.

Palliative Care

Policy

Any patient presenting to any component of the Johnston County EMS system with a completed North Carolina Do Not Resuscitate (DNR) Form (Yellow) or MOST Form (Pink) shall have the form honored in the event of a cardiac arrest. A living will (LW), advanced directive, or other legal document that identifies the patient's desire to withhold CPR or ALS therapy may be honored with the approval of Medical Control. This should be done, when possible, in consultation with the patient's family and personal physician.

Purpose

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

Procedure

When confronted with a patient or situation involving a DNR, MOST Form, or LW, the following conditions must be present to in order to honor the form:

- Original North Carolina DNR Form (Yellow form – not a copy) , NC MOST Form (Pink form – not a copy), or LW;
- Dates are current;
- Form signed by family physician; and
- Patient in cardiac arrest.

With all patients, perform adequate patient assessment.

This policy will only be activated when proper documentation of patient status and confirmation of patient identification is presented to the Paramedic(s) at the scene.

This policy does not apply to events of trauma to the patient unrelated to the patient's terminal illness.

This policy does not apply to events of Mass Casualty Incidents (MCI) or disasters.

In the absence of a DNR Form or MOST Form and proper patient identification, the patient must be provided all treatment in accordance with all appropriate Johnston County EMS System patient care protocols.

The original DNR form or MOST form and any other advanced directives shall be transported with the patient and be delivered to the receiving staff.

A photocopy of the DNR form or MOST form and any other advanced directives shall be attached to the EMS copy of the patient care report.

Appropriate Care

- Vital signs, current chief complaint and medical history;
- Administer oxygen as appropriate;
- Administer appropriate over the counter medications;
- Suction the oropharynx and nares as necessary;
- Position/reposition patient for comfort;
- Control external bleeding by direct pressure, dressing, etc.;
- Splint and immobilize fractures as appropriate;
- Treat uncontrolled pain or discomfort by providing "Palliative" care only;
- Allow patient, family or NON-EMS health care provider to administer patient's own medications, as appropriate. Said individual shall not be required to accompany patient to hospital;
- Administer drugs in compliance with system treatment protocols for comfort measures; and/or
- Establish IV's or initiate IV therapy.

Inappropriate Care

- Cardiopulmonary resuscitation (CPR) efforts.
- Airway adjuncts, especially tracheal intubation.
- Electrical therapy.

Emergency Medical Dispatch

Policy

Per the order of the Johnston County EMS System Medical Director, all dispatching of Emergency Medical Ambulances in Johnston County will be in accordance with the Medical Priority Dispatch System as published by Medical Priority Consultants, Inc., and approved by the International Academy of Emergency Dispatchers. All dispatchers will be trained in the use of the Medical Priority Dispatch System and will follow the protocol system without deviation. No person will give medical directions over the phone to a caller unless the North Carolina Office of Emergency Medical Services currently credentials them.

Priority Dispatching

For clarification the following definitions will apply-

- EMS Agencies – Any of Johnston County's Volunteer/Paid EMS Agencies.
- JCEMS – A Johnston County EMS System unit.
- Medical Responder – A volunteer/ paid fire unit when an ambulance is not available or any organization (i.e. Antioch Fire Department) that has an agreement with Johnston County to respond to emergencies.
- Non-emergent - No audible or visual warning devices will be used.
- Emergent - Audible and visual warning devices will be used. Due regard for the safety of all other motorists will be observed at all times.

The following response configurations will be dispatched for the indicated response determinant:

- Alpha "A" – EMS Agency non-emergent, No First Responder unless requested by EMS
- Bravo "B" – EMS Agency emergent, First Responder emergent
- Charlie "C" – EMS Agency emergent, First Responder emergent
- Delta "D" – EMS Agency emergent, First Responder emergent
- Echo "E" – EMS Agency emergent, First Responder emergent
- Omega "O" – Any unit responding to an Omega determinant will respond non-emergent

Quality Improvement

Policy:

The purpose of these policies and guidelines are to review, evaluate, and improve the emergency response, care, and transportation of patients within Johnston County EMS System.

These Quality Improvement (QI) policies apply to all pre-hospital and interfacility transport medical care provided by EMS professionals practicing in Johnston County under the Johnston County EMS System Medical Director, and the Johnston County EMS System Plan. All EMS patient care reports and other related documentation, along with all undocumented response and care, in the Johnston County EMS System shall be included in this QI program. This includes, but is not limited to all the following:

- Pre-hospital EMS First Responder programs.
- Pre-hospital EMS response and care whether by ground, water, or air ambulance.
- Interfacility/Specialty Care transport and care whether by ground, water, or air ambulance.
- Telecommunication and dispatch of EMS units, including Emergency Medical Dispatch (EMD) programs.
- Expanded scope of practice programs operating in non-traditional practice settings.

These policies and guidelines are applicable to all EMS response and care provided within the boundaries of Johnston County and any ground or air ambulance whose transport begins within those boundaries, with the following exception:

Inter-facility Critical Care Transport ambulances currently licensed by the North Carolina Office of EMS to hospitals outside of Johnston County, but only when requested by Johnston Health to transport in-hospital patients.

These policies and guidelines together comprise the complete "Medical Oversight" program of the Johnston County EMS System Medical Director and help meet the Johnston County EMS System Quality Management goal, as described in North Carolina EMS Rules.

QI review and evaluation shall include, but not be limited to:

- Immediate review of EMS patient care reports and associated medical care by emergency department and receiving physicians,
- Review of EMS patient care reports and non-documented EMS call aspects by the EMS agency's supervisors and staff officers,
- Review of voice recordings of all associated EMS radio frequencies and phone lines by the System Medical Director, Assistant to the Medical Director, EMS agency supervisors and staff officers,
- Review of all voice recordings and documentation regarding EMD personnel by the System Medical Director, Assistant to the Medical Director, 911 Center Head and the Johnston County EMS System Head,
- Review and reporting of statistical data from all available databases.
- Presentation and discussion of random patient care reports, statistical data and other issues at the Peer Review Meetings.

Purpose

It is the purpose of all Johnston County EMS System Peer Review Committee and sub committees to serve and advise the Johnston County Medical Director regarding findings pertinent to the quality and appropriateness of EMS response, care and transportation within the Johnston County EMS System.

It is not the purpose of said committees to become involved in the internal and personnel affairs of agencies or employers. However, findings of protocol/policy violations may have bearing on the EMS personnel's local credentials.

Each EMS agency shall adopt policies that direct the receipt and handling of clinical findings involving their personnel. In the absence of such policies, those procedures described below shall be applied.

Only the Chief, Training Officers or designated Supervisor of the affected EMS practitioners are permitted to approach the said EMS practitioner with Chart/Audit findings on an agency level. The Medical Director or representative may approach any provider in reference to clinical performance.

Chart/Audit findings on an agency level involving negative outcomes, protocol violation, or other clinical misadventures should be reported to the Chief, Training Officers or designated Supervisor, then immediately forwarded to the Johnston County EMS Office of the Medical Director Pending Medical Director review, findings are forwarded to the Critical Peer Review Committee as needed.

No discussion or presentation of damaging findings, regarded as individual employee or personnel matters, shall be made to anyone other than the employee's supervisor or employer, except as stated below.

All information and documentation regarding EMS calls, response and care are considered confidential in nature, and shall not be shared outside the members of the review process.

Violations of the policy may result in disciplinary action up to and including removal of the EMS credential privileges and adverse legal action against those involved.

General Chart Audit

Patient care assessments by review of patient care reports for evaluation of individual care-providers and system trends.

Statistical data review for issues of patient care trends and evaluation of individual care-providers.

Evaluation of EMS equipment, medications, and interventions by review of patient care call reports.

Procedures

Each of the EMS agencies supervisors and/or training officers are to review 100% of the agencies EMS calls. Any case that results in a negative outcome, protocol violation, or other clinical misadventure should be forward immediately to the Johnston County EMS Office of the Medical Director.

MD Review

The Medical Director shall have the authority to suspend temporarily, pending due process review, any EMS personnel from further participation in the Johnston County EMS System when it is determined the activities, or medical care rendered by such personnel may be detrimental to the care of a patient, constitute unprofessional behavior, or result in non-compliance with credentialing requirements. 10 NCAC Sections 2803(c). Authority NCGS 143-508(b); 143-509(12). Due process review offers the case to the Critical Peer Review Committee.

Critical Peer Review Committee

If needed, a Critical Peer Review meeting will be arranged. The panel will consist of 2-4 peers that are currently functioning in the EMS system.

Violations of any policy/protocol may result in disciplinary action up to and including removal of EMS privileges at the local level and notification to the North Carolina Office of EMS.

Disciplinary Review Board

The Disciplinary Review Committee (DRB) will exist to allow providers to appeal the decision of the Critical Peer Review Committee. The DRC will consist of the EMS System Manager, Johnston County Attorney, Johnston County HR representative and the Medical Director. This will help ensure due process for any provider in question.

Emergency Responder
On-Scene Rehabilitation

Policy:

An EMS unit shall be dispatched to any emergency scene to serve as an evaluating (rehab) unit for the on-scene responders. A emergency scene includes any activity (e.g., working fire, rescue, extrication, etc.) during which emergency responders may / will be:

- Working on the scene for more than an hour, particularly while wearing protective garments (turnout gear).
- In the presence of weather that will exceed 90 degrees F or be below 10 F.
- Expected to use two 20-minute or one 45-minute air bottle before the scene is under control.

Purpose:

Emergency Responder On-scene Rehabilitation is a vital service that is provided on an emergency scene to provide emergency responders with immediate medical attention including rehydration, treatment for smoke inhalation, and the prevention of such life-threatening conditions as heatstroke and heart attack.

Procedure:

The initial response shall be one ALS unit 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 resource and cancel and/or downgrade response as appropriate. When available, a District Supervisor and/or a department/ administrative officer should be notified to respond and assist with rehab.

If any responder or other victim requires transport to a hospital, a second ALS unit 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 unit (lights and sirens vs. no lights and sirens).

Transport of a responder or other patient will not be delayed while waiting for a second unit to arrive. If there is an urgent need for ALS personnel on the scene, the second unit should be dispatched with lights and sirens and the injured party transported without delay. It will be ideal to have a District Supervisor present to help with managing the scene.

It is important to note that rehab should be established at the request of the primary responding agency, as it is their responsibility to provide a rehab program for their responders. Our EMS System will gladly provide the EMS component of rehab, but can currently only provide those medical monitoring capabilities. It is the goal of our EMS system to work along side our county's agencies to protect the health and safety of all responders.

If rehab is not requested by the on-scene responding agency(ies), the responding EMS crew should maintain a ready position, as determined by command, in order to better provide timely response to an injured responder/ citizen on the scene. When establishing this position, the following equipment is required to be present with the EMS crew-

- Stretcher/ cot, primary bag, airway bag, monitor, and long spine board or scoop stretcher
- Portable radios, unit-assigned cell phone
- Assigned PPE (helmet, coat, pants, boots, gloves)

Interfacility Transfers

Indication:

✱ 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:

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

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

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

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

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

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

Drawing Blood for Law Enforcement

Policy:

The Johnston County EMS System supports all efforts of the Law Enforcement community to get impaired drivers off the road. Please note that only EMT-Paramedics cleared in the Johnston County EMS System are allowed to draw blood for Law Enforcement Officers (LEO). At any point in the process, EMS personnel may have to either begin transportation or respond to additional emergencies based on the Paramedic's discretion, no matter where in the process of the evidence collection they may be. In order for a Paramedic to draw blood for the officer, the subject must consent to have the procedure completed.

Purpose:

To provide standard system policy for drawing blood as requested by Law Enforcement Officers in accordance with NCGS § 20-16.2, *Implied consent to chemical analysis; mandatory revocation of license in event of refusal; right of driver to request analysis* and NCGS § 20-139.1(d2), *Procedures governing chemical analyses; admissibility; evidentiary provisions; controlled-drinking programs.*

Procedure:

1. Only Paramedics cleared in the Johnston County EMS System are allowed to draw blood for Law Enforcement Officers.

2. EMS units should perform blood draws when requested by Law Enforcement Officers (LEOs) due to the suspicion of a subject Driving While Impaired (DWI).

3. Transportation of a critical or "trauma" patient will not be delayed for a blood draw.

4. EMS shall not draw blood from a deceased subject.

5. The subject must be in custody and the LEO must present an appropriate Biological Blood Specimen Kit.

6. The patient must consent to the blood draw. Uncooperative patients and inappropriate manpower will never be combined with sharp needles and bloodborne pathogens for the safety of the patient, EMS crew, and the LEO.

Documentation:

If called by an LEO only for a blood draw, the Run Type is listed as '911 Response (Emergency)'. The disposition should be listed as 'Assist' and the Refusal Reason listed as 'Other'. The requesting law enforcement agency should be listed in Additional Factors under Additional Agencies. The patient's name and date of birth (DOB) should be obtained. The blood draw should be entered in the Flow Chart under IV Therapy as a Blood Draw and complete the information required. No refusal is required, unless additional assessment or treatment is performed or recommended.

If asked to draw the blood of a pre-existing patient (ex: a patient you are treating at a motor vehicle crash), the report should be completed as any other based on the overall patient situation. The blood draw should be entered in the Flow Chart under IV Therapy as a Blood Draw.

The Narrative page should accurately reflect the chief complaint of the patient, or if there was not a patient chief complaint, this may be the request from the officer. For Primary Impression list 'Other' and list as the Chief Complaint "Officer requests a blood draw". The Narrative section allows you to record your narrative of the events on the call.

Any difficulties that are realized with practice of this policy should be documented in a special report and reported to the appropriate supervisor due to the legal implications of this policy.

This policy has been altered from the original NCCEP Policy by the Johnston County EMS Medical Director

Spinal Precautions

Policy:

Johnston County EMS Providers will use the Spinal Precautions Policy to safely secure and move all patients with a possible spinal injury.

The goals of this policy are:

- to avoid additional injury to the patient during movement and transport
- to maximize patient safety
- to minimize patient discomfort
- to reduce provider injuries while caring for the patients
- to minimize scene times by eliminating unnecessary interventions

Purpose:

The Spinal Precautions Policy is a two-step process. In the first step, the EMS Provider will consider if the patient should be included in the Selective Cervical Spine Clearance (SCSC) Protocol. If the Provider uses the SCSC Protocol and the patient meets criteria, then the provider will use the Spinal Precautions Procedure to achieve the aforementioned goals.

Procedure:

Johnston County EMS Providers will extract data from the scene size-up, the history of present illness, and the physical exam. The Provider will use this data to determine if the patient should be included in the SCSC Protocol.

Inclusion criteria includes, but is not limited to:

- Mechanism consistent with potential for spinal injury
- Significant falls (greater than 20 feet)
- Motor vehicle collisions with significant force
- Direct trauma to the head, neck, or back
- Complaints or exam findings that may represent spinal injury
- Neck or back pain or tenderness
- Sensory or motor abnormalities
- History of loss of consciousness with current injury
- Altered mental status
- Multi-system trauma

If the patient has met inclusion criteria into the Selective Spinal Clearance Protocol, and the Provider has determined that the patient requires spinal precautions, then the Provider will utilize one of the four techniques found in the Spinal Precautions Procedure. All methods require inline stabilization of the head and cervical spine.

If the patient meets the “Spinal Precautions Not Required” criteria, then the Provider may secure and transport the patient without spinal precautions. These findings must be documented in the patient care report.

Spinal Precautions

Spinal Precaution Omission Criteria are:

- Normal neurologic exam in the cooperative patient
- Fully alert and oriented
- Normal sensory and motor exam
- Absence of midline neck or back tenderness
- Absence of distracting injuries
- Absence of clinical intoxication that impairs decision making ability
- No communication barriers, i.e. due to language, intellect, intoxication, emotional condition, etc.

Pearls:

- **Long spine boards are for extrication and transfer**. Once the patient is moved to the stretcher, the provider should use a lift-and-slide technique to lay the patient flat on the ambulance stretcher and off of the long spine board. The provider may elevate the back of the stretcher as needed for patient comfort.

- An unresponsive, multi-system blunt trauma patient may remain on the long spine board or scoop stretcher until patient care is transferred to the Emergency Department staff. **However, if this is undertaken, suitable blankets and rolled/folded towels should be utilized to pad the patient and fill all voids between the patient, straps, and long spine board/ scoop stretcher.**

- An unresponsive post-ROSC patient may remain on the long spine board or scoop stretcher until patient care is transferred to the Emergency Department staff.

- A combative or seizing patient should not be forcefully strapped to a backboard, beyond what is required for his/her safety, as this can create higher forces and may cause increased injury. Sedation should be provided for these patients.

- Do not routinely immobilize a patient with penetrating trauma such as gunshot or stab wounds. Emphasis should be on hemorrhage control, treatment of shock, airway management, and safe, rapid transport to the closest trauma center.

- EMS personnel should eliminate the “standing take down” technique for patients who are ambulatory after an injury. These patients may have their cervical spine stabilized with a cervical collar, and then may be secured to the stretcher in a position of comfort.

- All efforts should be made to secure the airway while maintaining in-line cervical spine immobilization. However, in the difficult airway patient, priority should be given to airway stabilization, and cervical spine motion may be needed to achieve this.

- Presence of intoxicants (i.e. ‘alcohol on the breath’) does not constitute intoxication. Clinical judgment should be exercised to determine if a patient’s decision making capacity is compromised.

Non-Paramedic Transport of Patients

Policy:

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

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

1. Any patient who requires or might reasonably require additional or ongoing medications, procedures and/or monitoring beyond the scope of practice of the lower credentialed provider. This includes any critically ill or unstable patient as advanced airway management may be required in any decompensating patient. EMT-Basic and EMT-Intermediate 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, the paramedic should attend the patient.

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

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

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

This policy has been altered from the original NCCEP Policy by the Johnston County EMS System Medical Director

Readiness for Response

Purpose:

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

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

Policy:

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

a. When a response vehicle is so depleted of medical supplies (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”.

b. For transport-capable vehicles, when at least one medically cleared Paramedic whose credential to practice is unrestricted in the Johnston 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-personnel”. This includes the illness/injury of a technician, a technician exceeding 36 hours of emergency services work without twelve (12) hours break from such work (see below), or recognition that the technician is otherwise unfit to effect 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.

ii. Unit staffed with at least one technician that has completed 36 hours of continuous emergency services work: The unit should check out of service and return to the primary station for shift change.

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-personnel”.

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 incident scene, or upon return to their primary response district.

Law Enforcement Officer Administration of Naloxone

Purpose

To establish guidelines and regulations governing utilization of naloxone (Narcan) by Johnston County Law Enforcement Agencies. The objective is to treat and reduce the injury and fatality from opiate overdoses.

Policy

It is the policy of the Johnston County EMS System that all law enforcement officers are require to be initially trained in the use of naloxone by North Carolina Harm Reduction Coalition.

Training

Initial Training

All participating officers will receive initial training that will include, at minimum, a overview of the law that permits law enforcement use of naloxone, patient assessment (e.g., signs/symptoms of overdose), universal precautions, rescue breathing, seeking medical attention, and the use of intra-nasal and/or intra-muscular naloxone as detailed in the standing order. Upon completion of training, officers will have their training recorded with the Johnston County EMS System Office of Training and Clinical Affairs.

Continuing Education

Officers participating in the administration of naloxone will receive training refreshers during their yearly continuing education by Johnston County EMS System Medical Director or his designee.

Naloxone Deployment

Johnston County Law Enforcement Agencies will deploy naloxone kits as approved by the Johnston County EMS System. It is understood that each individual agency will have to deploy the naloxone kits in accordance with their resources, however, at least one on-duty officer will have to be equipped with a naloxone kit.

Naloxone Use

When deploying the naloxone kit officers will: (1) maintain universal precautions; (2) perform patient assessment; and (3) determine unresponsiveness, absence of breathing and/or pulselessness; and (4) update the dispatcher that the patient is in potential overdose state. The dispatcher will then update the responding EMS units. Officers shall follow the protocol as outlined in the naloxone training in accordance with the Johnston County EMS System Clinical Operating Guidelines.

Maintenance/Replacement

1. An inspection of the naloxone kit shall be the responsibility of the personnel assigned the equipment and will be done each shift.
2. Missing or damaged naloxone kits will be reported to the Officer's immediate supervisor without delay.
3. Expired medication will be replaced and disposed of appropriately.
4. Where any condition necessitates the naloxone kit shall be taken off line and be submitted for replacement to the department naloxone coordinator.
5. Upon administering naloxone

Documentation/Naloxone report:

Officers administering the intranasal naloxone must submit a case report detailing the event. At a minimum the report must contain:

1. Dispatch information (OCA number, date, time, location, etc.)
2. Person(s) involved (patient, complainant, witnesses, etc.)
3. Patient assessment findings;
4. Amount of naloxone administered;
5. Outcome of the naloxone administration
6. Any and all other care provided to the patient by the responding officer;
7. Documentation supporting whether or not the naloxone was deployed or administered;
8. Disposition of the patient;
9. Make EMS aware of naloxone administration and document the notification;
10. Document how the applicator/remaining naloxone was disposed of.

Criminal and Civil Immunity

1. Administration of Naloxone

a. A person who receives an opioid antagonist (Naloxone) that was prescribed pursuant to NCGS 90-106.2 may administer same to another person if;

i. the person has a good faith belief that the other person is experiencing a drug related overdose and;

ii. the person exercises reasonable care in administering the drug to the other person.

b. Evidence of the use of reasonable care in administering the drug shall include the receipt of basic instruction and information on how to administer the opioid antagonist.

c. The following individuals are immune from any civil or criminal liability for the administration of the drug pursuant to NCGS 90-106.2

i. Any practitioner who prescribes an opioid antagonist;

ii. Any person who administers an opioid antagonist.

2. Reporting Criminal Immunity

a. Pursuant to NCGS 90-96.2, a person acting in good faith who seeks medical assistance for an individual experiencing a drug related overdose, or an individual experiencing a drug related overdose shall not be prosecuted for-

i. misdemeanor possession of any controlled substance;

ii. felony possession of less than one gram of cocaine;

iii. felony possession of less than one gram of heroin;

iv. possession of drug paraphernalia, if the evidence for prosecution was obtained as a result of the drug related overdose and need for medical assistance.

b. Pursuant to NCGS 18B-302.2, a person under the age of 21 shall not be prosecuted for the possession or consumption of alcoholic beverages if the possession or consumption was discovered solely because the person was seeking medical assistance on behalf of another person and;

i. acted in good faith, upon a reasonable belief that he or she was the first to call for assistance;

ii. used his or her own name when contacting authorities;

iii. remained with the individual needing medical assistance until help arrived;

Second Incident Encountered During Response

Purpose:

To provide guidance in the event that an EMS unit already assigned to an incident encounters a second incident that may or may not have been dispatched to responders.

Policy:

1. When an EMS unit is enroute to a dispatched call and comes upon another incident, the crew should notify JC911 of the nature and location of the incident, make a determination of the severity of the incident based upon a visual size up, assess the severity of the incident versus the originally dispatched call, and advise JC911 of which call you will be handling.

2. When an EMS unit is transporting a non-critical patient and comes upon another incident, the crew should notify JC911 of the nature and location of the incident, make a determination of the severity of the incident based upon a visual size up, and request necessary additional resources.

3. Should a patient at the scene of the secondary incident require advanced life support care, the driver will initiate care while awaiting additional resources while the attendant remains with the transported patient. If a delay in transport would be deleterious to the current patient, the ambulance crew may continue to the hospital without awaiting the arrival of additional resources.

4. Should the patient not require advanced care, the patient may be left with medical first responders while awaiting the arrival of EMS, and the transport will continue.

5. When an EMS unit is transporting a critical patient and comes upon another incident, the crew should notify JC911 of the nature and location of the incident, make a determination of the severity of the incident based upon a visual size-up, request additional resources, inform the citizens that you have a critical patient on board and that another ambulance is responding, and continue the emergent transport.

Transport and Screening for Mental Health and Substance Abuse Patients

Purpose: To establish criteria for EMS referral to a Crisis and Assessment Center 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 superficial abrasions may be evaluated at Crisis and Assessment whereas any patient with on-going bleeding or wounds requiring repair should be referred to an emergency department for evaluation.

2) Pulse is less than 120; SBP greater than 100 mmHg.

3) Patients with a history of diabetes who have no evidence of ketoacidosis and a blood glucose <300 are appropriate for referral to Crisis and Assessment.

4) 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 0.3 may be referred to Crisis and Assessment. Patients with a BAC greater than 0.3 are not eligible for alternative destination and must be referred to the Emergency Department .

5) If a patient has taken medications outside of normal dose not requiring acute treatment, a CIT trained paramedic will discuss this with the poison center (800-222-1222). When calling, the CIT trained paramedic should be prepared with the information outlined in Policy 18 Poison Control Center.

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.

The on-scene CIT trained paramedic must approve the patient for potential alternate destination in all cases. If a CIT trained paramedic 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. Notification to the Crisis and Assessment Center must be made by the on-scene CIT trained paramedic.

Transport of Service Animals

Purpose

In accordance with the Disability Rights Section of the United States Department of Justice (DOJ) Civil Rights Division, which is in charge of enforcing the Americans with Disabilities Act (ADA), a service dog should be allowed to ride in an ambulance with its handler when possible. The following information provides guidance in those situations. Although it should be rare that EMS encounters patients with service animals, we should generally allow a service dog to accompany the patient in the back of the ambulance. By allowing transport of the service animal, we will improve the emotional well-being of the patient resulting in lower anxiety and avoid legal risks associated with disability accommodation.

Procedure

1. The ADA defines a service animal as “any dog that is individually trained to do work or perform tasks for the benefit of an individual with a disability, including physical, sensory, psychiatric, intellectual, or other mental disability.”

    a. As of March 15, 2011, only dogs are recognized as service animals.

2. The ADA significantly limits the questions that EMS crews can ask to determine if a dog is a service animal. EMS crews may only ask:

    a. Is the dog a service animal required because of a disability?
    b. What work or task has the dog been trained to perform?

3. It is not permissible for the EMS crew to ask for documentation, such as proof the animal has been certified or trained.

4. It is not necessary that the dog wear a vest, ID tag, or anything else identifying it as a service animal.

5. There are only three reasons a crew can refuse to transport a service animal:

    a. If the service dog will “fundamentally alter the crew’s ability to provide lifesaving care;

    b. The dog is out of control and the handler does not take effective action to control it, or

    c. The dog isn’t housebroken.

6. Allergies and fear of dogs are not valid reasons for denying access or refusing service to patients with service animals.

7. The patient (handler) is required to maintain control of the dog at all times.

    a. The dog must be harnessed, leashed or tethered, unless these devices interfere with the service animal’s work or the individual’s disability prevents using these devices.

    b. In the case of “7-a” the patient must maintain control of the dog through voice, signal, or other effective control.

8. When the patient is unconscious or in a condition requiring critical lifesaving treatment and the dog’s presence would compromise care or safety, it is appropriate to make other transport arrangements for the dog. However, those arrangements should be made to reunite the patient and animal.

Weapons Encountered During Patient Care

Purpose

There is a possibility that providers will encounter persons armed with a firearm or other potentially dangerous weapon during the course of performing patient assessment, patient care, or ambulance transportation. Typically patients who have weapons as part of their concealed carry status mean no harm to us and will not make this a major issue during our interaction. This is intended to provide guidance, not specific instructions, to personnel in the event of such an encounter.

Procedure

1. A lawfully armed person will often tell an EMS provider about the presence of a firearm before the provider discovers it. If a provider becomes aware that a patient might be armed (e.g., the provider sees the firearm, holster clips, magazines or cartridges), the provider is encouraged to ask the patient if he or she is armed. A patient who acknowledges being armed before being moved to the ambulance should be instructed to leave the firearm at the residence or the patient's place of business if the weapon can be secured at that location. If the patient refuses to do so, or the location doesn't allow for the weapon to be properly secured, the provider should calmly evacuate the area and request law enforcement assistance. EMS providers should not knowingly place armed patients in to their ambulance.

2. Sick or injured law enforcement officers (LEO) may be transported while armed, provided that there is no indication of altered mental status or seizure activity. If the LEO - patient demonstrates altered mental status or seizure activity, another LEO should be asked to take custody of the sick/injured officer's firearm until after discharge from the hospital.

3. EMS providers who encounter firearms not acknowledged by a patient must exercise sound judgment. Firearms found in a holster are best left in the holster in which they are found. The holster containing the firearm may be removed and secured within the controlled substances cabinet of the ambulance. Depending on patient condition and attitude, or lack of comfort with firearms, EMS providers may elect to stop and request law enforcement assistance wherever they are located, to continue to the hospital with a heightened level of awareness (keeping eyes on the patient's hands and the firearm), or take other well-considered actions, including evacuation of themselves from the vicinity of the armed person. Note that EMS providers removing themselves from danger does not constitute "abandonment." EMS providers should be aware that patients can hear one or both sides of hospital radio communications, and discussion of their firearm may cause agitation or hostility.

4. Upon arrival at the hospital, the firearm should be left in the ambulance, secured in the controlled substance cabinet and with the ambulance completely secured. Hospital (preferably) or city police, or an available deputy sheriff, should meet the EMS provider at the ambulance, be briefed on the situation, and be asked to take custody of the patient's firearm.

Opiate Overdose

Policy:

Patients who have experienced an isolated opiate overdose should be offered a variety of options to more appropriately manage their addiction.

Purpose:

The purpose of this policy is to:

- Ensure that the patient is offered various options for treatment of substance abuse.
- Provide harm reduction measures

Procedure:

1. All patients must be over 18 years of age and must not have been in cardiac arrest during the incident.

2. The patient must regain a normal mental status and respiratory effort after the administration of Naloxone.

3. Transport to the Emergency Department should be offered to all patients.

4. For patients who decline transport to the Emergency Department, alternative destination to Crisis and Assessment should be offered when possible; refer to ***Policy 33 Transport and Screening for Behavioral Health Crisis Response***. Other options may include mobile crisis solutions, addiction specialists, 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
   c) Fully alert and oriented
   d) Be able to understand the risk of refusing transport as described in ***Universal Protocol 1 (UP 1)***

6. If the patient declines transport to the Emergency Department, an additional dose of Naloxone may be administered by EMS. When possible, a naloxone kit should be left with the patient, family, and/or friends on the scene. EMS should provide education on how to use these kits.

7. In addition to the medication, the following items should be utilized when possible:
   a) Information of where to dispose of any dirty needles
   b) Information of where to obtain clean needles/syringes
   c) References to a community peer support team if available
   d) Leave literature on resources for substance abuse treatment

8. Whenever a naloxone kit is provided to a patient or a patient's family member(s), this must be entered into the Flow Chart of the PCR. For these kits, the dosage will be listed as a 'unit' and the route of administration listed as 'other'.

9. Whenever a naloxone kit is provided to a patient or a patient's family member(s), notification must be sent to the EMS System's designated public access naloxone coordinator, as designated by the EMS System, via email.

This policy has been altered from the original NCCEP Policy by the Johnston County EMS System Medical Director

Rosters of Practicing Personnel

Purpose:

To ensure that rosters of credentialed personnel are maintained at all times to reflect the current status of those staff members approved for patient care by the Johnston County EMS System Medical Director and the Johnston County EMS System.

Application:

This policy will apply to all agencies that provide prehospital patient care in accordance with the Johnston County EMS System Protocols and Guidelines, including EMS agencies and fire departments.

Policy:

1. Each agency approved by the North Carolina Office of Emergency Medical Services (NCOEMS) to provide care at a designated level (Emergency Medical Responder, Emergency Medical Technician, Advanced Emergency Medical Technician, and Paramedic) shall maintain a current roster of credentialed personnel in the Continuum program on the website maintained by the NCOEMS.

2. Each agency will be responsible for apointing a member/ employee of their agency with responsibility to enter and maintain these rosters in the Continuum program.

3. Access to the rosters will also be provided to the Johnston County Emergency Services EMS Division (JCES EMS) Training & Clinical Affairs Section.

4. Rosters will be promptly updated as personnel are added or removed. New EMS-credentialed staff members (employed and volunteer) will be added into Continuum within fourteen (14) days of appointment or hire. Credentialed staff members (employed and volunteer) will be removed from the Continuum roster with fourteen (14) days of their last day.

5. The JCES EMS will review all rosters periodically to ensure accuracy.

Johnston County EMS System
Standards and Practice Document

Procedures

12-Lead ECG

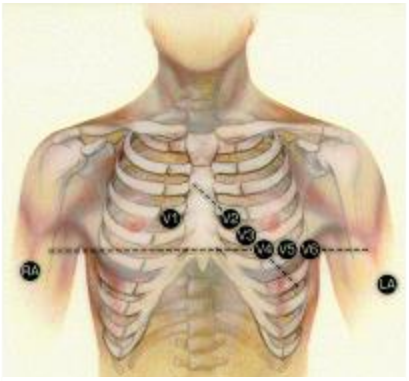
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications for 12-lead ECG:

- Suspected cardiac patient or suspected stroke patient
- Resuscitated cardiac arrest patients
- Suspected tricyclic overdose
- Electrical injuries
- Syncope/ near syncope/ unconscious patients
- Unexplained diaphoresis
- Dizziness, faintness, weakness
- Unexplained abdominal/ epigastric pain/ discomfort
- Any patient age ≥35 years with chest pain
- Potential atypical cardiac presentations (female, diabetic, geriatric)

Procedure:

1. Assess patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12-lead ECG.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12-lead ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
   - RA -Right arm (may be placed on proximal arm, upper humerus)
   - LA -Left arm (may be placed on proximal arm, upper humerus)
   - RL -Right leg (may be placed on proximal arm, upper thigh)
   - LL -Left leg (may be placed on proximal arm, upper thigh)
   - 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

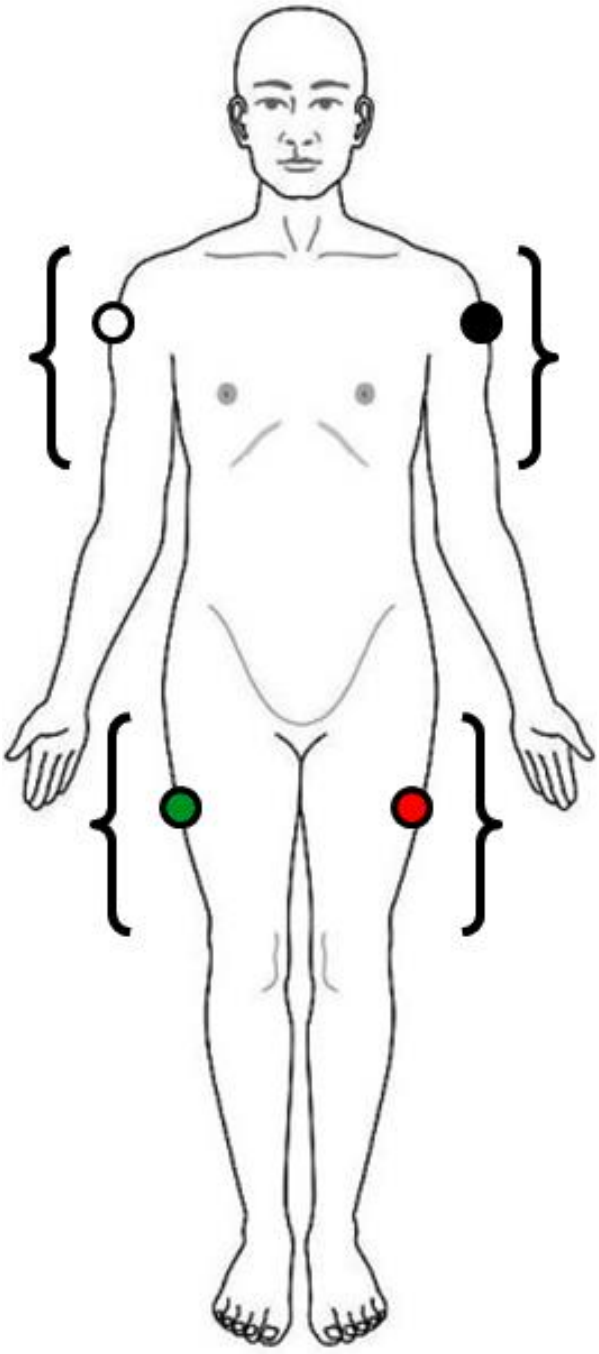


8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12-lead ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 Lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data, if possible, 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. Document the procedure, time, and results within the patient care report (PCR) Flow Chart and Vital Signs.
15. Each 12-lead ECG acquired must be uploaded to the PCR. If unable to download or digitally transfer data, print each 12-lead ECG, scan, and attach to PCR.
16. Any time a 12-lead ECG is acquire, serial 12-lead ECG's should be considered for comparison.
17. Electrodes should not be 'pre-loaded' onto cables prior to a call. Electrodes should only be removed from their packaging and attached to the cables just prior to application.

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 Johnston County EMS System.

12-Lead ECG



STANDARD PLACEMENT OF LIMB LEADS FOR DIAGNOSTIC 12-LEAD ECG

Torso placement of limb leads should be reserved for monitoring (non-diagnostic) purposes only.

Automated External Defibrillation (AED)

	EMR	
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

- Patients in cardiac arrest (pulseless, non-breathing).
- Age < 8 years, use Pediatric Pads if available.

Contraindication:

- Pediatric patients who are so small that the pads cannot be placed without touching one another.

Procedure:

1. Upon arrival at the patient's side initiate chest compressions and request additional resources. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use. If the arrest occurs while transporting a patient, stop the ambulance, pull over in a safe location, initiate chest compressions and the AED procedure, and request additional resources

2. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions.

3. Remove any medication patches on the chest and wipe off any residue.

4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.

5. Activate AED for analysis of rhythm.

6. Stop CPR and clear the patient for rhythm analysis. Keep interruption in CPR as brief as possible.

7. If shock is advised, resume compressions while AED is charging. As soon as the defibrillator has charged **assertively state "CLEAR" and quickly visualize that no one, including yourself, is in contact with the patient prior to defibrillation. Depress the "shock" button and, immediately after the shock is delivered, resume chest compressions.** 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. Upon arrival of ALS EMS personnel, provide an SBAR verbal report and provide assistance as needed.

12. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

13. Upon return of spontaneous circulation (ROSC) utilize the Post Resuscitation Protocol.

14. AED use by first responders, other healthcare providers, or bystanders must be documented in the patient call report (PCR) Flow Chart as occuring prior to arrival (PTA) of EMS.

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

Dual Sequential External Defibrillation

Clinical Indications:

P Paramedic P

- Any patient who has persisted in ventricular fibrillation/tachycardia, without even transient interruption of fibrillation, despite at least 4 external counter shocks.
- At least one of the four previous shocks was delivered using different pads applied so as to produce a different current vector than the first set and all other indicated treatment modalities have been implemented.
- Two system cleared paramedics have verified the persistence of the arrhythmia as persistent ventricular fibrillation without even transient interruption..

Procedure:

1. Ensure quality of CPR is not compromised during prolonged efforts.
2. Prepare the sites for attachment of an additional set of external defibrillation pads by drying the sites and minimizing interference of hair or other obstacles to good pad adhesion
3. Apply a new set of external defibrillation pads adjacent to, but not touching the pad set currently in use.
4. Assure that controls for the second cardiac monitor are accessible to Medical Branch.
5. Medical Branch will verify that the resuscitation protocol has been fully executed up to this point.
6. On rhythm check, Medical Branch will confirm the rhythm-
   a. If a shockable rhythm is detected, CPR will resume immediately. Medical Branch will verify that both cardiac monitor/defibrillators are attached to the patient, that all pads are well adhered, and direct the simultaneous charging of both attached cardiac monitors. Chest compressions will continue while the defibrillators are charging. When both monitors are charged to maximum energy, Medical Branch will announce “Stop CPR”, verify quickly that all persons are clear, and then both shock buttons as synchronously as possible. CPR will resume as soon as both shocks are delivered.
   b. If a non-shockable rhythm is present care will resume according to the appropriate protocol.
7. Additional documentation is necessary in the PCR to clarify when a dual sequential external defibrillation is administered. This should be accomplished by the addition of a “General Comments’ entry in the Flow Chart of the PCR immediately following the defibrillation entry.

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 Johnston County EMS System.

Manual Defibrillation

Clinical Indications:

P Paramedic P

- 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 pads to the patient's chest in the proper position

- Initial: anterior-lateral position (AL)
- Alternate: anterior-posterior (AP)

For patients with implanted pacers/defibrillators, pads can be in AP or AL positions. The presence of implanted pacers/defibrillators should not delay defibrillation. Attempt to avoid placing paddles or pads directly above device.

4. Set the appropriate energy level

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

6. Hold Compressions, assertively state "CLEAR", and quickly visualize that no one, including yourself, is in contact with the patient.

7. Deliver the counter shock by depressing the **shock button.** The pause between the last compression before the shock and the first compression after the shock should be limited to as close to five seconds as possible.

8. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.

9. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.

10. Keep interruption of CPR compressions as brief as possible. Adequate and effective CPR is a key to successful resuscitation.

11. In the event that the patient is not in a shockable rhythm, the charge should be 'dumped' following the procedure for the monitor/ defibrillator being used.

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

This procedure has been altered from the original NCCEP Procedure by the Johnston County EMS System Medical Director

External Cardiac 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

Procedure:

1. Attach standard four/five-lead electrodes.
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.
   - For Philips MRx monitor, after setting rate and output, press **'start'**.
5. Note pacer spikes on ECG screen.
6. If not already in place for airway management, place an EtCO2 sensor and monitor capnography waveforms and capnometry values. An increase in EtCO2 values will be an early indicator of mechanical capture.
7. Slowly increase output until capture of electrical rhythm on the monitor.
8. If unable to capture while at maximum current output, stop pacing immediately.
9. If capture observed on monitor, check for corresponding pulse and assess vital signs.
10. Consider the use of sedation or analgesia if patient is uncomfortable.
11. Document the dysrhythmia and the response to external pacing in the PCR; if unable to digitally transfer the data from the cardiac monitor into the PCR, pre- and post-pacing ECG strips should be printed, scanned, and attached to the PCR.
12. External pacing has been shown to provide no benefit in the setting of cardiac arrest and should not be used in the case of a pulseless patient.

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

Cardiopulmonary Resuscitation (CPR)

Clinical Indications:

	EMR	
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

- Basic life support for the patient in cardiac arrest

Procedure:

1. Within 10 seconds, assess the patient's level of consciousness (shake and shout) and check pulse.
2. 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 the chart below:

Age	Location	Depth	Rate
Infant	Over sternum, between nipples (inter-mammary line), 2-3 fingers	1/3 depth of anterior/ posterior depth	100 – 120 per minute (metronomes set for 116 per minute)
Child	Over sternum, just cephalad from xyphoid process, heel of one hand	1/3 depth of anterior/ posterior depth	100 – 120 per minute (metronomes set for 116 per minute)
Adult	Over sternum, just cephalad from xyphoid process, hands with interlocked fingers	≥2 inches	100 – 120 per minute (metronomes set for 116 per minute)

3. Go to Cardiac Arrest Procedure. Continue continuous chest compressions and begin ventilations in the age appropriate rhythm specific protocol.
4. Provide 8 - 12 breaths per minute with the BVM. Use $EtCO_2$ to guide your ventilations as directed in the Cardiac Arrest Protocol. Ventilations should be timed with the RESQPod flashing lights ***or*** LUCAS3 ventilation prompts.
5. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions (≤5 - 10 seconds) should be undertaken for rhythm analysis, defibrillation, and/or LUCAS3 application. Compressors should be rotated at two (2) minute intervals, or sooner if compressors become fatigued. **Full recoil must be allowed for each compression.**
6. Utilize feedback from monitor/defibrillators and metronome to guide compressions.
7. Utilize the Zoll X Series treatment buttons/ time stamp and Full Code Pro application in the EMS iPad devices to record actions/ interventions.
8. Document the time and procedure in the Patient Care Report (PCR) Flow Chart that CPR is initiated, to include restarting after a loss of ROSC. Documentation must include who performed CPR, to include fire department personnel and bystanders. Additionally, when CPR is terminated, either for a discontinuation of efforts or ROSC, this must be documented in the PC Flow Chart.

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 Johnston County EMS System.

Mechanical Chest Compression Device (LUCAS3™)

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

- Adult patient in cardiac arrest with effective manual compressions being performed.

Relative contraindications:

- Device does not properly fit patient
- Pectus deformity
- Provider discretion precludes use of LUCAS3 device

Notes/Precautions:

- Minimize interruptions in chest compressions to place device; there should be **no** interruptions greater than ten (10) seconds.
- LUCAS3 will be considered for placement only after completion of four (4) cycles of chest compressions after initial ALS measures (vascular access, epinephrine 0.1 mg/mL, airway management) are in place.
- Must be appropriately trained and complete the Johnston County EMS System in-service training session(s).

Procedure:

- **Placement**

1. Continue manual CPR with ZOLL defibrillation pads and CPR 'puck' in place.
2. Place the "change of vector" (Kendall) defibrillation pads prior to putting the LUCAS3 in place.
3. Position the carrying case with its top nearest to you and remove the LUCAS3 from carrying case.
3. Push ON/OFF on the user control panel for one (1) second to power up LUCAS3 in the bag and start the self test. The green LED adjacent to the ADJUST key illuminates when LUCAS3 is ready for use.
4. Remove the LUCAS3 Back Plate from the carrying case.
5. Stop manual CPR.
7. Carefully put the LUCAS3 back plate under the patient, immediately below the arm pits. Use one of these procedures:

   a. Hold the patient's shoulder and lift the patient's upper body a small distance,
   b. Roll the patient from side to side.

8. Start manual CPR again.
9. Attach the support leg that is nearest to you to the back plate. **DO NOT STRADDLE THE PATIENT TO PLACE THE LUCAS3.**

10. Stop manual CPR.
11. Attach the other support leg to the Back Plate, so that the two support legs lock against the Back Plate. Listen for click. (Pull up once to make sure that the parts are correctly attached).

✱ Adjustment and operation

12. The compression point should be the at the same spot as for manual CPR (center of ZOLL CPR Puck) and according to guidelines. When the pressure pad in the suction cup is in the correct positing, the lower edge of the suction cup is immediately above the end of the sternum.
13. Use your finger to make sure that the lower edge of the suction cup is immediately above the end of the sternum.
14. Adjust the height of the suction cup to set the start position.
    a. Make sure that LUCAS3 is in the ADJUST mode.
    b. Push the suction cup down with two fingers until the pressure pad touches the patient's chest without compressing the chest.
    c. Push PAUSE to lock the Start Position - then remove your fingers from the suction cup.
    d. Check for proper position. If not, push ADJUST, pull up the suction cup to readjust the central and/or height position for a new start position. Push PAUSE.
    e. Push ACTIVE (continuous) OR ACTIVE (30:2) to start the compressions.
    f. Mark the suction cup position on the patient's chest with a marker after the suction cup is properly positioned.
15. ALWAYS apply stabilization strap application as the LUCAS3 stabilization strap helps secure the correct position during operation.
16. Once patient has a sustained ROSC, release and retract the pressure pad to allow for greater chest excursion and tidal volume during BVM usage.

✱ Ventilations

17. LUCAS3 operates in two modes, however the Johnston County EMS system will utilize the **ACTIVE (continuous)** mode. When you push this key LUCAS3 performs continuous compressions. The green LED signal will blink 8 times per minute and provide an audible signal to alert for ventilations during ongoing compressions.

✱ PRECAUTION- If at any time the LUCAS3 device emits a continuous alarm, remove the device immediately and resume manual compressions. Do not attempt to trouble-shoot the device while it is in place on a cardiac arrest patient.

✱ **Post resuscitation**

18. At no time will a LUCAS3 be left at the hospital after a resuscitation attempt.

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 Johnston County EMS System.

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. First cardioversion is at 100J then max settings.
5. Set monitor/defibrillator to synchronized cardioversion mode.
6. Make certain all personnel are clear of patient.
7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may a delay between activating the cardioversion and the actual delivery of energy.
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient’s rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.
9. If the patient’s condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.
10. Repeat until maximum setting or until efforts succeed. Consider discussion with medical control if cardioversion is unsuccessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR) Flow Chart.

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 Johnston County EMS System.

Blind Insertion Airway Device (BIAD) i-Gel

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Cardiac arrest after assuring that continuous compressions, defibrillation, and BLS airway management has been completed (EMT, EMT-I, Paramedic)
- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- A situation in which it is more appropriate to utilize an i-gel airway due to patient access or expected difficulty with intubation.
- Patient must be unconscious.

Contraindications:

- Responsive patients with a gag reflex.
- Patients in whom caustic substance ingestion is suspected.
- Patients with known esophageal disease (varices, cirrhosis, alcoholism, etc.)
- Deforming facial trauma that prevents proper seating of airway.
- Patients under/over weight range for airway size used

Size Selection:

Select the appropriate size i-gel by assessing the patient's anatomy/weight.

Weight	iGel size	OG size
iGel for small adults 30-60 kg	3.0	10 FR
iGel for medium adults 50-90 kg	4.0	10 FR
iGel for large adults 90+kg	5.0	12 FR

Pre-use Checks:

1. Inspect packaging and ensure it is not damaged prior to opening.
2. Inspect the device carefully to ensure that there are no foreign bodies or a bolus of lubricant obstructing the distal opening of the airway or gastric channel.
3. Inspect the inside of the bowl to ensure that the surfaces are smooth and intact.
4. Discard the device if the airway tube, body, or bowl appear abnormal or deformed.

Pre-insertion Preparation:

1. Always wear gloves.
2. Open the i-gel package, and on a flat surface remove the inner tray containing the airway support strap and packet of lubricant and place to one side.
3. In the final minute of pre-oxygenation, remove the i-gel open the packet of supplied lubricant and **place a small bolus of the lubricant** on the base of the inner side of the main shell of the packaging.
4. Grasp the i-gel along the integral bite block and lubricate the back sides and front of the cuff with a thin layer of lubricant. This process may be repeated if lubrication is not adequate, but after lubrication has been completed. Check that no BOLUS of lubricant remains in the bowl of the cuff or elsewhere on the device. Avoid touching the cuff of the device with your hands.
5. Place the i-gel back into the main shell of the packaging in preparation for insertion.

Blind Insertion Airway Device (BIAD) i-Gel

WARNING: REMOVE DENTURES OR REMOVABLE PLATES FROM THE MOUTH BEFORE ATTEMPTING INSERTION OF THE DEVICE. DO NOT APPLY EXCESIVE FORCE DURING INSERTION.

IT IS NOT NECESSARY TO INSERT FINGERS OR THUMBS INTO THE PATIENT'S MOUTH DURING THE PROCESS OF INSERTING THE DEVICE.

Placement of the device:

1. Pre-oxygenate the patient. **Do not hyperventilate**.
2. Grasp the lubricated i-gel firmly along the integral bite block. Position the device so that the i-gel cuff outlet is facing towards the chin of the patient.
3. The patient should be in the 'sniffing' position with head extended and neck flexed. The chin should be gently pressed down by an assistant before proceeding to insert the i-gel .
4. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
5. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
6. At this point the tip of the airway should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework. The incisors should be resting on the integral bite-block.
7. **i-gel should be secured either with the Thomas Select Tube Holder or with the airway support strap provided. In some patients, the circumference of the head may be too great for the Thomas device.**
8. **Apply the capnography sensor and begin monitoring the $EtCO_2$ waveform and values.**
9. Confirm proper position by auscultation, chest movement and verification of $EtCO_2$ by capnography.
10. Insert appropriate size OG tube based on size selection chart and secure with tape.
11. Providers may continue to use approved patient transfer devices to assist in movement as needed.
12. **Once placement is verified, place a cervical collar prior to patient movement to ensure stability.**
13. **Once the airway is secured, ensure that the BVM mask travels with the patient at all times in case of BIAD failure.**
14. **Ventilations should be controlled at 8-10 per minute. Do not hyperventilate.**
15. **The Advanced Airway Form in the PCR must be completed with any BIAD use.**
17. **Document i-gel size, time, and result in the Flow Chart of the patient care report (PCR). Additionally, document all devices/methods used to confirm device placement and positive or negative lung sounds before and after every patient movement.**

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

Using the i-gel O_2 Resus Pack*

Preparation for use

1

Using the size guide in the grid to the right, choose the correct size of i-gel O_2 Resus Pack for your patient.

2

Open the packaging and remove the inner tray, setting the support strap, suction tubing and sachet of lubricant to one side and within easy reach. Remove the i-gel O_2.

3

Open the sachet of lubricant and place a small bolus on the inner side of the main shell of the packaging.

4

Lubricate the back, sides and front of the i-gel O_2 with a thin layer of water based lubricant. (Ensuring any excess is removed prior to insertion)

Insertion technique

5

Grasping the i-gel O_2 firmly along the bite block, place the patient in the 'sniffing the morning air' position (unless contraindicated) with the head extended and the neck flexed.

6

Position the device so that the i-gel O_2 cuff outlet is facing the patient. Introduce the leading soft tip into the mouth of the patient in the direction of the hard palate.

7

Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.

8

The tip of the airway should be located into the upper oesophageal opening (a), with the cuff located against the laryngeal framework (b). The incisors should be resting on the bite block (c).

9

Secure the device by sliding the strap underneath the patient's neck and attaching to the hook ring. Take care to ensure the strap is not secured too tight.

Alternatively the device can be secured by taping maxilla to mandible.

10

Now that the i-gel O_2 has been correctly prepared, inserted and secured, positive pressure ventilation can commence in accordance with applicable resuscitation guidelines.**

i-gel O_2™

i-gel O_2 size	Patient size	Patient weight guidance (kg)
3	Small adult	30-60
4	Medium adult	50-90
5	Large adult+	90+

Notes on insertion:

Insertion can be achieved in **less than five seconds.**

Sometimes a feel of 'give-way' is felt before the end point resistance is met. This is the due to the passage of the bowl of the i-gel O_2 through the faucial pillars. It is important to continue to insert the device until a **definitive resistance** is felt.

Once correct insertion is achieved and the teeth are located on the integral bite block, **do not** repeatedly push down or apply excessive force during insertion.

No more than three attempts on one patient should be attempted.

It is not necessary to insert fingers or thumbs into the patient's mouth during the insertion process.

www.i-gel.com/igel-o2-resus

T: 0118 9656 300

info@intersurgical.com

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Quality, innovation and choice

Procedure 7 (page 3 of 4)

Blind Insertion Airway Device (BIAD)
i-Gel

Weight Ranges with two colors (yellow and green) may use either iGel3 or iGel4

Male			Female		
Height	Ideal Weight Lbs.	Ideal Weight Kg	Height	Ideal Weight Lbs.	Ideal Weight Kg
4'6"	77	35	4'6"	77	35
4'7"	84	38	4'7"	83	38
4'8"	90	41	4'8"	88	40
4'9"	97	44	4'9"	94	43
4'10"	103	47	4'10"	99	45
4'11"	110	50	4'11"	105	48
5'0"	117	53	5'0"	110	50
5'1"	123	56	5'1"	116	53
5'2"	130	59	5'2"	121	55
5'3"	136	62	5'3"	127	58
5'4"	143	65	5'4"	132	60
5'5"	150	68	5'5"	138	63
5'6"	156	71	5'6"	143	65
5'7"	163	74	5'7"	149	68
5'8"	169	77	5'8"	154	70
5'9"	176	80	5'9"	160	73
5'10"	183	83	5'10"	165	75
5'11"	189	86	5'11"	171	78
6'0"	196	89	6'0"	176	80
6'1"	202	92	6'1"	182	83
6'2"	209	95	6'2"	187	85
6'3"	216	98	6'3"	193	88
6'4"	222	101	6'4"	198	90
6'5"	229	104	6'5"	205	93
6'6"	235	107	6'6"	209	95
6'7"	242	110	6'7"	216	98
6'8"	249	113	6'8"	220	100
6'9"	255	116	6'9"	227	103
6'10"	262	119	6'10"	231	105
6'11"	268	122	6'11"	238	108

3 3 4 4 5 5

Blind Insertion Airway Device (BIAD) King LT

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.
- ✱ A situation in which it is more appropriate to utilize a King airway due to patient access or expected difficulty with intubation.
- ✱ Patient must be unconscious.

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Procedure:

1. Preoxygenate the patient. Do not hyperventilate.
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. **Utilize inflation chart. DO NOT OVER INFLATE.**
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 capnography and breath sounds. If unsure of placement, remove airway device and ventilate with BVM / OPA.**
11. Secure airway with commercial device or tape, then place a cervical collar.
12. Once the airway is secured, ensure that the BVM mask travels with the patient at all times in case of BIAD failure.
13. **Airway should be monitored continuously through waveform capnography ($EtCO_2$) and pulse oximetry (SpO_2).**
14. Ventilations should be controlled at 8-12 per minute. Do not hyperventilate.
15. An Advanced Airway Form in the PCR must be completed with any BIAD use.
16. **Document King LT size, time, result, and placement location by the centimeter (cm) mark either at the patient's teeth or lips on the patient care report (PCR). Additionally, document all devices/methods used to confirm device placement and positive or negative lung sounds before and after every patient movement.**

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

Nasotracheal Intubation

A	Advanced EMT	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. Pre-medicate 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. Pre-oxygenate 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 $EtCO_2$ monitoring.**
11. Secure the tube. Place a cervical collar to help prevent dislodgement of 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. **It is required that the airway be monitored continuously through $EtCO_2$ waveform capnography and pulse oximetry.**
14. **It is required that the Advanced Airway Form in the PCR be completed with all intubations.**
15. **Document ET tube size, time, result, and placement location by the centimeter (cm) mark at the patient's nare on the patient care report (PCR) Flow Chart. Additionally, document all devices/methods used to confirm device placement and positive or negative lung sounds before and after every patient movement.**

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 Johnston County EMS System.

Endotracheal Intubation

A	AEMT	A
P	Paramedic	P

Clinical Indications:

* Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances may require a more advanced airway.
* An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.

Procedure:

1. Prepare, position, and oxygenate the patient with 100% oxygen.
2. Select proper ET tube (and stylette, if used), have suction ready.
3. Using laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).
4. Limit each intubation attempt to 30 seconds with BVM between attempts.
5. Visualize tube passing through vocal cords.
6. **Confirm and document tube placement using $EtCO_2$ 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. Consider using a Blind Insertion Airway Device if intubation efforts are unsuccessful.
10. After the tube is secure, place a cervical collar to help stabilize the patient's head and neck to prevent dislodgement of the tube.
11. **Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR) Flow Chart. Document all devices and procedures used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.**
12. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
13. **It is required that the airway be monitored continuously through $EtCO_2$ waveform capnography and pulse oximetry.** Obtain and record readings upon placement, after every patient movement, during transport, and upon arrival at the facility. If there is any doubt as to the placement of the ET tube, withdraw it immediately and begin BVM ventilations.
    * **Verify placement of the ETT after every patient move.**
14. **It is required that the Advanced Airway Form in the PCR be completed with all intubations**

Certification Requirements:

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

Video Laryngoscopy

A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

- Inability to adequately ventilate a patient with a Bag Valve Mask or Blind Insertion Airway Device (BIAD).
- 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. Evaluate the patient's airway status (LEMON, MONS, RODS, SHORT).
3. Prepare equipment while patient is being ventilated. Equipment includes video laryngoscope, alternative airway device, suction, gum elastic Bougie, etc.).
4. Continue to pre-oxygenate patient during procedure. Apneic oxygenation may continue with high-flow oxygen via a nasal cannula during the entire procedure.
5. Monitor oxygen saturation with pulse oximetry, waveform capnography with $EtCO_2$, and heart rhythm with ECG.
6. Use of Bougie device is preferred with both channeled and non-channeled blades.
7. Select the blade type (open or channeled) and open packaging.
8. Insert the display into the blade, listening for a 'click' and feel the display engage the blade.
9. Attach the recording device to the video laryngoscope display.
10. Turn the display ON; both the LED should illuminate GREEN and the video screen should display an image.
11. SKIP THIS STEP IF USING THE STANDARD BLADE. If using the channeled blade, slide a lubricated endotracheal tube through the channel to lubricate it.
12. Insert the video laryngoscope in to the patient's mouth midline. With very large patients you may have to enter the patient's mouth from the side while rotating to the midline. Watch for airway structures as you advance the laryngoscope. Place the tip of the blade into the vallecula, lifting upwards against the tissue. Always center the vocal cords in to the middle of the display screen.
    - The provider who is placing the endotracheal tube should hold the device lower and closer to the blade, rather than high up on the handle in the manner of a traditional laryngoscope blade. Upon entry into the patient's mouth, the blade should be held in a manner in which the paramedic's thumb touches the patient's lips.
    - The provider placing the endotracheal tube should exercise caution against 'rocking' the handle against the patient's teeth.
13. Pass the Bougie device or the endotracheal tube through the vocal cords confirming placement with the display. A second paramedic should be utilized to also visualize the passage of the tube through the vocal cords and proper placement of the endotracheal tube.

Video Laryngoscopy

14a. STANDARD BLADE- Remove the video laryngoscope from the patient's airway.

14b. CHANNELED BLADE- "PEEL" the endotracheal tube from the channel before removing the video laryngoscope from the patient's airway.

15. Verify the endotracheal tube placement through waveform capnography ($EtCO_2$), auscultation of stomach and lung fields, chest rise and fall, and pulse oximetry (SpO_2).

16. Secure the endotracheal tube with a commercial tube holding device (Thomas Tube Holder).

17. Reassess the endotracheal tube placement after every patient move and upon arrival at the receiving facility.

18. Consider placement of a gastric tube to evacuate stomach contents after the endotracheal tube has been secured.

19. **Documentation requirements-**

Endotracheal tube size, time, result (successful/ unsuccessful), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR) Flow Chart.

All devices and procedures used to confirm initial tube placement.

Positive or negative breath sounds before and after each movement of the patient.

EtCO2 values before and after endotracheal tube placement, as well as at regular intervals after endotracheal tube placement

When available, all patient care data must be transferred and imported into the PCR. If data transfer is not available, ECG strips with EtCO2 data should be printed, scanned, and attached to the PCR.

20. It is required that the airway be monitored continuously through EtCO2 waveform capnography and pulse oximetry.

Obtain and record readings upon placement, after every patient movement, during transport, and upon arrival at the facility.

21. If there is any doubt as to the placement of the ET tube, withdraw it immediately and begin BVM ventilations.

22. It is required that an Airway Evaluation Form be completed with all intubations.

23. Ensure that the video display device is not disposed of- only the actual intubation blade.

Special Note:

Per Johnston County EMS System (JCEMSS) standards, endotracheal intubation is not a first line airway maneuver in the management of a cardiac arrest; utilization of basic airway maneuvers (BVM or BVM/OPA/NPA), or the placement of a BIAD, has yielded better results in discharge to home from the hospital. Endotracheal intubation, in the setting of cardiac arrest, should be considered **only after other options have failed**.

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

Continuous Positive Airway Pressure (CPAP)

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical indications for Continuous Positive Airway Pressure (CPAP) use:

- CPAP is indicated in patients for whom inadequate ventilation is suspected This could be as a result of pulmonary edema, pneumonia, COPD, asthma, etc. In asthmatic patients, continuous monitoring is required to reduce the risk of respiratory depression or arrest.

Clinical contraindications for Continuous Positive Airway Pressure (CPAP) use:

- Decreased Mental Status.
- Hypotension
- Facial features or deformities that prevent an adequate mask seal.
- Excessive respiratory secretions.

Procedure:

1. Assemble the equipment and ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Place a nasal-type $EtCO_2$ sensor over the patient's face prior to applying the CPAP face mask.
5. Choose the appropriate PEEP setting-
   - 5 – 10 cmH_20 for Pulmonary Edema, Near Drowning, possible aspiration or pneumonia
   - 5 cm H_20 for COPD or Asthma.
6. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
7. Secure the mask with provided straps until minimal air leak occurs, using the least amount of pressure to make a seal.
8. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
9. Titrate oxygen levels to the patient's response. Many patients respond to low FiO_2 (30- 50%).
10. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for optimal use of the CPAP device.
11. Monitor the patient's condition for improvement, including respiratory rate, mental status, and SpO_2.
    - If the patient's condition is improving continue to monitor.
    - If the patient's condition is not improving, adjust the PEEP setting.
12. Document time and response on patient care report (PCR) Flow Chart.

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 Johnston County EMS System.

Cricothyrotomy (Quick Trach)

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
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 $EtCO_2$ detector, then the connecting tube to the $EtCO_2$ detector and connect the other end to the BVM.
14. Confirm placement with the use of breath sounds, pulse ox, and $EtCO_2$.
15. Ensure 100% FiO_2 to BVM via supplemental O_2.
16. Document the time the procedure was performed, the indications, and the patient's response in the patient care report (PCR) Flow Chart. Complete the Advanced Airway Form 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 Johnston County EMS System.

Cricothyrotomy (Surgical)

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
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. Prep area with betadine if possible.
5. Attach a 5-cc syringe to an 18G – 1½" needle.
6. Insert the needle (with syringe attached) perpendicularly through the cricothyroid membrane with the needle directed posteriorly.
7. 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 advanced the needle any further attach forceps and remove syringe.
8. With the needle remaining in place, make a 1" 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.
9. With the needle still in place, make a horizontal stabbing incision approx. ½" through the membrane on each side of the needle. Remove the needle.
10. Using a skin hook, tracheal hook, or gloved finger to maintain surgical opening, insert the Bougie and place the cuffed tube into the trachea. (Cric tube from the kit or a #6 endotracheal tube is usually sufficient.)
11. Inflate the cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube.
12. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, $EtCO_2$, etc.). Esophageal bulb devices are not accurate with this procedure.
13. Secure the tube.
14. Apply $EtCO_2$ and record continuous readings throughout the call including before and after patient handoff at the receiving facility.
15. Document ETT size, time, result, and placement location. Document all devices used to confirm initial tube placement and after each movement of the patient.
16. Consider placing an NG or OG tube to clear stomach contents after the airway is secured.
17. It is strongly recommended that the airway be monitored continuously through $EtCO_2$ and SPO2.
18. Document the time the procedure was performed, the indications, and the patient's response in the patient care report (PCR) Flow Chart. Complete the Advanced Airway Form 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 Johnston County EMS System.

Endotracheal Tube Introducer (Bougie)

A	Advanced EMT	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 endotracheal tube (ETT) size less than 6.5 mm

Procedure:

1. Prepare, position and oxygenate the patient with 100% oxygen;
2. Select proper ETT without stylet, test cuff, and prepare suction;
3. Lubricate the distal end and cuff of the ETT and the distal 1/2 of the Endotracheal Tube Introducer (Bougie) (note: failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT);
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick's/BURP as needed;
5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized;
6. Once inserted, gently advance the Bougie until you meet resistance or "hold-up" **(if you do not meet resistance you have a probable esophageal intubation and insertion should be 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 ETT until you have hold-up again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie;
9. While maintaining a firm grasp on the proximal Bougie, introduce the ETT over the Bougie passing the tube to its appropriate depth;
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 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 ETT 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 ETT, reassess breath sounds, apply $EtCO_2$ monitor, and record and monitor readings to assure continued tracheal intubation.
14. Document use of the Bougie in the Flow Chart of the PCR as a General Comment to indicate the time of the procedure with the results.

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

Tracheostomy Tube Change

A	Advanced EMT	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 Johnston County EMS System. Assessment for this skill should include direct observation at least once per certification cycle.

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 through $EtCO_2$ 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.
11. If at all possible, if the patient being transported on a ventilator is being transferred from another ambulance, the personnel familiar with the ventilator should accompany the JCEMSS ambulance.

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 Johnston County EMS System.

Foreign Body Airway Obstruction

	EMR	
B	EMT	B
A	Advanced EMT	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 may clutch his/her neck in the universal choking sign.

2. **For an infant**, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.

3. **For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.

4. **For adults**, a combination of maneuvers may be required.
   * First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
   * If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in morbidly obese patients and in the patients who are in the late stages of pregnancy

5. If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.

6. **Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**

7. In unresponsive patients, EMT-Intermediate and EMT-Paramedic level professionals should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magil forceps.

8. Document the methods used and result of these procedures in the patient care report (PCR) as a General Comment in the Flow Chart to indicate the time of the procedure and results.

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 Johnston County EMS System.

Nebulizer Inhalation Therapy

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

* Patients experiencing bronchospasm.

Procedure:

1. Gather the necessary equipment.

2. Assemble the nebulizer kit and explain the procedure to the patient as you assemble the nebulizer. Utilize the nebulizer mask with the nebulizer as this ensures that the patient receives more of the medication, especially while talking/answering questions.

3. Instill the premixed drug (such as Albuterol or other approved drug) into the reservoir well of the nebulizer.

4. Apply a nasal cannula type $EtCO_2$ sensor to the patient prior to applying the nebulizer mask.

5. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.

6. Instruct the patient to inhale normally through the mask of the nebulizer.

7. 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.

8. 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, SpO_2, $EtCO_2$, and breath sounds.

9. Document the treatment, dose, route, and any changes in patient's condition in the patient care report (PCR) Flow Chart.

10. The administration of nebulized medications may also be accomplished during CPAP administration. During treatment utilizing portable oxygen sources, the nebulizer must be operated from an oxygen source separate from CPAP.

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 Johnston County EMS System.

Impedance Threshold Device (ITD)
(Res-Q-Pod®)

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

- The ITD should be utilized to assist with control of ventilatory rate and improve cardiac preload for patients who are receiving CPR.
- It may be utilized with an endotracheal tube, BIAD or with a BVM.

Contraindications:

- The ITD should not be utilized for patients who have spontaneous respirations. It should be removed from the endotracheal tube/BIAD/BVM once spontaneous respirations have returned.

Procedure:

1. Ensure airway is adequate per airway/failed airway protocol.

2. Place the ITD between the $EtCO_2$ detector and ET tube (for intubated patients), between the $EtCO_2$ detector and BIAD (for patients being ventilated with a BIAD), or between the BVM and mask (for patients ventilated with the BVM with or without an OPA).

3. Move the switch to the “on” position so that the respiratory timing lights flash.

4. Provide a steady ventilation after each flash of the LED timing lights.

5. Perform chest compressions per the CPR procedure.

6. Once there is return of spontaneous circulation and the $EtCO_2$ climbs above 40, remove the ITD. Allow the $EtCO_2$ value to control your respiratory rate (bag faster if $EtCO_2$ >50, bag slower if EtCO2 <30). The ITD should also be removed if the patient has spontaneous respirations.

7. Upon removal of the ITD for a patient who regains spontaneous circulation but still must be ventilated, maintain the ITD close by in case of re-arrest, as well as to continue to utilize the respiratory timing lights.

8. Carefully monitor the placement of the endotracheal tube after movement of the patient, placement of the ITD, and/or removal of the ITD.

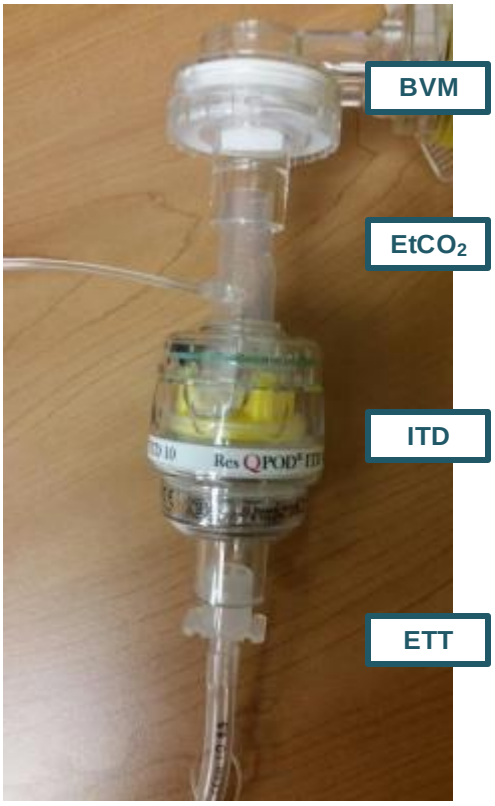
9. Document the procedure and results in the Patient Care Report (PCR).

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 Johnston County EMS System.

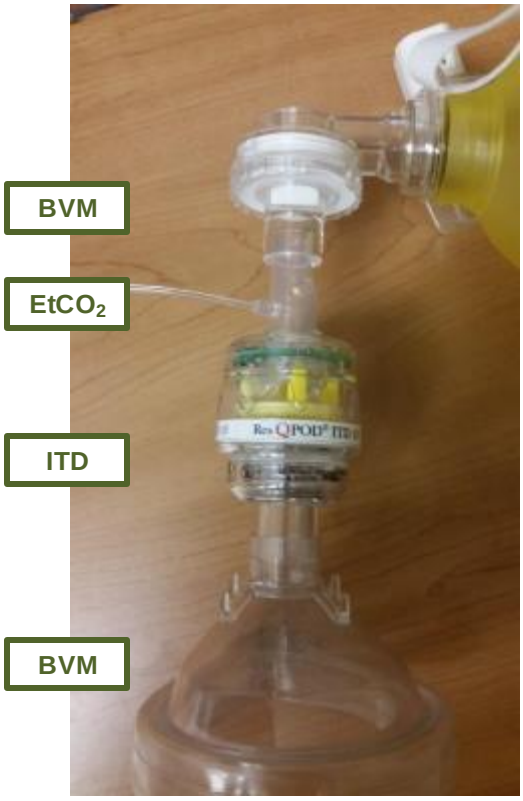
Impedance Threshold Device (ITD)
(Res-Q-Pod®)

ITD with ETT



ITD with BIAD

ITD with BVM



Chest Decompression

Clinical Indications:

P Paramedic P

- Patients with hypotension (SBP <90), clinical signs of shock, and at least one of the following signs:
  - Jugular vein distention.
  - Tracheal deviation away from the side of the injury (often a late sign).
  - Absent or decreased breath sounds on the affected side.
  - Hyper-resonance to percussion on the affected side.
  - Increased resistance when ventilating a patient.
- 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.
   - If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.
   - Prepare the site with providone-iodine ointment or solution, or similar solution.
4. Pass the chest decompression needle/catheter through a finger cut from an exam glove prior to insertion. 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 or a saline lock.)
5. Insert the catheter (14 gauge x 3.25 inch for adults, 18 gauge x 1.25 inch for peds) into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.
6. 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. NOTE: Due to ambient noise, the escape of air through the catheter may not be heard. A 10cc syringe filled with 5cc of normal saline may be attached to the catheter, prior to insertion, and the escape of air from the chest cavity will cause air bubbles to be visible in the syringe.
7. Remove the needle, leaving the plastic catheter in place.
8. Secure the catheter hub to the chest wall with rolled / folded dressings and tape.
9. Document the procedure, time, indications, and the patient's response to the procedure in the patient care report (PCR) Flow Chart.

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 Johnston County EMS System. Assessment should include direct observation once per certification cycle.

Pulse Oximetry

Clinical Indications:

- Patients with suspected hypoxemia.
- Assessment of blood oxyhemoglobin

B	EMT	B
A	Advanced EMT	A
P	EMT- P	P

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. If this data is not transferred from the monitor into the PCR, record time and initial saturation percent in the Vital Signs. If at all possible as not to compromise patient care, document a 'room air' reading if possible in the patient care report (PCR). That this is a 'room air' reading needs to be clarified as a General Comment in the Flow Chart.

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%. If below 94%, suspect a respiratory compromise.

8. Use 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. Supplemental oxygen is not required if the oxyhemoglobin saturation is ≥94%, unless there are obvious signs of heart failure, dyspnea, or hypoxia.

10. Factors which may reduce the reliability of the pulse oximetry reading include:

   a. Poor peripheral circulation (blood volume, hypotension, hypothermia)
   b. Excessive pulse oximeter sensor motion
   c. Fingernail polish (may be removed with acetone pad)
   d. Carbon monoxide bound to hemoglobin
   e. Irregular heart rhythms (atrial fibrillation, SVT, etc.)
   f. Jaundice
   g. 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 Johnston County EMS System.

This procedure has been altered from the original NCCEP Procedure by the Johnston County EMS System Medical Director

Advanced Airway Suctioning

A	Advanced EMT	A
P	EMT- P	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 nasotracheal tube, endotracheal tube, King LT airway, tracheostomy tube, or a cricothyrotomy tube.

Procedure:

1. Ensure suction device is in proper working order.

2. Preoxygenate the patient as is possible.

3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.

4. Using the suprasternal notch and the end of the airway, 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 Johnston County EMS System.

Basic Airway Suctioning

B	EMT	B
A	Advanced EMT	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. Pre-oxygenate the patient as is possible.

3. Explain the procedure to the patient if they are coherent.

4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.

5. If applicable, remove ventilation devices from the airway.

6. Use the suction device to remove any secretions, blood, or other substance.

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 Johnston County EMS System.

Adult Assessment

	EMR	
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

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

Procedure:

1. Scene size-up, including universal precautions, scene safety and environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction. Scene size-up is an ongoing process and EMS providers should maintain situational awareness.

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's needs.

6. Perform a focused history and physical examination 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. All procedures and medication administrations should be listed in the Flow Chart, along with clarifications, which would be listed as a General Comment.

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 Johnston County EMS System.

Pain Assessment and Documentation

	EMR
B	EMT
A	Advanced EMT
P	Paramedic

Clinical Indications:

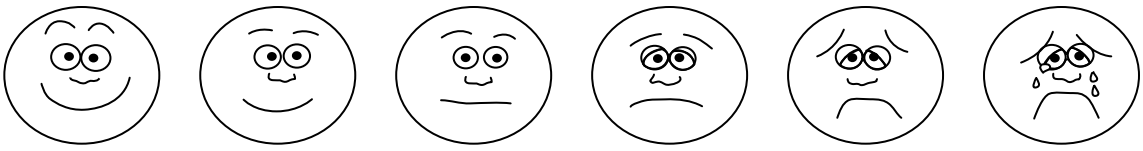
- Any patient with pain.

Definitions:

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective and is based upon the patient's perspective, i.e. 'whatever the patient says it is'.

Procedure:

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



0	2	4	6	8	10
No hurt	Hurts little bit	Hurts little more	Hurts even more	Hurts whole lot	Hurts worst

From Hockenberry MJ, Wilson D, Winkelstein ML: Wong's Essentials of Pediatric Nursing, ed. 7, St. Louis, 2005, p. 1259. Used with permission. Copyright, Mosby.

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

CATEGORIES	SCORING		
	0	1	2
FACE	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested.	Frequent to constant quivering chin, clenched jaw.
LEGS	Normal position or relaxed.	Uneasy, restless, tense.	Kicking, or legs drawn up.
ACTIVITY	Lying quietly, normal position moves easily.	Squirming, shifting back and forth, tense.	Arched, rigid or jerking.
CRY	No cry, (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints.
CONSOLABILITY	Content, relaxed.	Reassured by occasional touching hugging or being talked to, distractable.	Difficulty to console or comfort

Certification Requirements:

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

Pediatric Assessment

	EMR	
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

* Any child that can be measured with the Broselow-Luten Resuscitation Tape or similar color coded measuring device.

Procedure:

1. Scene size-up, including universal precautions, scene safety and environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction. Scene size-up is an ongoing process and EMS providers should maintain situational awareness.

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. Initiate spinal precautions if suspicious of spinal injury

4. Establish responsiveness appropriate for age (AVPU, GCS, etc.)

5. Using the Broselow-Luten or similar, color coded tape, establish a weight-size for the patient.

6. Assess disability (pulse, motor function, sensory function, papillary reaction)

7. Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.

8. Record vital signs (BP > 3 years of age, cap refill < 3 years of age)

9. Include immunizations, allergies, medications, past medical history, last meal, and events leading up to injury or illness where appropriate.

10. Treat chief complaint as per protocol.

11. **Drug dosing will be accomplished using the Johnston County EMS System Pediatric Drug Dosing Chart and NOT the Broselow-Luten tape drug dosages.**

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 Johnston County EMS System.

Blood Glucose Analysis

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

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

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick.
3. Explain the procedure to the patient.
4. Cleanse and prep the site; ensure that the site is dry.
5. Obtain a venous blood sample by piercing the skin with a lancet.
6. Place correct amount of blood on the reagent strip.
7. Document the glucometer reading and treat the patient as indicated by the analysis, presentation, and protocol.
8. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
9. Check for continued bleeding and apply an adhesive dressing over the test site.
10. 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.
11. Blood glucose readings have been shown to be inaccurate in cardiac arrest situations and blood glucose analysis should be deferred until after circulation has been restored.

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 Johnston County EMS System.

Capnography

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

- Capnography shall be utilized with all invasive airway procedures including endotracheal and/or nasotracheal intubation, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography should also be used with CPAP.
- Capnography should also be used on all patients experiencing respiratory distress, any patient treated under the cardiac, seizure, trauma, hypotension, and diabetic protocols, and any patient who has received opioids for pain management.

Precautions:

- In low perfusion states, such as cardiac arrest, carbon dioxide (CO_2) will not wash out through the lungs as it would normally and provides a low $EtCO_2$ reading unless adequate CPR is being performed.
- A patient that has recently consumed carbonated beverages may cause a false positive reading if ventilation is attempted through a tube placed in the esophagus – this will also be short lived.
- $EtCO_2$ should always be used in conjunction with other assessments for endotracheal tube placement, such as lung sounds, chest rise, absence of gastric sounds, tube fogging, and pulse oximetry.

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or as a nasal type sensor.
2. Note $EtCO_2$ level and waveform changes. These will be documented on each patient as listed in the Clinical Indications listed above.
3. The capnography sensor shall remain in place with the patient and be monitored throughout the prehospital care and transport.
4. Any loss of CO_2 detection or waveform indicates an airway/perfusion 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 Johnston County EMS System.

Cincinnati Prehospital Stroke Screen

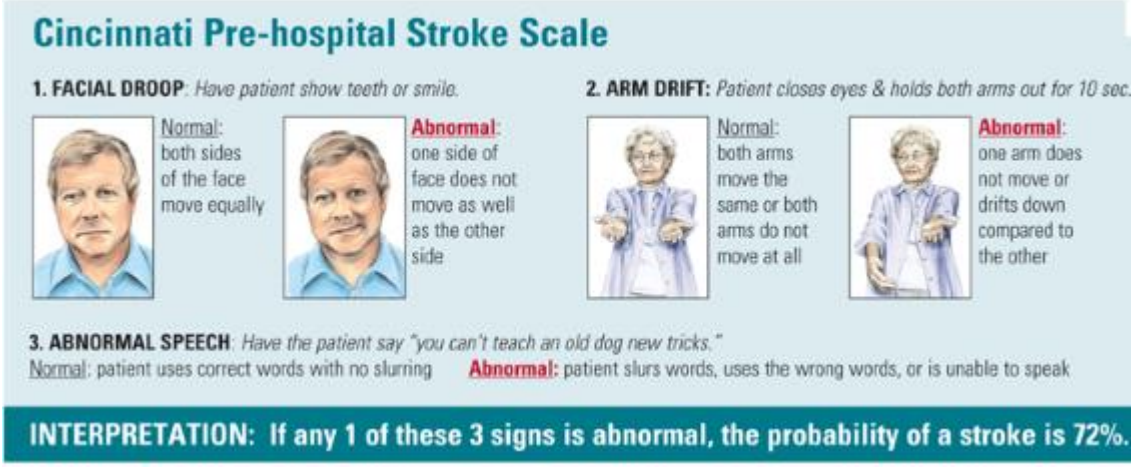
	EMR	
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

- Suspected Stroke Patient

Procedure:

1. Assess and treat suspected stroke patients as per protocol.
2. The Cincinnati Stroke Screen should be completed for all suspected stroke patients.
3. Establish the **"Last Known Well"** (LKW) time for the patient. This will be presumed time of onset. If the patient woke up with signs/symptoms, then the time the patient went to sleep will be considered as the LKW time. LKW is expressed as a specific time, not a period of time, i.e. As "14:45", not "45 minutes ago". LKW must be documented in the PCR Flow Chart and in the specialty stroke page.
4. Perform the screen through physical exam:
   - Look for facial droop by asking the patient to smile.
   - Assess for decreased hand grip strength on one side.
   - Have patient, while sitting upright or standing, extend both arms parallel to floor, close eyes and turn their palms upward. Assess for unilateral drift of arm.
5. One of these exam components must be positive to answer "yes" on the screening form.
6. Evaluate blood glucose level results
7. **If the "Last Known Well" time is less than 24 hours, blood glucose is between 60 and 400, and at least one of the physical exam elements is positive, follow the Johnston County EMS System Suspected Stroke Protocol and Destination Plan, alerting the receiving hospital of a possible stroke patient as early as possible.**
8. All sections of the Cincinnati screen must be completed
9. The completed Stroke Screening procedure should be documented 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 Johnston County EMS System.

Orthostatic Blood Pressure Measurement

	EMR	
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization.
- Patients ≥ 8 years of age, or patients larger than the Broselow-Luten tape
- Orthostatic Vital Signs are not sensitive nor specific for volume loss/dehydration and may include syncope in some cases. Assessment of orthostatic vital signs are not routinely recommended.

Procedure:

1. Gather and prepare standard sphygmomanometer and stethoscope, or utilize an automatic sphygmomanometer.
2. With the patient supine, obtain pulse and blood pressure.
3. Have the patient sit upright.
4. After 30 seconds, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 30 mmHg or the pulse rises more than 20 bpm, the patient is considered to be orthostatic.
6. If a patient experiences dizziness upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic examination should be omitted and fluid resuscitation initiated.
7. Document the results and resultant treatments 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 Johnston County EMS System.

Temperature Measurement

	EMR	
B	EMT	B
A	Advanced EMT	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 Johnston County EMS System.

Paramedic Wellness Check

P Paramedic P

Indications:

* When patient safety needs to be ensured for patients who are evaluated by paramedics for presumed non-urgent situations and not initiated by 911. This includes patients who are referred by other EMS providers, those identified by query of patient records, and those referred by external entities.

Contraindications:

* Any patient for whom an emergency medical condition exists that would normally be treated under standards Johnston County EMS System protocols, policies, and procedures.

Procedure:

1. Ensure scene safety and at all times make Central aware of your location. When possible remain available for dispatch to 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.
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. Paramedics 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 two consecutive blood glucose measurements above 300 should contact their primary care physician within 24 hours. A phone call follow up by the paramedic 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 concerns over falls prevention, ensure there are no loose rugs, handrails are present on all steps and restroom facilities have available handrails and slip resistant surfaces in showers/bath tubs. If these items are needed, note this in the patient call report (PCR).
9. For pediatric asthma patients, assure medications are available. If smoking in 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 Johnston County EMS System.

Decontamination

	EMR	
B	EMT	B
A	Advanced EMT	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. **Manage patients for hypothermia after decontamination.**

6. Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personal affects for law enforcement.

7. Monitor all patients for environmental illness.

8. Treat and transport patients per applicable 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 Johnston County EMS System.

CNS Epidural Catheter Maintenance

P Paramedic P

Clinical Indications:

* Presence of an epidural catheter in a patient requiring transport

Procedure:

1. Prior to transport, ensure catheter is secure and that transport personnel are familiar with medication(s) being delivered and devices used to control medication administration.
2. No adjustments in catheter position are to be attempted.
3. No adjustments in medication dosage or administration are to be attempted without direct approval from on-line medical control.
4. Report any complications immediately to on-line medical control.
5. Document the time and dose of any medication administration or rate adjustment in the patient care report (PCR) Flow Chart.

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 Johnston County EMS System.

CNS Ventricular Catheter Maintenance

Clinical Indications:

P Paramedic P

* Transport of a patient with an intra-ventricular catheter in place

Procedure:

1. Prior to transport, ensure the catheter is secure.
2. Prior to transport, determine from the referring hospital/physician the desired patient position (e.g., supine, head of bed elevated 30 degrees, etc.).
3. Prior to transport, determine the height at which the drain is to be maintained, given the patient position desired from #2 above (if applicable).
4. Do not manipulate or move the drain.
5. If the patient or height of the drain is altered, immediately correct based on the pre-determined configuration in step 2 and 3 above.
6. Report any problems immediately to on-line medical control.
7. Document the time and any adjustments or problems in the patient care report (PCR) Flow Chart.

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 Johnston County EMS System.

Gastric Tube Insertion

P Paramedic P

Clinical Indications:

- Gastric decompression in intubated patients. Do not administer charcoal via an NG tube.

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 unconscious, intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred.
5. Continue to advance the tube gently until the appropriate distance is reached.
6. Confirm placement by injecting 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) as a General Comment.

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 Johnston County EMS System.

Intranasal Medication Administration

	EMR	
B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

* When medication administration is necessary and the medication must be given via the IN route or as an alternative route in selected medications.

Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Verify that you have the proper medication, in the proper concentration, that the medication is in date, and that the medication is safe for IN administration.
3. Prepare equipment and medication, expelling excess air from the syringe. Attach the MAD device to the syringe.
4. Explain the procedure to the patient and reconfirm patient allergies.
5. Place the MAD device gently but firmly against the nasal opening.
   * Injection volume should not exceed 1-2 cc.
6. Depress the syringe briskly to administer the medication.
7. Withdraw the syringe and MAD device and dispose of properly.
8. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
9. Document the medication, dose, route, and time on/with the patient care report (PCR).

Certification Requirements:

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

Intramuscular and Subcutaneous Medication Administration

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

- When medication administration is necessary and the medication must be given via the IM or SQ route.

Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Verify that you have the proper medication, in the proper concentration, that the medication is in date, and that the medication is safe for IM/SQ administration.
3. Prepare equipment and medication expelling air from the syringe.
4. Explain the procedure to the patient and reconfirm patient allergies.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.
   - Injection volume should not exceed 1 cc for the arm
   - Injection volume should not exceed 2 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
7. Expose the selected area and cleanse the injection site with alcohol.
8. If administering medication from a pre-filled syringe (e.g. naloxone)-
   a. Attach a suitable needle to the syringe,
   b. Expel excess air from the syringe.
9. If administering medication that must be withdrawn from a vial (e.g. diphenhydramine)-
   a. Remove the vial's protective cap and clean the withdrawal site with an alcohol prep,
   b. Attach a suitable needle onto the syringe,
   c. Draw the same volume of air into the syringe as is to be withdrawn from the vial,
   d. Insert the needle/syringe into the top of the vial, inject the air, and withdraw the desired medication amount.
   e. Expel excess air from the syringe.
10. If administering medication that must be withdrawn from an ampule (e.g. epinephrine 1:1,000)-
    a. Ensure that the medication is in the main body of the ampule,
    b. Grasp the tip of the ampule in a gauze pad and gently break the tip from the main body,
    c. Utilizing a filter/filtered needle, withdraw the desired medication into the syringe,
    d. Remove and properly dispose of the filter/filtered needle (**without recapping the needle**),
    e. Attach a suitable needle to the syringe.
11. Insert the needle into the skin with a smooth, steady motion

    SQ: 45-degree angle skin pinched **IM: 90-degree angle skin flattened**

12. Aspirate for blood
13. Inject the medication.
14. Withdraw the needle/syringe quickly and **dispose of properly without recapping**.
15. Apply pressure to the site and apply an adhesive dressing.
16. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
17. Document the medication, dose, route, and time on/with the patient care report (PCR).

Certification Requirements:

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

Intravenous and Intraosseous Medication Administration

A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

* When medication administration is necessary and the medication must be given via the IV or IO route.

Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Verify that you have the proper medication, in the proper concentration, that the medication is in date, and that the medication is safe for IV/IO administration.
3. Prepare equipment and medication.
4. Explain the procedure, if possible, to the patient and reconfirm patient allergies.
5. If administering medication from a pre-filled syringe (e.g. epinephrine 0.1 mg/kg (1:10,000))-
   a. Clean the injection port with an alcohol prep pad,
   b. Expel excess air from the syringe,
   c. Attach the syringe to the injection port,
   d. Depress the syringe to administer the medication into the IV/IO access,
   e. Detach the syringe from the access port and dispose of properly,
   f. Dispose of the syringe properly,
   g. Monitor the IV/IO site for infiltration into the surrounding tissue.
6. If administering medication that must be withdrawn from a vial (e.g. diphenhydramine)-
   a. Remove the protective cap and clean the withdrawal site with an alcohol prep,
   b. Draw the same volume of air into the syringe as is to be withdrawn from the vial,
   c. Insert the needle into the vial and depress the syringe to inject the air into the vial,
   d. Withdraw the amount of medication needed into the syringe,
   e. Remove the needle from the syringe and **dispose of it properly without recapping**,
   f. Attach the syringe to the needleless port and inject the medication,
   g. Dispose of the syringe properly,
   h. Monitor the IV/IO site for infiltration into the surrounding tissue.
7. If administering medication that must be withdrawn from an ampule (e.g. epinephrine 1 mg/kg (1:1,000))-
   a. Ensure that the medication is in the main body of the ampule,
   b. Grasp the tip of the ampule in a gauze pad and gently break the tip from the main body,
   c. Utilizing a filter/filtered needle, withdraw the desired medication into the syringe,
   d. Remove and properly dispose of the filter/filtered needle (without recapping the needle),
   e. Attach the syringe to the needleless port and inject the medication,
   f. Dispose of the syringe properly,
   g. Monitor the IV/IO site for infiltration into the surrounding tissue.
8. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
9. Document the medication, dose, route, and time on/with the patient care report (PCR) Flow Chart. Complications should be listed as a General Comment in the Flow Chart.

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 Johnston County EMS System.

Spinal Care Precautions

B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

- Need for spinal precautions as determined by protocol.
- Long spine boards (LSB) have both risks and benefits for patients and have not been shown to improve outcomes. The best use of the LSB may be for extricating the unconscious patient or providing a firm surface for compressions. However, several devices may be appropriate for patient extrication and movement, including the scoop stretcher.
- Utilization of the LSB should occur in consideration of the individual patient's benefit vs. risk.
- Patients who should receive spinal care precautions include: blunt trauma and distracting injury, intoxication, altered mental status, or neurologic complaint (e.g. numbness or weakness), and non-ambulatory blunt trauma patients with spinal pain, tenderness, or spinal deformity.
- Patients with penetrating trauma and no evidence of spinal injury do not require spinal immobilization. Patients who are ambulatory at the scene of blunt trauma (.i.e. motor vehicle crash) in general do not require placement on a LSB, and may or may not require c-collar and spinal precautions.
- Placement of a patient on a LSB, scoop stretcher, or other device does not indicate that the patient must remain on that device during transport, except in the case of an unresponsive blunt trauma patient and an unresponsive post-ROSC patient.
- Whether or not a LSB is utilized, spinal precautions are STILL VERY IMPORTANT in patients at risk for spinal injury. Adequate spinal precautions may be achieved by placement of a hard cervical collar and ensuring that the patient is secured tightly to the stretcher, ensuring minimal movement and patient transfers, and manual in-line stabilization during any transfers.

Procedure:

After reviewing the scene size-up, the history of present illness, and the physical exam, the provider will choose the most appropriate method from the following four techniques:

A. Spinal Precautions using a Long Spine Board

1. Gather a backboard, straps, cervical collar appropriate for patient's size, tape, and head blocks / rolls. In the setting of potential hypothermia, a blanket should be folded and secured to the long spine board via tape as to provide a barrier between the patient and the long spine board.

2. Explain the procedure to the patient.

3. Place the patient in an appropriate and **properly sized** cervical collar while maintaining in-line stabilization of the cervical spine. This stabilization, to be provided by a second provider, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first provider applied the collar.

4. Once the collar is secure, the second provider should still maintain his / her position to ensure stabilization.

5. Place the patient on a long spine board with the lift-and-slide or log-roll technique if the patient is supine or prone. For the patient in a vehicle or otherwise unable to be placed prone or supine, place him / her on a backboard by the safest method available that allows maintenance of in-line spinal stability while preventing excessive movement.

6. Stabilize the patient with appropriate straps and head blocks / rolls and tape. Once the head is secured to the backboard, the second provider may release manual in-line stabilization.

7. Some patients, often due to size or age, will not be able to be immobilized through in-line stabilization with a cervical collar. Never force a patient into a non-neutral position. Such situations may require a second provider, pillows, and / or folded blankets to maintain manual stabilization.

8. Upon placement on the cot, the providers should remove the long spine board from under the patient by an appropriate means. Maintain manual alignment of the head during this process. Head blocks / rolls should be replaced on each side of the patient's head and secured with tape and appropriate straps placed to secure the patient to the stretcher. If appropriate in the provider's judgment, the back of the stretcher may be adjusted for the patient's comfort.

9. Document the procedure in the patient call report. Documentation should include an assessment of the patient's peripheral neurological status before and after the procedure.

B. Spinal Precautions using a Scoop Stretcher

1. Gather a scoop stretcher, straps, cervical collar appropriate for patient's size, tape, and head blocks / rolls. In the setting of potential hypothermia, a blanket should be folded and secured to each section of the scoop stretcher via tape as to provide a barrier between the patient and the scoop stretcher.

2. Explain the procedure to the patient

3. Place the patient in a **properly sized** cervical collar while maintaining in-line stabilization of the cervical spine. This stabilization, to be provided by a second provider, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first provider applied the collar.

4. Once the collar is secure, the second provider should still maintain his/her position to ensure stabilization.

5. Unlatch the two sides of the scoop stretcher, place them on either side of the patient, adjust them to the appropriate size, and then slide them together underneath the patient, making sure that all latches are secured.

6. Stabilize the patient with appropriate straps and head blocks / rolls and tape. Once the head is secured to the scoop stretcher, the second provider may release manual in-line stabilization

7. Some patients, often due to size or age, will not be able to be immobilized through in-line stabilization with a cervical collar. Never force a patient into a non-neutral position. Such situations may require a second provider, pillows, and / or folded blankets to maintain manual stabilization.

8. The scoop stretcher may be placed on the ambulance cot, and then unlatched and removed, allowing the patient to rest directly on the ambulance stretcher mattress.

9. Secure the patient to the ambulance cot with appropriate straps and head blocks / rolls placed on each side of the patient's head in preparation for transport. If appropriate in the provider's judgment, the back of the stretcher may be adjusted for the patient's comfort.

10. Document the procedure in the patient call report. Documentation should include an assessment of the patient's peripheral neurological status before and after the procedure.

C. Spinal Precautions using a Kendrick Extrication Device

1. Gather a KED and a cervical collar appropriate for patient's size. Additionally, the curvature of the patient's spine may result in a significant void between the patient's upper spine, neck, and head, therefore sufficient padding may also be required. This maybe be fashioned from folded blankets and / or towels.

2. Explain the procedure to the patient.

3. Place the patient in a **properly sized** cervical collar while maintaining in-line stabilization of the cervical spine. This stabilization, to be provided by a second provider, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first provider applied the collar.

4. Once the collar is secure, the second provider should still maintain his/her position to ensure stabilization.

5. Apply and secure the KED. The patient may then be secured to a long spine board or scoop stretcher for transfer to the ambulance cot.

6. Secure the patient to the ambulance stretcher in preparation for transport. Upon placement on the ambulance cot, the providers should remove the KED and long spine board, first by releasing the KED and sliding it from under the patient towards the feet or head, and then remove the long spine board by an appropriate means. Maintain manual alignment of the head during this process. After the KED and long spine board have been removed, head rolls / blocks should be placed on each side of the patient's head and secured with tape and appropriate straps placed to secure the patient to the stretcher. If appropriate in the provider's judgment, the back of the stretcher may be adjusted for the patient's comfort.

7. Some patients, often due to size or age, will not be able to be immobilized through in-line stabilization with a cervical collar. Never force a patient into a non-neutral position to immobilize him/her. Such situations may require a second provider to maintain manual stabilization.

8. Document the procedure in the patient call report. Documentation should include an assessment of the patient's peripheral neurological status before and after the procedure.

D. Spinal Precautions using a Cervical Collar and Ambulance Stretcher

1. Gather a cervical collar appropriate for patient's size.

2. Explain the procedure to the patient.

3. Document the procedure in the patient call report. Documentation should include an assessment of the patient's peripheral neurological status before and after the procedure.

D. Spinal Precautions using a Cervical Collar and Ambulance Stretcher

1. Gather a cervical collar appropriate for patient's size.

2. Explain the procedure to the patient.

3. Place the patient in a **properly sized** cervical collar.

4. Once the cervical collar is secure, the patient should self extricate to a standing position, move to an appropriate position with assistance (if needed), and be allowed to sit down on the ambulance cot and move into a position of comfort. Providers should / may assist in limiting movement of the spine during this process.

5. A patient who is permitted to 'self-extricate' with a cervical collar in place does not require the placement of head blocks / rolls if the patient is able to maintain his / her head in a neutral position. If in doubt, place head blocks / rolls on either side of the patient's head and secure with tape. Secure the patient to the ambulance stretcher in preparation for transport. The back of the stretcher may be adjusted to the patient's comfort.

6. Some patients, often due to size or age, will not be able to be immobilized through in-line stabilization with a cervical collar. Never force a patient into a non-neutral position to immobilize him/her. Such situations may require a second provider to maintain manual stabilization.

7. Document the time of the procedure in the patient care report.

Additional Considerations:

1. When removing a long spine board, scoop stretcher, or KED from under a patient after placement on the ambulance cot, manual stabilization of the patient's head should be maintained. Also, support should also be provided for the patient's torso and pelvis, as well as injured extremities, during this procedure.

2. When securing the patient to the ambulance cot straps should be placed so as to limit forward movement (while supine) of the patient in the event of a sudden deceleration during transport.

3. Option 'D' under this procedure is reserved for conscious and alert patients involved in low velocity/ damage motor vehicle crashes and, after a careful assessment, have no noted injuries.

4. It is very rare that a patient should require transport while secured to a long spine board or scoop stretcher. This will usually involve a unresponsive, blunt trauma patient or an unresponsive post-ROSC patient. **In the event that transport is undertaken while the patient remains on a long spine board or scoop stretcher, suitable blankets and rolled/folded towels should be placed to pad the patient and fill all voids between the patient, straps, and long spine board/ scoop stretcher.**

5. A patient should never be forcibly secured to a long spine board, scoop stretcher, or ambulance cot. In these instances, sedation should be considered.

6. Some patients, due to size, age, medical condition, or injury, will be able to be placed in the 'standard' supine position for spinal precautions. As an example, a patient experiencing kyphosis will not be able to be placed in a full supine position, rather, there will have to be ample padding placed (pillows, folded blankets, etc.).A pregnant patient in the third trimester (≥26 weeks) or a patient who is vomiting should be placed on her left side, when possible, with proper padding.

7. Athletes in full shoulder pads and helmet may be transported with helmet (with face mask removed) and pads in place.

8. Assess and record extremity neuro status and distal pulses pre- and post-procedure. If a deterioration is noted, remove any immobilization-type devices and reassess.

9. Document time of the procedure and results in the PCR. Upon placement of the patient on the ambulance cot and removal of the LSB (or other device) from under the patient, this procedure and the time must be documented in the narrative of the PCR.

Credential 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 Johnston County EMS System.

Splinting

	EMR	
B	EMT	B
A	AEMT	A
P	Paramedic	P

Clinical Indications:

- Immobilization of an extremity for transport, either due to suspected fracture, sprain, or injury.
- Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters

Procedure:

1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
2. Explain the procedure to the patient.
3. Prior to the application of a splint, paramedic personnel should consider administration of pain control medications per protocol.
4. Remove all clothing from the extremity.
5. 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.
6. Do not secure the splint directly over the injury or device.
7. Place the splint and secure with Velcro, straps, or bandage material (e.g., Kling, Kerlix, cloth bandage, etc.) depending on the splint manufacturer and design.
8. 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
9. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint:

    - Assess neurovascular function as in #1 above.
    - Place the ankle device over the ankle.
    - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis
    - Extend the distal end of the splint at least 6 inches beyond the foot.
    - Attach the ankle device to the traction crank.
    - Twist until moderate resistance is met.
    - Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.

8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

Certification Requirements:

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

SBAR Patient Report

	EMR	
B	EMT	B
A	AEMT	A
P	Paramedic	P

Definition:

- SBAR is an acronym for Situation, Background, Assessment, Recommendation. It is a communication model that can be used to facilitate prompt and appropriate communication and is common within the healthcare professions. The format of SBAR allows for short and organized communications between healthcare professionals with a predictable flow of information.

Indications:

- Any time that information is shared between Johnston County EMS System personnel and other system personnel, ED staff, cath lab staff, etc.

Elements:

- **Situation-** A concise statement of the problem that answers the questions "why EMS was called?", which includes patient's age, sex, chief complaint, nature of the call, and a description of the scene if relevant.

- **Background-** This is the history of present illness (HPI) or information on the background of what happened to the patient, including nature of illness (NOI) or mechanism of injury (MOI). Provide more in-depth, precise information. Also include pertinent medical history, medications and allergies (specifically if a medication should be given). Convey only relevant information.

- **Assessment-** Provide pertinent assessment findings, including a general impression of the patient, such as stable vs. unstable observations, vital signs, ECG results, pain level ratings, stroke scale, etc.

- **Recap/Rx (treatment)-** Explain what treatment was given. Include the patient's response to treatments rendered. Also indicate whether the treatments rendered were effective. This is the time to restate concerns about the patient and to respond to questions.

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

Tourniquet

	EMR	
B	EMT	B
A	AEMT	A
P	Paramedic	P

Clinical Indications:

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

Contraindications:

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

Procedure:

1. Place tourniquet proximal to wound

2. Tighten per manufacturer instructions until hemorrhage stops and/or distal pulses in affected extremity disappear.

3. Secure tourniquet per manufacturer instructions

4. Note time of tourniquet application and communicate this to receiving care providers

5. Dress wounds per standard wound care protocol

6. If delayed or prolonged transport and tourniquet application time > 45 minutes, consider reattempting standard hemorrhage control techniques and removing tourniquet.

7. If one tourniquet is not sufficient or not functional to control hemorrhage consider the application of a second tourniquet proximal to the first.

8. Document the placement of the tourniquet(s) in the Flow Chart of 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 Johnston County EMS System.

Wound Packing

	EMR
E	EMT
A	AEMT
P	PARAMEDIC

Clinical Indications:

* Management of severe hemorrhage from deep lacerations or penetrating traumatic injuries.

Procedure:

1. Use personal protective equipment, including gloves, gown, and mask as indicated.

2. If active bleeding, provide direct pressure to the site, utilizing fingertip pressure to the vessel if possible. Do not rely on solely on a "compression" bandage to control bleeding. Direct pressure is much more effective.

3. If the determination is made to apply wound packing, designate a provider to maintain focused direct pressure while supplies are prepared.

4. Select a sterile 4 ½" bulky gauze roll (commonly referred to as Kerlix®).

5. Using a gloved hand, wrap the gauze roll around the provider's forefinger 2-3 times, then push the gauze in to the wound. Withdraw the forefinger, then repeat the procedure until the wound is packed firmly with gauze. Any excess roll gauze should be placed on top of the wound with significant pressure to assist in controlling hemorrhage.

6. Maintain significant pressure on the site during transport. It may be necessary to designate a provider specifically for this task.

7. Monitor the site for additional hemorrhage.

8. Document the procedure in the Flow Chart of the patient care report (PCR) as a General Comment and provide specific information describing the procedure, additional steps undertaken, and if needed, the name of the provider assigned to maintain focused direct pressure.

Certification Requirements:

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

Taser® Probe Removal

	EMR	
B	EMT	B
A	AEMT	A
P	Paramedic	P

Clinical Indications:

- Patient with uncomplicated conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.
- Taser probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.

Contraindications:

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

Procedure:

- Ensure wires are disconnected from weapon.
- Stabilize skin around probe using non-dominant hand.
- Grasp probe by metal body with pliers or hemostats using dominant hand.
- Remove probe in single quick motion.
- Wipe wound with antiseptic wipe and apply dressing.

Certification Requirements:

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

General Wound Care

	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. Do not continue to add additional dressing in the event blood soaks through, as this creates a 'wicking' effect. Remove the original dressing and replace. Blood soaking through a dressing is indicative of the need for direct pressure or a tourniquet.
6. Monitor wounds and/or dressings throughout transport for bleeding.
7. 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 Johnston County EMS System.

Venous Blood Draw

A	Advanced EMT	A
P	EMT- P	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.
- Patient's suspected of experiencing an acute stroke and for which a 'Stroke Alert' has been initiated

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, i.e. Vacutainer holder, adapter, lab tubes, etc.
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, blue-top tube first and then the purple-top tube***).
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.
10. Law enforcement blood draws will be accomplished utilizing the blood draw kit provided by law enforcement.
11. Record the procedure in the patient care report (PCR) in the Flow Chart as a Blood Draw. Immediately after in the Flow Chart, enter a General Comments notation to list whether this procedure was for a Stroke Alert, law enforcement blood draw, etc. If for a law enforcement blood draw, enter the officers name and department in the General Comments notation also.
12. Dispose of all used supplies appropriately.

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 Johnston County EMS System.

This procedure has been altered from the original NCCEP Procedure by the Johnston County EMS Medical Director

Intraosseous Access (EZ-IO)

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.

When in doubt, contact a senior medical authority (district supervisor, medical control) for advice.

Contraindications:

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

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient >12 years of age, identify the 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.
3. Prep the selected site with an alcohol prep.
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, power the driver until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further. 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.
10. You may administer 10 to 20 mg (1 to 2 cc) of 2% Lidocaine in adult patients who are not allergic to lidocaine who experience infusion-related pain. This may be repeated prn to a maximum of 60 mg (6 cc) in adults. See appendix for lidocaine infusion manufacturer’s guidelines, including pediatric dosing.
11. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
12. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

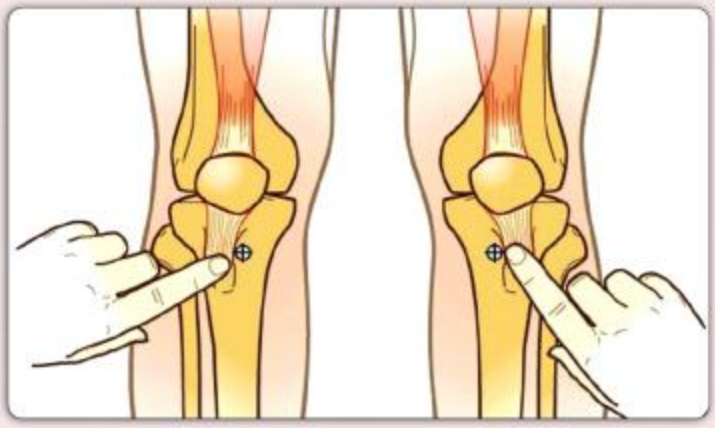
- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Johnston County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

Intraosseous Access (EZ-IO)

Proximal humerus site

Drawing courtesy of Vidacare Corp, San Antonio, Texas.

Proximal tibial site



Drawing courtesy of Vidacare Corp, San Antonio, Texas.

Distal tibial site

Drawing courtesy of Vidacare Corp, San Antonio, Texas.

Extremity Vascular Access

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. Paramedics can use intraosseous access where threat to life exists as provided for in the Intraosseous Access 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
   - Dextrose 10% with a macro drip (10 gtt/cc) for diabetic/ hypoglycemia
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 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 Johnston County EMS System.

This procedure has been altered from the original NCCEP Procedure by the Johnston County EMS Medical Director

External Jugular Access

A	AEMT	A
P	Paramedic	P

Clinical Indications:

* External jugular (EJ) 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. Consider IO access in addition to or instead of an EJ attempt.

* External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

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

Central Line Maintenance

P Paramedic P

Clinical Indications:

- Transport of a patient with a central venous pressure line already in place

Procedure:

1. Prior to transportation, ensure the line is secure.
2. Medications and IV fluids may be administered through a central venous pressure line. Such infusions must be held while the central venous pressure is transduced to obtain a central venous pressure, but may be restarted afterwards.
3. Do not manipulate the central venous catheter.
4. If the central venous catheter becomes dysfunctional, does not allow drug administration, or becomes dislodged, contact medical control.
5. Document the time of any pressure measurements, the pressure obtained, and any medication administration in the patient care report (PCR).

Certification Requirements:

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

Swan-Ganz Catheter Maintenance

Clinical Indications:

P Paramedic P

- Transport of a patient with a Swan-Ganz catheter that is in place prior to transport.

Procedure:

1. Make certain catheter is secure prior to transport.

2. Under the supervision of the nurse or physician caring for the patient, make certain the transport personnel are aware of the depth at which the catheter is secured.

3. UNDER NO CIRCUMSTANCES SHOULD TRANSPORT PERSONNEL ADVANCE THE SWAN-GANZ CATHETER.

4. The sterile plastic sheath that surrounds the catheter should not be manipulated.

5. The ports of the catheter may be used to continue administration of medications or IV fluids that were initiated prior to transport. These should be used as any other IV port with attention to sterile technique.

6. If applicable, measurements from the catheter may be obtained during transport and used to guide care as per local protocols and medical control orders.

7. If at anytime during the transport difficulties with the function of the Swan-Ganz catheter is noted, contact medical control.

8. Document the time and any adjustments or problems associated with the catheter 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 Johnston County EMS System.

Carbon Monoxide Monitoring

	EMR	
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.
- Patients exhibiting the following sign and/or symptoms in a setting that may be suggestive of a carbon monoxide environment-
  - Dyspnea
  - Headache
  - Lethargy
  - Nausea/ monitoring
  - Hallucinations

Procedure:

1. Apply probe to patient's middle finger or any other digit as recommended by the device manufacturer. Where the manufacturer provides a light shield it should be used.
2. Allow machine to register percent circulating carboxyhemoglobin or methemoglobin values
3. Record levels in patient care report or on the scene rehabilitation form.
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 carboxyhemoglobin values every time vital signs are recorded during therapy for exposed patients.
7. Use the pulse oximetry feature of the device as an added tool for patient evaluation. Treat the patient based upon presentation, not just the data provided by the device. Utilize the relevant protocol for guidance.
8. 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.
9. Factors which may reduce the reliability of the reading include:
   - Poor peripheral circulation (blood volume, hypotension, hypothermia)
   - Excessive external lighting, particularly strobe/flashing lights
   - Excessive pulse oximeter sensor motion
   - Fingernail polish (may be removed with acetone pad)
   - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
   - Jaundice
   - Placement of BP cuff on same extremity as pulse ox probe.
10. Patients should not be considered to have positive CO poisoning based on SpCO readings alone.

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 Johnston County EMS System.

Crisis Response Alternative Care Site Transportation

Clinical Indications:

- Patient presents with primary substance abuse and/or mental health crisis, including suicidal ideations without an actual attempt.

P Paramedic P

- Indicated when patient/guardian has consented to voluntary evaluation by a mental health professional and/or crisis intervention.

Clinical Contraindications:

- Non-consenting or violent patients
- Involuntary commitment patients
- Patients with an acute medical or traumatic condition. Patients with superficial abrasions may be evaluated at Crisis and Assessment Center whereas any patient with on-going bleeding or wounds requiring repair should be referred to an emergency department for evaluation.

Procedure:

1. Evaluate the patient using protocol UP 6 Behavioral.
2. Perform an appropriate physical/clinical assessment and complete the Mandatory Evaluation Criteria in accordance with Protocol SO 5B Crisis Response.
3. Determine the appropriate destination facility in accordance with JCEMS Protocols, Policies, Procedures, and Destination Plans.
4. If you are a non CIT certified paramedic you should request a supervisor “reference crisis intervention”. If a CIT trained paramedic is closer they may respond at the discretion of the supervisor.
5. Maintain appropriate clinical contact, care, and monitoring of the patient (do not leave the patient unattended).
6. Transport the patient to the determined destination, providing appropriate supportive care.
7. Documentation of the patient care report shall be completed upon appropriate transfer of patient care, despite destination.

Caveats:

1. If the patient refuses transport to the most appropriate determined destination, the patient shall be offered transport to the closest, most appropriate emergency department.
2. If the patient does not fit the criteria for transport to an alternative destination site, the patient shall be offered transport to the closest, most appropriate emergency department.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Evaluation of these patients must be performed by a CIT certified paramedic. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Johnston County EMS System. Assessment should include direct observation at least once per certification cycle.

Specialty Patient Notification

	EMR	
B	EMT	B
A	AEMT	A
P	PARAMEDIC	P

Clinical Indications:

✱ Any patient who meets the criteria for transportation to a specialty receiving facility as outlined in the Destination Plans:

- Post cardiac arrest resuscitation
- ST- Elevated MI (STEMI)
- Stroke/CVA
- Trauma

Procedure:

1. Upon determination that the patient meets the criteria for a specialty receiving facility, contact that facility direct via radio or directly via phone to advise them of your patient.

NOTE: Past practice involved contacting the Johnston County Communications Center and they would provide the notification to the facility. However, the receiving facilities do not always activate special capabilities until they receive direct notification from the transporting unit.

2. Provide the following information as designated by nature of patient situation

✱ Post cardiac arrest resuscitation – Age, sex, date of birth, current level of consciousness, time of arrest (given as time not xx minutes ago), and estimated time of arrival.

✱ ST-Elevated MI (STEMI) – Age, sex, name, date of birth, name of cardiologist, time of first EMS patient contact (given as time and not xx minutes ago), and estimated time of arrival.

✱ Stroke / CVA – Age, sex, name, current level of consciousness, last known well time – (given as time and not xx minutes ago), and estimated time of arrival.

✱ Trauma – Age, sex, current level of consciousness, primary trauma criteria, and estimated time of arrival.

3. Provide any necessary updated via radio or phone directly to the receiving facility, This could include changes in patient status (e.g. re-arrest on a post-ROSC patient), change in ETA (e.g. extended extrication), etc.

4. When approximately 10 minutes out from the receiving facility, contact with a patient update and current ETA.

5. The trauma triage criteria in use by the Johnston County EMS System is the CDC Trauma Triage Criteria. The criteria are referenced in Destination Plan #7 Trauma.

Certification Requirements:

✱ Maintain knowledge of the indication, 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 Johnston County EMS System. Assessment should include direct observation at least once per certification cycle.

Specialty Patient Notification

JOHNSTON COUNTY EMS SYSTEM TRAUMA TRIAGE CRITERIA

ASSESS VITAL SIGNS AND LEVEL OF CONSCIOUSNESS:

✱ Glasgow Coma Scale	<13
✱ Systolic Blood pressure	<90mm Hg
✱ Respiratory rate	<10 or >29 breaths per minute (<20 in infant aged <1 year)

ASSESS ANATOMY OF INJURY:

- ✱ All penetrating injuries to head, neck, torso, and extremities proximal to elbow and knee
- ✱ Chest wall instability or deformity (e.g. flail chest
- ✱ Crush, degloved, mangled, or pulseless extremity
- ✱ Amputation proximal to wrist or ankle
- ✱ Pelvic fractures
- ✱ Open or depressed skull fracture
- ✱ Paralysis

ASSESS MECHANISM AND EVIDENCE OF HIGH-ENERGY IMPACT:

- ✱ Falls
  - ✚ Adults: >20 feet (one story is 10 feet)
  - ✚ Children: >10 feet or 2-3 times height of child
- ✱ High-risk auto crash
  - ✚ Intrusion, including roof: >12 inches occupant site; >18 inches passenger compartment
  - ✚ Death in same passenger compartment
  - ✚ Vehicle telemetry data consistent with high risk of injury
- ✱ Auto vs. pedestrian/bicyclist thrown, run over, or with significant (>20 mph) impact
- ✱ Motorcycle crash >20 mph

ASSESS SPECIAL PATIENT OR SYSTEM CONSIDERATIONS:

- ✱ Older adults
  - ✚ Age ≥55 years
  - ✚ Age ≥65 years with SBP <110mm Hg in setting of injury
  - ✚ Ground level fall with s/s of head/serious injury
- ✱ Children
  - ✚ Triaged to pediatric capable trauma center
- ✱ Anticoagulants and bleeding disorders
  - ✚ Patients taking clopigrodel, Coumadin, heparin, ASA, or NSAID's
  - ✚ Hemophilia or clotting disorders
- ✱ Pregnancy >20 weeks
- ✱ EMS Provider judgement

Physical Restraints

B	EMT	B
A	Advanced EMT	A
P	Paramedic	P

Clinical Indications:

✱ Any patient who may harm himself, herself, or others may be restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or less restrictive therapeutic means. Physical or chemical restraints should be a last resort technique.

Procedure:

1. If at all possible, attempt less restrictive means of managing the patient.

2. Request law enforcement assistance and maintain situational awareness at all times.

3. If physical restraints are required, ensure that there are sufficient personnel available to physically restrain the patient safely.

4. Restrain the patient in a lateral or supine position. No devices such as backboards, splints, or other devices will be on top of the patient. **The patient will never be restrained in the prone position**.

5. The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as continuous cardiac, $EtCO_2$, and SpO_2 monitoring. Serial ECG's will be obtained and uploaded into the PCR.

6. The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This MUST be documented in the Flow Chart of the PCR as a General Comment.

7. Documentation on/within the patient care report (PCR) should include the reason for the use of restraints (narrative), the type of restraints used (narrative and Flow Chart General Comment), and the time restraints (Flow Chart General Comment) were placed. Use of the Restraint Checklist is highly recommended. If used, scan and attach to the PCR.

8. If the above actions are unsuccessful, or if the patient is resisting the restraints, consider administering medications per protocol. (Chemical restraint may be considered earlier.)

9. If a patient is restrained by law enforcement personnel with handcuffs or other devices, EMS personnel can not remove them. **A law enforcement office must accompany the patient to the hospital in the transporting EMS vehicle – *NO EXCEPTIONS* .**

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 Johnston County EMS System Medical Director.

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 safe 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.

Chest Pain Blood Draw

A	Advanced EMT	A
P	Paramedic	P

Purpose:

* The purpose of this procedure is to outline the process for drawing labs on chest pain patients by Johnston County EMS providers in the field, further enhancing the care of these patients.

Procedure:

1. The Johnston County EMS provider will draw designated blood tubes on all chest pain patients that are transported to Johnston Health facilities in Smithfield and Clayton.

2. Once venous access has been established, the order to follow for blood collection with the tubes provider are as followed: blue, orange, and purple.

3. The EMS provider will label the tubes with the patient's name, date of birth, date and time drawn, and the provider's initials. This should also be documented in the PCR as well.

4. The EMS provider will hand the blood specimen to the receiving nurse on arrival to the Emergency Department, in the presence of the patient.

5. The EMS provider that obtained the labs and the receiving nurse will compare the patient's demographics together on the specimen samples and the patient's armband to confirm that the specimens are those of the patient.

6. The EMS provider will remain with the patient until the blood specimen is labeled and scanned by the Emergency Department nurse or the Emergency Department Technician.

7. Inadequately filled or incorrectly labeled tubes will not be utilized a
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 Johnston County EMS System.

Johnston County EMS System
Standards and Practice Document

Destination Plans

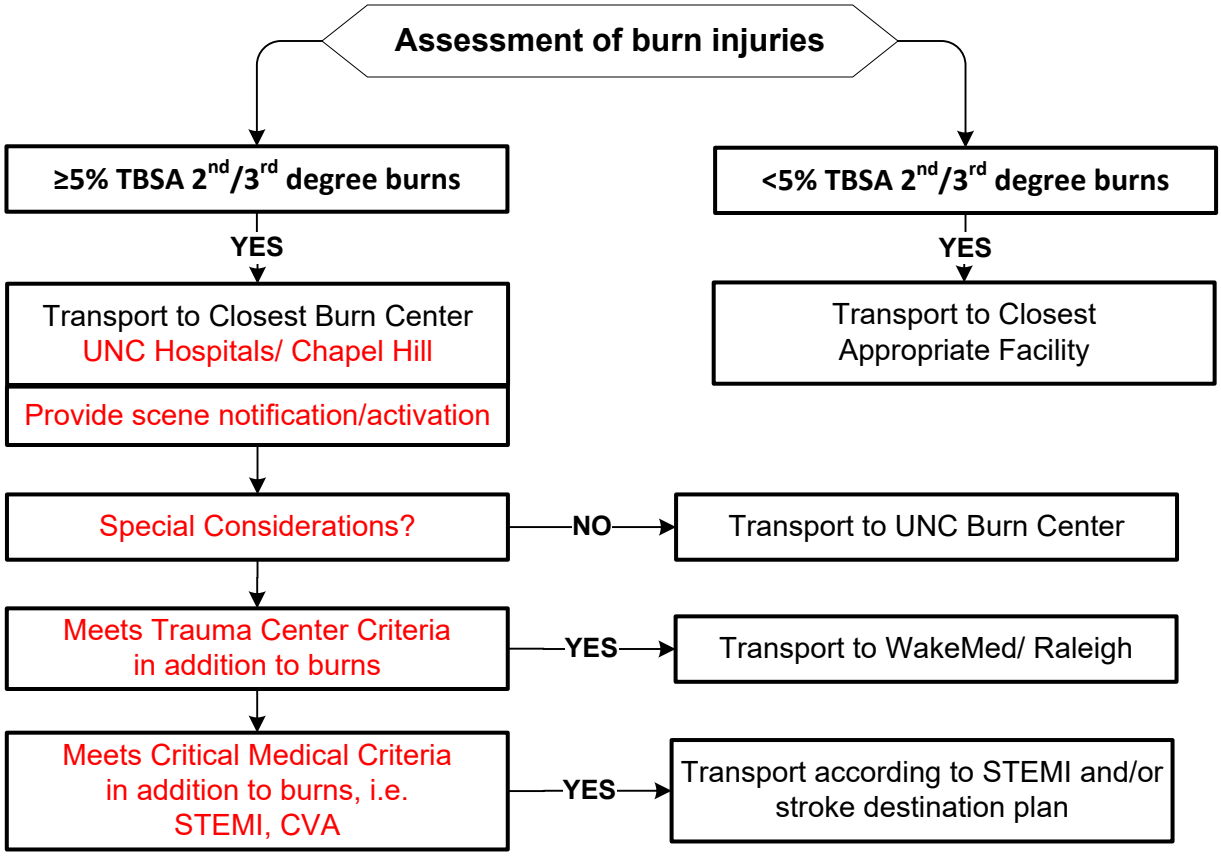
Burns

Burn Patient

* **Any patient (regardless of age) with a significant injury**

The purpose of this plan is to:

* Rapidly identify burned patients who call 911 or present to EMS
* Minimize the time from injury to definitive care for critical burns
* Quickly identify life or limb threatening burns 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 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



BURN NOTIFICATION

Contact destination directly via radio for "BURN NOTIFICATION". Information provided includes-
Age and sex of patient
Level of consciousness/ GCS
TBSA and degree(s) of burns
Estimated Time of Arrival

Unstable airway? = CONSIDER CLOSEST FACILITY

EMS Triage and Destination Plan

Pearls and Definitions

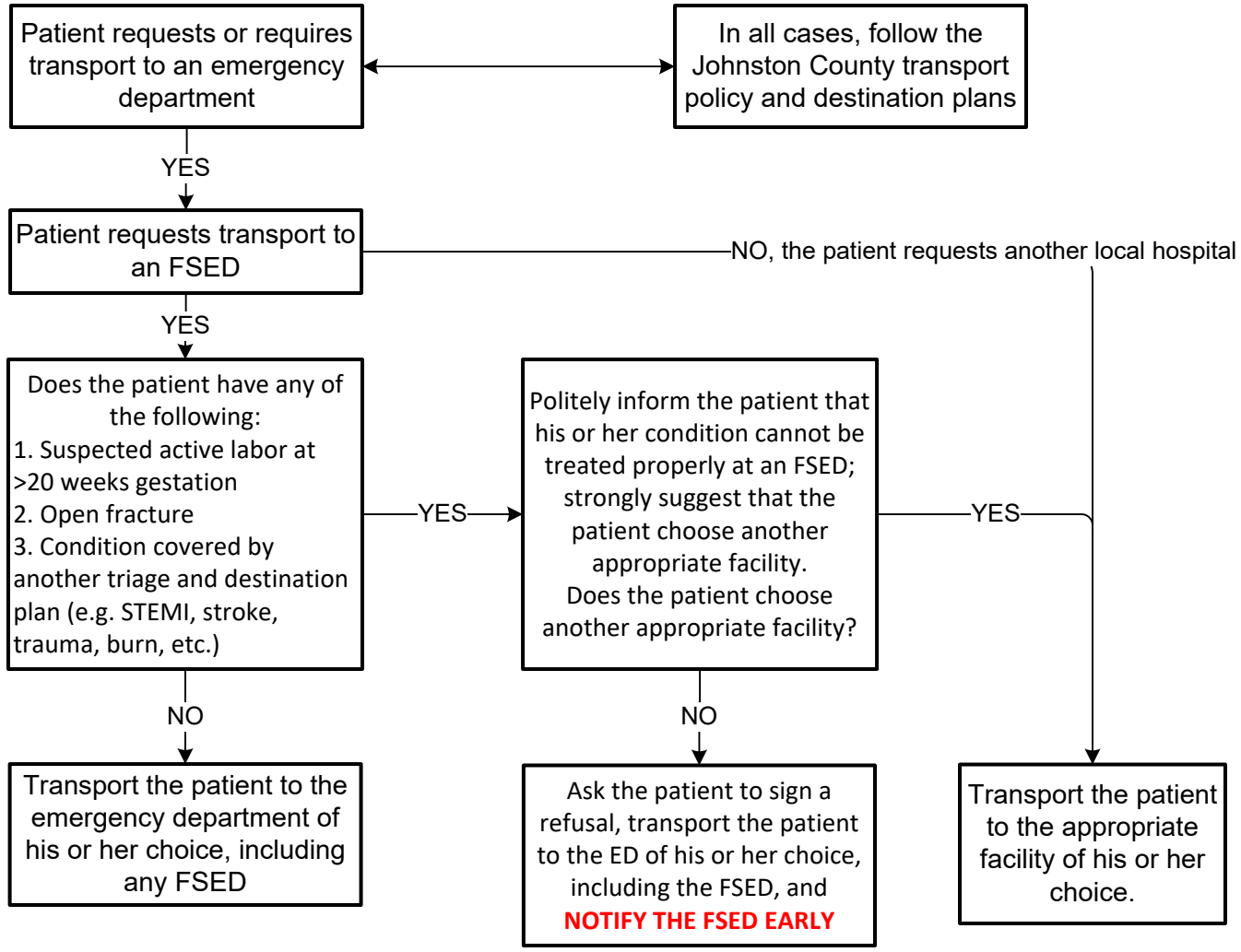
* **All Burn patients must be triaged and transported using this plan. This plan is in effect 24/7/365.**
* **All Patient Care is based on the appropriate EMS Burn Protocol**

Free-Standing Emergency Departments

Adult and pediatric patients may be transported to Free-Standing Emergency Departments (FSED); 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.



EMS Triage and Destination Plan

Pearls and Definitions

* **A free-standing emergency department (FSED) 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 FSED**
* **This protocol and the destinations have been approved by the Johnston County EMS System Medical Director.**

Pediatrics

Pediatric Patient

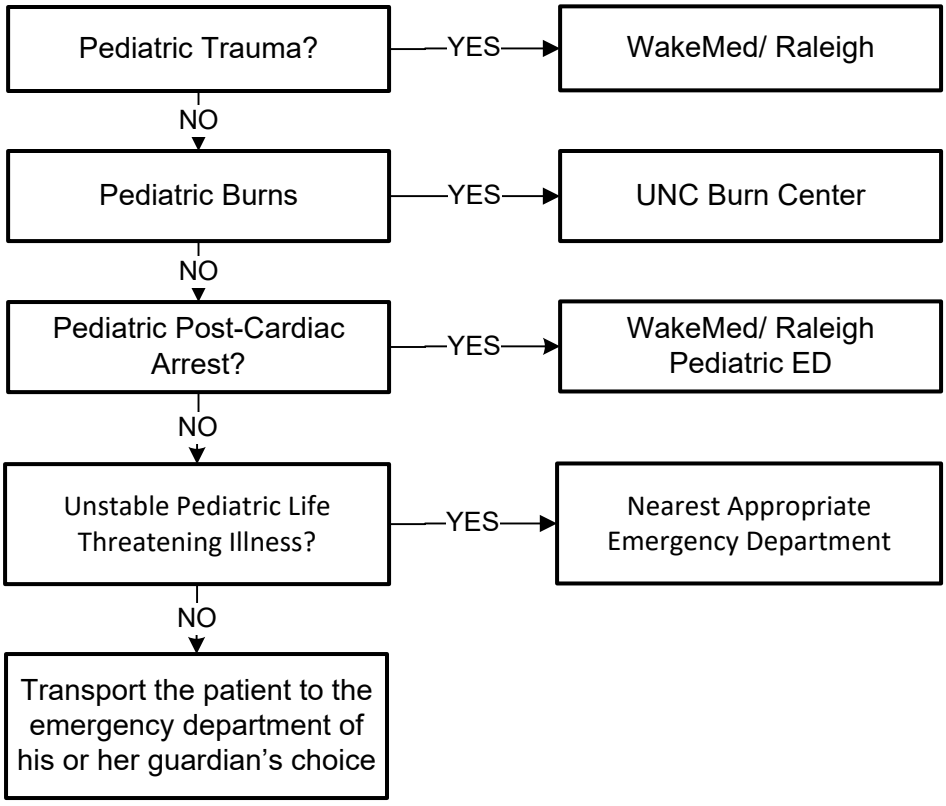
* Any patient less than 16 years of age with a life-threatening illness (not trauma or burn)

Life Threatening Illness

* Decreased mental status (GCS <13)
* Non-responsive respiratory distress
* Airway management
* Non-responsive hypotension (shock)
* Status epilepticus
* Potential dangerous envenomation
* Life threatening ingestion/chemical exposure
* Children with special healthcare needs (and destination choice based on parental request)

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 excellent care and quality EMS service 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 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 from EMS or a Community Hospital and transport the patient to a Pediatric Capable Hospital.

Post Cardiac Arrest

Post Cardiac Arrest Patient

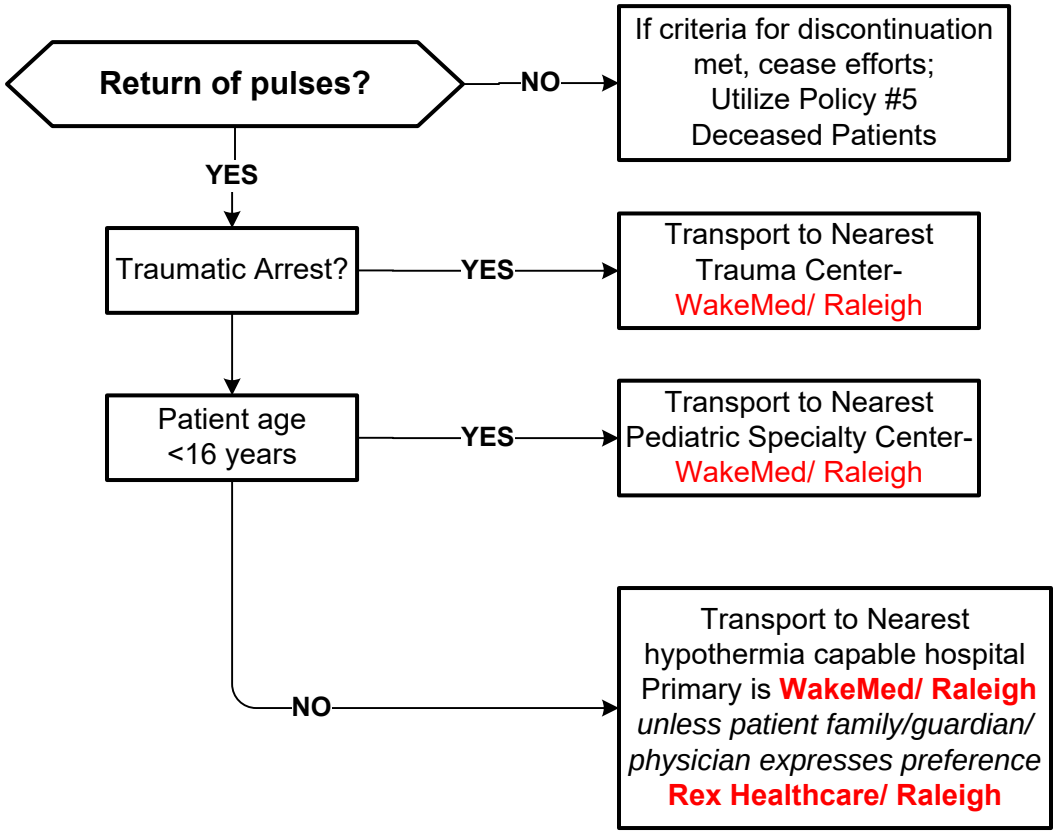
* **Resuscitation was attempted by 911 responder(s)**

And/or

* **CPR performed prior to EMS arrival and pulses restored**

The purpose of this plan is to:

* Transport post cardiac arrest and post resuscitation patients to the appropirate receiving facility



EMS Triage and Destination Plan

Pearls and Definitions

* **All Post Cardiac Arrest patients must be triaged and transported using this plan. This plan is in effect 24/7/ 365.**
* **All Patient Care is based on the appropriate EMS Protocol**
* **This destination plan has been approved by the Johnston County EMS System Medical Director**

STEMI

STEMI Patient
(ST Elevation Myocardial Infarction)

*** Cardiac symptoms greater than 15 minutes and less than 12 hours**

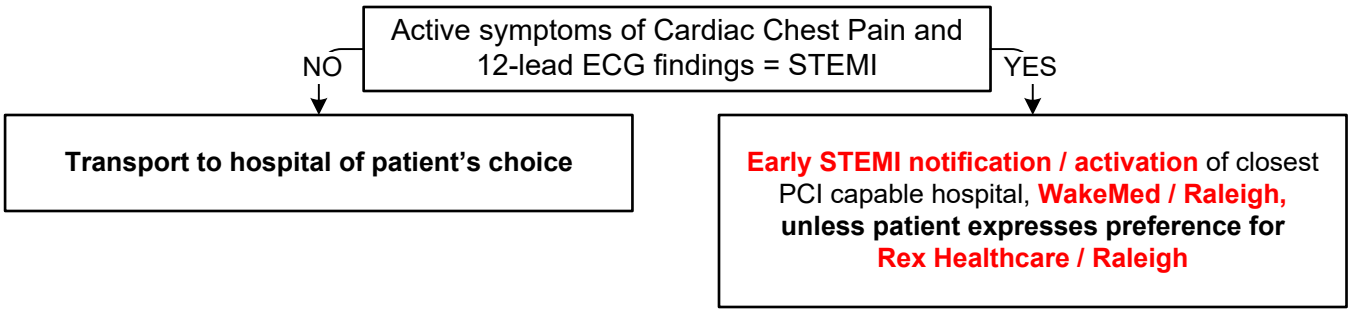
AND

*** 12 lead ECG criteria of 1mm ST elevation in 2 or more leads and/or**
LBBB not known to be old with signs/symptoms indicative of MI

(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 within 5 minutes of patient contact
- 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 within first five minutes of patient contact)
- Provide quality EMS service and patient care to the Johnston County EMS System's citizens
- Continuously evaluate the EMS System based on North Carolina's STEMI EMS performance measures



STEMI NOTIFICATION

Contact destination directly radio for "STEMI NOTIFICATION". Information provided includes-
Name, age, date of birth, and sex of patient
Name of cardiologist (if any)
Time of First Medical Contact
Estimated Time of Arrival

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**

- Obtain the following information *before* your scene pre-alert: Patient's age and gender, cardiologist, and preferred STEMI hospital.

- As soon as possible, provide the following information to destination facility: 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), absence or presence of **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, i.e. signs and symptoms of a cardiac event.

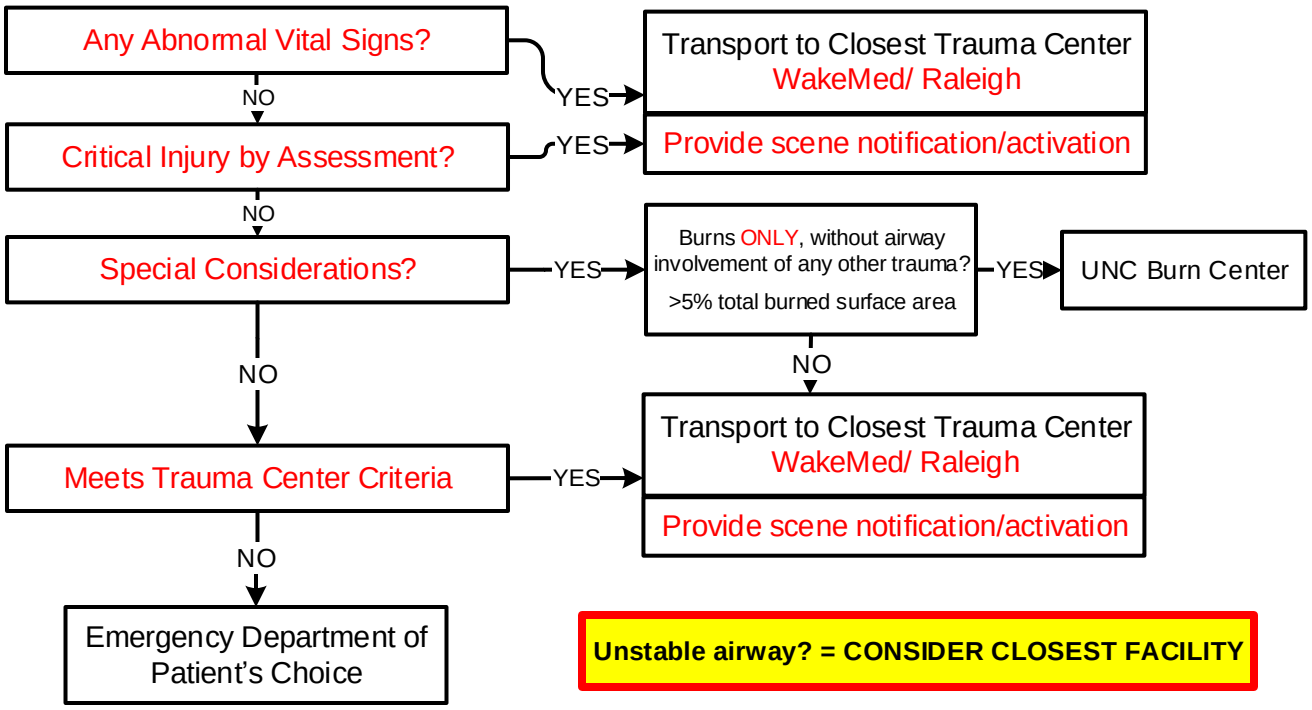
TRAUMA

Trauma Patient

* **Any patient (regardless of age) with a significant injury**

The purpose of this plan is to:

* Rapidly identify injured patients who call 911 or present to EMS
* Minimize the time from injury to definitive care for critical injuries
* 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 patient prior to patient arrival
* Minimize scene time to 10 minutes or less with a "load and go" approach
* Provide excellent patient care and quality EMS service to the EMS System's citizens
* Continuously evaluate the EMS System based on North Carolina's EMS performance measures



Unstable airway? = CONSIDER CLOSEST FACILITY

TRAUMA NOTIFICATION:
Contact destination directly via radio for "TRAUMA NOTIFICATION". Information provided includes-
Age and sex of patient
Level of consciousness/ GCS
Primary applicable criteria
Estimated Time of Arrival

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.**
* **All Patient Care is based on the appropriate EMS Trauma Protocol.**
* **When making the scene notification or communicating with the hospital, specify that the patient is a pediatric (>18 y/o) or pregnant (OB) >20 weeks.**
* **For TRAUMA CENTER CRITERIA, SEE PAGE 2 of this destination plan**

TRAUMA

Potential traumatic injury?

1 Assess vital signs and level of consciousness

Abnormal Vital Signs?

- ✱Glasgow Coma Score <13
- ✱Systolic Blood Pressure <90 mm Hg
- ✱Respiratory Rate <10 or >29 breaths per minute or need for ventilatory support (<20 in infant aged <1 year)

2 Assess anatomy of injury

- ✱All penetrating injuries to head, neck, torso, and extremities proximal to elbow and knee
- ✱Chest wall instability or deformity (e.g. flail chest)
- ✱Two or more proximal long bone fractures
- ✱Crushed, degloved, mangled, or pulseless extremity
- ✱Amputation proximal to wrist or ankle
- ✱Pelvic fractures in setting of suspicious mechanism
- ✱Open or depressed skull fracture
- ✱Paralysis

3 Assess mechanism of injury and evidence of high-energy impact

- ✱Falls:
  - Adults: >20 feet (one story is equal to 10 feet)
  - Children: >10 feet or two-three times the height of child
- ✱High-risk auto crash:
  - Intrusion, including roof: >12 inches occupant site; >18 inches passenger compartment
  - Death in same passenger compartment
  - Vehicle telemetry data consistent with high risk of injury
- ✱Auto vs. pedestrian/bicyclist thrown, run over, or with significant (>20 mph) impact
- ✱Motorcycle crash >20 mph

4 Assess special patient or system considerations

- ✱Older Adults:
  - Age ≥55 years in setting of injury
  - Age ≥65 with SBP <110 mm Hg in setting of injury
  - Ground level fall with s/s of head/serious injury
- ✱Children:
  - Triaged to pediatric capable trauma center
- ✱Anticoagulants and bleeding disorders
  - Patients taking anticoagulants and anti-platelets.
  - Hemophilia or clotting disorders
- ✱Pregnancy >20 weeks
- ✱EMS provider judgment

Transport to trauma center

EMS Triage and Destination Plan

Stroke

Stroke Patient

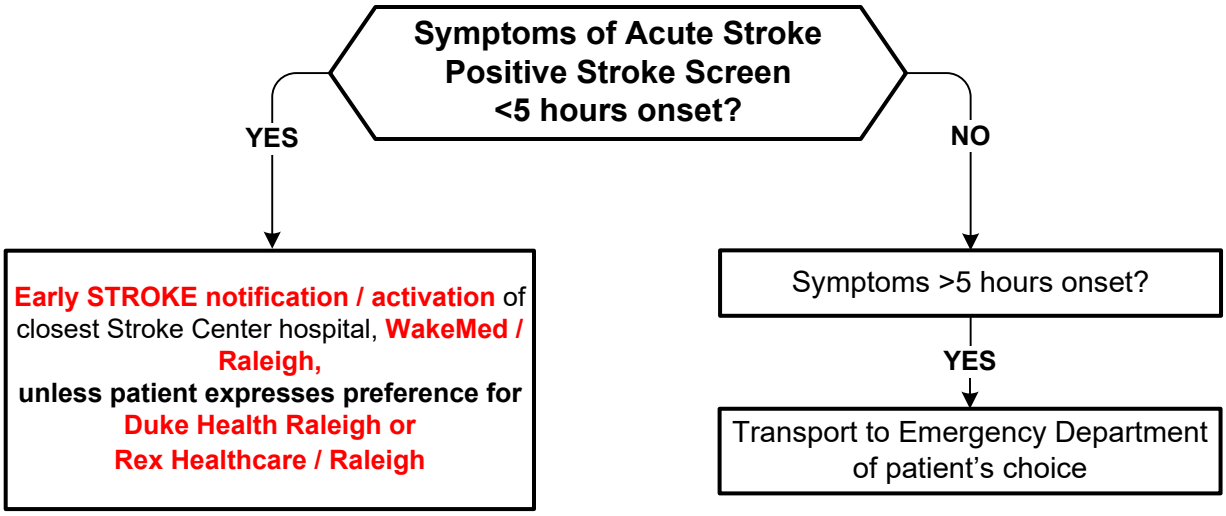
* **Any patient with symptoms of an acute stroke as identified by the EMS Stroke Screen**

Time of Symptom Onset

* **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 the 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 a 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 minutes or less
* Provide excellent patient care and 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



STROKE NOTIFICATION

Contact destination directly via radio or phone for "STROKE NOTIFICATION". Information provided includes-
Name, age, and sex of patient
Level of consciousness/ GCS
Last known well time
(*provide as a 'time' not 'hours ago'; if patient awakens with symptoms, 'last know well' is defined as previous night when patient was symptom free***)**
Estimated Time of Arrival

Wake Up Stroke: Any patient that has awoken from sleep having a positive Cincinnati Stroke Screen, should be transported to the nearest 24/7 mechanical thrombectomy facility.

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 appropriate EMS Stroke Protocol**

EMS Triage and Destination Plan

Johnston County EMS System
Standards and Practice Document

Patient Treatment Protocols

Adult Asystole / Pulseless Electrical Activity

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

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

Differential
- See Reversible Causes below

Cardiac Arrest Protocol AC 3

Criteria for Death / No Resuscitation
Review DNR / MOST Form

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

NO ↓

Utilize this protocol with Team Focused Resuscitation Protocol

ROSC at any time Go to Post Resuscitation Protocol

CPR Procedure

AED Procedure ***if available***

Consider reversible causes

P
Consider Chest Decompression Procedure in setting of possible chest trauma

Cardiac Monitor; place Zoll Stat Padz and secondary set of pads

A
IV / IO Procedure

Epinephrine 0.1mg/mL (1:10,000) 1 mg IV / IO
Every 5 minutes

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

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

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

Consider Early for PEA

1. Repeated NS boluses for possible hypovolemia
2. Glucagon 4 mg IV/IO/IM for suspected beta blocker or calcium channel blocker overdose
3. Calcium chloride 1 g IV/IO for suspected hyperkalemia/ hypocalcemia
4. Sodium bicarbonate 50 mEq IV/IO for possible overdose, hyperkalemia, renal failure
5. Consider dopamine drip
6. Consider chest decompression

Airway protocols ***as indicated***

Airway protocols ***as indicated***

P
After four (4) cycles of CPR **after** initial ALS in place consider LUCAS3 placement

ROSC?

NO → Termination on scene Protocol

YES → Post Resuscitation Protocol

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

This protocol has been altered from the original NCCEP Protocol by the Johnston County EMS System Medical Director

Adult Asystole / Pulseless Electrical Activity

- **No medications are permitted to be administered through an ET tube**
- Early administration of Epinephrine has been shown to have some benefit. If effective CPR is being performed, IO placement with early administration of Epinephrine can be initiated.
- Potential association of PEA with hypoxia so early airway management with oxygenation early may provide benefit.
- PEA caused by sepsis or severe volume loss may benefit from higher volume of normal saline administration.
- **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.
- Asystole is commonly an end-stage rhythm following prolonged VF or PEA with a poor prognosis.
- Naloxone has no role in the management of cardiac arrest.
- Sodium bicarbonate should be considered in the dialysis / renal patient, known hyperkalemia, or tricyclic overdose at 50 mEq total IV / IO.
- Potential protocols used during resuscitation include Overdose / Toxic Ingestion, Diabetic and Dialysis / Renal Failure.

Pearls:

- **Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: Maintained controlled ventilations at rate of 10 per minute or as guided by $EtCO_2$, with continuous uninterrupted compressions. Administer controlled ventilations of 400-600 mL air volume. This can be accomplished by providing a half squeeze of the adult BVM or a full squeeze of a pediatric BVM.**
- **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**.
- **End Tidal CO_2 ($EtCO_2$)**
  - If $EtCO_2$ is < 10 mmHg, improve chest compressions.
  - If $EtCO_2$ spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to receiving hospital and safe transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - **Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - **Opioid Overdose** - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.
  - **Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:** Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
- Sodium bicarbonate should be considered in the dialysis / renal patient, known hyperkalemia, or suspected tricyclic overdose at 50 mEq IV / IO.
- Consider placement of LUCAS3 after four (4) rounds of CPR after implementation of initial ALS.

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-Blacker or Calcium Channel Blocker

Follow Overdose/Toxic Ingestion Protocol

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

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

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

B Search for Reversible Causes ↔

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

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

B 12-lead ECG Procedure

A IV / IO Procedure

P Cardiac Monitor & $EtCO_2$

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

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

If no response to atropine

Dopamine 5 – 20 mcg/kg/min IV / IO
or, if dopamine unavailable
Epinephrine 2 - 10 mcg/min IV / IO
Titrate to SBP ≥ 90 mmHg ↔

Use Johnston County EMS System Dosing Charts and Instructions

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

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

P Consider Sedation

Midazolam 2 – 2.5 mg IV / IO / IM / IN

Maximum 10 mg

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Bradycardia; Pulse Present

Calculations are using a 60 gtt (micro drip) set or 10 gtt (macro drip) set with a DIAL-A-FLOW device

Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 250 mL (1,600 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min		10 mcg/kg/min		15 mcg/kg/min		20 mcg/kg/min	
	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr
30	150	6	300	11	450	17	600	23
40	200	8	400	15	600	23	800	30
50	250	9	500	19	750	28	1000	38
60	300	11	600	23	900	34	1200	45
70	350	13	700	26	1050	39	1400	53
80	400	15	800	30	1200	45	1600	60
90	450	17	900	34	1350	51	1800	68
100	500	19	1000	38	1500	56	2000	75
110	550	21	1100	41	1650	62	2200	83
120	600	22	1200	45	1800	68	2400	90
130	650	24	1300	49	1950	73	2600	98
140	700	26	1400	52	2100	79	2800	105
150	750	28	1500	56	2250	84	3000	112
160	800	30	1600	60	2300	90	3200	120
170	850	32	1700	64	2550	96	3400	128

Calculations are using a 60 gtt (micro drip) set or 10 gtt (macro drip) set with a DIAL-A-FLOW device

Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 500 mL (800 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min		10 mcg/kg/min		15 mcg/kg/min		20 mcg/kg/min	
	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr
30	150	11	300	22	450	34	600	45
40	200	15	400	30	600	45	800	60
50	250	19	500	38	750	56	1000	75
60	300	22	600	45	900	68	1200	90
70	350	26	700	52	1050	79	1400	105
80	400	30	800	60	1200	90	1600	120
90	450	34	900	68	1350	101	1800	135
100	500	38	1000	75	1500	112	2000	150
110	550	41	1100	82	1650	124	2200	165
120	600	45	1200	90	1800	135	2400	180
130	650	49	1300	98	1950	146	2600	195
140	700	52	1400	105	2100	158	2800	210
150	750	56	1500	112	2250	170	3000	225
160	800	60	1600	120	2300	180	3200	240
170	850	64	1710	128	2550	191	3400	255

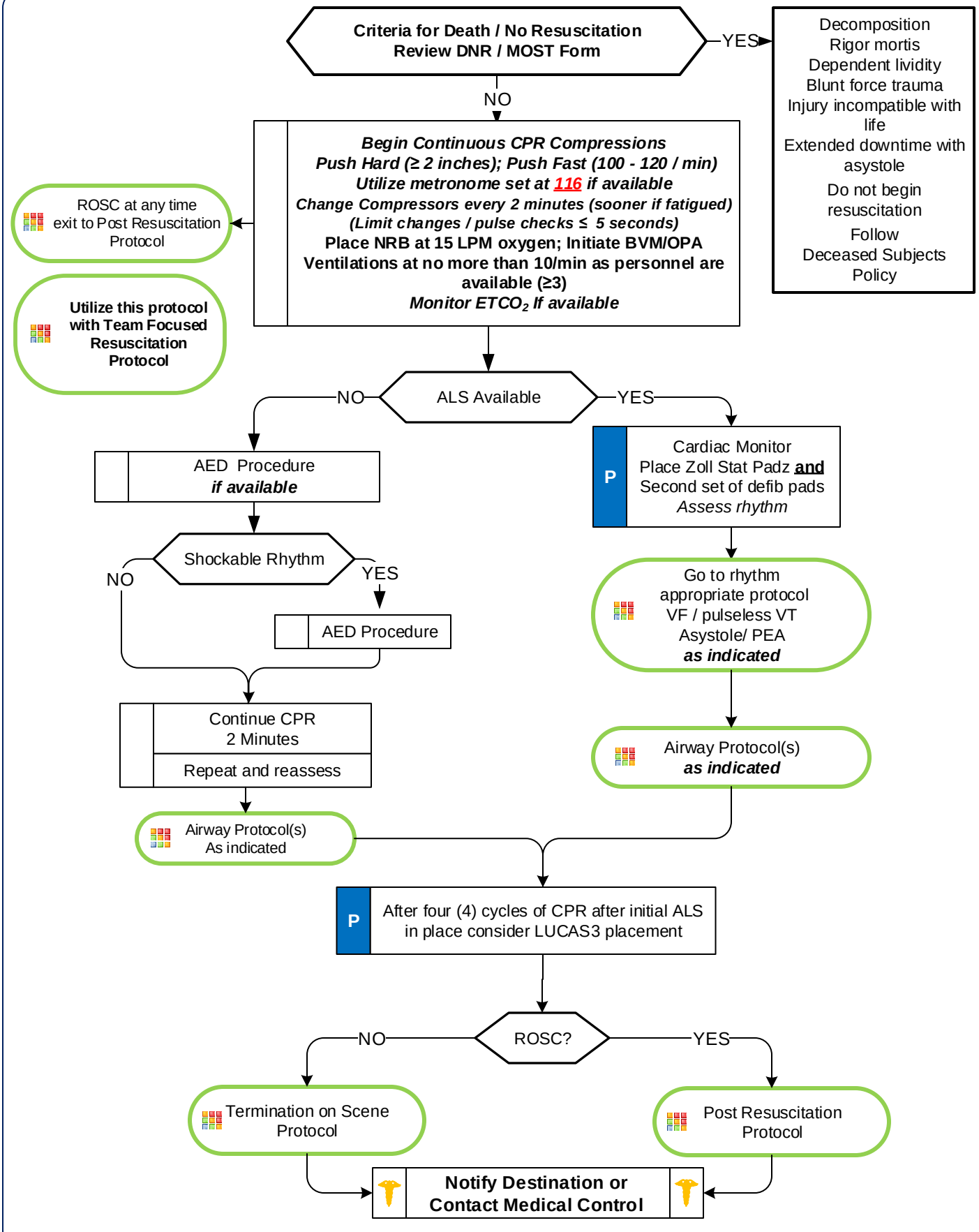
Bradycardia; Pulse Present

Epinephrine Drip Chart 1 mg of 1mg /mL (1:1,000) solution in 250 mL NS Renders 4 mcg / mL	
Infusion Dosage Mcg / min	**Infusion Rate mL / hr via Dial-a-Flow**
2	30
4	60
6	90
8	125
10	150

Pearls

- Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro, abdominal exam.
- Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.
- Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.
- Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.
- Hypoxemia is a common cause of bradycardia. Ensure oxygenation and support respiratory effort.
- Atropine
  - Do NOT delay Transcutaneous Pacing to administer Atropine in bradycardia with poor perfusion. Caution in setting of acute MI. Elevated heart rate can worsen ischemia.
  - Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.
- Transcutaneous Pacing Procedure (TCP)
  - 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.
- Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)

Cardiac Arrest; Adult



Adult Cardiac Protocol Section

Cardiac Arrest; Adult

- **Successful resuscitation is based on proper planning and execution. Procedures require space and patient access. Make room to work. Utilize Team Focused Approach assigning responders to predetermined tasks and use the Pre-ROSC Cardiac Arrest Checklist and Medical Branch as personnel are available to do so.**
- **Refer to Dialysis / Renal Failure protocol caveats when presented with dialysis / renal failure patient experiencing cardiac arrest**
- **Continuously monitor $EtCO_2$ readings as this will usually provided the first indication of ROSC.**
- **Consider LUCAS3 placement after four (4) cycles of CPR completed after initial ALS measures (IV / IO access, epinephrine, appropriate airway management) are in place.**

Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: Maintained controlled ventilations at rate of 10 per minute or as guided by $EtCO_2$, with continuous uninterrupted compressions. Administer controlled ventilations of 400-600 mL air volume. This can be accomplished by providing a half squeeze of the adult BVM or a full squeeze of a pediatric BVM.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- Reassess and document BIAD and / or endotracheal tube placement and $EtCO_2$ frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery are secondary to high-quality chest compressions and early defibrillation**.
- **End Tidal CO_2 ($EtCO_2$)**
  If $EtCO_2$ is < 10 mmHg, improve chest compressions.
  If $EtCO_2$ 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 safe transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - **Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - **Opioid Overdose** - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.
  - **Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:** Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

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

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

B	**12 Lead ECG Procedure**
	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 (12-lead ECG ≤5 minutes from initial patient contact) Monitor $ETCO_2$**

Acute MI / STEMI (STEMI = 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

Keep Scene Time to ≤10 Minutes from first medical contact

NO ↓

A	IV / IO Procedure
	Nitroglycerin 0.3 / 0.4 mg SL Repeat every 5 minutes as needed
	Nitroglycerin Paste SBP > 100 1 inch SBP >150 1.5 inch SBP > 200 2 inch
P	**Morphine 0.1 mg/kg IV / IO** Repeat every 5 minutes as needed **Maximum initial and total 10 mg Or Fentanyl 1 mcg/kg IV / IO** Repeat 25 mcg every 20 minutes as needed **Maximum Initial 100 mcg Maximum 200 mcg**
	Hypotension / Shock Protocol AM 5 ***if indicated***
	CHF / Pulmonary Edema Protocol AC 5 ***if indicated***

Document time of first medical contact and share this information when contacting the receiving facility. This should be added to the PCR as well.

For patients that do not fit STEMI criteria, obtain the NSTEMI kit and draw labs for the receiving hospital

Routine oxygen administration is not indicated for chest pain/STEMI UNLESS Patient is hypoxic with SpO_2 <94% and / or experiencing respiratory distress

Oxygen administration should be titrated to maintain SpO2 ≥94%

Hyperoxia should be avoided

Upon confirmation of STEMI-

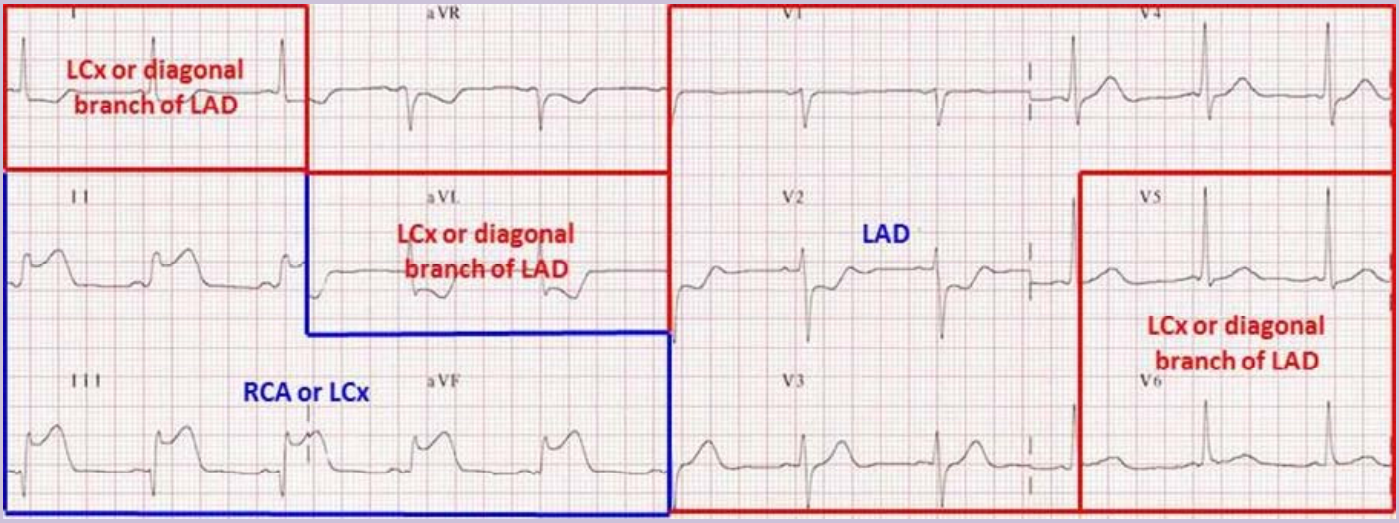
Perform serial 12-lead ECG Q5 minutes

Apply therapy pads

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

STEMI Culprit Vessel Localization Aid



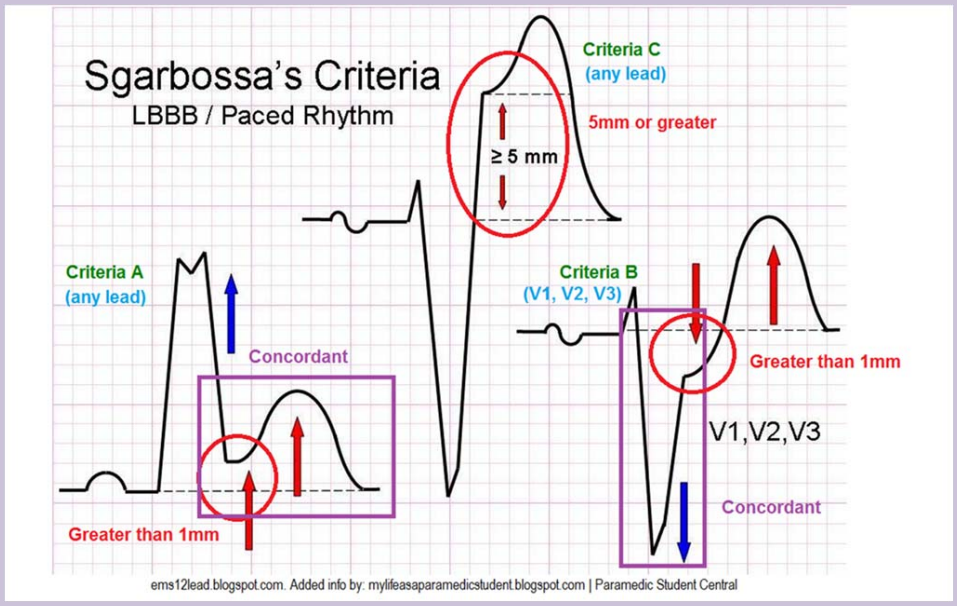
*** SEE 12-LEAD/CODE STEMI CATH LAB ACTIVATION PROCEDURE FOR CRITERIA TO CALL "CODE STEMI" AND ACTIVATE CATH LAB VS. SEND EKG FOR CONSULT.**

- **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.**

- **Be prepared to transport the patient from the ED to the cath lab**
- **Keep the patient on the EMS monitor until arriving at the assigned ED bed or the cath lab**
- **If the patient goes into cardiac arrest treat the patient even if inside the hospital**



** Sgarbossa's Criteria can be used to diagnose acute MI in patients with LBBB or in those with pacemakers

Chest Pain: Cardiac and STEMI

SCENE NOTIFICATION

As soon as assessment reveals that patient meets STEMI criteria contact via radio for **"STEMI NOTIFICATION"** to WakeMed/ Raleigh (or Rex Healthcare if preferred by patient):

Patient's name, age, date of birth, and sex

Name of cardiologist (if any)

Time of First Medical Contact as a time and not as '*xx* minutes ago'

Estimated time of arrival (ETA) to facility

Provide updates from scene as needed. Provide update via radio or phone when approximately 10-15 minutes out.

Pearls

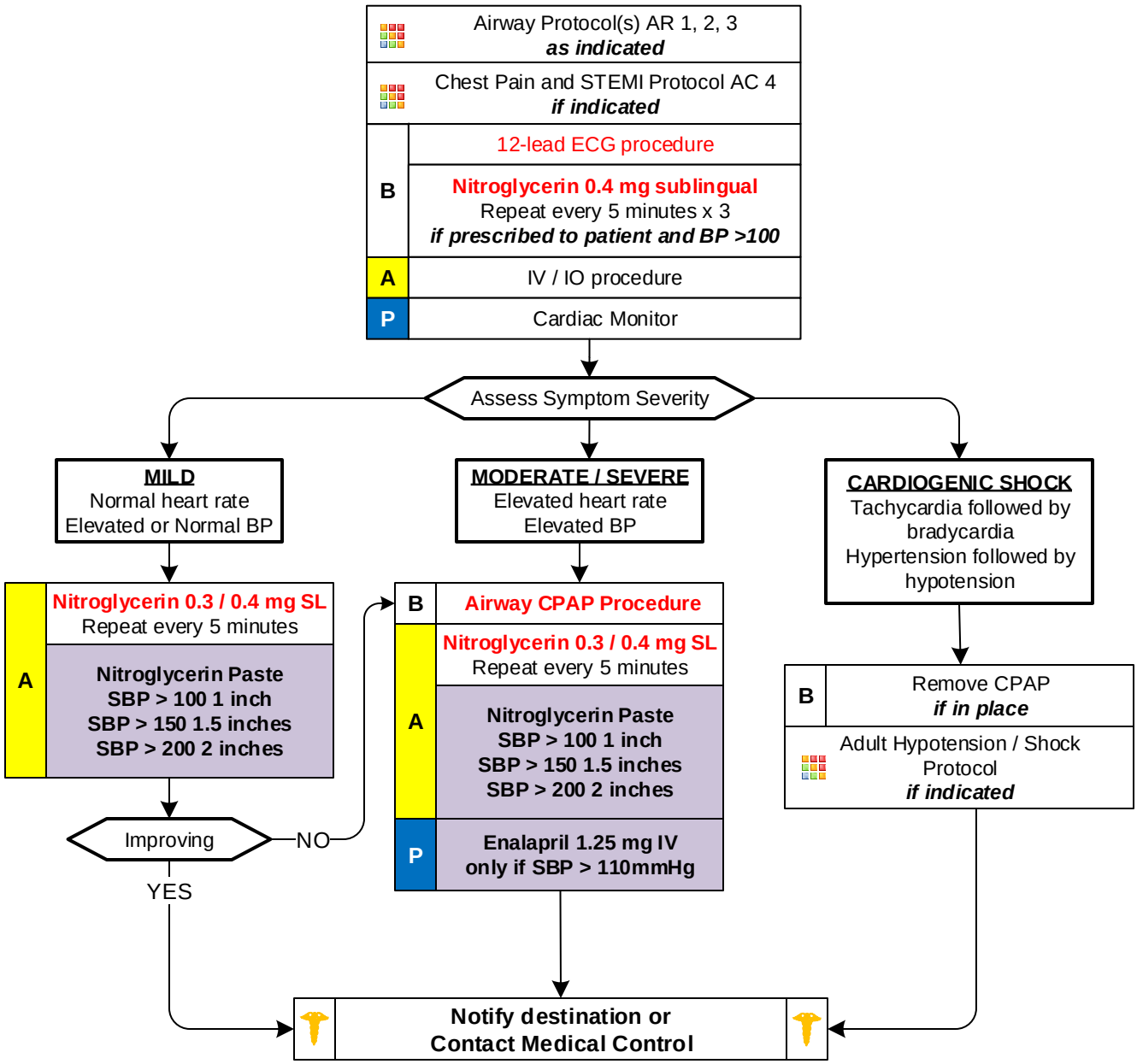
- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are the key performance indicators for the EMS Acute Cardiac (STEMI) Care Toolkit**
- **Administration of oxygen is contraindicated for routine use in chest pain or STEMI except in the presence of hypoxia (SpO_2 <94%) or respiratory distress.**
- **Diabetic, geriatric, and female patients often have atypical presentations without specific pain or only generalized complaints. Have a low threshold of suspicion to perform a 12-lead ECG in these patients.**
- **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.**
- **<u>STEMI (ST-Elevation Myocardial Infarction)</u>**
  - **Positive Reperfusion Checklist should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.**
  - **Consider placing 2 IV sites in the left arm: Many PTCI centers use the right radial vein for intervention.**
  - **Place 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). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and narcotics (Morphine or Fentanyl).
- 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.**
- Agency medical director may require Contact of Medical Control prior to administration.
- Monitor for hypotension after administration of nitroglycerin and narcotics.
- Nitroglycerin and opioids may be repeated per dosing guidelines.

CHF / Pulmonary Edema

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

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

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



Adult Cardiac Protocol Section

CHF / Pulmonary Edema

* **It is no longer recommended to administer midazolam/ Versed for sedation with respiratory compromise. Correction of hypoxia may alleviate the complications of an anxious patient. Utilize verbal calming measures and coaching with CPAP in place.**

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 MI (II, III, aVF), consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring normal saline boluses.**
* If patient has taken nitroglycerin without relief, consider potency of the medication.
* If nitroglycerine paste is used, do not continue to use nitroglycerine SL
* Contraindications to opioids include severe COPD and respiratory distress. Monitor the patient closely.
* 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 their 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. Monitor $EtCO_2$ during CPAP use, utilizing the nasal type sensor.
* **EMT may administer nitroglycerin to patients already prescribed medication. May give from EMS supply**.
* Agency medical director may require contact of Medical Control.

This protocol has been altered from the original NCCEP Protocol by the Johnston County EMS System Medical Director

Adult Tachycardia

Narrow Complex (≤ 0.11 sec) REGULAR RHYTHM

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 — Cardioversion Procedure

Narrow and Regular: 50 – 100J

Narrow and Irregular: 120 – 200J

May repeat and increase dose with subsequent cardioversion attempts

Consider Sedation Prior to Cardioversion

Midazolam 2 – 2.5 mg IV / IO
May repeat as needed
Maximum 10 mg

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

NO

B — 12 Lead ECG Procedure

A — IV / IO Procedure

Cardiac Monitor & $ETCO_2$

Attempt Vagal Maneuvers Procedure

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

P — **Diltiazem 20 mg IV / IO**
If age ≥ 60 give **10 mg** then repeat **10 mg** in 5 minutes
if SBP ≥ 100

If rate not controlled repeat bolus in 15 minutes
Diltiazem 25 mg IV / IO
If age ≥ 60 give **15 mg** then repeat **10 mg** in 5 minutes
if SBP ≥ 100

RHYTHM CONVERTS

Single lead ECG able to diagnose and treat arrhythmia

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

NO

P — **Amiodarone 150 mg IV/IO in 250 NS**
Infuse over 10 minutes
May repeat if wide complex tachycardia recurs

Monitor and Reassess

YES

B — 12 Lead ECG Procedure

Monitor and Reassess

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Adult Tachycardia

Narrow Complex (≤ 0.11 sec) IRREGULAR RHYTHM

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	Cardioversion Procedure
	Narrow and Regular: 50 – 100J
	Narrow and Irregular: 120 – 200J
	May repeat and increase dose with subsequent cardioversion attempts
	Consider Sedation Prior to Cardioversion
	Midazolam 2 – 2.5 mg IV / IO May repeat as needed **Maximum 10 mg**

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

NO ↓

B	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor & $ETCO_2$
	Attempt Vagal Maneuvers Procedure
	Diltiazem 20 mg IV / IO If age ≥ 60 give **10 mg** then repeat **10 mg** in 5 minutes if SBP ≥ 100 If rate not controlled repeat bolus in 15 minutes **Diltiazem 25 mg IV / IO** If age ≥ 60 give **15 mg** then repeat **10 mg** in 5 minutes if SBP ≥ 100

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 (≤ 0.11 sec)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **Rhythm should be interpreted in the context of symptoms.**
- **Unstable condition**
  - **Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**
  - **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic condition**
  - **Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.**
  - **Symptomatic tachycardia usually occurs at rates ≥ 150 beats per minute. Patients symptomatic with heart rates < 150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
  - **Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute 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 Calcium Channel Blocker (e.g. Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- Typical sinus tachycardia is in the range of 100 to (200 - patient's age) beats per minute.
- **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.
  - Agencies using both calcium channel blockers and beta blockers should choose one primarily. Giving the agents sequentially requires **Contact of Medical Contro**l. This may lead to profound bradycardia / hypotension.
- **Irregular Tachycardias:**
  - First line agents for rate control are calcium channel blockers or beta blockers.
  - Agencies using both calcium channel blockers and beta blockers should choose one primarily. Giving the agents sequentially requires **Contact of Medical Control**. This may lead to profound bradycardia / hypotension.
  - Adenosine may not be effective in identifiable atrial fibrillation / flutter, yet is not harmful and may help identify rhythm.
  - Amiodarone may be given in CHF, risk of rhythm conversion in patients with arrhythmia > 48 hours.
- **Synchronized Cardioversion:**
  - Recommended to treat UNSTABLE Atrial Fibrillation, Atrial Flutter and Monomorphic-Regular Tachycardia (VT.)
- Monitor for hypotension after administration of Calcium Channel Blockers or Beta Blockers.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Adult Tachycardia

Wide Complex (≥0.12 sec) REGULAR RHYTHM

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	Cardioversion Procedure
	Wide and Regular: 100J
	Wide and Irregular: 200J (Not Synchronized)
	May repeat and increase dose with subsequent cardioversion attempts
	Consider Sedation Prior to Cardioversion
	Midazolam 2 – 2.5 mg IV / IO May repeat as needed **Maximum 10 mg**

NO

B	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor

REGULAR RHYTHM and Monomorphic QRS Complex

NO

YES

P	**Amiodarone 150 mg IV / IO in 250 NS Infuse over 10 minutes**
	May repeat if wide complex tachycardia recurs
	Or
	Lidocaine 1 mg / kg IV / IO.
	May repeat ½ dose if wide complex 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.

P	**Consider consultation with medical control if 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

Wide Complex (≥0.12 sec) IRREGULAR RHYTHM

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	Cardioversion Procedure
	Wide and Regular: 100J **Wide and Irregular: 200J (Not Synchronized)** *May repeat and increase dose with subsequent cardioversion attempts*
	Consider Sedation Prior to Cardioversion **Midazolam 2 – 2.5 mg IV / IO** May repeat as needed **Maximum 10 mg**

NO

B	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor

IRREGULAR RHYTHM and MONOMORPHIC QRS Complex

IRREGULAR RHYTHM and POLYMORPHIC QRS Complex

P	**Amiodarone 150 mg IV / IO in 250 mL NS** **Infuse over 10 minutes** May repeat if wide complex tachycardia recurs Or **Lidocaine 1 mg / kg IV / IO.** May repeat ½ dose if wide complex tachycardia recurs

	Airway Protocol(s) AR 1, 2, 3 **as indicated**
	Pulseless VF / VT Protocol AC 8 Cardiac Arrest Protocol AC 3 **as indicated**

Single lead ECG able to diagnose and treat arrhythmia

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

P	**Consider consultation with medical control if 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
Wide Complex (≥0.12 sec)

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Most important goal is to differentiate the type of tachycardia and if STABLE or UNSTABLE and SYMPTOMATIC.**
- **Rhythm should be interpreted in the context of symptoms**
- **Unstable condition**
  - **Condition which acutely impairs vital organ function and cardiac arrest may be imminent.**
  - **If at any point patient becomes unstable move to unstable arm in algorithm.**
- **Symptomatic condition**
  - **Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.**
  - **Symptomatic tachycardia usually occurs at rates ≥ 150 beats per minute. Patients symptomatic with heart rates <150 likely have impaired cardiac function such as CHF.**
- **Serious Signs / Symptoms:**
  - **Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute congestive heart failure.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- **If patient has history or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer a Calcium Channel Blocker (e.g., Diltiazem) or Beta Blockers. Use caution with Adenosine and give only with defibrillator available.**
- **Search for underlying cause of tachycardia such as fever, sepsis, dyspnea, etc.**
- Typical sinus tachycardia is in the range of 100 to (220 – patients age) beats per minute.
- **Regular Wide-Complex Tachycardias:**
  - **Unstable condition:**
    - Immediate defibrillation if pulseless and begin CPR.
  - **Stable condition:**
    - Typically VT or SVT with aberrancy. Adenosine may be given if regular and monomorphic and if defibrillator available.
    - Verapamil contraindicated in wide-complex tachycardias.
    - Agencies using Amiodarone, Procainamide and Lidocaine need choose one agent primarily. Giving multiple anti-arrhythmics requires contact of medical control.
    - Atrial arrhythmias with WPW should be treated with Amiodarone or Procainamide
- **Irregular Tachycardias:**
  - Wide-complex, irregular tachycardia: Do not administer calcium channel, beta blockers, or adenosine as this may cause paradoxical increase in ventricular rate. This will usually require cardioversion. Contact medical control.
- **Polymorphic / Irregular Tachycardia:**
  - This situation is usually unstable and immediate defibrillation is warranted.
  - When associated with prolonged QT this is likely Torsades de pointes: Give 2 gm of Magnesium Sulfate slow IV / IO.
  - Without prolonged QT likely related to ischemia and Magnesium may not be helpful.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Adult Cardiac Protocol Section

History
- SAMPLE
- Estimated downtime
- Events leading to arrest
- Suspected hypothermia. Overdose
- End stage renal disease
- DNR, MOST, or Living Will

Signs and Symptoms
- Pulseless
- Apneic
- VF or pulseless VT on ECG

Differential
- See Reversible Causes below
- Artifact
- Device failure
- Cardiac
- Endocrine / metabolic
- Drugs
- Pulmonary

Cardiac Arrest Protocol AC 3

Criteria for Death / No Resuscitation
Review DNR / MOST Form

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

NO ↓

CPR Procedure

AED Procedure
if available

P — Cardiac Monitor; place Zoll Stat Padz and secondary set of pads

P — **Manual defib procedure 200j**
If VF/ pulseless VT
Repeat every two minutes as needed

Consider reversible causes

A — IV / IO Procedure

A — **Epinephrine 0.1mg/mL (1:10,000) 1 mg IV / IO**
Every 5 minutes

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

P — **Amiodarone 300 mg IV / IO**
May repeat if refractory
Amiodarone 150 mg IV / IO
Refractory
Consider Lidocaine 1.5 mg/kg IV / IO
May repeat if refractory
Lidocaine ½ initial dose IV/ IO

P — **Refractory after three (3) defibrillation attempts?**
Change defibrillation vector

P — **Refractory after four (4) defibrillation attempts?**
Consider DSED

Consider Intra-Arrest Targeted Temperature Management Therapy for refractory VF

Reversible Causes
Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia
Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

Torsades de pointes
Low Magnesium States (Malnourished / alcoholic)
Suspected Digitalis Toxicity

P — **Defibrillate 200 J**
Consider
Magnesium Sulfate 2g IV / IO

ROSC?
NO → Termination on scene Protocol
YES → Post Resuscitation Protocol

Notify Destination or Contact Medical Control

Utilize this protocol with Team Focused Resuscitation Protocol

Airway protocol(s)
As indicated

ROSC at any time
Go to
Post Resuscitation Protocol

P — After four (4) cycles of CPR after initial ALS in place consider LUCAS3 placement

AC 8

This protocol has been altered from the original NCCEP Protocol by the Johnston County EMS System Medical Director

Ventricular Fibrillation
Pulseless Ventricular Tachycardia

- **It is important to minimize interruptions in chest compressions, especially prior to and immediately post shock. Compressions must continue while the defibrillator is charging.**
- **Coarse ventricular fibrillation (VF) is most likely to convert to a perfusing rhythm.**
- **If a patient goes into ventricular fibrillation (VF) or pulseless ventricular tachycardia in front of you, immediate defibrillation is needed.**
- **Airway management should never be a priority with patients in VF/pulseless VT.**
- **Medications should never be administered through an ET tube.**
- **Resuscitation efforts should never be discontinued on a patient in VF.**
- **High quality CPR has been proven to increase chances of converting rhythms along with defibrillation. Continuously monitor the quality of compressions and adjust as needed.**
- **If applicable, continuously monitor filtered rhythm for changes.**
- **Monitor $EtCO_2$ and improve compressions. A low $EtCO_2$ could be due to compression quality and not ventilations. Adjust compressions and keep the ventilation rate at 10 breaths per minute.**
- **If BVM/OPA or BIAD is effective, continue its use. Studies show endotracheal intubation within the first 15 minutes of a working code can increase mortality.**
- **Naloxone has no role in cardiac arrest.**

Pearls

- **Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.**
- **DO NOT HYPERVENTILATE: Maintained controlled ventilations at rate of 10 per minute or as guided by $EtCO_2$, with continuous uninterrupted compressions. Administer controlled ventilations of 400-600 mL air volume. This can be accomplished by providing a half squeeze of the adult BVM or a full squeeze of a pediatric BVM.**
- **Consider early IO placement if available and / or difficult IV access anticipated.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Consider Passive oxygenation during first 2 defibrillations, focus on high quality compressions and early defibrillations versus obtaining an airway.**
- Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care. ETCO2 must be utilized with ventilations.
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation**.
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO_2 ($EtCO_2$)**
  - If $EtCO_2$ is < 10 mmHg, improve chest compressions.
  - If $EtCO_2$ doesn't increase, further evaluate and inquire about extended downtime.
  - If $EtCO_2$ spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Magnesium Sulfate is not routinely recommended during cardiac arrest, but may help with Torsades de points, Low Magnesium States (Malnourished / alcoholic), and Suspected Digitalis Toxicity.**
- Sodium bicarbonate should be considered in the dialysis / renal patient, known hyperkalemia, or suspected tricyclic overdose at 50 mEq IV / IO.
- Consider placement of LUCAS3 after four (4) rounds of CPR after implementation of initial ALS.

Post Resuscitation

Cardiac arrest / Rhythm specific protocol

B

Repeat Primary Assessment

10-minute pause prior to moving patient
Anticipate re-arrest and prepare for movement

Optimize Ventilation and Oxygenation
- Maintain SpO_2 ≥ 94 %
- $EtCO_2$ ideally 35 – 45 mm Hg
- Respiratory Rate 10 / minute
- Remove Impedance Threshold Device
- DO NOT HYPERVENTILATE

12 Lead ECG Procedure

A IV / IO Procedure

P Cardiac Monitor

If not utilized, place LUCAS3 device

Monitor Vital Signs / Reassess

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

P If post-ROSC patient is conscious, consider sedation prior to placing LUCAS3 if SBP ≥90

Midazolam 1.0 – 2.5 mg IV/IO

Do not delay transport beyond 10-minute pause to await LUCAS3 arrival.

Utilize Post Cardiac Arrest Triage and Destination Plan

STEMI/ Suspicion of STEMI? YES → Chest Pain and STEMI Protocol ***if indicated***

NO

Arrhythmias are common and usually self limiting after ROSC

Persistant arrhythmia? YES → Appropriate arrhythmia Protocol ***as indicated***

NO

Hypotension SBP <90? YES → Hypotension / Shock Protocol ***as indicated***

NO

Symptomatic bradycardia? YES → Appropriate Arrhythmia Protocol(s) ***as indicated***

NO

Unresponsive? YES → Targeted Temperature Management Protocol ***if available***

NO

BIAD/ ETI in place? YES → Post Intubation/ BIAD Management Protocol

If patient re-arrests during transport at <u>any point</u> prior to arrival at destination-

1. Stop ambulance in a safe manner and location,

2. If LUCAS3 in place, notify JC911 and specify minimal additional resources are needed, i.e. fire engine company, activate LUCAS3 and re-assess,

If LUCAS3 not in place, Notify JC911 of re-arrest and request full cardiac arrest assignment,

3. Work the arrest in place until ROSC or termination of efforts

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Post Resuscitation

Pearls

- **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 FiO_2 to maintain SpO_2 of ≥ 94%.**
- **Initial Et CO_2 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.**
- **<u>STEMI:</u>**
  - **Transport to a primary cardiac catheter facility per destination protocols with evidence of STEMI on 12-lead ECG.**
- **<u>Targeted Temperature Management:</u>**
  - **Maintain core temperature between 34ºC - 36°C (93.2ºF – 96.8ºF).**
  - **Infusion of cold saline is NOT recommended in the prehospital setting.**
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiology / cardiac catheterization, intensive care service, and neurology services.**
- The condition of post-resuscitation patients fluctuates rapidly and continuously and requires close monitoring. Appropriate post-resuscitation management may best be planned in consultation with medical control.
- **Do not delay transport of a post-ROSC patient beyond the 10-minute post-ROSC pause to await the arrival of the LUCAS3 device.**
- **If the patient re-arrests at any point during transport prior to arrival at destination-**
  - **If LUCAS3 device is in place, stop ambulance in a safe manner and location notify JC911 of re-arrest and minimal resources, i.e fire engine company, are needed and work the arrest in place until ROSC or termination of efforts.**
  - **If LUCAS3 device is not in place, stop ambulance in a safe manner and location notify JC911 of re-arrest and request afull cardiac arrest assignment, and work the arrest in place until ROSC or termination of efforts.**

Target Temperature Management

History
- Non-traumatic cardiac arrests (drownings and hanging / asphyxiation are permissible in this protocol.)
- All presenting rhythms are permissible in this protocol
- Age 18 or greater

Signs and Symptoms
- Cardiac arrest
- Return of Spontaneous Circulation post-cardiac arrest
- No neurological functioning noted. (no purposeful movement)

Differential
- Continue to address specific differentials associated with the arrhythmia

Return of Spontaneous Circulation ROSC

Criteria for Targeted Temperature Management
Initial tympanic temperature ≥ **93.2° F (34°C)**

NO → Exit to Post Resuscitation Protocol AC 9

YES

B	**Advanced Airway (includes BIAD) in place** with $EtCO_2$ >20 mmHg
	Perform Neurological Assessment
	Expose and apply ice packs to axilla and groin areas
A	IV / IO Procedure
	Cold Normal Saline bolus 30 mL/kg IV / IO max 2L
	Hypotension / Shock Protocol AM 5 ***as indicated***

NO → Airway Protocol(s) AR 1, 2, 3 ***as indicated***

Reassess Tympanic Temperature
Target: 93.2ºF – 96.8°F
(Range 34ºC – 36ºC)

< 93.2°F (34°C) → Stop cooling measures Until temperature increases
Reassess temperature every 10 minutes
Continue Post Resuscitation Care

≥ 93.2°F (34°C) → Continue Cooling

Exit to Post Resuscitation Protocol AC 9

Shivering noted

NO → Exit to Post Resuscitation Protocol AC 9

YES

P

Fentanyl 50 – 75 mcg IV / IO Repeat every 5 minutes as needed
Maximum 200 mcg

Etomidate 10 – 20 mg IV / IO

If shivering uncontrolled following opioid and benzodiazepine Administration Choose ***ONE***

Vecuronium 10 mg IV / IO
Pancuronium 0.1 mg/kg IV / IO
Rocuronium 1 mg/kg IV / IO

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Target Temperature Management

Pearls:

- **Criteria for Targeted Temperature Mangement:**
  - **Return of spontaneous circulation not related to blunt / penetrating trauma or hemorrhage with ventricular fibrillation / tachycardia and non-shockable arrhythmias.**
  - **Temperature greater than 93.2°F (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 FiO_2 to maintain SpO_2 of ≥ 94%.**
- **Initial End tidal CO_2 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.**
- **STEMI: Transport to a primary cardiac catheter facility per destination protocols with evidence of STEMI on 12-lead ECG.**
- **Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiac catheterization 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 studies to date demonstrate improved neurological outcomes with prehospital initiated cooling.

Team Focused Resuscitation

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES ←

- Decomposition
- Rigor mortis
- Dependent lividity

Injury incompatible with life, extended downtime with asystole, or traumatic arrest with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO ↓

Begin Continuous CPR Compressions
Compress Chest ≥ 2 inches
Compress Chest at a rate of 100-120 / min
Change Compressors every 2 minutes
(*Limit changes / rhythm checks ≤ 5 seconds*)

First Arriving Fire Department units
Provide size-up as "working code", "CPR in progress", etc.
Establish and name command and verbalize via radio to JC911
Initiate compressions
Initiate AED procedure ***If available***
Place NRB at 15 LMP oxygen; Initiate BVM/OPA Ventilations at no more than 10 / minute as personnel are available (≥3)

Provide updates via radio, i.e. "shock delivered", "pulses present", etc.

↓

B

First Arriving EMS units
If not done, give size-up as "working code" or "CPR in progress"
If not done, establish and name COMMAND, verbalize via radio to JC911
Ensure / initiate continuous chest compressions
Initiate BVM / OPA / ITD / $EtCO_2$ ventilations as adequate personnel are available (≥3)
Apply Defib Pads / Switch Pads if compatible

P

Establish Medical Branch
Initiate manual defibrillation procedure
Utilize pre-ROSC checklist

↓

B

Second Arriving EMS units
Receive report (SBAR) from Medical Branch
Place second set of defib pads
Ensure continuous chest compressions
Ensure adequate airway BVM / $EtCO_2$ / OPA / BIAD / ITD
10 / minute via BVM / $EtCO_2$ / OPA / BIAD / ITD

A

Establish vascular access (IO preferred)
Initiate medication therapy

↓

P

First Arriving EMS Supervisor units
Receive report (SBAR) from Medical Branch
Ensure command established and named
Ensure adequate resources present
Ensure scene management (remain hands off as possible)
Ensure family care is taking place

↓

Continue Cardiac Arrest Protocols
Utilize pre- and post-ROSC checklists

Utilize this protocol with

Cardiac Arrest Protocol AC 3

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

Medical Branch-Run Pre-ROSC checklist

Adult Cardiac Section Protocols

Team Focused Resuscitation

- **During each shift communicate with you partner(s) about your role during a cardiac arrest. Have a pre-plan and assign tasks each shift.**
- **Consider a debriefing after each cardiac arrest to include all personnel that was involved.**

Pearls:

- **Responding units should bring all necessary equipment to the patient's side:**
  - **First arriving EMS unit: Primary medical bag, defibrillator, airway bag, portable suction unit**
  - **Second arriving EMS unit: Primary medical bag, defibrillator, airway bag, back-up drug box, portable suction unit**
  - **First arriving EMS supervisor: Hypothermic therapy supplies, defibrillator, primary medical bag**
- **Compressor changes / rhythm checks (shock if indicated) should be limited to five seconds or less and the defiibrillator should be pre-charged prior to the actual pause. Additionally, these pauses should be spaced at least two (2) minutes apart as more frequent pauses reduce time on the chest. If available, continuously monitor filtered CPR and $EtCO_2$ for rhythm changes.**
- **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 / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: Maintained controlled ventilations at rate of 10 per minute or as guided by $EtCO_2$, with continuous uninterrupted compressions. Administer controlled ventilations of 400-600 mL air volume. This can be accomplished by providing a half squeeze of the adult BVM or a full squeeze of a pediatric BVM. *Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.***
- **When possible continuously monitor $EtCO_2$ readings as this will usually provided the first indication of ROSC and verify quality of compressions. If $EtCO_2$ is low, improve compression quality.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Breathing / Airway management after second shock and / or 2 rounds of compressions (2 minutes each round.)**
- Successful resuscitation is based on proper planning and execution. Procedures require space and patient access. Make room to work. Utilize Team Focused Approach assigning responders to predetermined tasks and use the Pre-ROSC Cardiac Arrest Checklist and Medical Branch as personnel are available to do so.
- Allocate tasks as resources become available:
  - First arriving fire department units should focus on continuous chest compressions and early AED; ventilations should be deferred until at least three personnel are on scene. Utilize passive oxygenation with a NRB if necessary to ensure adequate compressions are ongoing.
  - First arriving EMS unit should focus on continuous chest compressions, early manual defibrillation, and if three or more personnel are on scene, maintain controlled ventilations utilizing BVM / OPA / ITD / $EtCO_2$. Consider passive oxygenation with a NRB to ensure adequate compressions are ongoing.
  - Second arriving EMS unit should establish vascular access (consider early IO) and BIAD / ITD / $EtCO_2$ placement
- Utilize Team Focused Approach assigning responders to predetermined tasks and utilize the Pre- and Post-ROSC checklists as appropriate. Assign task as personnel are available to perform them.
- Consider possible CAUSE of arrest early: for example, resuscitated VF may be STEMI. Consider traditional ACLS "H's and T's" for PEA: Hypovolemia, Hypoxia, Hydrogen ions (acidosis), Hyperkalemia, Hypothermia, Toxins/Tricyclics, Tamponade, Tension pneumothorax, Thrombosis (MI), Thromboembolism (PE), Trauma
- When considering CAUSE, consider utilizing relevant protocols in conjunction: airway, all cardiac protocols, allergic reaction, dialysis/renal failure, overdose/ingestion, suspected stroke, environmental protocols, etc.
- INCIDENT COMMANDER may be fire department personnel or EMS ALS personnel or supervisor. It is not necessary to transfer command if already established. Responsibilities include team leader until EMS arrival, scene / bystander management, and initial family briefing prior to EMS ALS arrival.
- MEDICAL BANCH may be EMS ALS personnel. It is not necessary to transfer Medical Branch automatically. Responsibilities include overall patient care, ensuring high-quality compressions, properly timed compressor changes, and recording the time of significant events, including rhythm changes, medication administration, return of spontaneous circulation (ROSC), etc.
- Upon obtaining ROSC or termination of efforts, notifiy JC911 of time and request an entry into the computer aided dispatch (CAD) notes.

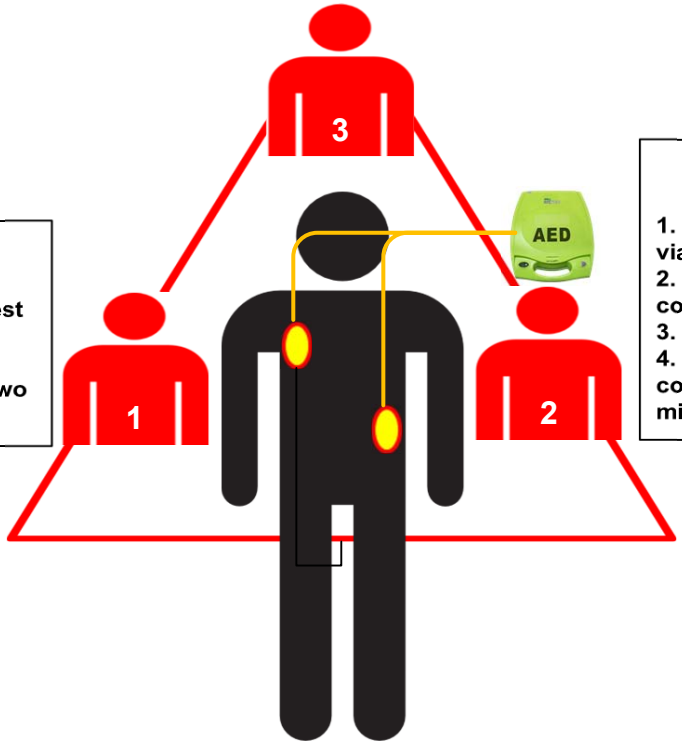
Team Focused Resuscitation

FIRE DEPARTMENT ARRIVES FIRST / NO EMS RESOURCE ON SCENE

Successful resuscitation is based on proper planning and execution. Procedures require space and patient access. Make room to work.

Position 3 always at patient's head prior to EMS arrival

1. Initiates passive oxygenation via NRB at 15 LPM oxygen
   or
2. Initiates controlled ventilations via BVM / OPA; 8-10 ventilations per minute if adequate personnel are on scene to perform adequate compressions.



Position 1 always on patient's right side

1. Initiates continuous chest compressions
2. Alternates chest compressions with #2 at two minute intervals

Position 2 always on patient's left side

1. Provide update to JC911 via radio
2. Establish and name command
3. Apply AED
4. Alternates chest compressions with #1 at two minute intervals

As fire personnel arrive assign to BLS roles including chest compressions, airway management, scribe, etc.

Until resources are available, modification of the typical deployment will be necessary. Priorities of assignments should follow the Team Focused Resuscitation Protocol.

Team Focused Resuscitation

EMS UNIT ARRIVES FIRST / NO FIRE DEPARTMENT RESOURCE ON SCENE

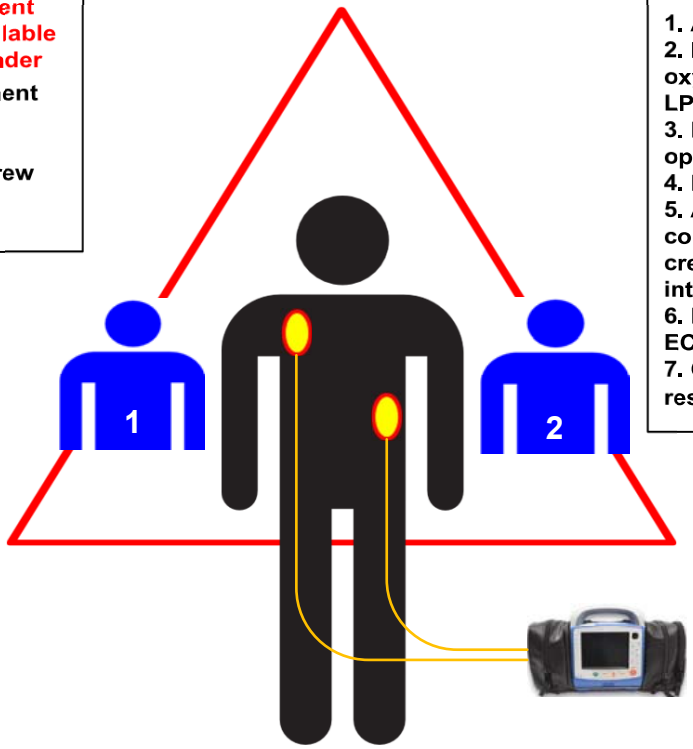
Successful resuscitation is based on proper planning and execution. Procedures require space and patient access. Make room to work.

Non-lead crew member (#1) initially locates on patient's right side; then moves to head of patient upon arrival of first available fire department responder

1. Initial patient assessment
2. Initiates chest compressions
3. Alternates with lead crew member at two minute intervals

Lead crew member (#2) initially opposite non-lead until resources arrive; then moves outside CPR Zone near lower leg when able

1. Assumes Medical Branch
2. Initiates passive oxygenation via NRB at 15 LPM oxygen
3. Places pads and leads; operates monitor
4. Provides updates to JC911
5. Alternates chest compressions with non-lead crew member at two minute intervals
6. Prints rhythm strips of all ECG changes
7. Confirms assignments as resources arrive



As fire personnel arrive assign to BLS roles including chest compressions, airway management, scribe, etc.

As EMS personnel arrive assign to BLS and ALS roles including chest compressions, airway management, vascular access, family care, etc., as needed.

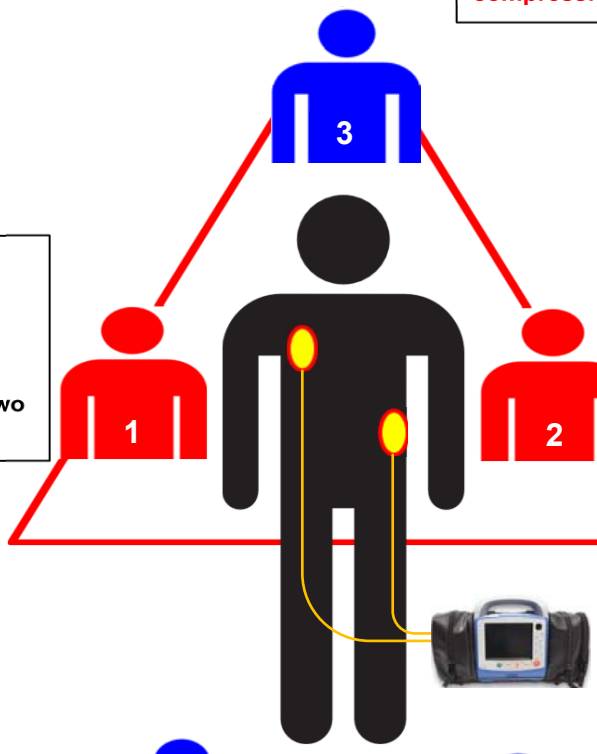
Until resources are available, modification of the typical deployment will be necessary. Priorities of assignments should follow the Team Focused Resuscitation Protocol.

Team Focused Resuscitation

FIRST ARRIVING EMS UNIT / FIRE PERSONNEL ON SCENE

Position 3 always at patient's head

1. Opens / clears airway and place OPA
2. Assemble / apply BVM / ETCO2 / ITD
3. Placement of BIAD / ETCO2 / ITD after arrival of 2nd EMS unit
4. Rotates with fire personnel for chest compressions every two minutes



Position 1 always on patient's right side

1. Continues chest compressions
2. Alternates chest compressions with #1 at two minute intervals

Position 2 always on patient's left side

1. Continues chest compressions
2. Alternates chest compressions with #1 at two minute intervals

Position 4 always at area outside CPR Zone near lower leg

1. Assumes Medical Branch
2. Operates monitor
3. Records events on monitor
4. Prints rhythm strips of all ECG changes
4. Makes patient treatment decisions
5. Ensures compressor switches are occurring at two minute intervals
6. Communicates with COMMAND and EMS Supervisor

F

As additional fire personnel arrive assign to BLS roles including chest compressions, airway management, scribe, etc.

E

As EMS personnel arrive assign to BLS and ALS roles including chest compressions, airway management, vascular access, family care, etc., as needed.

Until resources are available, modification of the typical deployment will be necessary. Priorities of assignments should follow the Team Focused Resuscitation Protocol.

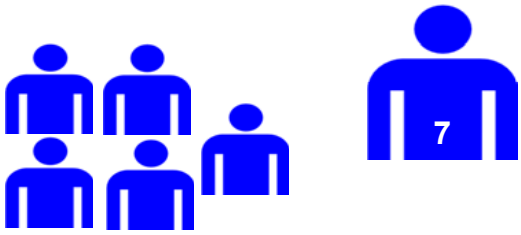
Team Focused Resuscitation

ASSIGN PERSONNEL AS THEY BECOME AVAILABLE

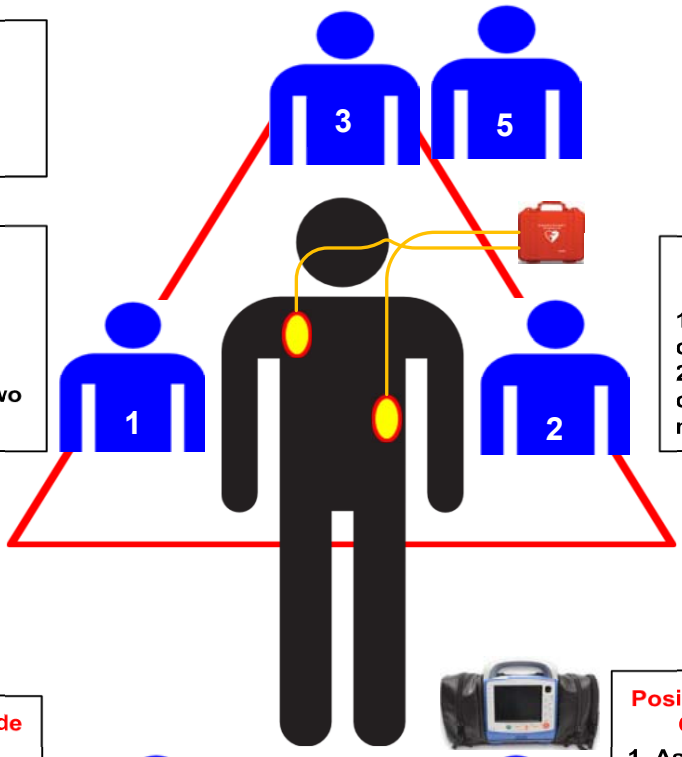
Position 7 always outside CPR Zone
1. Provide oversight to resuscitation
2. Provide family care
3. Ensure scene needs are met
4. Assists as needed

Position 3 always at patient's head
1. Opens / clears airway and place OPA
2. Assemble / apply BVM / ETCO2 / ITD
3. Placement of ETCO2 / ITD / BIAD after arrival of 2nd EMS unit or 400 compressions

Position 5 at patient's head as available
1. Provides two-hand seal until placement of BIAD
2. Assists with airway management, including suction



Personnel Pool
Assign extra personnel as-
1. Compressors for rotation
2. Scribe
3. Equipment runners



Position 1 always on patient's right side
1. Continues chest compressions
2. Alternates chest compressions with #1 at two minute intervals

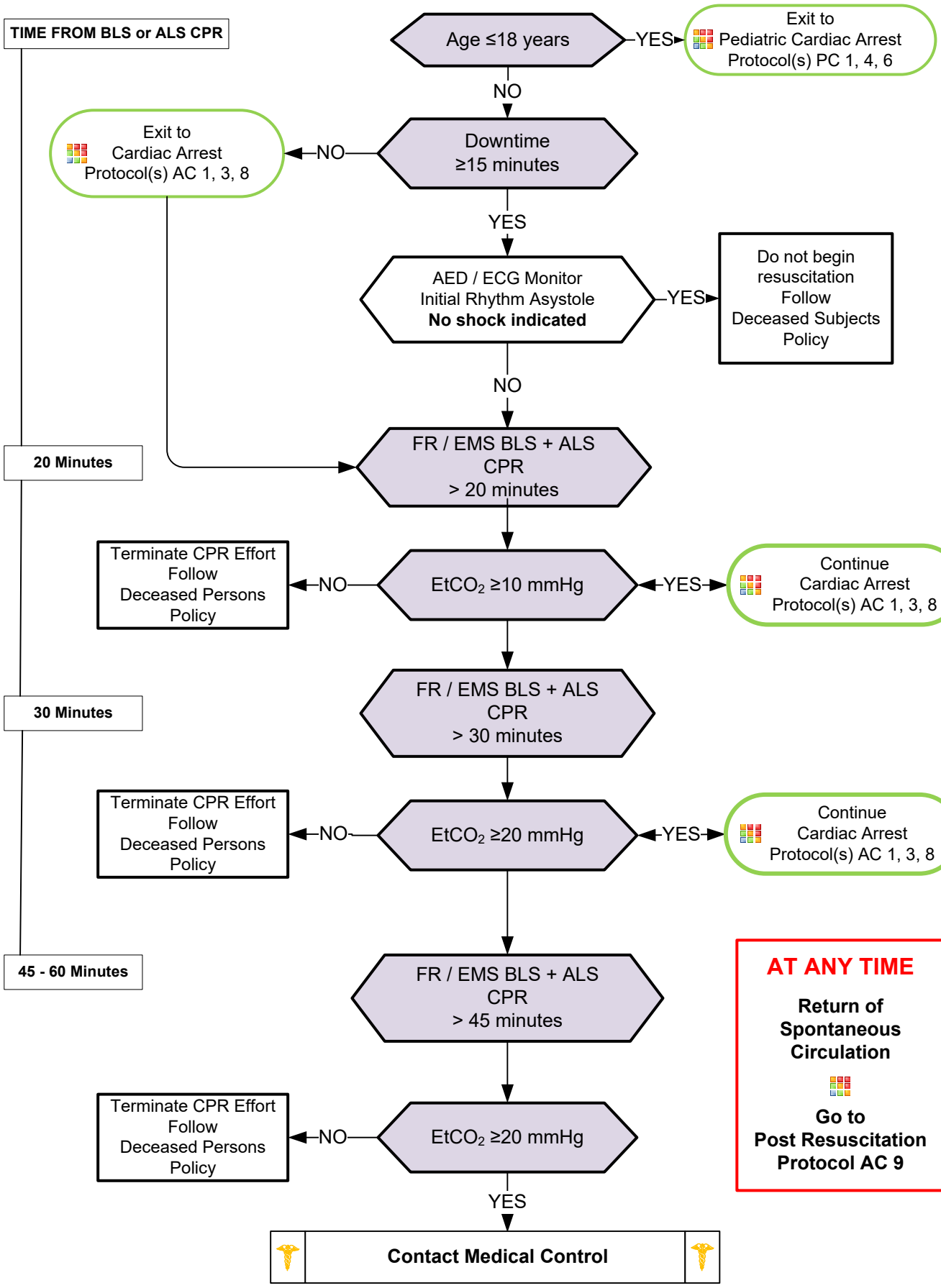
Position 2 always on patient's left side
1. Continues chest compressions
2. Alternates chest compressions with #1 at two minute intervals

Position 6 always at area outside CPR Zone near lower leg
1. Establish vascular access
2. Administer medications requested by Medical Branch
3. Records dosages and times of medications administered

Position 4 always at area outside CPR Zone near lower leg
1. Assumes Medical Branch
2. Operates monitor
3. Records events on monitor
4. Prints rhythm strips of all ECG changes
4. Makes patient treatment decisions
5. Communicates with COMMAND and EMS Supervisor

Until resources are available, modification of the typical deployment will be necessary. Priorities of assignments should follow the Team Focused Resuscitation Protocol.

On Scene Resuscitation
Termination of CPR



On Scene Resuscitation / Termination of CPR

Pearls.

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

Emergencies Involving Left Ventricular Assist Devices (LVAD)

History
- End-stage heart failure
- Patient has surgically-implanted pump that assists the action of one or both ventricles
- Patient may or may not be on a list for transplantation

Signs and Symptoms
- The flow through many of these devices in not pulsatile, therefore THE PATIENT MAY NOT HAVE A PULSE AT BASELINE. For this reason SpO2 readings may also be inaccurate
- Altered mental status may be the only indicator of a problem
- Consider both VAD-related and non-VAD related problems

Differential
- Stroke
- Cardiac arrest
- Dysrhythmia different from patient's baseline
- Infection
- Bleeding (VAD patients are anticoagulated)
- Dehydration
- Cardiac tamponade
- Device problem such as low battery or disconnected drive line

Signs or symptoms of possible device malfunction or failure (hypoperfusion)

YES

Determine type of device and assess any alarms
CALL VAD COORDINATOR and DISCUSS PLAN WITH CAREGIVERS
Consider changing device batteries and/or reconnect cables

Pulsatile Flow Device (less common)

Measure pulse and blood pressure, If no pulse or blood pressure, providers should use the device's **HAND PUMP** to maintain perfusion

Continuous Flow Device (most common)

B ***Auscultate chest for whirring mechanical pump sound.*** Assess patient for hypoperfusion: Altered mental status, pallor, diaphoresis.
Pulses or blood pressure may not be detectable with this type of device

B **DO NOT PERFORM CHEST COMPRESSIONS**
If no pump sound, no pulse or blood pressure, and/or signs of perfusion

NO

Problem with circulation, perfusion, SYMPTOMATIC dysrhythmia not at patient's baseline, any other problems

Exit to appropriate protocol(s)
Treat as per usual guideline

- 1. Establish vascular access; consider fluid bolus
- 2. Cardiac monitor
- 3. Acquire 12-lead ECG
- 4. Treat symptomatic dysrhythmias
- 5. If indicated, place defib pads away from LVAD site and ICD

Check for GO bag (extra cables/batteries) Call LVAD coordinator early

Call LVAD coordinator before initiating CPR.

Check for advanced directives.

P
- **Transport symptomatic medical LVAD patients to implanting center if local**
- **Transport LVAD patient with unstable airway to nearest facility**
- **Transport Level 1 and 2 trauma LVAD patients to nearest trauma facility.**
- **Transport Level 3 and 4 trauma LVAD patients to implanting center, if local stable patients with non-LVAD related issues, or after consultation with LVAD coordinator, may be transported to local ED**

LVAD Coordinator
Duke 919-684-8111
Request LVAD emergency contact to be paged
UNC 919-216-2095

Notify Destination or Contact Medical Control

Adult Cardiac Protocols

Emergencies Involving Left Ventricular Assist Devices (LVAD)

Pearls

- **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.**
- Common complications in VAD patients include Stroke and TIA (incidence up to 25%), bleeding, dysrhythmia, and infection.
- The cardiac monitor will reveal the underlying rhythm, this is not typically affected by the VAD device.
- VAD patients typically have low ejection fractions, hence why they received the VAD to aid in circulation and increased afterload.
- VAD patients are preload dependent. Consider that a FLUID BOLUS can often reverse hypoperfusion.
- Transport patients with ALL device equipment including any instructions, hand pumps, backup batteries, primary and secondary controllers, as well as any knowledgeable family members or caregivers.

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 25 - 50 mg PO**

A
- IV Procedure ***if indicated***
- **Diphenhydramine 25 - 50 mg PO / IV / IM / IO**

B
- Monitor and Reassess
- Monitor for Worsening Signs and Symptoms

MODERATE
2 + Body Systems

B
- **Epinephrine 1 mg/mL (1:1,000) 0.5 mg IM *if available***
- **Diphenhydramine 25 - 50 mg PO**
  See Pearls
- **Albuterol Nebulizer 2.5 – 5 mg**
  Repeat as needed x 3
  if indicated

A
- **Diphenhydramine 25 - 50 mg IV / IM / IO *if not already given PO***

SEVERE
2 + Body Systems + hypotension
Or Isolated Hypotension

B
- **Epinephrine 1 mg/mL (1:1,000) 0.5 mg IM *if available***
- **Albuterol 2.5 – 5 mg**
  Nebulizer
  Repeat as needed x 3
  if indicated

- Airway Protocol(s) AR 1-4 ***if indicated***
- Hypotension / Shock Protocol AM 5 ***if indicated***

A
- **Epinephrine 1mg/mL (1:1,000) 0.3 – 0.5 mg IM**
  Repeat in 5 minutes if no improvement
- IV / IO Procedure
- **Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg**
  Repeat as needed x 3
  if indicated
- **Normal Saline Bolus 500 mL IV / IO**
  Repeat as needed
  Maximum 2 Liters

P
- No improvement with IM Epinephrine
  Epinephrine 0.1 mg/mL (1:10,000) 0.5 mg IV / IO
- **Methylprednisolone 125 mg IV / IO**

EMR
For Moderate and Severe allergic reaction, an EMR can utilize an Epi Auto-injector.

Cardiac and EtCO2 Monitoring
Indicated for Moderate and Severe Reactions

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

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

Allergic Reaction / Anaphylaxis

* ***Patients who are ≥ 50 years of age, have a history of cardiac disease, take beta-blockers / digoxin, or patients who have heart rates ≥ 150; give one-half the dose of epinephrine (0.25mg of epi 1mg/mL (1:1,000)) as epinephrine may precipitate cardiac ischemia.***

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 immediately before or during attempts at IV or IO access.**
  - **Diphenhydramine and steroids have no proven utility in Moderate / Severe anaphylaxis and may be given only after epinephrine. Diphenhydramine and steroids should NOT delay repeated Epinephrine administration.**
  - **In Moderate and severe anaphylaxis diphenhydramine may decrease mental status. Oral diphenhydramine should NOT be given to a patient with decreased mental status and / or a hypotensive patient as this may cause nausea and / or vomiting.**
* **Anaphylaxis unresponsive to repeat doses of IM epinephrine may require IV epinephrine administration by IV push or epinephrine infusion. Contact Medical Control for appropriate dosing.**
* **Symptom Severity Classification:**
  - **Mild symptoms:**
    - **Flushing, hives, itching, erythema with normal blood pressure and perfusion.**
  - **Moderate symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with normal blood pressure and perfusion.**
  - **Severe symptoms:**
    - **Flushing, hives, itching, erythema plus respiratory (wheezing, dyspnea, hypoxia) or gastrointestinal symptoms (nausea, vomiting, abdominal pain) with hypotension/poor perfusion or isolated hypotension.**
* **Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.**
* **Angioedema** is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in **-il.**
* **Hereditary Angioedema** involves swelling of the face, lips, airway structures, extremities, and may cause moderate to severe abdominal pain. Some patients are prescribed specific medications to aid in reversal of swelling. **Paramedic may assist or administer this medication per patient / package instructions.**
* **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

B	Blood Glucose Analysis Procedure
	12 Lead ECG Procedure ***if indicated***
A	IV / IO Procedure
P	Cardiac Monitor
	Altered Mental Status Protocol UP 4 ***if indicated***
	Hypotension / Shock Protocol AM 5 ***if indicated***
	Suspected Stroke Protocol AM 7 ***if indicated***
	Seizure Protocol UP 13 ***if indicated***

A

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

Blood Sugar ≤ 69 mg / dl

- **Consider Oral Glucose Solution** *if available*
- **Consider Oral Solution (Juices / Food)**
- **A** — If no improvement: **D10W IV titrated to effect until blood glucose level ≥ 80 mg/dL**

Blood Sugar 70 – 249 mg / dl

- Blood Glucose Analysis Procedure ***if condition changes***
- Exit to Appropriate Protocol(s)

Blood Sugar ≥ 250 mg / dl

- **A** — **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

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Diabetic; Adult

A patient may refuse transportation after being treated for hypoglycemia without medical control approval if the following criteria are met:

- **The patient is not taking oral diabetic medication(s), and**
- **Blood sugar is ≥ 80 mg/dL, and**
- **A competent adult is present with the patient, and**
- **The patient has the ability to eat a meal now, and**
- **The patient has no complaints.**

When encountering situations that are not straight forward or do not meet the requirements above continue to contact medical control via phone or radio (attempt contact with JCEMSS Medical Director first, then online medical control). Also, please be mindful of patients that you routinely treat and discontinue and their ultimate need for physician consultation.

When D10 is not available, D50 may be allowed if the JCEMS System Medical Director has released a directive to do so. D50 should be given 12.5mg IV / IO. If no improvement, repeat dosing of 12.5mg IV / IO.

Pearls

- **Recommended exam: Mental Status, Skin, Respirations and effort, Neuro, Heart, Lung.**
- **Patients with prolonged hypoglycemia may not respond to glucagon.**
- **Do not administer oral glucose to patients that are not able to swallow or protect their airway.**
- **Quality control checks should be maintained per manufacturers recommendation for all glucometers.**
- **Blood samples for glucose analysis should be from capillary samples (fingertip, palm, forearm) and not venous samples due to calibration of Johnston County EMS System glucometers.**
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
  - Blood sugar must be ≥ 80, patient has ability to eat and availability of food with responders on scene.
  - Patient must have known history of diabetes and not taking any oral diabetic agents.
  - Patient returns to normal mental status and has a normal neurological exam with no new neurological deficits.
  - Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol. Otherwise contact medical control.
- **Hypoglycemia with Oral Agents:**
  - Patient's 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.
  - Not all oral agents have prolonged action so Contact Medical Control for advice.
  - Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Hypoglycemia with Insulin Agents:**
  - Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established.
  - Not all insulin have prolonged action so Contact Medical Control for advice.
  - Patient's who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Congestive Heart Failure patients who have Blood Glucose > 250:**
  - Limit fluid boluses unless they have signs of volume depletion, dehydration, poor perfusion, hypotension, and / or shock.

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**; **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 dressing not effective and significant hemorrhage, apply tourniquet to affected extremity far away from shunt/fistula ***Only in the event of life threatening exsanguinating hemorrhage***

NO

- B: Blood Glucose Analysis Procedure
- Diabetic Protocol AM 2 ***as indicated***
- B: 12 Lead ECG Procedure
- A: IV / IO Procedure
- P: Cardiac Monitor & $EtCO_2$
- 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** Over 2 to 3 minutes; **Sodium Bicarbonate 50 mEq IV / IO**

NO

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

Dialysis / Renal Failure

Pearls

- **Recommended exam: Mental status. Neurological. Lungs. Heart.**
- **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 indicated in the dead or near-dead patient only with no IV or IO access.**
- **If hemorrhage cannot be controlled with firm, uninterrupted direct pressure, application of tourniquet with uncontrolled dialysis fistula bleeding is indicated.**
- **Hemodialysis:**
  - Process which removes waste from the blood stream and occurs about three times each week.
  - Some patients do perform hemodialysis at home.
- **Peritoneal dialysis:**
  - If patient complains of fever, abdominal pain, and / or back pain, bring the 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

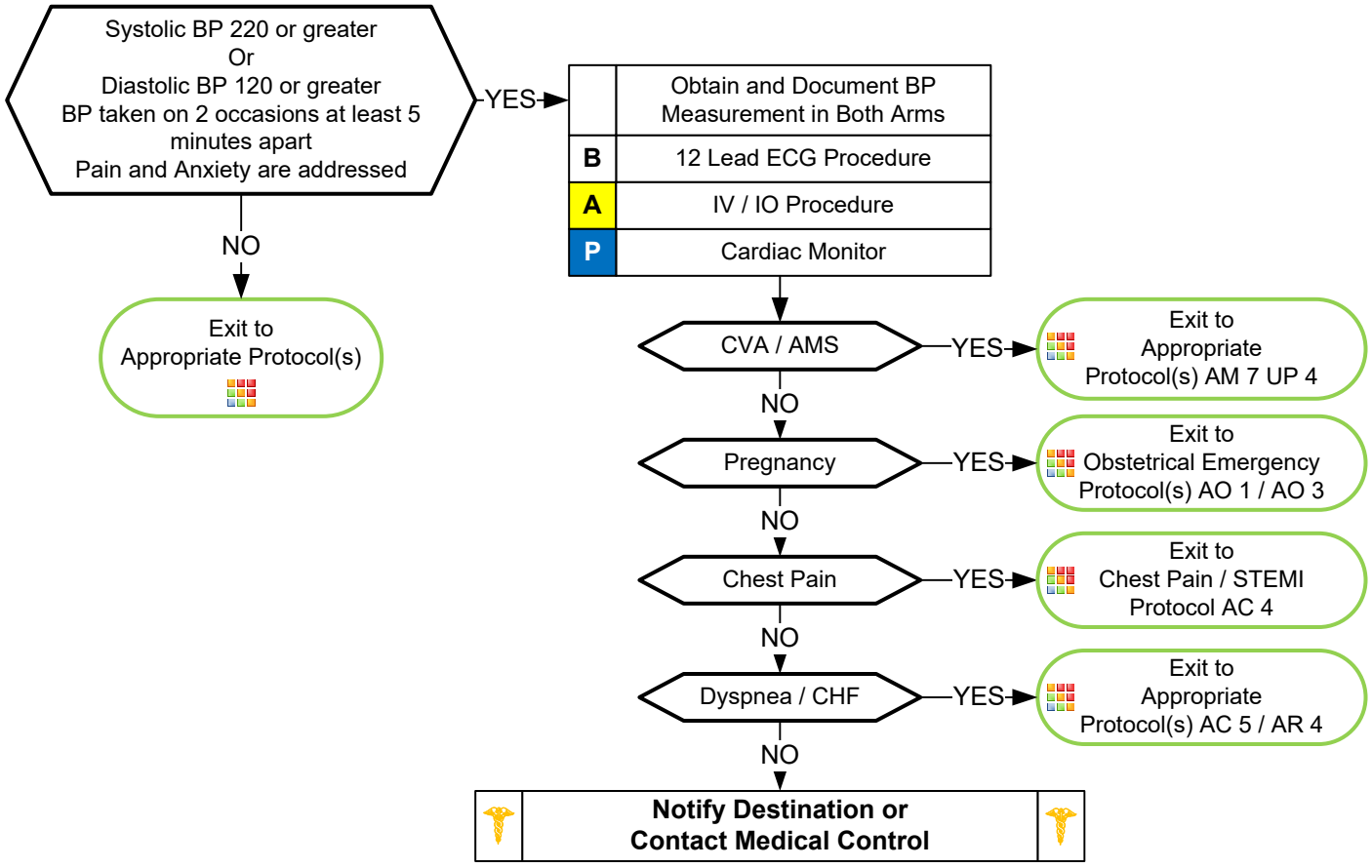
History
- Documented Hypertension
- Related diseases: Diabetes; CVA; Renal Failure; Cardiac Problems
- Medications for Hypertension
- Compliance with Hypertensive Medications
- Erectile Dysfunction medications
- Pregnancy

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.

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

Hypotension / Shock

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

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

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

Adult Diabetic protocol *if indicated*

B — Blood Glucose Analysis procedure
B — 12-lead ECG Procedure
A — IV / IO Procedure
P — Cardiac monitor & $EtCO_2$
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
Appropriate Cardiac protocol(s) *if indicated*

Hypovolemic / **Distributive**
Allergy protocol AM 1 *if indicated*
Suspected Sepsis protocol UP 14 *if indicated*
Multiple Trauma protocol TB 6 *if indicated*

Obstructive
P — Chest Decompression procedure *if indicated*

A — **Normal Saline Bolus 500 mL IV**
Repeat to effect SBP > 90 **2 L Maximum**

P — **Dopamine 5 – 20 mcg/kg/ min IV/IO**
or
Norepinephrine (Levophed) 2 – 10 mcg/min
Titrate to systolic SBP ≥90

P — **Epinephrine 2 – 10 mcg/min IV / IO**
Titrate to systolic SBP > 90

CAUTION
Patients must have adequate intravascular fluid load prior to use of vasopressors

Utilize Johnston County EMS System approved dosing charts and instructions

Notify Destination or Contact Medical Control

Adult Medical Protocol Section

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

Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 250 mL (1,600 mcg/mL)

Calculations are using a 60 gtt (micro drip) set or 10 gtt (macro drip) set with a DIAL-A-FLOW device

Patient Weight (kg)	5 mcg/kg/min		10 mcg/kg/min		15 mcg/kg/min		20 mcg/kg/min	
	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr
30	150	6	300	11	450	17	600	23
40	200	8	400	15	600	23	800	30
50	250	9	500	19	750	28	1000	38
60	300	11	600	23	900	34	1200	45
70	350	13	700	26	1050	39	1400	53
80	400	15	800	30	1200	45	1600	60
90	450	17	900	34	1350	51	1800	68
100	500	19	1000	38	1500	56	2000	75
110	550	21	1100	41	1650	62	2200	83
120	600	22	1200	45	1800	68	2400	90
130	650	24	1300	49	1950	73	2600	98
140	700	26	1400	52	2100	79	2800	105
150	750	28	1500	56	2250	84	3000	112
160	800	30	1600	60	2300	90	3200	120
170	850	32	1700	64	2550	96	3400	128

Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 500 mL (800 mcg/mL)

Calculations are using a 60 gtt (micro drip) set or 10 gtt (macro drip) set with a DIAL-A-FLOW device

Patient Weight (kg)	5 mcg/kg/min		10 mcg/kg/min		15 mcg/kg/min		20 mcg/kg/min	
	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr
30	150	11	300	22	450	34	600	45
40	200	15	400	30	600	45	800	60
50	250	19	500	38	750	56	1000	75
60	300	22	600	45	900	68	1200	90
70	350	26	700	52	1050	79	1400	105
80	400	30	800	60	1200	90	1600	120
90	450	34	900	68	1350	101	1800	135
100	500	38	1000	75	1500	112	2000	150
110	550	41	1100	82	1650	124	2200	165
120	600	45	1200	90	1800	135	2400	180
130	650	49	1300	98	1950	146	2600	195
140	700	52	1400	105	2100	158	2800	210
150	750	56	1500	112	2250	170	3000	225
160	800	60	1600	120	2300	180	3200	240
170	850	64	1710	128	2550	191	3400	255

Hypotension / Shock

Norepinephrine (Levophed) Drip Chart 4 mg solution in 1,000 mL NS Renders 4 mcg / mL	
Infusion Dosage Mcg / min	**Infusion Rate mL / hr via Dial-a-Flow**
2	30
4	60
6	90
8	125
10	150

Epinephrine Drip Chart 1 mg of 1mg /mL (1:1,000) solution in 250 mL NS Renders 4 mcg / mL	
Infusion Dosage Mcg / min	**Infusion Rate mL / hr via Dial-a-Flow**
2	30
4	60
6	90
8	125
10	150

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 dopamine 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 ventricle / 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 stopped a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain. **If suspected paramedic should give methylprednisolone 125 mg IM / IV / IO.**
  - **May administer prescribed steroid carried by patient IM / IV / IO. Patient may have hydrocortisone (Cortef or Solu-Cortef). Dose: <1 y/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, or hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta

Abnormal Vaginal Bleeding / Hypertension / Hypotension

YES → Obstetrical Emergency Protocol AO 3 ***as indicated***

NO

Inspect Perineum
(No digital vaginal exam)

No Crowning

- Left lateral position
- Monitor and Reassess
- Document frequency and duration of contractions

Crowning >36 Weeks Gestation

- **A** IV / IO Protocol
- Childbirth Procedure

Priority symptoms:
Crowning
<36 weeks gestation
Abnormal presentation
Severe vaginal bleeding
Multiple gestation

Expedite Safe 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

Unable to Deliver

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

Delivery

Go to Newly Born Protocol AO 2

- High Flow Oxygen to Mother
- Monitor and Reassess
- **Notify Receiving Facility Immediately**

Notify Destination or Contact Medical Control

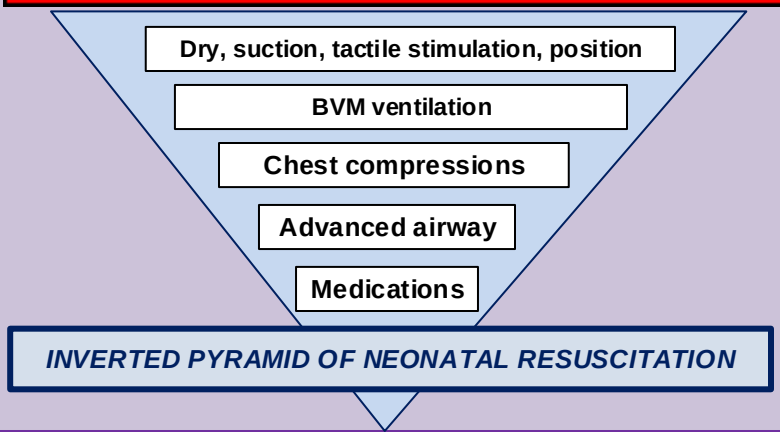
Adult Obstetrical Protocol Section

Childbirth / Labor

APGAR SCORE				
	0 (POINTS)	1	2	TOTALS
APPEARANCE	BLUE OR PALE ALL OVER	BLUE EXTREMITIES, BUT TORSO PINK	PINK ALL OVER	
PULSE	NONE	<100	≥100	
GRIMACE	NO RESPONSE	WEAK GRIMACE WHEN STIMULATED	CRIES OR PULLS AWAY WHEN STIMULATED	
ACTIVITY	NONE	SOME FLEXION OF ARMS	ARMS FLEXED, LEGS RESIST EXTENSION	
RESPIRATIONS	NONE	WEAK, IRREGULAR, OR GASPING	STRONG CRY	

EVALUATE AT ONE (1) AND FIVE (5) MINUTES POSTPARTUM.
RECORD SCORES IN PCR

0-3 SEVERELY DEPRESSED
4-6 MODERATELY DEPRESSED
7-10 GENERALLY NORMAL



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.**
- Notify JC911 and advise of time of birth. Have this entered in the CAD. 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, if needed. Most twins deliver at about 34 weeks so lower birth weight and hypothermia are common. Twins may share a placenta so clamp and cut umbilical cord after first delivery. Notify receiving facility immediately.
- 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 if necessary
- Supplemental Oxygen
- BVM Ventilations
- **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
- Pediatric Airway Protocol(s)
- **A** IV / IO Procedure
- **Epinephrine 0.1 mg/mL (1:10,000)**
  0.01 mg /kg IV / IO
  Every 3 to 5 minutes as needed
- **Normal Saline Bolus**
  10 mL / kg IV / IO
  May repeat x 1

NO ↓

Most newborns requiring resuscitation will respond to ventilations / BVM, compressions and / or epinephrine.

If not responding consider hypovolemia, pneumothorax and / or hypoglycemia (< 40.)

- **Notify Destination or Contact Medical Control**

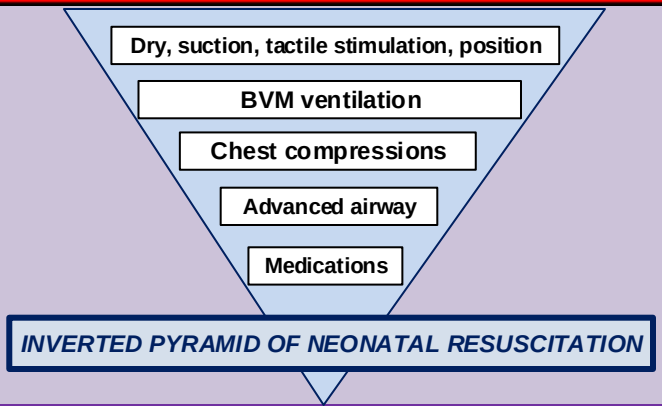
Adult Obstetrical Protocol Section

Newly Born

APGAR SCORE				
	0 (POINTS)	1	2	TOTALS
APPEARANCE	BLUE OR PALE ALL OVER	BLUE EXTREMITIES, BUT TORSO PINK	PINK ALL OVER	
PULSE	NONE	<100	≥100	
GRIMACE	NO RESPONSE	WEAK GRIMACE WHEN STIMULATED	CRIES OR PULLS AWAY WHEN STIMULATED	
ACTIVITY	NONE	SOME FLEXION OF ARMS	ARMS FLEXED, LEGS RESIST EXTENSION	
RESPIRATIONS	NONE	WEAK, IRREGULAR, OR GASPING	STRONG CRY	

EVALUATE AT ONE (1) AND FIVE (5) MINUTES POSTPARTUM.
RECORD SCORES IN PCR

0-3 SEVERELY DEPRESSED
4-6 MODERATELY DEPRESSED
7-10 GENERALLY NORMAL



INVERTED PYRAMID OF NEONATAL RESUSCITATION

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- **Document one and five minute Apgar Scoress in PCR**
- **Most newborns requiring resuscitation respond to ventilations / BVM, compressions, and/or epinephrine. If infant not responding 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.
- CPR in infants is 120 compressions/minute with a 3:1 compression to ventilation ratio. 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).
- Notify JC911 and advise time of birth. Have this entered into the CAD. Document procedure and time of birth into PCR.
- Document 1 and 5 minute APGAR Scores into PCR

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
B	Blood Glucose Analysis Procedure
A	IV / IO Procedure
P	Cardiac Monior
	Abdominal Pain Vomiting and Diarrhea Protocol UP 3 **if indicated**
	Diabetic Protocol AM 2 / PM 2 **if indicated**
	Hypotension / Shock Protocol AM 5 / PM 3 **if indicated**

NO

Exit to Appropriate Protocol(s)

Pre-eclampsia and eclampsia can present at any time from ≈20 weeks gestation to ≈8 weeks post partum

Seizure Activity

NO

Is patient hypertensive with BP ≥140/90 and signs/ symptoms of pre-eclampsia?

NO

YES

P — **Magnesium Sulfate 4 g IV / IO slow drip over over 15 - 20 minutes**

YES

P — **Magnesium Sulfate 4 g IV / IO drip over Over 2 – 3 minutes**
For persistent seizure after 5-10 min, may repeat Magnesium Sulfate 2g

Magnesium Sulfate is the priority for pregnant seizure. In addition, if patient is seizing upon EMS arrival, give Midazolam 5mg IM x 1- do not wait for IV/ IO access to give Midazolam

If patient begins seizing with EMS, give Midazolam 2.5mg IV/IO/IM/IN in addition to Magnesium Sulfate
May repeat q3-5mins for continued seizure activity to **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 effective in termination of seizures. Do not delay IM administration with difficult IV or IO access.**
- **Magnesium Sulfate should be administered as quickly as possible. May cause hypotension and decreased respiratory drive, but typically in doses higher than 6 g.**
- **Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks generally require 4 to 6 hours of fetal monitoring. DO NOT suggest the patient needs an ultrasound.**
- **Ectopic pregnancy:**
  Implantation of fertilized egg outside the uterus, commonly in or on the fallopian tube. As fetus grows, rupture may occur. Vaginal bleeding may or may not be present. Many women with ectopic pregnancy do not know they are pregnant. Usually occurs within 5 to 10 weeks of implantation. Maintain high index of suspicion with women of childbearing age experiencing abdominal pain.
- **Preeclampsia:**
  Occurs in about 6% of pregnancies. Defined by hypertension and protein in the urine. **RUQ pain, epigastric pain, N/V, visual disturbances, headache, peripheral and facial edema, and hyperreflexia are common symptoms.**
  In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
  Risk factors: < 20 years of age, first pregnancy, multigestational pregnancy, gestational diabetes, obesity, personal or family history of gestational hypertension.
- **Eclampsia:**
  Seizures occurring in the context of preeclampsia. Remember, women may not have been diagnosed with preeclampsia.
- Maintain patient in a left lateral position, right side up 10 - 20° to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour.

Adult Airway

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

YES → Supplemental oxygen
Goal oxygen saturation ≥ 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, 2, and 3 should be utilized together (even if agency is not using Drug Assisted Airway Protocol) as they contain useful information for airway management.

Airway Obstructed

YES →

- Airway Foreign Body Obstruction Procedure
- **A** — Direct Laryngoscopy
- **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)

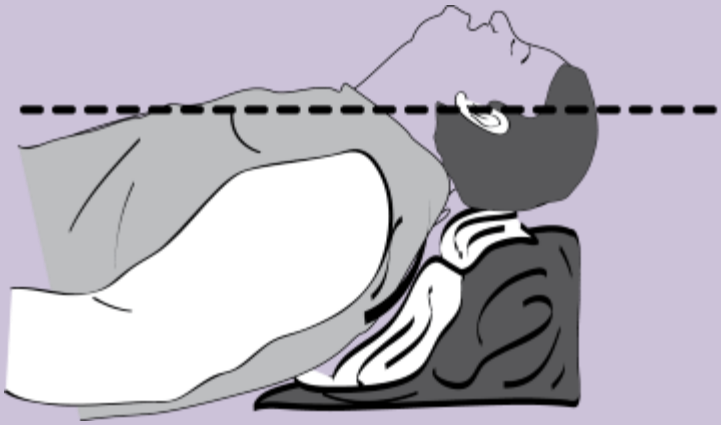
Unable to Ventilate and Oxygenate ≥ 90% during or after one (1) or more unsuccessful intubation attempts .
and/or
Anatomy inconsistent with continued attempts.
and/or
Three (3) unsuccessful attempts by most experienced Paramedic/ AEMT.

Exit to
Adult Failed Airway
Protocol AR 2

Notify Destination or
Contact Medical Control

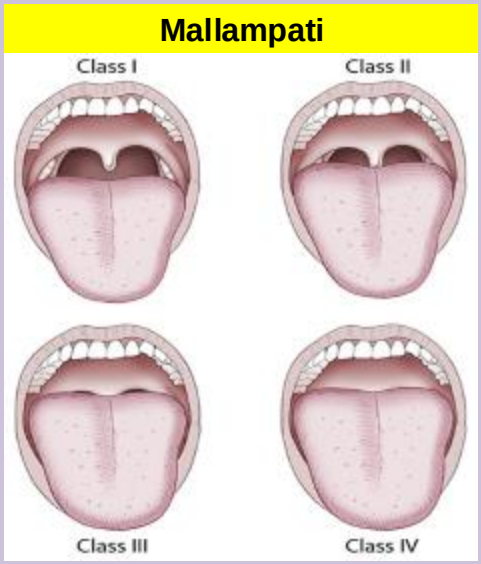
Airway Respiratory Protocol Section

Adult Airway



Utilize the ear to sternal notch position when attempting ETI.

Picture from theairwayjedi.com



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

Pearls

- **See Pearls section of protocols AR 2 and 3.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.**
- **An intubation attempt is defined as passing the laryngoscope blade past the teeth or ETT inserted into the nasal passage.**
- **Capnometry or capnography is mandatory with all methods of intubation. Continuous capnography ($EtCO_2$) is strongly recommended for the monitoring of all patients with a BIAD and mandatory with monitoring of an endotracheal tube.**
- **Ventilatory rate should be 8-10 per minute to maintain a $EtCO_2$ 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 – 2nd and 3rd 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, mentum 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 – 2nd and 3rd trimesters; **N**eck mobility limited.
  - **Difficulty BIAD (RODS): R**estricted mouth opening; **O**bese, obstruction, OB – 2nd and 3rd 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.
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- **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.**
- 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, 2, and 3 should be utilized together (even if agency is not using Drug Assisted Airway as they contain useful information for airway management.

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

NO MORE THAN THREE (3) ATTEMPTS TOTAL

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	Airway Video Laryngoscopy Device Procedure ***if available***
P	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.
- Conditions which define a Failed Airway:
  1. Failure to maintain adequate oxygen saturation after 2 or more failed intubation attempts, OR
  2. Three (3) failed attempts at intubation by the most experienced prehospital provider on scene in a patient who requires an advanced airway to prevent death, OR
  3. Unable to maintain adequate oxygen saturation with BVM techniques and insufficient time to attempt alternative maneuvers.
- 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 f not optimal Oxygen Saturation, i.e. stable (not dropping) SpO_2 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. Please refer to AR 1, Adult Airway page 2 for information in how to identify the patient with potential difficult airway.*
- **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 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.
- Continuous pulse oximetry should be utilized in all patients with inadequate respiratory function.
- Continuous EtCO2 should be applied to all patients with respiratory failure or to all patients with advanced airways.
- **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.

Airway, Drug Assisted

	Preoxygenate 100% O2
A	IV / IO Procedure (preferably 2 sites)
P	Assemble Airway Equipment Suction equipment Alternative Airway Device

Hypoxic Or Hypotension Or Dangerously Combative?

P	**Airway Management** **Ketamine 1.5 - 2 mg/kg IV / IO** **Airway Management + Dangerously Combative** **Ketamine 300 – 400 mg IM** **Ketamine 1.5 - 2 mg/kg IV / IO**
	Correct Hypoxia and / or Hypotension
	Adult Airway Adult Failed Airway Protocol(s) AR 1, 2 ***as indicated***
	Hypotension / Shock Protocol AM 5 ***as indicated***

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

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

Can the patient be managed with BLS techniques to include BIAD?

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

NO

This procedure will remove patient's protective airway reflexes and ability to ventilate.

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

Must have two (2) Paramedics on scene

Must contact Medical Director before proceeding with this step

P	**Etomidate 0.3 mg/kg IV / IO** **Or** **Ketamine 1.5 - 2 mg/kg IV / IO** **May repeat x 1**
	Succinylcholine 1.5 mg / kg IV/ IO ***Or*** **Rocuronium 1 mg kg IV / IO** **(if Succinylcholine contraindicated)** **May repeat x 1** **Or** **Vecuronium 0.1 mg/kg IV / IO** **Or** **Pancuronium 0.1 mg/kg IV / IO**
	Intubate trachea
	Placement Verified **Continuous Capnography**
	Consider Restraints Physical Procedure
P	Consider Gastric Tube Insertion Procedure

YES → Awakening or Moving after intubation

NO → **Notify Destination or Contact Medical Control**

Red Text are the key performance indicators used to evaluate protocol compliance.

An Airway Evaluation Form must be completed on every patient who receives Drug Assisted Intubation.

Airway Respiratory Protocol Section

Airway, Drug Assisted

- A Johnston County EMS System Supervisor or Administrative Paramedic must be available to assist with this protocol with online medical control clearance once the decision has been made to go the route of intubation. This paramedic must also be cleared by the Medical Director to execute this protocol.
- If the patient's airway is successfully maintained with BLS procedures after the use of Ketamine, it is acceptable to stop and not proceed any further. If the patients oxygen saturation is maintaining above 90% with a NRB / BVM / OPA / NPA, continuously monitor their $EtCO_2$ and SpO_2 values for any sustainable changes.
- A BIAD should be considered as a first line airway device once it is determined that the patients airway cannot be maintained with a NRB / BVM / OPA / NPA.
- Failure of a BIAD includes: unable to ventilate, unable to oxygenate, documented and confirmed absence of an $EtCO_2$ waveform, absent lung sounds, absent chest rise and fall. A proper assessment of the airway ruling out all possibilities will confirm a failed BIAD.

Pearls

- **Agencies must maintain a separate Performance Improvement Program specific to Drug Assisted Airway.**
- **See Pearls section of protocols AR 1 and 2.**
- **This procedure requires at least 2 Paramedics. Divide the workload – ventilate, suction, cricoid pressure, drugs, intubation.**
- **Patients with hypoxia and/or hypotension are at risk of cardiac arrest when a sedative and paralytic medication are administered. Hypoxia and hypotension require resuscitation and correction prior to use of these combined agents. Ketamine allows time for appropriate resuscitation to occur during airway management.**
- **<u>This protocol is only for use in patients who are longer than the Broselow-Luten Tape.</u>**
  - **Ketamine may be used during airway management of patients who FIT on the Broselow-Luten Tape with a DIRECT, ONLINE MEDICAL ORDER, by the system MEDICAL DIRECTOR OR ASSISTANT MEDICAL DIRECTOR ONLY.**
- **<u>KETAMINE:</u>**
  - **Ketamine may be used with and without a paralytic agent in conjunction with either a OP, NP, BIAD or endotracheal tube.**
  - **Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management. Once hypoxia and hypotension are corrected, use of a sedative and paralytic can proceed if indicated.**
  - **Ketamine may be used in the dangerously combative patient requiring airway management IM. IV / IO should be established as soon as possible.**
  - **Ketamine may NOT be used for purposes of sedation only – it must be used only during airway management procedures.**
- **Continuous Waveform Capnography and Pulse Oximetry are required for intubation verification and ongoing patient monitoring, though this is not validated and may prove impossible in the neonatal population (verification by two (2) other means is recommended in this population.)**
- **Before administering any paralytic drug, screen for contraindications with a thorough neurologic exam.**
- **<u>If first intubation attempt fails, make an adjustment and try again: (Consider change of provider in addition to equipment)</u>**
  - **Different laryngoscope blade**
  - **Different ETT size**
  - **Change head positioning**
  - **Change cricoid pressure; No longer routinely recommended and may worsen your view.**
  - **Align external auditory canal with sternal notch / proper positioning.**
  - **Consider applying BURP maneuver (Back [posterior], Up, and to patient's Right)**
- Paramedics / AEMT should consider using a BIAD if oral-tracheal intubation is unsuccessful.
- During intubation attempts use External Laryngeal Manipulation to improve view of glottis.
- Protect the patient from self-extubation when the drugs wear off. Longer acting paralytics may be needed post-intubation.
- Drug Assisted Airway is not recommended in an urban setting (short transport) when able to maintain oxygen saturation ≥ 90 %.
- Consider Naso or orogastric tube placement in all intubated patients to limit aspiration and decompress stomach if needed.
- **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 & $EtCO_2$ Monitoring

Following Assessment

WHEEZING

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

STRIDOR

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

	Adult Airway Protocol(s) ***as indicated***
B	Airway CPAP Procedure
A	**Albuterol Nebulizer 2.5 – 5 mg +/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated***
A	Consider **Epinephrine 1 mg/mL (1:1,000) 0.3 – 0.5 mg IM**
P	**Methylprednisolone 125 mg IV / IO / IM**
P	**Magnesium Sulfate 2g IV / IO** Infuse over 10 – 20 minutes

Notify Destination or Contact Medical Control

Airway Respiratory Protocol Section

Adult COPD / Asthma Respiratory Distress

- **Magnesium Sulfate has been shown to improve condition and should be considered early in severe cases.**

- **Patients who are ≥ 50 years of age, have a history of cardiac disease, take beta-blockers / digoxin or patient's who have heart rates ≥150 give one-half the dose of epinephrine (0.15 – 0.25 mg of 1 mg/mL (1:1,000)) as epinephrine may precipitate cardiac ischemia.**

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care.**
- **This protocol includes all patients with respiratory distress, COPD, Asthma, Reactive Airway Disease, or Bronchospasm. Patients may also have wheezing and respiratory distress with viral upper respiratory tract infections and pneumonia.**
- **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.**
- **Consider Magnesium Sulfate with impending respiratory failure and no improvement.**
- **Pulse oximetry and ETCO2 should be monitored continuously if available.**
- **CPAP or Non-Invasive Positive Pressure Ventilation:**
  - **May be used with COPD, Asthma, Allergic reactions, and CHF.**
  - **Consider early in treatment course.**
  - **Consider removal if SBP remains < 100 mmHg and not responding to other treatments.**
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.**

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

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: Direct Laryngoscopy
- P: Airway Cricothyrotomy Needle Procedure **See Pearls Section**

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: 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 .
and/or
Anatomy inconsistent with continued attempts.
and/or
Three (3) unsuccessful attempts by most experienced Paramedic/AEMT.

Exit to Pediatric Failed Airway Protocol AR 6

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 Broselow-Luten tape.**
- **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.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.**
- **Continuous capnography ($EtCO_2$) is strongly recommended 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: 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8 – 10 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **Ketamine may be used during airway management of patients who FIT on the Broselow-Luten Tape with a DIRECT, ONLINE MEDICAL ORDER, by the system MEDICAL DIRECTOR OR ASSISTANT MEDICAL DIRECTOR ONLY. Specific use in this population of patients must also be for use in individual agencies by the NC OEMS State Medical Director prior to use.**
- **<u>Agencies utilizing Ketamine must submit a local systems plan to State Medical Director detailing how the drug is used in your program.</u>**
  - **Ketamine may be used with and without a paralytic agent in conjunction with either a OP, NP, BIAD or endotracheal tube.**
  - **Ketamine may be used during the resuscitation of hypoxia or hypotension in conjunction with airway management.**
  - **Ketamine may be used in the dangerously combative patient requiring airway management IM. IV / IO should be established as soon as possible.**
  - **Ketamine may NOT be used for purposes of sedation only – it must be used only during airway management procedures.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- 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 consider c-collar (even in absence of trauma) to better maintain ETT placement. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **<u>Airway Cricothyrotomy Needle Procedure:</u>**
  - **Indicated as a lifesaving / last resort procedure in pediatric patients ≤ 11 years of age.**
  - **Very little evidence to support it's use and safety.**
  - **A variety of alternative pediatric airway devices now available make the use of this procedure rare.**
  - **Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.**
- **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.
and/or
Anatomy inconsistent with continued attempts.
and/or
Three (3) unsuccessful attempts by most experienced Paramedic / AEMT.
Each attempt should include change in approach
or equipment

NO MORE THAN THREE (3) ATTEMPTS TOTAL

Call for additional resources if available

Failed Aiway

BVM
Adjunctive Airway NP / OP
Maintains Oxygen Saturation
≥ 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

P Airway Cricothyrotomy
Needle Procedure
See Pearls Section

BIAD / Cricothyrotomy
Successful
Or
Oxygenation / Ventilation
Adequate

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

NO

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

Notify Destination or
Contact Medical Control

Pediatric Failed Airway

Pearls

- **For this protocol, pediatric is defined as any patient which can be measured within a Length-based Resuscitation Tape.**
- **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 instead of using a BIAD or Intubation.**
- **For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.**
- **An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.**
- **Capnometry (color) or capnography is mandatory with all methods of intubation. Document results.**
- **Continuous capnography ($EtCO_2$) is strongly recommended 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: 30 for Neonates, 25 for Toddlers, 20 for School Age, and for Adolescents the normal Adult rate of 8 – 10 per minute. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.**
- **It is strongly encouraged to complete an Airway Evaluation Form with any BIAD or Intubation procedure.**
- **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 consider c-collar (even in absence of trauma) to better maintain ETT placement. Do not have the c-collar too tight to restrict venous blood return. Manual stabilization of endotracheal tube should be used during all patient moves / transfers.
- **<u>Airway Cricothyrotomy Needle Procedure:</u>**
  - **Indicated as a lifesaving / last resort procedure in pediatric patients ≤ 11 years of age.**
  - **Very little evidence to support it's use and safety.**
  - **A variety of alternative pediatric airway devices now available make the use of this procedure rare.**
  - **Agencies who utilize this procedure must develop a written procedure, establish a training program, maintain equipment and submit procedure and training plan to the State Medical Director / Regional EMS Office.**
- **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 & $ETCO_2$ Monitoring

Following Assessment

WHEEZING / Asthma

B **Albuterol Nebulizer**
1.25 - 2.5 mg

STRIDOR / Croup

B **Albuterol Nebulizer**
1.25 - 2.5 mg

A **Epinephrine Nebulizer**
1 mg 1 mg/mL (1:1,000) in 2 mL NS
May repeat x 1

Pediatric Airway Protocol(s) 5 - 7
as indicated

A

No response? Consider
Epinephrine 1 mg/mL (1:1,000)
0.01 mg / kg IM
Maximum 0.3 mg

Albuterol Nebulizer
1.25 - 2.5 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

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 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.**
- **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.**
- **Consider Magnesium Sulfate with impending respiratory failure and no improvement.**
- **Albuterol dosing: ≤ 1 year of age 1.25 mg; 1 – 6 years 1.25 – 2.5 mg; 6 – 14 years 2.5 mg; ≥ 15 years 2.5 – 5 mg.**
- **Consider IV access when Pulse oximetry remains ≤ 92 % after first beta agonist treatment.**
- **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 or agency's supply.
- **EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.**

Post Intubation / BIAD Management

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

ETT or Blind Insertion Airway Device Successful

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

YES

B	12 Lead ECG Procedure ***as indicated***
A	IV / IO Procedure (preferably 2 sites)
	Continue Airway Adjuncts Maintain SpO_2 ≥ 90 % Preferably ≥ 94 % $EtCO_2$ 35 – 45 Ventilate 8 – 10 breaths / minute May require faster rate See Pearls
P	Cardiac Monitor & $EtCO_2$
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 **Morphine 4 mg IV / IO** Repeat **2 mg** every 5 minutes as needed **Maximum 10 mg** **Pediatric: 0.1 mg / kg IV / IO** **Maximum single dose 5 mg** **Maximum 10 mg**
	Midazolam 2 - 2.5 mg IV / IO Repeat every 3 – 5 minutes as needed **Maximum 10 mg** **Pediatric: 0.1 – 0.2 mg / kg IV / IO / IN**
	Consider long term paralytic **Vecuronium 10 mg (0.1 mg/kg) IV / IO** **Pancuronium 0.1 mg/kg IV/IO** **Rocuronium 1 mg/kg IV/IO** If needed for patient movement. Not indicated in Pediatrics

Notify Destination or Contact Medical Control

Post Intubation / BIAD Management

Pearls

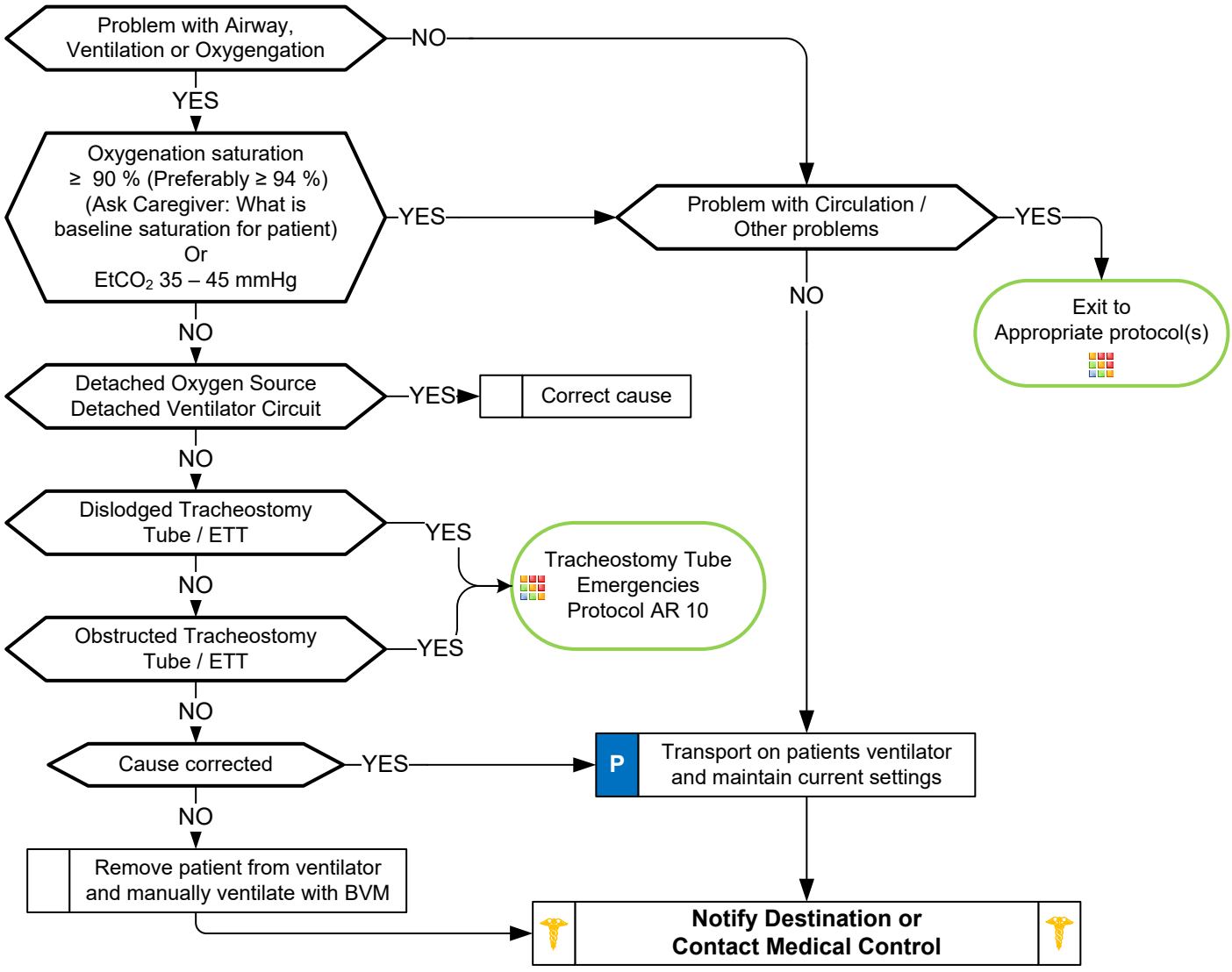
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Patients requiring advanced airways and ventilation commonly experience pain and anxiety.**
- **Unrelieved pain can lead to increased catecholamine release, ischemia, immunosuppression, and prolonged hospitalization.**
- **Ventilated patients cannot communicate pain / anxiety and providers are poor at recognizing pain / anxiety.**
- **Vital signs such has tachycardia and / or hypertension can provide clues to inadequate sedation, however they 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.**
- **Ventilator / Ventilation strategies will need to be tailored to individual patient presentations. Medical director can indicate different strategies above.**
- In general ventilation with BVM should cause chest rise. With mechanical ventilation a reasonable tidal volume should be about 6 mL/kg and peak pressures should be < 30 cmH20.
- Continuous pulse oximetry and capnography should be maintained during transport for monitoring.
- Head of bed should be maintained at least 10 – 20 degrees of elevation when possible to decrease aspiration risk.
- 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

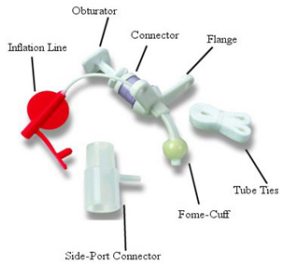
Differential
- Allergic reaction
- Asthma
- Aspiration
- Septicemia
- Foreign body
- Infection
- Congenital heart disease
- Medication or toxin
- Trauma

Trachesotomy Tube in place — YES → A: Remove Obturator ***If in place*** — YES → Inner Cannula in place (Double lumen) / Speaking Valve / Decannulation plug in place — YES → A: Remove Inner Cannula Or Remove Speaking Valve Remove Decannulation plug

Trachesotomy Tube in place — NO → Trachesotomy Tube available — YES → Allow *Caregiver* to insert Tracheostomy Tube **Or**

Trachesotomy Tube available — NO → A: Place Tracheostomy Tube Or Appropriately sized ETT into stoma

Inner Cannula in place (Double lumen) / Speaking Valve / Decannulation plug in place — NO → A: Advanced Suctioning Procedure Tracheostomy Tube Procedure



Continued Respiratory Distress — YES → Assist Ventilations via Tracheostomy Tube / ETT; Age Appropriate Respiratory Distress Protocol

Continued Respiratory Distress — NO → **Notify Destination or Contact Medical Control**

Airway Respiratory Protocol Section

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

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

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, epiglottitis)
- Congenital heart disease
- See Reversible Causes below

Medical Branch- Utilize Pre-ROSC checklist

Utilize this protocol with

Team Focused Resuscitation Protocol

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
Blunt force trauma
Injury incompatible with life
Extended downtime with asystole

Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Begin continuous chest compressions
Push Hard (1.5 inches Infant / 2 inches in Children)
(≥ 1/3 AP Diameter of Chest)
Push Fast (100 - 120 / min)
Utilize the metronome at *116* a minute
Change compressors every 2 minutes
(Limit changes / pulse checks ≤ 5 seconds)
Ventilate 1 breath every 6 seconds
15:2 Compression: Ventilation if no advanced airway

AED Procedure
if available

Search for Reversible Causes

B — Blood Glucose Analysis procedure

P — Cardiac Monitor & $EtCO_2$

Consider Chest Decompression-Needle procedure

A — IV / IO procedure

Epinephrine 0.1 mg/mL (1:10,000)
0.01 mg/kg IV / IO
every 5 minutes

Normal Saline Bolus 20 mL/kg IV / IO
May repeat as needed
Maximum 60 mL/kg

P

Dopamine 5 – 20 mcg /kg / min IV / IO

If dopamine is not available

Epinephrine 0.1 – 1 mcg/kg/min IV / IO

Consider Early for PEA
1. Repeated saline boluses for possible hypovolemia
2. Dextrose IV/IO
3. Naloxone IV/IO/IN
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)

Use Johnston County EMS System Dosing Charts and Instructions

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

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

Pediatric Asystole / PEA

Pediatric Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 250 mL (1,600 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds
1	0.2 gtt/min	0.5 gtt/min	0.6 gtt/min	0.75 gtt/min
3	0.5 gtt/min	1 gtt/min	1.5 gtt/min	2.25 gtt/min
5	1 gtt/min	2 gtt/min	3 gtt/min	4 gtt/min
7	1.25 gtt/min	2.5 gtt/min	4 gtt/min	5 mL/hr
9	1.75 gtt/min	3.5 gtt/min	5 mL/hr	7 mL/hr

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds	mL / hr
10	2 gtt/min	4 gtt/min	6 mL/hr	8 mL/hr
15	3 gtt/min	6 mL/hr	8 mL/hr	11 mL/hr
20	4 gtt/min	8 mL/hr	11 mL/hr	15 mL/hr
25	5 mL/hr	9 mL/hr	14 mL/hr	19 mL/hr
30	6 mL/hr	11 mL/hr	17 mL/hr	22 mL/hr

Utilize 60 gtt/mL set for pediatric dosages without Dial-A-Flow device

Utilize 60 gtt/mL set for pediatric dosages WITH Dial-A-Flow device

Pediatric Asystole / PEA

Pediatric Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 500 mL (800 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds
1	0.5 gtt/min	1 gtt/min	1.5 gtt/min	2 gtt/min
3	1 gtt/min	2 gtt/min	3 gtt/min	4 gtt/min
5	2 gtt/min	4 gtt/min	6 mL/hr	8 mL/hr
7	2.5 gtt/min	5 mL/hr	8 mL/hr	10 mL/hr
9	3 gtt/min	7 mL/hr	10 mL/hr	14 mL/hr
Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	Number of drops per 60 seconds	mL / hr	mL / hr	mL / hr
10	4 mL/hr	8 mL/hr	11 mL/hr	15 mL/hr
15	6 mL/hr	11 mL/hr	17 mL/hr	22 mL/hr
20	8 mL/hr	15 mL/hr	22 mL/hr	30 mL/hr
25	9 mL/hr	19 mL/hr	28 mL/hr	38 mL/hr
30	11 mL/hr	22 mL/hr	34 mL/hr	45 mL/hr

Utilize 60 gtt/mL set for pediatric dosages WITHOUT Dial-A-Flow device

Utilize 60 gtt/mL set for pediatric dosages WITH Dial-A-Flow device

Pediatric Asystole / PEA

Pediatric Epinephrine Infusion Chart

1 mL of 1 mg/mL (1:1,000) solution in 250 mL NS
Renders 4 mcg/mL

Infusion Dosage Mcg/min	Infusion Rate mL/hr via Dial-A-Flow
2	30
4	60
6	90
8	125
10	150

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.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **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 and in children 2 inches. Consider early IO placement if available and / or difficult IV access anticipated.**
- **DO NOT HYPERVENTILATE: If advanced airway in place ventilate 6 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **<u>High-Quality CPR:</u>**
  - Make sure chest compressions are being delivered at 100 – 120 / min.
  - Make sure chest compressions are adequate depth for age and body habitus.
  - Make sure you allow full chest recoil with each compression to provide maximum perfusion.
  - Minimize all interruptions in chest compressions to < 5 seconds.
  - Do not hyperventilate, ventilate every 6 seconds only.
- **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. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks.
- **<u>Vasopressor agents:</u>**
  - **Dopamine 5 – 20 mcg / kg / min IV / IO**
  - **Epinephrine 0.05 – 5 mcg/kg/min**
  - **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.

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, epiglottitis)
- 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

Suspected Beta-Blocker or Calcium Channel Blocker

Follow Pediatric Toxicology Protocol

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 & $EtCO_2$

Search for reversible causes

IV / IO procedure

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

Epinephrine 0.1 mg/mL (1:1,000)
0.01 mg / kg IV / IO
Repeat every 3 – 5 minutes

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

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

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

P — ***If no response to atropine***
Dopamine 5 – 20 mcg/kg/min IV / IO
if dopamine not available
Epinephrine 0.1 – 1 mcg/kg/min IV / IO
Titrate to age appropriate SBP ≥70 + 2 x Age

→ **Use Johnston County EMS System Dosing Charts and Instructions**

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

Consider
Cardiac pacing procedure

Bradycardia / Heart Rate <60 Persists
AND
Poor Perfusion / Shock
Cardiac arrest?

YES → Exit to Pediatric Cardiac Arrest Protocol PC 1, 4, 6

NO

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Bradycardia With Poor Perfusion

Pediatric Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 250 mL (1,600 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds
1	0.2 gtt/min	0.5 gtt/min	0.6 gtt/min	0.75 gtt/min
3	0.5 gtt/min	1 gtt/min	1.5 gtt/min	2.25 gtt/min
5	1 gtt/min	2 gtt/min	3 gtt/min	4 gtt/min
7	1.25 gtt/min	2.5 gtt/min	4 gtt/min	5 mL/hr
9	1.75 gtt/min	3.5 gtt/min	5 mL/hr	7 mL/hr

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds	mL / hr
10	2 gtt/min	4 gtt/min	6 mL/hr	8 mL/hr
15	3 gtt/min	6 mL/hr	8 mL/hr	11 mL/hr
20	4 gtt/min	8 mL/hr	11 mL/hr	15 mL/hr
25	5 mL/hr	9 mL/hr	14 mL/hr	19 mL/hr
30	6 mL/hr	11 mL/hr	17 mL/hr	22 mL/hr

Utilize 60 gtt/mL set for pediatric dosages without Dial-A-Flow device

Utilize 60 gtt/mL set for pediatric dosages WITH Dial-A-Flow device

Pediatric Bradycardia With Poor Perfusion

Pediatric Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 500 mL (800 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds	Number of drops per 60 seconds
1	0.5 gtt/min	1 gtt/min	1.5 gtt/min	2 gtt/min
3	1 gtt/min	2 gtt/min	3 gtt/min	4 gtt/min
5	2 gtt/min	4 gtt/min	6 mL/hr	8 mL/hr
7	2.5 gtt/min	5 mL/hr	8 mL/hr	10 mL/hr
9	3 gtt/min	7 mL/hr	10 mL/hr	14 mL/hr
Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	Number of drops per 60 seconds	mL / hr	mL / hr	mL / hr
10	4 mL/hr	8 mL/hr	11 mL/hr	15 mL/hr
15	6 mL/hr	11 mL/hr	17 mL/hr	22 mL/hr
20	8 mL/hr	15 mL/hr	22 mL/hr	30 mL/hr
25	9 mL/hr	19 mL/hr	28 mL/hr	38 mL/hr
30	11 mL/hr	22 mL/hr	34 mL/hr	45 mL/hr

Utilize 60 gtt/mL set for pediatric dosages WITHOUT Dial-A-Flow device

Utilize 60 gtt/mL set for pediatric dosages WITH Dial-A-Flow device

Pediatric Bradycardia With Poor Perfusion

Pediatric Epinephrine Infusion Chart

1 mL of 1 mg/mL (1:1,000) solution in 250 mL NS
Renders 4 mcg/mL

Infusion Dosage Mcg/min	Infusion Rate mL/hr via Dial-A-Flow
2	30
4	60
6	90
8	125
10	150

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Use Length-based Resuscitation Tape 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.**
- **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 give 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 post arrest hypoxic / ischemic myocardial insult or respiratory failure.
  - Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the defibrillator/ monitor manufacturer's guidelines.
- **Do not delay therapy when bradycardia is evident and no ECG monitor is available.**
- **Vasopressor agents:**
  - **Epinephrine 0.05 – 5 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)**
- 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 narcotic effects may produce bradycardia. Many other agents a child ingests can cause bradycardia, often is a single dose.

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

B	Blood Glucose Analysis procedure
A	IV / IO procedure
P	Cardiac Monitor & $EtCO_2$
	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 indicted***
- Suspected Sepsis protocol UP 15 ***if indicted***
- Multiple Trauma protocol TB 6 ***if indicted***

A — **Normal Saline Bolus 20 mL / kg IV / IO** Titrate to age appropriate SBP ≥ 70 + 2 x Age **Maximum 60 mL / kg**

Obstructive

P — Chest Decompression-Needle procedure ***if indicated***

P — **Use caution with excess fluids in cardiogenic shock; consider presence of pulmonary edema; utilize pressors early:**
Dopamine 5-20 mcg/kg/min IV/IO age
if dopamine not available
Epinephrine 0.1 – 1 mcg/kg/min IV / IO
titrate to maintain SBP ≥70 + 2x

Use Johnston County EMS System Dosing Charts and Instructions

Notify Destination or Contact Medical Control

Pediatric Medical Protocol Section

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

Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 250 mL (1,600 mcg/mL)

Calculations are using a 60 gtt (micro drip) set or 10 gtt (macro drip) set with a DIAL-A-FLOW device

Patient Weight (kg)	5 mcg/kg/min		10 mcg/kg/min		15 mcg/kg/min		20 mcg/kg/min	
	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr
30	150	6	300	11	450	17	600	23
40	200	8	400	15	600	23	800	30
50	250	9	500	19	750	28	1000	38
60	300	11	600	23	900	34	1200	45
70	350	13	700	26	1050	39	1400	53
80	400	15	800	30	1200	45	1600	60
90	450	17	900	34	1350	51	1800	68
100	500	19	1000	38	1500	56	2000	75
110	550	21	1100	41	1650	62	2200	83
120	600	22	1200	45	1800	68	2400	90
130	650	24	1300	49	1950	73	2600	98
140	700	26	1400	52	2100	79	2800	105
150	750	28	1500	56	2250	84	3000	112
160	800	30	1600	60	2300	90	3200	120
170	850	32	1700	64	2550	96	3400	128

Hypotension / Shock

Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 500 mL (800 mcg/mL)

Calculations are using a 60 gtt (micro drip) set or 10 gtt (macro drip) set with a DIAL-A-FLOW device

Patient Weight (kg)	5 mcg/kg/min		10 mcg/kg/min		15 mcg/kg/min		20 mcg/kg/min	
	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr
30	150	11	300	22	450	34	600	45
40	200	15	400	30	600	45	800	60
50	250	19	500	38	750	56	1000	75
60	300	22	600	45	900	68	1200	90
70	350	26	700	52	1050	79	1400	105
80	400	30	800	60	1200	90	1600	120
90	450	34	900	68	1350	101	1800	135
100	500	38	1000	75	1500	112	2000	150
110	550	41	1100	82	1650	124	2200	165
120	600	45	1200	90	1800	135	2400	180
130	650	49	1300	98	1950	146	2600	195
140	700	52	1400	105	2100	158	2800	210
150	750	56	1500	112	2250	170	3000	225
160	800	60	1600	120	2300	180	3200	240
170	850	64	1710	128	2550	191	3400	255

Hypotension / Shock

Pediatric Epinephrine Infusion Chart 1 mL of 1 mg/mL (1:1,000) solution in 250 mL NS Renders 4 mcg/mL	
Infusion Dosage Mcg/min	**Infusion Rate mL/hr via Dial-A-Flow**
2	30
4	60
6	90
8	125
10	150

- **For trauma related shock, consider LR or NS 60ml/kg prior to use of vasopressor as this is a hypovolemic problem. Attempt to identify possible source of hemorrhaging and control it if possible.**
- **Other types of shock may need pressor agents instead of fluid as it may be a loss of sympathetic tone.**

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Lowest blood systolic 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 ventricle / septum / valve / toxins.
- **Distributive Shock:**
  - Septic
  - Anaphylactic
  - Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
  - Toxic
- **Obstructive Shock:**
  - Pericardial tamponade, pulmonary embolus, tension pneumothorax.
  - Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency or Congenital Adrenal Hyperplasia:**
  - Body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary or secondary adrenal disease, congenital adrenal hyperplasia, or more commonly have stopped a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain.
  - **If suspected paramedic should give methylprednisolone 125 mg IM / IV / IO. Use steroid agent specific to your drug list. May administer prescribed steroid carried by patient IM / IV / IO. Patient may have hydrocortisone (Cortef or Solu-Cortef). Dose: <1 y/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.**
- **Vasopressor agents:**
  - **Dopamine 5 – 20 mcg / kg / min IV / IO**
  - **Epinephrine 0.1 – 1 mcg/kg/min**

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

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, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax, cardiac tamponade, pulmonary embolism
- Hypothermia
- Toxin or medication
- Electrolyte abnormalities (Glucose, K)
- Acidosis

Medical Branch- Utilize Pre-ROSC checklist

Utilize this protocol with
Team Focused Resuscitation Protocol

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

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

Begin Continuous CPR Compressions
Push Hard (1.5 inches Infant / 2 inches in Children)
(≥ 1/3 AP Diameter of Chest)
Push Fast (100 - 120 / min)
Use metronome set at 116 when available
Change Compressors every 2 minutes
(Limit changes / pulse checks ≤ 5 seconds)

Ventilate 1 breath every 6 seconds
15:2 Compression: Ventilation if no Advanced Airway

Defibrillation Automated
if available

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, Heart, Lung Abdomen, Extremities, Skin.**
- **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.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **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: If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Defibrillation: First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks ≥ 4 J/kg (Maximum 10 J/kg or adult dose)**
- **End Tidal CO2 ($EtCO_2$)**
  - If $EtCO_2$ is < 10 mmHg, improve chest compressions.
  - If $EtCO_2$ spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient's left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - **Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - **Opioid Overdose** - Naloxone cannot be recommended in opioid-associated cardiac arrest. If suspected, attention to airway, oxygenation, and ventilation increase in importance. Naloxone is not associated with improved outcomes in cardiac arrest.
  - **Drowning / Suffocation / Asphyxiation / Hanging / Lightning Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:** Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.

Pediatric Tachycardia

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

Single lead ECG able to diagnose and treat arrhythmia

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

Unstable / Serious Signs and Symptoms
HR Typically > 180 Child
HR Typically > 220 Infant

YES → **P** Cardioversion Procedure
0.5 – 1 J / kg
Repeat and increase to **2 J / Kg**
May increase to **4 J / Kg**
Or adult maximum

P Consider sedation
Do NOT delay cardioversion
Midazolam 0.1 – 0.2 mg / kg IV / IO / IN
May repeat if needed
Maximum Single Dose 2 mg
Maximum Total Dose 5 mg

NO

B 12 Lead ECG Procedure
A IV / IO Procedure
P Cardiac Monitor & $EtCO_2$

QRS ≥ 0.09 seconds
NO → Probable Sinus Tachycardia → Identify and Treat Underlying Cause → Exit to Appropriate Protocol(s)

NO → Probable SVT

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

YES → Possible VT → Unstable Hypotension / AMS / Poor perfusion

YES → **P**
Adenosine
0.1 mg / kg IV / IO
Maximum 6 mg
May repeat
Adenosine
0.2 mg / kg IV / IO
Maximum 12 mg

Only if rhythm is regular and QRS are monomorphic

B Rhythm Converts
12 Lead ECG Procedure

Notify Destination or Contact Medical Control

P **Torsades de pointes**
Magnesium Sulfate
40 mg / kg IV / IO
Over 10 minutes
Cardiac arrest:
Over 2 minutes

AT ANY TIME

Pulseless

Go to Pediatric Pulseless Arrest Protocol

Pediatric Cardiac Protocol Section

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

Pediatric Tachycardia

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **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
- **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 is** recommended agents. Consultation with Medical Control is advised when these agents are considered.
- **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**. Cardiac arrest given over 2 minutes.
- **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.
- Pediatric defibrillation pads should be used in children < 10 kg or Broselow-Luten color Purple if available.
- Monitor for respiratory depression and hypotension associated if Midazolam is used.
- Continuous pulse oximetry and ETCO2 is required for all SVT Patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Generally, the maximum sinus tachycardia rate is 220 – the patient’s age in years.

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

Medical Branch-
Utilize Pre-ROSC checklist

Utilize this protocol with
Team Focused Resuscitation Protocol

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Pediatric Pulseless Arrest Protocol

Begin Continuous CPR Compressions
Push Hard (1.5 inches Infant / 2 inches in Children)
(≥ 1/3 AP Diameter of Chest)
(Push Fast (100 - 120 / min)
Utilize metronome at 116 if available
Change Compressors every 2 minutes
(Limit changes / pulse checks ≤ 5 seconds)

Ventilate 1 breath every 6 seconds
15:2 Compression:Ventilation if no Advanced Airway

A	Defibrillation Automated ***if available***
A	IV / IO Procedure
A	**Epinephrine 0.1 mg/mL (1:1,000)** **0.01 mg/kg IV / IO Maximum 1mg** Every 5 minutes
P	Defibrillation Manual Procedure 2 J / Kg

<u>If Rhythm Refractory</u>
Continue CPR and give Agency specific Anti-arrhythmic(s). Continue CPR up to point where you are ready to defibrillate with device charged.
Repeat pattern during resuscitation.

P	**Amiodarone 5 mg / kg IV / IO** **(single dose Maximum 300 mg)** **May repeat x 2 to a Maximum of 15 mg / kg.**
P	Defibrillation Manual Procedure 4 J / Kg Subsequent shocks ≥ 4 J / kg Maximum 10 J / kg or adult dose
P	Consider Defibrillation Dual Sequential Manual Procedure ***if available and rhythm refractory***
P	**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

<u>Torsades de points</u>

P	**Magnesium Sulfate** **40 mg/kg IV / IO** May repeat every 5 minutes **Maximum 2 g**

Persistent VF / VT
Or
<u>Torsades de Points</u>

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

✱ **It is important to minimize interruptions in chest compressions, especially prior to and immediately post shock. Compressions must continue while the defibrillator is charging.**

✱ **Course ventricular fibrillation (VF) is most likely to convert to a perfusing rhythm.**

✱ **If a patient goes into ventricular fibrillation (VF) or pulseless ventricular tachycardia in front of you an immediate shock is needed**

✱ **Medications should never be administered through an ET tube**

✱ **Resuscitation efforts should never be discontinued on a patient in VF**

Pearls

- **Recommended Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Skin.**
- **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.**
- **When 1 provider is present, perform 30 compressions with 2 ventilations.**
- **When 2 providers are present, perform 15 compressions with 2 ventilations.**
- **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: If advanced airway in place ventilate 8 – 10 breaths per minute with continuous, uninterrupted compressions.**
- **Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.**
- **Defibrillation: First defibrillation is 2 J/kg, second defibrillation is 4 J/kg, subsequent shocks ≥ 4 J/kg (Maximum 10 J/kg or adult dose)**
- **End Tidal CO_2 ($EtCO_2$)**
  - If $EtCO_2$ is < 10 mmHg, improve chest compressions.
  - If $EtCO_2$ spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Antiarrhythmic agents:**
  - **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.**
  - **Magnesium Sulfate 40 mg / kg IV / IO over 10 – 20 minutes. In Torsades de pointes give over 1 – 2 minutes. Maximum 2 g.**
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work. Consider Team Focused Approach / Pit-Crew Approach assigning responders to predetermined tasks. Refer to optional protocol.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.

Pediatric Post Resuscitation

History
- Respiratory arrest
- Cardiac arrest

Signs/Symptoms
- Return of pulse

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

Arrhythmias are common and usually self limiting after ROSC

If Arrhythmia Persists follow Rhythm Appropriate Protocol

Medical Branch- Utilize post-ROSC checklist

	Pediatric Airway Protocol(s) AR 5 - 7 ***as needed***
	Monitor Vital Signs / Reassess
B	Blood Glucose Analysis Procedure
B	**Optimize Ventilation and Oxygenation** • Maintain SpO_2 ≥ 90% • Preferably SpO_2 ≥ 94% • Advanced airway if indicated • $EtCO_2$ ideally 35 – 45 mm Hg • Respiratory Rate 8 – 10 • Remove Impedence Threshold Device DO NOT HYPERVENTILATE
B	12 Lead ECG Procedure
A	IV / IO Procedure
P	Cardiac Monitor & $EtCO_2$
	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 – 28 Days
< 60 mmHg

1 Month to 1 Year
< 70 mmHg

1 to 10 Years
< 70 + (2 x age) mmHg

11 Years and older
< 90 + (2 x age) mmHg

Antiarrhythmic Medication Given During Arrest

YES → P: Continue Antiarrhythmic Utilized. Refer to Appropriate Pediatric Arrhythmia Protocol

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 % FiO_2 is not necessary, titrate oxygen accordingly.**
- **$EtCO_2$ should be continually monitored with advanced airway in place.**
- **Administer resuscitation fluids and vasopressor agents to maintain SBP at targets listed on page 1. This table represents minimal SBP targets.**
- **Targeted Temperature Management is recommended in pediatrics, but prehospital use is not associated with improved outcomes. Transport to facility capable of intensive pediatric care.**
- **<u>Antiarrhythmic agents:</u>**
  - **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 if needed repeat 0.5 mg / kg bolus.**
  - **Magnesium Sulfate 40 mg / kg IV / IO over 10 – 20 minutes. In Torsades de pointes give over 1 – 2 minutes. Maximum 2 g.**
- **<u>Vasopressor agents:</u>**
  - **Norepinephrine 0.1 – 2 mcg / kg / min IV / IO *IF: Peds age ≥16 or ≥50 kg, contact medical control if the patient doesn't meet this criteria***
  - **Dopamine 2 – 20 mcg / kg / min IV / IO**
  - **Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)**
- If pediatric weight is known, use in drug and fluid calculations. Use actual body weight for calculating initial medication dosages. If unknown then use a body length tape system and refer to pediatric drug dosing chart.
- Appropriate post-resuscitation management may best be planned in consultation with medical control.

Pediatric Allergic Reaction

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

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

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

Assess Symptom Severity

MILD
Skin Only

B	**Diphenhydramine 1 mg / kg mg PO**
A	IV Procedure ***If indicated***
A	**Diphenhydramine 1 mg / kg IV / IM / IO / PO**
B	Monitor and Reassess Monitor for Worsening Signs and Symptoms

MODERATE
2+ Body Systems

	Epinephrine 1 mg/mL (1:1,000) 0.01 mg / kg IM **Maximum 0.3 mg** Repeat in 5 minutes if no improvement
B	**Diphenhydramine 1 mg / kg PO** *See Pearls*
B	**Albuterol Nebulizer 2.5 – 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 mg/mL (1:1,000) 0.01 mg / kg IM **Maximum 0.3 mg** Repeat in 5 minutes if no improvement
B	**Albuterol Nebulizer 2.5 – 5 mg** Repeat as needed x 3 ***if indicated***
	Airway Pediatric Protocol(s) ***if indicated***
	Pediatric Hypotension / Shock Protocol PM 3 ***if indicated***

A	**Epinephrine 1 mg/mL (1:1,000)** **0.01 mg / kg IM** **Maximum 0.3 mg** Repeat in 5 minutes if no improvement
A	IV / IO Procedure
A	**Albuterol Nebulizer 2.5 – 5 mg** **+/- Ipratropium 0.5 mg** Repeat as needed x 3 ***if indicated***
P	Cardiac & $EtCO_2$ monitoring indicated for moderate and severe reactions
P	**Methylprednisolone 2 mg/kg IV** **Maximum 125 mg**

Notify Destination or Contact Medical Control

Pediatric Medical Protocol Section

Pediatric Allergic Reaction

- **To increase patient safety, use an auto-injector if available to deliver epinephrine. For pediatric patients, either the 0.15mg dose ("Epi-Pen jr") or 0.3mg dose ("Epi-Pen") may be used. Either may be repeated for severe symptoms that have not improved or are worsening 5 minutes after the first dose.**

Pearls

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

Pediatric Diabetic

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

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

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

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

A

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

Consider Oral Glucose Solution *if available*

Blood Sugar ≤ 69 mg / dl

	Oral Glucose ½ to 1 Tube If age appropriate
	Consider Oral Solution (Juices / Food)
A	0 Days to 2 Years: **D10 5 mL/kg IV / IO** Repeat as needed > 2 Years: **D10W IV titrated to effect until blood glucose level ≥ 80**

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 - 20 mL/kg IV / IO** **Maximum 20 mL/kg**

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

Notify Destination or Contact Medical Control

Pediatric Medical Protocol Section

Pediatric Diabetic

Pearls

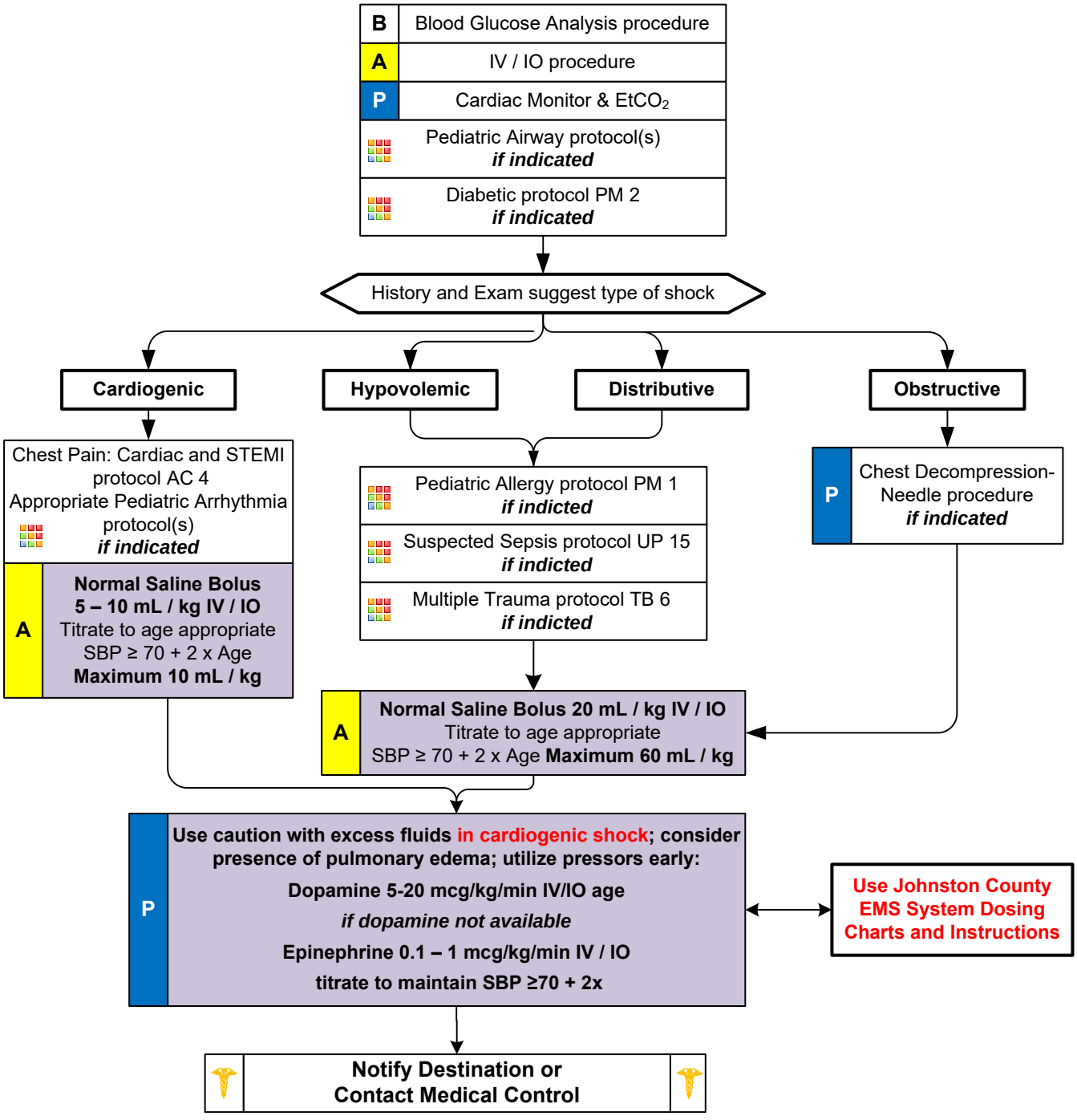
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients with prolonged hypoglycemia my not respond to glucagon.**
- **Do not administer oral glucose to patients that are not able to swallow or protect their airway.**
- **Quality control checks should be maintained per manufacturers recommendation for all glucometers.**
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
  - Adult caregiver must be present with pediatric patient.
  - Blood sugar must be ≥ 80, patient has ability to eat and availability of food with responders on scene.
  - Patient must have known history of diabetes and not taking any oral diabetic agents.
  - Patient returns to normal mental status and has a normal neurological exam with no new neurological deficits.
  - Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol UP-1.
  - Otherwise contact medical control.
- **Hypoglycemia with Oral Agents:**
  - Patients taking oral diabetic medications should be strongly encouraged to allow transportation to a medical facility. They are at risk of recurrent hypoglycemia that can be delayed for hours and require close monitoring even after normal blood glucose is established. Not all oral agents have prolonged action so Contact Medical Control for advice. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.
- **Hypoglycemia with Insulin Agents:**
  - Many forms of insulin now exist. Longer acting insulin places the patient at risk of recurrent hypoglycemia even after a normal blood glucose is established. Not all insulins have prolonged action so Contact Medical Control for advice. Patients who meet criteria to refuse care should be instructed to contact their physician immediately and consume a meal.

Pediatric Hypotension / Shock

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

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

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



Pediatric Medical Protocol Section

Pediatric Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 250 mL (1,600 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	gtt / min	gtt / min	gtt / min mL / hr	gtt / min mL / hr
1	0.2 gtt/min	0.5 gtt/min	0.6 gtt/min	0.75 gtt/min
3	0.5 gtt/min	1 gtt/min	1.5 gtt/min	2.25 gtt/min
5	1 gtt/min	2 gtt/min	3 gtt/min	4 gtt/min
7	1.25 gtt/min	2.5 gtt/min	4 gtt/min	5 mL/hr
9	1.75 gtt/min	3.5 gtt/min	5 mL/hr	7 mL/hr
Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	gtt / min mL / hr	gtt / min mL / hr	mL / hr	mL / hr
10	2 gtt/min	4 gtt/min	6 mL/hr	8 mL/hr
15	3 gtt/min	6 mL/hr	8 mL/hr	11 mL/hr
20	4 gtt/min	8 mL/hr	11 mL/hr	15 mL/hr
25	5 mL/hr	9 mL/hr	14 mL/hr	19 mL/hr
30	6 mL/hr	11 mL/hr	17 mL/hr	22 mL/hr

Utilize 60 gtt/mL set for pediatric dosages without Dial-A-Flow device

Utilize 60 gtt/mL set for pediatric dosages WITH Dial-A-Flow device

Pediatric Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 500 mL (800 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	gtt / min	gtt / min mL / hr	gtt / min mL / hr	gtt / min mL / hr
1	0.5 gtt/min	1 gtt/min	1.5 gtt/min	2 gtt/min
3	1 gtt/min	2 gtt/min	3 gtt/min	4 gtt/min
5	2 gtt/min	4 gtt/min	6 mL/hr	8 mL/hr
7	2.5 gtt/min	5 mL/hr	8 mL/hr	10 mL/hr
9	3 gtt/min	7 mL/hr	10 mL/hr	14 mL/hr
Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	mL / hr	mL / hr	mL / hr	mL / hr
10	4 mL/hr	8 mL/hr	11 mL/hr	15 mL/hr
15	6 mL/hr	11 mL/hr	17 mL/hr	22 mL/hr
20	8 mL/hr	15 mL/hr	22 mL/hr	30 mL/hr
25	9 mL/hr	19 mL/hr	28 mL/hr	38 mL/hr
30	11 mL/hr	22 mL/hr	34 mL/hr	45 mL/hr

Utilize 60 gtt/mL set for pediatric dosages WITHOUT Dial-A-Flow device

Utilize 60 gtt/mL set for pediatric dosages WITH Dial-A-Flow device

Pediatric Hypotension / Shock

Pediatric Epinephrine Infusion Chart 1 mL of 1 mg/mL (1:1,000) solution in 250 mL NS Renders 4 mcg/mL	
Infusion Dosage mcg/min	**Infusion Rate mL / hr via Dial-A-Flow**
2	30
4	60
6	90
8	125
10	150

- **For trauma related shock, consider LR or NS 60ml/kg prior to use of vasopressor as this is a hypovolemic problem. Attempt to identify possible source of hemorrhaging and control it if possible.**
- **Other types of shock may need pressor agents instead of fluid as it may be a loss of sympathetic tone.**

Pearls

- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Lowest blood systolic 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 ventricle / septum / valve / toxins.
- **Distributive Shock:**
  - Septic
  - Anaphylactic
  - Neurogenic: Hallmark is warm, dry, pink skin with normal capillary refill time and typically alert.
  - Toxic
- **Obstructive Shock:**
  - Pericardial tamponade, pulmonary embolus, tension pneumothorax.
  - Signs may include hypotension with distended neck veins, tachycardia, unilateral decreased breath sounds or muffled heart sounds.
- **Acute Adrenal Insufficiency or Congenital Adrenal Hyperplasia:**
  - Body cannot produce enough steroids (glucocorticoids / mineralocorticoids.) May have primary or secondary adrenal disease, congenital adrenal hyperplasia, or more commonly have stopped a steroid like prednisone. Injury or illness may precipitate. Usually hypotensive with nausea, vomiting, dehydration and / or abdominal pain.
  - **If suspected paramedic should give methylprednisolone 125 mg IM / IV / IO. Use steroid agent specific to your drug list. May administer prescribed steroid carried by patient IM / IV / IO. Patient may have hydrocortisone (Cortef or Solu-Cortef). Dose: <1 y/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.**
- **Vasopressor agents:**
  - **Dopamine 5 – 20 mcg / kg / min IV / IO**
  - **Epinephrine 0.1 – 1 mcg/kg/min**

Suspected Viral Hemorrhagic Fever
Ebola

EMS Dispatch Center

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

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

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

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

Monitor for protocol updates.

Viral Hemorrhagic Fevers:
Ebola is one of many.

YES → **DO NOT DISPATCH FIRST RESPONDERS**

Dispatch EMS Unit only
Discretely notify EMS Supervisor or command staff

NO

EMS

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

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

EMS Immediate Concern

1. Traveler from area with known VHR (Ebola) with or without symptoms
2. Traveler from Sierra Leone, Guinea, or Liberia within past 21 days

AND

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

NO → Exit to Appropriate Protocol(s)

YES

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

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

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

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

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

Special Circumstances Section

Suspected Viral Hemorrhagic Fever
Ebola

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

DONNING PPE: BEFORE you enter the patient area.

Recommended PPE

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

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

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

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

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

Single-use (disposable) fluid-resistant or impermeable shoe covers are acceptable only if they will be used in combination with a coverall with integrated socks.

Single-use (disposable), fluid-resistant or impermeable apron that covers the torso to the level of the mid-calf should be used if Ebola patients have vomiting or diarrhea. An apron provides additional protection against exposure of the front of the body to body fluids or excrement. If a PAPR will be worn, consider selecting an apron that ties behind the neck to facilitate easier removal during the doffing procedure

DOFFING PPE: OUTSIDE OF PPE IS CONTAMINATED! DO NOT TOUCH

1) PPE must be carefully removed without contaminating one's eyes, mucous membranes, or clothing with potentially infectious materials.

Use great care while doffing your PPE so as not to contaminate yourself (e.g. Do not remove your N-95 facemask or eye protection BEFORE you remove your gown). There should be a dedicated monitor to observe donning and doffing of PPE. It is very easy for personnel to contaminate themselves when doffing. A dedicated monitor should observe doffing to insure it is done correctly. Follow CDC guidance on doffing.

2) PPE must be double bagged and placed into a regulated medical waste container and disposed of in an appropriate location.
3) Appropriate PPE must be worn while decontaminating / disinfecting EMS equipment or unit.
3) Re-useable PPE should be cleaned and disinfected according to the manufacturer's reprocessing instructions.

Hand Hygiene should be performed by washing with soap and water with hand friction for a minimum of 20 seconds. Alcohol-based hand rubs may be used if soap and water are not available.

EVEN IF AN ALCOHOL-BASED HAND RUB IS USED, WASH HANDS WITH SOAP AND WATER AS SOON AS FEASIBLE.

THE USE OF GLOVES IS NOT A SUBSTITUTE FOR HAND WASHING WITH SOAP & WATER

For any provider exposure or contamination contact occupational health.

If the patient is being transported via stretcher then a disposable sheet can be placed over them.

Special Circumstances Section

Pearls

- **Transmission to another individual is the greatest after a patient develops fever. Once there is fever, the viral load in the bodily fluids appears to be very high and thus a heightened level of PPE is required.**
- **Patient contact precautions are the most important consideration.**
- **Incubation period 2-21 days**
- **Ebola must be taken seriously; however using your training, protocols, procedures and proper Personal Protective Equipment (PPE), patients can be cared for safely.**
- When an infection does occur in humans, the virus can be spread in several ways to others. The virus is spread through direct contact (through broken skin or mucous membranes) with a sick person's blood or body fluids (urine, saliva, feces, vomit, and semen) objects (such as needles) that have been contaminated with infected body fluids.
- Limit the use of needles and other sharps as much as possible. All needles and sharps should be handled with extreme care and disposed in puncture-proof, sealed containers. Safety devices must be employed immediately after use.
- Ebola Information: **For a complete review of Ebola go to:**
  http://www.cdc.gov/vhf/ebola/index.html
  http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-emergency-medical-services-systems-911-public-safety-answering- points-management-patients-known-suspected-united-states.html

Suspected Viral Hemorrhagic Fever
Ebola

EMS Personal
Requires Decontamination

If EMS personnel are exposured to blood, bodily fluids, secretions, or excretions from a patient with suspected or confirmed Ebola should immediately:

1) Stop working and wash the affected skin surfaces with soap and water.
2) Mucous membranes (e.g., conjunctiva) should be irrigated with a large amount of water or eyewash solution;

EMS Equipment / Transport Unit
Requires Decontamination

1) EMS personnel performing decontamination / disinfection should wear recommended PPE
   When performing Decontamination EMS Personnel MUST wear appropriate PPE, which includes:
   - •Gloves (Double glove)
   - •Fluid resistant (impervious) Tyvek Like Full length (Coveralls)
   - •Eye protection (Goggles)
   - •N-95 face mask
   - •Fluid resistant (impervious)-Head covers
   - •Fluid resistant (impervious)-Shoe / Boot covers
2) Face protection (N-95 facemask with goggles) should be worn since tasks such as liquid waste disposal can generate splashes.
3) Patient-care surfaces (including stretchers, railings, medical equipment control panels, and adjacent flooring, walls and work surfaces) are likely to become contaminated and should be decontaminated and disinfected after transport.
4) A blood spill or spill of other body fluid or substance (e.g., feces or vomit) should be managed through removal of bulk spill matter, cleaning the site, and then disinfecting the site. For large spills, a chemical disinfectant with sufficient potency is needed to overcome the tendency of proteins in blood and other body substances to neutralize the disinfectant's active ingredient. An EPA-registered hospital disinfectant with label claims for viruses that share some technical similarities to Ebola (such as, norovirus, rotavirus, adenovirus, poliovirus) and instructions for cleaning and decontaminating surfaces or objects soiled with blood or body fluids should be used according to those instructions.
   (Alternatively, a 1:10 dilution of household bleach (final working concentration of 500 parts per million or 0. 5% hypochlorite solution) that is prepared fresh daily (i.e., within 12 hours) can be used to treat the spill before covering with absorbent material and wiping up. After the bulk waste is wiped up, the surface should be disinfected as described in the section above).
5) Contaminated reusable patient care equipment should be placed in biohazard bags (double-bagged) and labeled for decontamination and disinfection.
6) Reusable equipment should be cleaned and disinfected according to manufacturer's instructions by appropriately trained personnel wearing correct PPE.
7) Avoid contamination of reusable porous surfaces that cannot be made single use. Use only a mattress and pillow with plastic or other covering that fluids cannot get through.
8) To reduce exposure, all potentially contaminated textiles (cloth products) should be discarded. This includes non-fluid-impermeable pillows or mattresses. They should be considered regulated medical waste and placed in biohazard red bags. They must be double-bagged prior to being placed into regulated medical waste containers.

Pearls

- Ebola Information: **For a complete review of Ebola EMS Vehicle Disinfection go to:**
  http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-emergency-medical-services-systems-911-public-safety-answering-points-management-patients-known-suspected-united-states.html

Suspected Viral Hemorrhagic Fever
Ebola

Special Circumstances Section

Decedent Known or suspected carrier of HVF / Ebola Requires Transportation

Only personnel trained in handling infected human remains, and wearing full PPE, should touch, or move any Ebola-infected remains.
Handling human remains should be kept to a minimum.

Donning / Doffing PPE

PPE should be in place **BEFORE** contact with the body

1) Prior to contact with body, postmortem care personnel must wear PPE consisting of: surgical scrub suit, surgical cap, impervious Tyvex-Coveralls, eye protection (e.g., face shield, goggles), facemask, shoe covers, and double surgical gloves.

2) Additional PPE (leg coverings,) might be required in certain situations (e.g., copious amounts of blood, vomit, feces, or other body fluids that can contaminate the environment).

PPE should be removed immediately after and discarded as regulated medical waste.

1) Use caution when removing PPE as to avoid contaminating the wearer.

2) Hand hygiene (washing your hands thoroughly with soap and water or an alcohol based hand rub) should be performed immediately following the removal of PPE. If hands are visibly soiled, use soap and water.

Preparation of Body Prior to Transport

1) At the site of death, the body should be wrapped in a plastic shroud. Wrapping of the body should be done in a way that prevents contamination of the outside of the shroud.
2) Change your gown or gloves if they become heavily contaminated with blood or body fluids.
3) Leave any intravenous lines or endotracheal tubes that may be present in place.
4) Avoid washing or cleaning the body.
5) After wrapping, the body should be immediately placed in a leak-proof plastic bag not less than 150 µm thick and zippered closed The bagged body should then be placed in another leak-proof plastic bag not less than 150 µm thick and zippered closed before being transported to the morgue.

Surface Decontamination

1) Prior to transport to the morgue, perform surface decontamination of the corpse-containing body bags by removing visible soil on outer bag surfaces with EPA-registered disinfectants which can kill a wide range of viruses.
2) Follow the product's label instructions. Once the visible soil has been removed, reapply the disinfectant to the entire bag surface and allow to air dry.
3) Following the removal of the body, the patient room should be cleaned and disinfected.
4) Reusable equipment should be cleaned and disinfected according to standard procedures.

Transportation of VHV / Ebola Remains

PPE is required for individuals driving or riding in a vehicle carrying human remains. DO NOT handle the remains of a suspected / confirmed case of Ebola The remains must be safely contained in a body bag where the outer surface of the body bag has been disinfected prior to the transport.

Pearls

* Ebola Information: **For a complete review of Handling Remains of Ebola Infected Patients go to:**
http://www.cdc.gov/vhf/ebola/hcp/guidance-safe-handling-human-remains-ebola-patients-us-hospitals-mortuaries.html

Scene Rehabilitation
General / Special Event / Mass Gathering

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

Initial Process
1. Personnel logged into General Rehabilitation Section
2. VS Assessed / Recorded (If HR > 110 then obtain Temp)
   Carbon Monoxide monitoring if indicated
3. Personnel assessed for signs / symptoms
4. Remove PPE, Body Armor, Haz-Mat Suits, Turnout Gear, Other equipment as indicated

Significant Injury
Cardiac Complaint: Signs / Symptoms
Respiratory Complaint: Serious Signs / Symptoms
Respiratory Rate < 8 or > 40
Systolic Blood Pressure ≤ 80

YES → Exit to 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
May administer up to 2L of NS

NO

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

Reassess responder after 20 Minutes in General Rehabilitation Section
Reassess VS

HR ≥ 110 → YES → Temp ≥ 100.6 → YES → Extend Rehabilitation Time Until VS Improve

HR ≥ 110 → NO → Temp ≥ 100.6 → YES → Extend Rehabilitation Time Until VS Improve

Temp ≥ 100.6 → NO → HR ≥ 110 → NO

Discharge patient from General Rehabilitation Section

VITAL SIGN CAVEATS

Blood Pressure:
Prone to inaccuracy on scenes; must be interpreted in the proper context.

Individuals at special events may have elevated blood pressured due to physical exertion and is not typically pathologic.

Individuals with SBP ≥160 or DBP ≥100 may need extended rehabilitation. However this does not necessarily prevent them from returning to the event.

Temperature:
Individuals may have increased temperature during rehabilitation.

Special Operations Section

Scene Rehabilitation:
General / Special Event / Mass Gathering

Pearls

- **This protocol should be utilized for evaluating patrons of certain special events that may or may not otherwise meet the definition of a patient**
- **When a person presents with a medical complaint, or has persistent abnormal vital signs, they become a patient and an individual PCR must be completed..**
- **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.**
- **People taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- **Serious signs / symptoms:**
  - Chest pain, dizziness, dyspnea, weakness, nausea, or headache.
  - Symptoms of heat stress (cramps) or cold stress.
  - Changes in gait, speech, or behavior.
  - Altered Mental Status.
  - Abnormal Vital Signs per agency SOP or Policy / Procedure.
- **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.**
- **Establish rehab location such that it provides shelter, privacy and freedom from smoke or other hazards.**
- **For approved gatherings, other patient contact requirements may be determined at approval of event coverage.**

Scene Rehabilitation: Responder

Remove:
PPE
Body Armor
Chemical Suits
SCBA
Turnout Gear
Other equipment as indicated

Continue:
Heat and Cold Stress treatment techniques from General Rehab Section

Injury / Illness / Complaint should be treated using appropriate treatment protocol beyond need for oral or IV hydration.

NFPA Age Predicted 85 % Maximum Heart Rate	
20 - 25	170
26 - 30	165
31 - 35	160
36 - 40	155
41 - 45	152
46 - 50	148
51 -55	140
55 - 60	136
61 - 65	132

Initial Process
1. Personnel logged into Responder Rehabilitation Section
2. VS Assessed and Recorded / Orthostatic Vital Signs
3. Pulse oximetry and SPCO (if available)
4. Personnel assessed for signs / symptoms

Use in conjunction with General Rehabilitation Protocol

10 Minute Rest Period

Pulse Rate > 85 % NFPA Age Predicted Maximum — YES → **A** **Normal Saline Bolus 500 mL IV / IO Maximum 2 L** Titrate to HR ≤ 100 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

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 optional and given only as an example. Agencies may and are encouraged to develop their own.**
- **Rehabilitation officer has full authority in deciding when responders may return to duty.**
- **Utilized when responder is not appropriate for General Rehabilitation Protocol.**
- **May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.**
- **Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.**
- Rehabilitation Section is an integral function within the Incident Management System.
- Establish section such that it provides shelter, privacy and freedom from smoke or other hazards.
- **If available, use the RAD-57 device in rehab to determine carbon monoxide levels of responders.**
- May treat with fluids and discharge without Medical Control contact if only the ALS care provided is IV fluids up to two liters.

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

Multiple Patient Incident

History
- Number of patients
- Cause of incident
- Chemical, biological, or radiological contamination
- Secondary devices

Signs and Symptoms
- SLUDGEM for chemical exposure
- Respiratory distress for narcotic exposure
- Nausea/vomiting for radiation

Differential
- Blast response
- MPI penetrating trauma
- MPI blunt trauma/MVC

Scene safety; Maintain situational awareness
If blast response, utilize respiratory protection and full turnout gear until advised to remove

↓

Provide scene size-up on assigned Ops channel; activate appropriate ALARM level

↓

If not already accomplished, establish COMMAND and TRIAGE (utilize ICS job cards) → Triage Protocol ***as needed***

↓

Move all ambulatory (GREEN) patients to a safe area in COLD ZONE

← **Consider public transportation to alternative receiving facility for ambulatory patients**

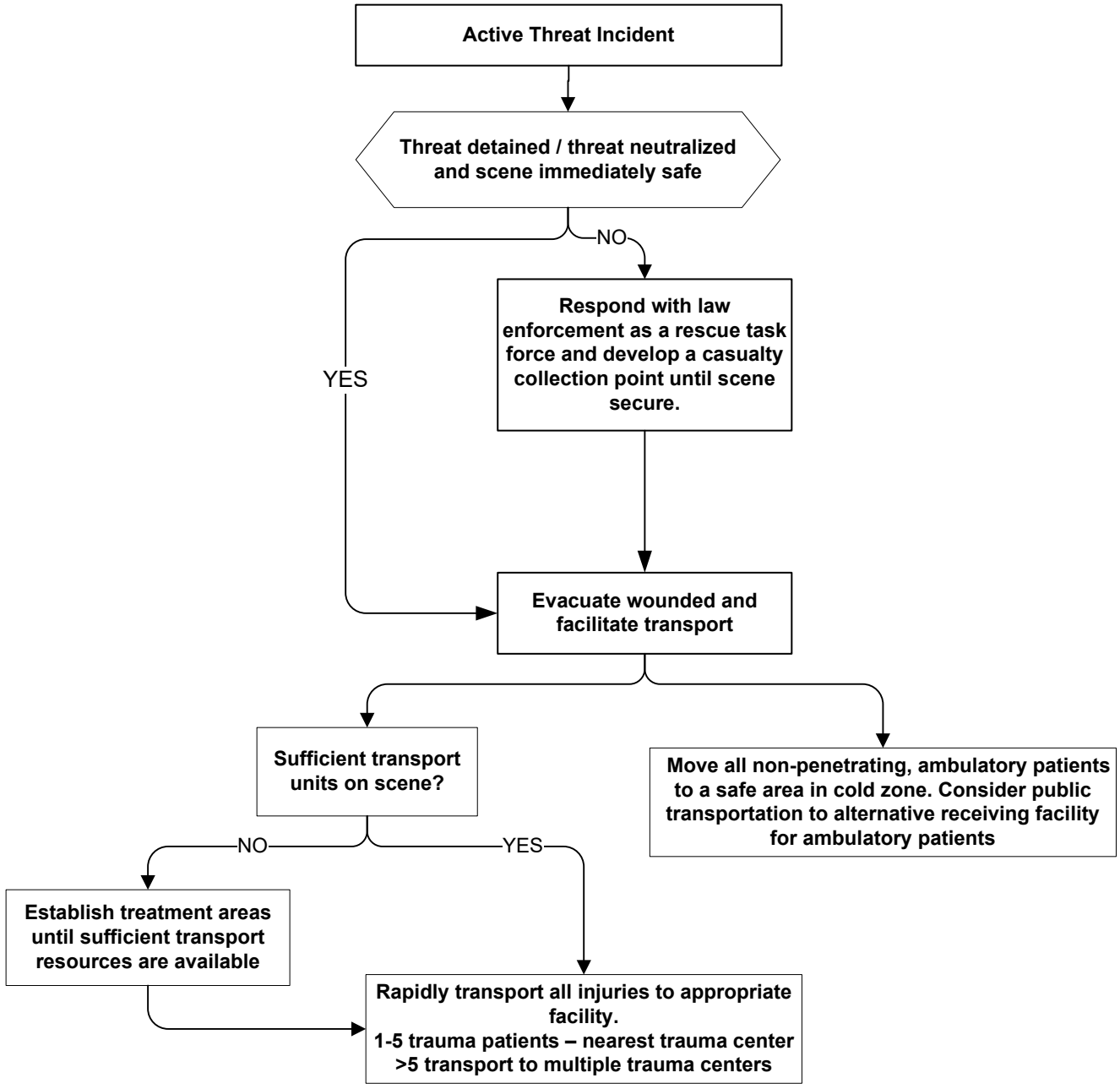
↓

Move non-ambulatory patients to transportation area as rapidly as possible. Establish treatment areas only if there are insufficient transport resources available for rapid evacuation → Appropriate Treatment Protocols as needed and resources allow

Special Operations Protocols

Pearls
- In absence of guidance from JC911, consider utilizing the following communications assignments:
  1. MEDICAL BRANCH on separate OPS channel
  2. Transportation/Destination Coordination on separate OPS channel
- ICS Job Cards and ICS Job Vests should be utilized by all personnel involved in an MPI
- If blast injury with more than five (5) patients, patients with SBP <90 mm Hg and/or obvious external trauma to four (4) or more body areas should go to a Level I Trauma Center (WakeMed/Raleigh). Others may be considered for community hospital transport.
- Multiple patients may be transported in the same EMS unit if needed during a catastrophic mass casualty. When possible, patients of similar acuity should be transported in the same unit to assist with appropriate transport destination.

Active Threat



Pearls

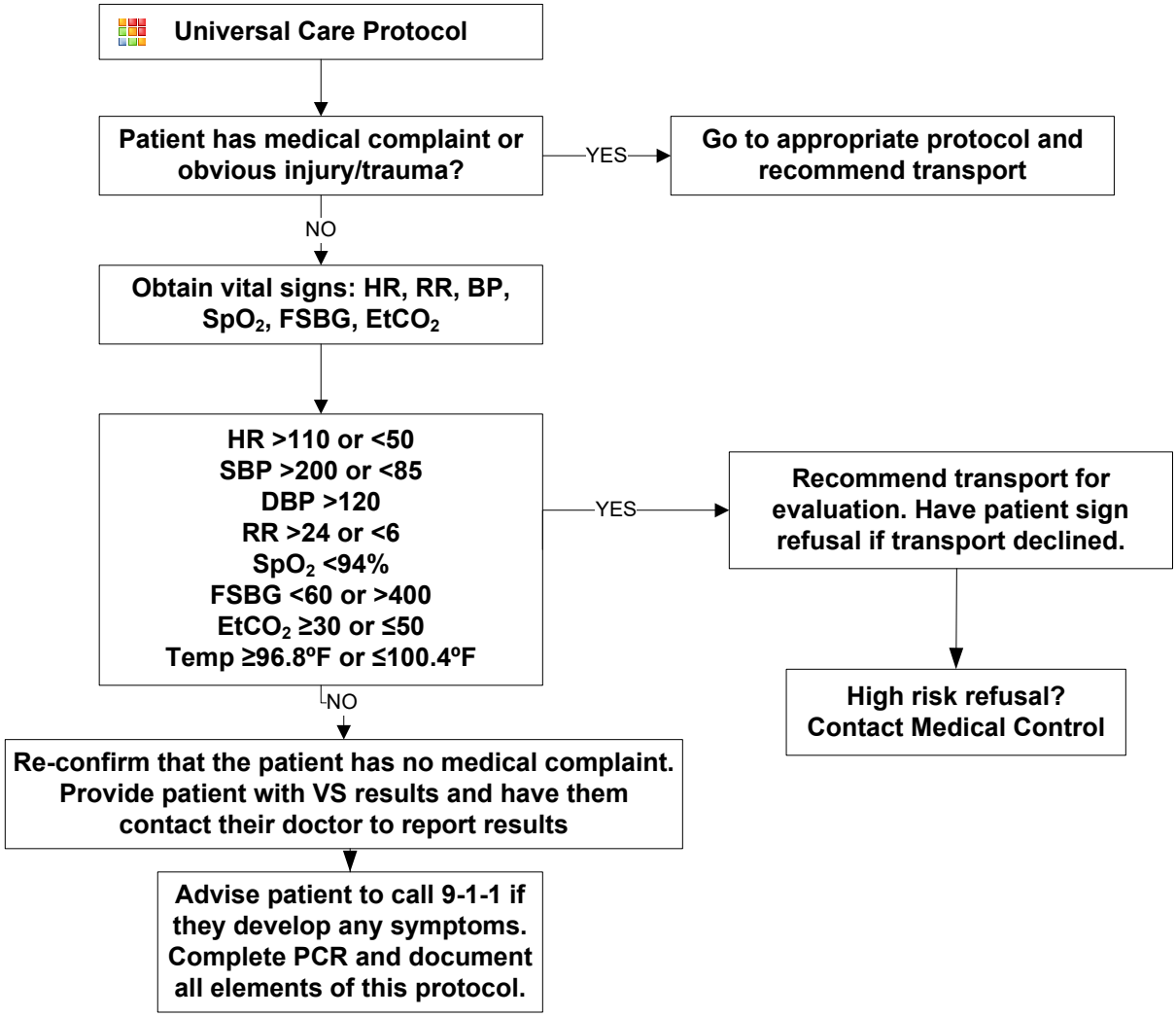
- Make notification to JC911 and all local hospitals as soon as possible with the projected number of patients.
- Level 1 trauma centers can manage up to 5 penetrating trauma patients per hour.
  - If more than 5 penetrating trauma patients, consider transporting to multiple trauma centers.
  - If more than 30 patients require Level One trauma care, then transport of trauma patients to non-trauma center local hospitals may be required.
- The penetrating trauma bag or “active threat bag” is the only equipment initially required. If a casualty collection point is established and additional equipment is required, a cache of needed supplies should be requested.
- Please refer to the MCI protocol for proper radio communication and channel assignments. Task cards and job vests should be utilized by all personnel involved in an MPI
- If blast injury with more than 5 patients, patients with SBP <90 and/or obvious external trauma to 4 or more body surface areas should go to Level 1 trauma center. Others may be considered for a community hospital transport.
- Multiple patients may be transported in the same EMS unit if needed. When possible, patients with similar acuity should be transported in the same unit to assist with appropriate transport destination.

Well Person Check

History
- Patient requests “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

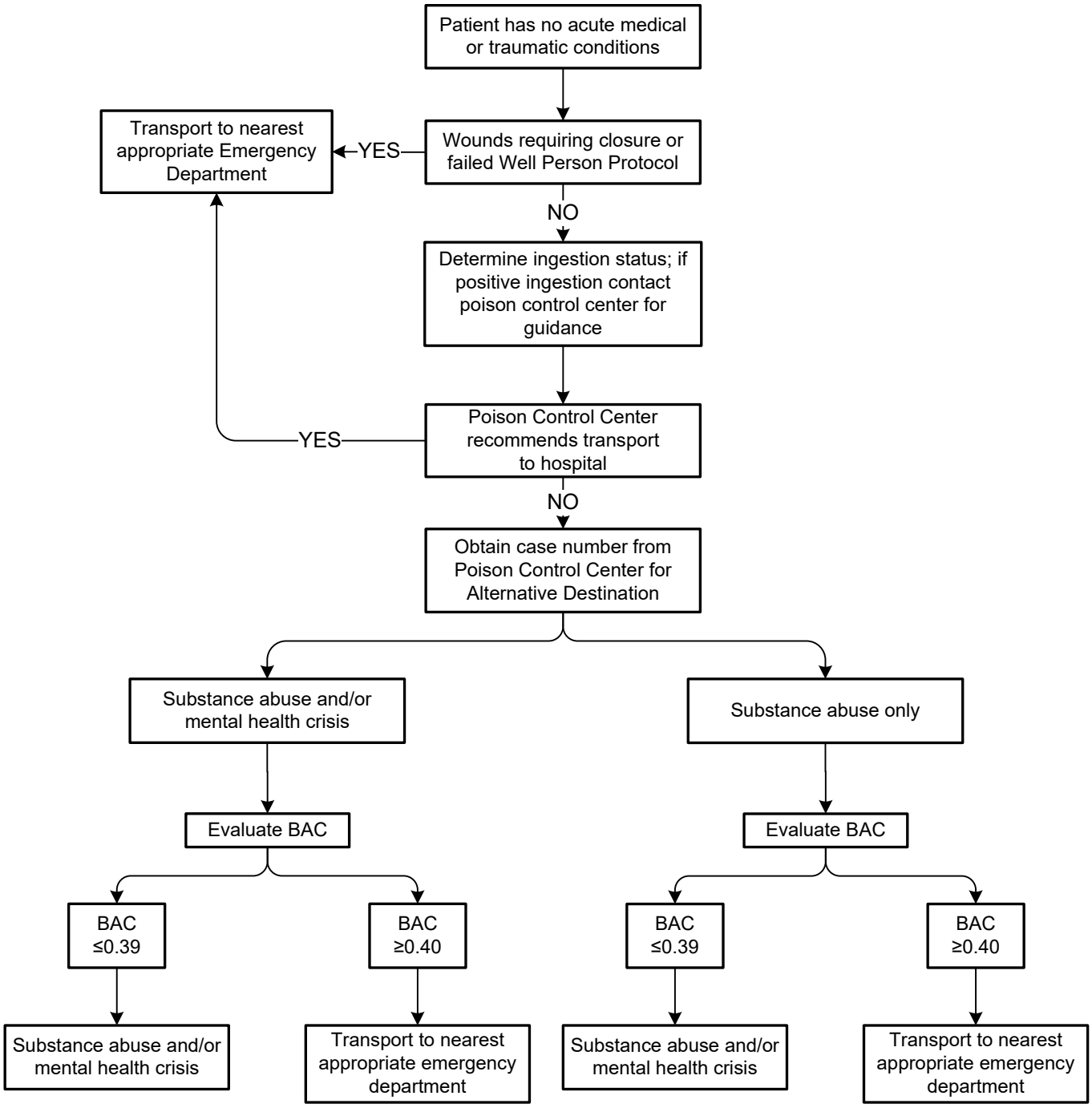
Differential
- Hypertensive urgency
- Hypertensive emergency
- Syncope
- Cardiac ischemia
- Cardiac dysrhythmia
- Fracture
- Head trauma



Special Operations Protocols

Pearls
- This protocol applies to ALL responders
- Patients who are denying more severe symptoms may initially present for a “routine check”. Cconfirm with the patient at least twice that they have no medical complaints.
- All persons who request service are considered patients and shall have a PCR completed.
- 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 RR assessed. The PCR narrative is key in these and all cases, and must accurately and thoroughly describe the patient encounter.
- Any person that a responder comes into contact with that has a medical complaint or concern for themselves or others immediately with them should be evaluated under this protocol.

Medical Clearance for Mental Health / Substance Abuse Patients



Special Response Section Protocols

Pearls:

* **Patient preference may still be honored if the patient wishes to be taken to a hospital instead of mental health or substance abuse facility.**
* **Use this protocol in conjunction with the Johnston County EMS Policy 'Transport and Screening for Mental Health and Substance Abuse Patients'.**

Crisis Response

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
- Expression of suicidal / homicidal thoughts

Differential
- Altered mental status
- Alcohol intoxication
- Toxin / substance abuse
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders

This protocol should only be utilized after redirection from the Behavioral Protocol and the patient / guardian has consented to Crisis Intervention

Universal Care Protocol

Scene Safe?

No → Call for help / additional resources. Stage until the scene is safe and maintain situational awareness

Mandatory Evaluation Criteria
- LOC – Alert / oriented to person place time and event
- BAC <0.3
- HR < 120
- SBP > 100 mm hg
- BSFS > 70 or <300
- Temperature <100.4ºF or >96.0ºF
- No acute Trauma
- Non violent
- Able to ambulate or operate wheelchair
- No seizure within the past 24 hours

No → Patient does not qualify for crisis intervention. Consider appropriate protocol and transportation to the appropriate emergency department.

If you are not a CIT certified paramedic, request a supervisor response **"reference crisis intervention."**

Utilize de-escalation techniques and maintain situational awareness

CIT P — Consider on-site intervention, calling mobile crisis, or contacting a mental health provider for appointment

CIT P — Monday – Friday 08:00 – 17:00 and not a holiday

No → P — Consider transporting to the appropriate emergency department

Yes → CIT P — Contact Johnston County Crisis and Assessment Center (919) 989-5500 . Be prepared to give vital signs, pertinent PMHx, and ETA

Special Response Protocols

Blast Incident Injury

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

Nature of Device: Agent / Amount. Industrial Explosion. Terrorist Incident. Improvised Explosive Device.
Method of Delivery: Incendiary / Explosive
Nature of Environment: Open / Closed.
Distance from Device: Intervening protective barrier. Other environmental hazards,
Evaluate for: Blunt Trauma / Crush Injury / Compartment Syndrome / Traumatic Brain Injury / Concussion / Tympanic Membrane Rupture / Abdominal hemorrhage or Evisceration, Blast Lung Injury and Penetrating Trauma.

Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute

Accidental / Intentional Explosions (See Pearls)

- Triage Protocol UP 2 ***as indicated***
- Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***as indicated***
- Multiple Trauma Protocol TB 6 ***if indicated***
- A: IV / IO Procedure ***if indicated***
- P: Cardiac Monitor & $ETCO_2$ ***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***

Blast Lung Injury — YES → Age Appropriate Airway Protocol(s) AR 4, 7 ***as indicated***

NO

- Decontamination Procedure ***if indicated***
- Pain Control Protocol UP 11 ***if indicated***
- **Safe 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 Incident Injury

SCENE NOTIFICATION

As soon as assessment reveals that patient meets trauma triage criteria, contact WakeMed/ Raleigh via radio to make a trauma notification:

Patient's age, sex, and GCS

Primary trauma triage criteria

Estimated time of arrival (ETA) to facility

Provide updates from scene as needed and update via radio or phone when approximately 10-15 minutes out.

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 prone and in slight 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
- 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

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
No inhalation injury, Not Intubated, Normotensive
GCS 14 or Greater
Minor Burn

5-15% TBSA 2nd/3rd Degree Burn
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
(When reasonably accessible, transport to a Burn Center)
Serious Burn

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
(When reasonably accessible, transport to a Burn Center)
Critical Burn

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7
if indicated

Identify Contact Points

Eye Involvement
Irrigate Involved Eye(s) with Normal Saline for 15 – 30 minutes
May repeat as needed

Chemical Exposure / Burn
Flush Contact Area with Normal Saline for 15 minutes

Decontamination Procedure
if indicated

Age Appropriate Cardiac Protocol(s)
if indicated

Thermal Burn Protocol TB 9

Prehospital Fluid Resuscitation for Burns

≤5 y/o: 125mL LR / hour
6-13 y/o: 250mL LR / hour
≥14 y/o: 500mL LR / hour

Utilize the Dial-A-Flow extension to administer accurate fluids

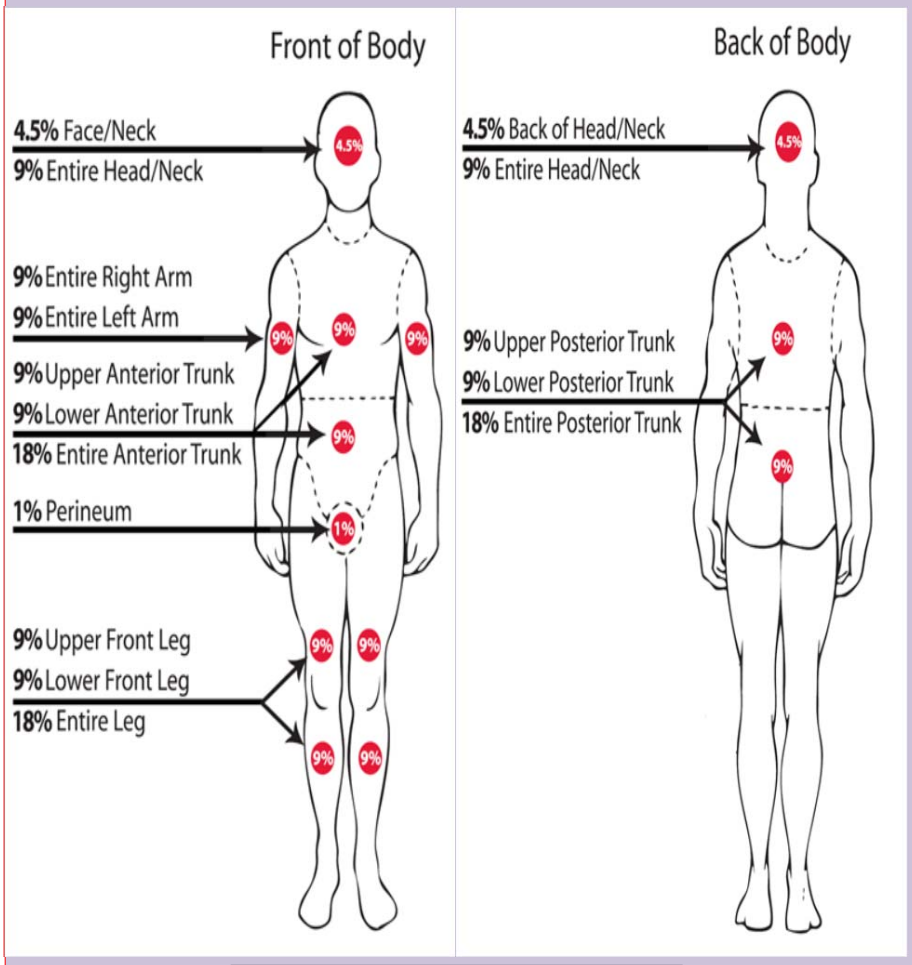
Refer to Thermal Burn Protocol TB 9 for the Modified Parkland Formula in regards to Interfacility Transport Fluid Administration

Safe 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



Estimate spotty areas of burn by using the size of the patient's palm as 1 %

Rule of Nines

- Seldom do you 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 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 and Full Thickness 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.
- Other burn classifications in general include:
  - 4th referring to a burn that destroys the dermis and involves muscle tissue.
  - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

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 Triage systems.**
- **Refer to Rule of Nines: Remember the extent of the obvious external burn from an electrical source does not always reflect more extensive internal damage not seen.**
- **Chemical Burns:**
  - Refer to Decontamination Procedure.
  - 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. If it is a dry chemical, gently brush it off as it may react violently with water.
- **Electrical Burns:**
  - 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.
  - **Do not refer to as entry and exit sites or wounds.**
  - 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.

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, 3, 4, 5, 6, 7
as indicated

B 12 Lead ECG Procedure

A IV / IO Procedure

P Cardiac Monitor & $ETCO_2$

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

P
Consider
Midazolam 0.5 – 2 mg IV / IO
Midazolam 1 – 2 mg IN
Maximum 5 mg
Pediatric: 0.1 – 0.2 mg / kg
IV / IO / IN
Pediatric Maximum 2 mg
Over 2 – 3 minutes as needed

Entrapped < 2 hours

A
Normal Saline Infusion
1 Liter per hour IV / IO
Pediatric:
3 x maintenance fluid rate

Entrapped > 2 hours

A
Decrease Normal Saline Infusion
500 mL per hour IV / IO
Pediatric:
Maintenance fluid rate

Abnormal ECG
Peaked T Waves
QRS ≥ 0.12 seconds
QT ≥ 0.46 seconds
Loss of P wave
Or
Hemodynamically Unstable
Or
Asystole / PEA / VF / VT

P
Sodium Bicarbonate
50 mEq IV / IO
Pediatric: 1 mEq / kg IV / IO

Calcium Chloride 1 g IV / IO
Pediatric: 20 mg / kg IV / IO
Over 2- 3 minutes

Albuterol Nebulizer
2.5 – 5 mg
May repeat x 3

Consider
Age Appropriate Multiple
Trauma Protocol
Hypothermia / Hyperthermia
Protocol(s)
as indicated

Exit to
Age Appropriate
Cardiac Arrest
Protocol AC 3 / PC 4
Arrhythmia Protocol(s)
if indicated

Safe 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

SCENE NOTIFICATION

As soon as assessment reveals that patient meets trauma triage criteria, contact WakeMed/ Raleigh via radio to make a trauma notification:

Patient's age, sex, and GCS

Primary trauma triage criteria

Estimated time of arrival (ETA) to facility

Provide updates from scene as needed and update via radio or phone when approximately 10-15 minutes out.

ECG changes related to hyperkalemia are:

- Mild hyperkalemia (6-7 mmol/l) – peaked T waves.
- Moderate hyperkalemia (7 – 8 mmol/l) – flattened P wave, prolonged PR interval, depression of ST segment, peaked T wave.
- Severe hyperkalemia (8 – 9 mmol/l) – atrial standstill, prolonged QRS duration, further peaking T waves.
- Life-threatening hyperkalemia (>9 mmol/l) – sine wave pattern.

Pediatric Fluid Maintenance rate example
25kg pediatric
(4x10) mL + (2x10) mL + (5x1) mL =
60 mL/hr or 1mL/min

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 systolic 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.

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
	Wound Care – Wound Packing ***If indicated***
	Wound Care - Tourniquet Procedure ***if indicated***
A	IV / IO Procedure ***if indicated***
	Age Appropriate Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7 ***if indicated***
	Multiple Trauma Protocol TB 6 ***if indicated***
	Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***
	Pain Protocol UP 11 ***if indicated***
	Crush Syndrome Protocol TB 3 ***as indicated***

Suspected blunt trauma?
Usual equipment is taken to patient's side

Suspected penetrating trauma?
Active Threat Bag should be included with usual equipment.

ANTICOAGULANTS-

Arixtra (fondaparinux); Xarelto (rivaroxaban)
Eliquis (apixaban); Savaysa (edocaban)
Bevyxxa (betrixaban); Jantoven (warfarin)
Coumadin (warfarin)
Fragmin (dalteparin); Innohep (tinzaparin)
Lovenox (enoxaparin)
Heparin
Pradaxa (dabigatran)

Antiplatelet Agents and Dual Antiplatelet Therapy (DAPT)

Plavix (clopidogrel); Effient (prasugrel)
Brilinta (ticagrelor)

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.
P	**Zosyn** **Adult 4.5g IV / IO** **Peds 2 – 9 months 80 mg/kg** **> 9 months and ≤40 kg 100 mg/kg** **≥40 kg refer to adult dosing** **or** **Vancomycin 15 mcg / kg IV / IO** **Max 2g Initial dose**

NO ↓

Monitor and Reassess

Notify Destination or Contact Medical Control

Safe Transport
to appropriate destination using
Trauma:
EMS Triage and Destination Plan
Scene time should be limited
≤10 minutes
Provide Early Trauma Notification

Trauma and Burn Protocol Section

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

Extremity Trauma

SCENE NOTIFICATION

As soon as assessment reveals that patient meets trauma triage criteria, contact receiving facility via radio to make a trauma notification to WakeMed/ Raleigh:

Patient's age, sex, and GCS

Primary trauma triage criteria

Estimated time of arrival (ETA) to facility

Provide updates from scene as needed and update via radio or phone when approximately 10-15 minutes out.

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.
- The decision to transport a patient to a trauma center utilizing lights and sirens transport should be based upon the clinical picture presented and reasonable expectation of potential changes. Routine transport of stable patients utilizing lights and sirens transport, especially those that meet trauma criteria by mechanism of injury or non-physiological criteria, is discouraged.
- Obtain allergies as Zosyn is part of the penicillin family of medications. Penicillin is a common medication allergy.

Head Trauma

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

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

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

	Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***if indicated***
	Obtain and Record GCS
B	Supplemental oxygen Maintain SpO2 ≥ 90% Preferably ≥ 94%
B	Prevent Oxygen desaturation events < 90%
B	Maintain $EtCO_2$ 35 – 45 mmHg
B	Blood Glucose Analysis Procedure
A	IV / IO Procedure ***if indicated***
P	Cardiac Monitor & $EtCO_2$
	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

Safe Transport to appropriate destination using Trauma and Burn: EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

DO NOT ROUTINELY HYPERVENTILATE

Ventilate 8-10 breaths per minute to maintain $EtCO_2$ 35-45 mmHg

OR

Evidence of Brain Herniation:
Unilateral or Bilateral Dilation of Pupils / Posturing

Hyperventilate to maintain $EtCO_2$ 30 – 35 mmHg
See Pearls

ANTICOAGULANTS-

Arixtra (fondaparinux)
Xarelto (rivaroxaban)
Eliquis (apixaban)
Savaysa (edocaban)
Bevyxxa (betrixaban)

Jantoven (warfarin)
Coumadin (warfarin)

Fragmin (dalteparin)
Innohep (tinzaparin)
Lovenox (enoxaparin)
Heparin

Pradaxa (dabigatran)

Antiplatelet Agents and Dual Antiplatelet Therapy (DAPT)

Plavix (clopidogrel)
Effient (prasugrel)
Brilinta (ticagrelor)

Trauma and Burn Protocol Section

Head Trauma

GLASGOW COMA SCALE	Eye Opening Response	Verbal Response	Motor Response
	4 = Spontaneous 3 = To verbal stimuli 2 = To pain 1 = None	5 = Oriented 4 = Confused 3 = Inappropriate words 2 = Incoherent 1 = None	6 = Obeys commands 5 = Localizes pain 4 = Withdraws from pain 3 = Flexion to pain or decorticate 2 = Extension to pain or decerebrate 1 = None

SCENE NOTIFICATION

As soon as assessment reveals that patient meets trauma triage criteria, contact WakeMed/ Raleigh via radio to make a trauma notification:

Patient's age, sex, and GCS

Primary trauma triage criteria

Estimated time of arrival (ETA) to facility

Provide updates from scene as needed and update via radio or phone when approximately 10-15 minutes out.

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **GCS is a key performance measure used in the EMS Acute Trauma Care Toolkit.**
- **A single episode of hypoxia and / or hypotension can significantly increase morbidity and mortality with head injury.**
- **Hyperventilation in head injury:**
  - **Hyperventilation lowers CO2 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 EtCO2 between 30 - 35 mmHg. Short term option only used for severe head injury typically GCS ≤ 8 or unresponsive.**
- **Do not place in Trendelenburg position as this may increase ICP and worsen blood pressure.**
- **Poorly fitted cervical collars may also increase ICP when applied too tightly.**
- **In areas with short transport times, Drug Assisted Airway protocol is not recommended for patients who are spontaneously breathing and who have oxygen saturations of ≥ 90% with supplemental oxygen including BIAD / BVM.**
- **Hypotension:**
  - Limit IV fluids unless patient is hypotensive.
  - Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
  - Usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
  - Fluid resuscitation should be titrated to maintain at least a systolic BP of > 70 + 2 x the age in years.
  - **Lowest systolic 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

ANTICOAGULANTS-

Arixtra (fondaparinux)
Xarelto (rivaroxaban)
Eliquis (apixaban)
Savaysa (edocaban)
Bevyxxa (betrixaban)

Jantoven (warfarin)
Coumadin (warfarin)

Fragmin (dalteparin)
Innohep (tinzaparin)
Lovenox (enoxaparin)
Heparin

Pradaxa (dabigatran)

Antiplatelet Agents and Dual Antiplatelet Therapy (DAPT)

Plavix (clopidogrel)
Effient (prasugrel)
Brilinta (ticagrelor)

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

Control External Hemorrhage
Consider Pelvic Binding
Splint Suspected Fractures

P — Chest Decompression-Needle Procedure ***if indicated***

Obtain and Record GCS

A — IV / IO Procedure

P — Cardiac Monitor & $EtCO_2$

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***

Routine spinal precautions in the setting of patients with penetrating trauma is not recommended in the absence of signs / symptoms of spinal cord injury

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

Safe Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan
Limit Scene Time ≤ 10 minutes
Provide Early Scene Notification

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

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

Multiple Trauma

JOHNSTON COUNTY EMS SYSTEM TRAUMA TRIAGE CRITERIA

ASSESS VITAL SIGNS AND LEVEL OF CONSCIOUSNESS:

✱ Glasgow Coma Scale	<13
✱ Systolic Blood pressure	<90mm Hg
✱ Respiratory rate	<10 or >29 breaths per minute (<20 in infant aged <1 year)

ASSESS ANATOMY OF INJURY:

- ✱ All penetrating injuries to head, neck, torso, and extremities proximal to elbow and knee
- ✱ Chest wall instability or deformity (e.g. flail chest
- ✱ Crush, degloved, mangled, or pulseless extremity
- ✱ Amputation proximal to wrist or ankle
- ✱ Pelvic fractures
- ✱ Open or depressed skull fracture
- ✱ Paralysis

ASSESS MECHANISM AND EVIDENCE OF HIGH-ENERGY IMPACT:

- ✱ Falls
  - ✚ Adults: >20 feet (one story is 10 feet)
  - ✚ Children: >10 feet or 2-3 times height of child
- ✱ High-risk auto crash
  - ✚ Intrusion, including roof: >12 inches occupant site; >18 inches passenger compartment
  - ✚ Death in same passenger compartment
  - ✚ Vehicle telemetry data consistent with high risk of injury
- ✱ Auto vs. pedestrian/bicyclist thrown, run over, or with significant (>20 mph) impact
- ✱ Motorcycle crash >20 mph

ASSESS SPECIAL PATIENT OR SYSTEM CONSIDERATIONS:

- ✱ Older adults
  - ✚ Age ≥55 years in setting of injury
  - ✚ Age ≥65 years with SBP <110mm Hg in setting of injury
  - ✚ Ground level fall with s/s of head/serious injury
- ✱ Children
  - ✚ Triaged to pediatric capable trauma center
- ✱ Anticoagulants and bleeding disorders
  - ✚ Patients taking anticoagulants and anti-platelets
  - ✚ Hemophilia or clotting disorders
- ✱ Pregnancy >20 weeks
- ✱ EMS Provider judgement

SCENE NOTIFICATION

As soon as assessment reveals that patient meets trauma triage criteria, contact WakeMed/ Raleigh via radio to make a trauma notification:

Patient's age, sex, and GCS

Primary trauma triage criteria

Estimated time of arrival (ETA) to facility

Provide updates from scene as needed and update via radio or phone when approximately 10-15 minutes out.

Multiple Trauma

* Preload the stretcher with an emergency thermal blanket prior to extricating a trauma patient. This can be a beneficial tool in combating the hypothermia arm of the trauma triad of death.

Pearls

* **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
* **Items in Red Text are key performance measures used in the EMS Acute Trauma Care Toolkit**
* **Transport Destination is chosen based on the EMS System Trauma Plan with EMS pre-arrival notification.**
* **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.**
* **Control external hemorrhage and prevent hypothermia by keeping patient warm.**
* **Consider Chest Decompression with signs of shock and injury to torso and evidence of tension pneumothorax.**
* **Trauma Triad of Death:**
  - **Metabolic acidosis / Coagulopathy / Hypothermia**
  - **Appropriate resuscitation measures and keeping patient warm regardless of ambient temperature helps to mitigate metabolic acidosis, coagulopathy, and hypothermia.**
* **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 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.
* Severe bleeding from an extremity not rapidly controlled with direct pressure may necessitate the application of a tourniquet.
* Maintain high-index of suspicion for domestic violence or abuse, pediatric non-accidental trauma, or geriatric abuse.

Radiation Incident

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

Signs and Symptoms
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/ wheezing / Hypotension

Differential
- Superficial (1st Degree) red - painful (Do not 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)

Prehospital Fluid Resuscitation for Burns

- **≤5 y/o: 125mL LR / hour**
- **6-13 y/o: 250mL LR / hour**
- **≥14 y/o: 500mL LR / hour**

Utilize the Dial-A-Flow extension to administer accurate fluids

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7
if indicated

Eye Involvement
Irrigate Involved Eye(s) with Normal Saline
for 15 – 30 minutes
May repeat as needed

Flush Contact Area with Normal Saline for 15 minutes

Decontamination Procedure
if indicated

Age Appropriate Cardiac Protocol(s)
as indicated

Thermal Burn Protocol TB 9
if indicated

Safe Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

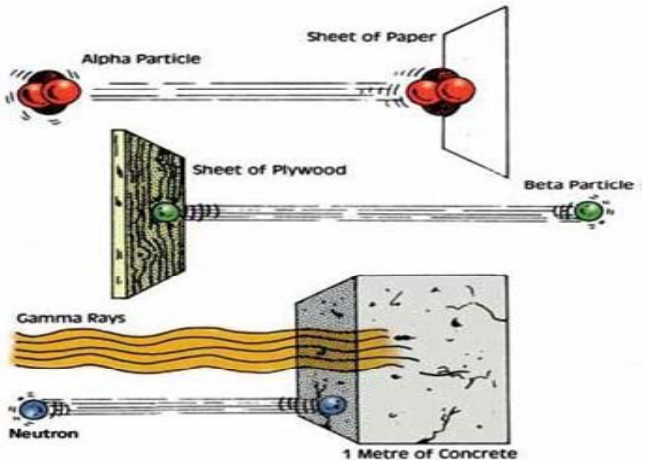
Collateral Injury: Most all injuries immediately seen will be a result of collateral injury, such as heat from the blast, trauma from concussion, treat collateral injury based on typical care for the type of injury displayed.·

Qualify: Determine exposure type; external irradiation, external contamination with radioactive material, internal contamination with radioactive material.·

Quantify: Determine exposure (generally measured in Grays/Gy). *Information may be available from those on site who have monitoring equipment, do not delay transport to acquire this information.*

Trauma and Burn Protocol Section

Radiation Incident



Time Phases of Radiation Injury
(Exposure Dose vs Clinical Outcome)

Exposure Dose (Gy)	Prodrome Severity	Manifest Illness - Symptom Severity			Prognosis
		Hematologic	Gastrointestinal	Neurologic	
0.5 to 1.0	+	+	0	0	Survival almost certain
1.0 to 2.0	+/++	+	0	0	Survival >90 percent
2.0 to 3.5	++	++	0	0	Probable survival
3.5 to 5.5	+++	+++	+	0	Death in 50% at 3.5 to 6 wks
5.5 to 7.5	+++	+++	++	0	Death probable in 2-3 wks
7.5 to 10	+++	+++	+++	0*	Death probable in 1-2.5 wks
10 to 20	+++	+++	+++	+++	Death certain in 5-12 days
> 20	+++	+++	+++	+++**	Death certain in 2-5 days

Abbreviations: Gy: dose in Grey;
0: no effects; +: mild; ++: moderate; +++: severe or marked

* Hypotension
** Also cardiovascular collapse, fever, shock

Modified from : Waselenko, JK, MacVittie, TJ, Blakely, WF, et al. Medical management of the acute radiation syndrome: Recommendations of the strategic national stockpile radiation working group. Ann Int Med 2004; 140:1039.

Pearls

- Dealing with a patient with a radiation exposure can be a frightening experience. Do not ignore the ABC's, a dead but decontaminated patient is not a good outcome. Refer to the Decontamination Procedure for more information.
- Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation using tap water. Other water sources may be used based on availability. Flush the area as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- **Three methods of exposure:**
  - External irradiation
  - External contamination
  - Internal contamination
- **Two classes of radiation:**
  - Ionizing radiation (greater energy) is the most dangerous and is generally in one of three states: Alpha Particles, Beta Particles and Gamma Rays.
  - Non-ionizing (lower energy) examples include microwaves, radios, lasers and visible light.
- Radiation burns with early presentation are unlikely, it is more likely this is a combination event with either thermal or chemical burn being presented as well as a radiation exposure. Where the burn is from a radiation source, it indicates the patient has been exposed to a significant source, (> 250 rem).
- Patients experiencing radiation poisoning are not contagious. Cross contamination is only a threat with external and internal contamination.
- Typical ionizing radiation sources in the civilian setting include soil density probes used with roadway builders and medical uses such as x-ray sources as well as radiation therapy. Sources used in the production of nuclear energy and spent fuel are rarely exposure threats as is military sources used in weaponry. Nevertheless, these sources are generally highly radioactive and in the unlikely event they are the source, consequences could be significant and the patient's outcome could be grave.
- **The three primary methods of protection from radiation sources:**
  - Limiting time of exposure
  - Distance from
  - Shielding from the source
- Dirty bombs ingredients generally include previously used radioactive material and combined with a conventional explosive device to spread and distribute the contaminated material.
- Refer to Decontamination Procedure / WMD / Nerve Agent Protocol for dirty contamination events.
- If there is a time lag between the time of exposure and the encounter with EMS, key clinical symptom evaluation includes: Nausea/ Vomiting, hypothermia/hyperthermia, diarrhea, neurological/cognitive deficits, headache and hypotension.
- This event may require an activation of the National Radiation Injury Treatment Network, RITN. UNC Hospitals, Wake Forest-Baptist and Duke are the NC hospitals, with burns managed at UNC and Wake Forest.

Selective Spinal Care / Immobilization

B **N**euro Exam: Any focal deficit? — YES →

NO ↓

B **S**ignificant mechanism of injury? High-energy events such as ejection, high falls, and abrupt deceleration crashes — YES →

NO ↓

B **A**lertness: Alteration in mental status? — YES →

NO ↓

B **I**ntoxication: Any evidence? Includes Drugs and / 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 to ROM? — YES →

NO ↓

B **Spinal Motion Restriction Not Required** → Exit to Appropriate protocol(s)

Apply
Cervical Immobilization Device

Restrict Spinal Movement

Follow
Spinal Precautions Procedure

AMBULATORY
Bring stretcher to patient, assist patient onto stretcher with minimal spinal movement, and then secure patient to stretcher

NONAMBULATORY
Use Long Spine Board (OR any of the multiple equivalent devices) to ***TRANSFER*** patient to stretcher with minimal spinal movement, *remove the device, 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

Trauma and Burn Protocol Section

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Patients meeting all the above criteria do not require spinal motion restriction. However, patients who fail one or more criteria above require spinal motion restriction, but does NOT require use of the long spine board for immobilization.**
- **Long spine boards are NOT considered standard of care in most cases of potential spinal injury. Spinal motion restriction with cervical collar and securing patient to cot, while padding all void areas is appropriate.**
- **True spinal immobilization is not possible. Spine protection and spinal motion restriction do not equal long spine board.**
- **Spinal motion restriction is always utilized in at-risk patients. These include cervical collar, securing to stretcher, minimizing movement / transfers and maintenance of in-line spine stabilization during any necessary movement / transfers. This includes the elderly or others with body or spine habitus preventing them from lying flat.**
- **Consider spinal motion restriction in patients with arthritis, cancer, dialysis, underlying spine or bone disease.**
- Range of motion (ROM) is tested by touching chin to chest (look down), extending neck (look up), and turning head from side to side (shoulder to shoulder) without posterior cervical mid-line pain. ROM should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted.
- **The EMR may participate in spinal motion restriction by applying manual traction/stability to the head (does not include application of a cervical collar).**
- **<u>Immobilization on a long spine board is not necessary where</u>:**
  - **Penetrating trauma to the head, neck or torso with no signs / symptoms of spinal injury.**
- **<u>Concerning mechanisms that may result in spinal column injury</u>:**
  - **Fall from ≥ 3 feet and/or ≥ 5 stairs or steps**
  - **MVC ≥ 30 mph, rollover, and/or ejection**
  - **Motorcycle, bicycle, other mobile device, or pedestrian-vehicle crash**
  - **Diving or axial load to spine**
  - **Electric shock**

Thermal Burn

History
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history 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
- Superficial (1st degree) red - painful (do not 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

Assess Burn / Concomitant Injury Severity

< 5% TBSA 2nd/3rd Degree Burn
No inhalation injury, Not Intubated, Normotensive
GCS 14 or Greater
Minor Burn

5-15% TBSA 2nd/3rd Degree Burn
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension or GCS 13 or Less
(When reasonably accessible, transport to a Burn Center)
Serious Burn

>15% TBSA 2nd/3rd Degree Burn
Burns with Multiple Trauma
Burns with definitive airway compromise
(When reasonably accessible, transport to a Burn Center)
Critical Burn

The Modified Parkland Formula should be utilized if transferring a patient from another facility. Follow age based fluid resuscitation in the prehospital setting

Prehospital Fluid Resuscitation for Burns

✱ 5 y/o: 125mL LR / hour ✱
✱ 6-13 y/o: 250mL LR / hour ✱
✱ ≥14 y/o: 500mL LR / hour ✱

Utilize the Dial-A-Flow extension to administer accurate fluids

- 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
- **A** IV / IO Procedure
  Consider 2 IV sites if greater than 15 % TBSA
- **A** **Prehospital Fluid Resuscitation for Burns**
  ✱ ≤5 y/o: 125mL LR / hour ✱
  ✱ 6-13 y/o: 250mL LR / hour ✱
  ✱ ≥14 y/o: 500mL LR / hour ✱
  Utilize the Dial-A-Flow extension to administer accurate fluids
- Pain Control Protocol UP 11 ***if indicated***
- Carbon Monoxide / Cyanide Protocol TE 2 ***if indicated***
- Monitor and Reassess

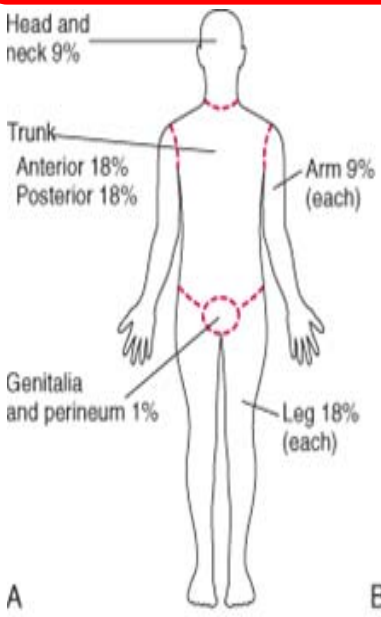
Safe Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

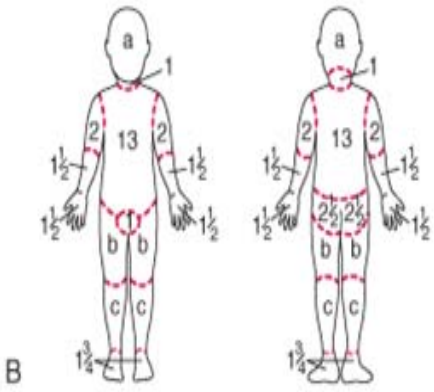
Notify Destination or Contact Medical Control

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

- Seldom do you 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 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 and Full Thickness 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.
- Other burn classifications in general include:
  - 4th referring to a burn that destroys the dermis and involves muscle tissue.
  - 5th referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6th referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

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.**
- **Critical or Serious Burns:**
  - ***>5-15% total body surface area (TBSA) 2nd or 3rd degree burns, or***
  - ***3rd degree burns > 5% TBSA for any age group, or***
  - ***circumferential burns of extremities, or***
  - ***electrical or lightning injuries, or***
  - ***suspicion of abuse or neglect, or***
  - ***inhalation injury, or***
  - ***chemical burns, or***
  - ***burns of face, hands, perineum, or feet***
- Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- 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.

The Modified Parkland Formula

Research indicates that resuscitation based on using 4mL / kg x %TBSA burn has commonly caused excessive edema and over fluid administration

Adult Thermal and Chemical Burns

2 mL LR x Patients Body Weight in Kg x % 2º and 3º burns
½ is given in the first 8 hours.

Ex 2 x 100kg x 20% = 4,000mL LR
½ in 8 hours is 2,000mL LR in first 8 hours
2,000mL LR / 8 = 250mL / hr

Peds ≤13 years old Thermal and Chemical Burns

3 mL LR x Patients Body Weight in Kg x % 2º and 3º burns
½ is given in the first 8 hours.

High Voltage Burns for *All* Ages

4 mL LR x Patients Body Weight in Kg x % 2º and 3º burns
½ is given in the first 8 hours.

Traumatic Arrest

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES →
Decomposition
Rigor mortis
Dependent lividity
Blunt force trauma
Injury incompatible with life
Downtime ≥ 15 minutes with asystole

DNR / MOST Form

Do not begin resuscitation

Follow Deceased Subjects Policy

If there is a lack of a suggestive mechanism of injury, the arrest may be Medical in nature.

Utilize appropriate protocol for presenting rhythm.

Blunt Arrest

YES
Apnea — NO
YES
Pulseless — NO
YES
Asystole or PEA < 40 — NO
YES

Do not begin resuscitation
Follow Deceased Subjects Policy

Medical Branch
Utilize Pre-ROSC Checklist

Penetrating Arrest

YES
NO — Apnea
YES
NO — Pulseless
YES
NO — Asystole or PEA < 40
YES
YES — Pupil Reflexes
NO
YES — Spontaneous Body Movement
NO

Do not begin resuscitation
Follow Deceased Subjects Policy

Cardiopulmonary Resuscitation Procedure

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

Control External Hemorrhage
Splint Suspected Fractures
Consider Pelvic Binding

P — Chest Decompression-Needle Procedure
if indicated

Spinal Motion Restriction Procedure
Protocol TB 8
If indicated

A — IV / IO Procedure

ROSC — No →

Consider termination of efforts if:
No ROSC after ≥15 minutes resuscitation attempt
No ROSC and transport time to trauma center ≥15 minutes

Questions

Contact Medical Control

Safe Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan
Limit Scene Time ≤ 10 minutes
Provide Early Notification

Trauma and Burn Protocol Section

Traumatic Arrest

- **Epinephrine administration in a traumatic arrest has shown to have no benefit.**
- **Consider rapid fluid administration in the case of traumatic arrest up to 2L.**
- **Identify correctible causes of arrest.**
- **Consider early bilateral chest decompression.**

Pearls.

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- **Withholding resuscitative efforts with blunt and penetrating trauma victims who meet criteria is appropriate.**
- **Organized rhythms for the purposes of this protocol include Ventricular Tachycardia, Ventricular Fibrillation and PEA.**
- **Wide, bizarre rhythms such as Idioventricular and severely brachycardic rhythms < 40 BPM are not organized rhythms.**
- **First arriving EMS personnel should make the assessment concerning agonal respirations, pulselessness, asystole or PEA < 40, pupillary reflexes and spontaneous body movements.**
- **Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.**
- **DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compressions to ventilations are 30:2. If advanced airway in place ventilate 8 – 10 breaths per minute.**
- **ALS procedures should optimally be performed during safe transport.**
- **Time considerations:**
  - **From the time cardiac arrest is identified, if CPR is performed ≥ 15 minutes with no ROSC consider termination of resuscitation.**
  - **From the time cardiac arrest is identified, if transport time to closest Trauma Center is > 15 minutes consider termination of resuscitation.**
- Lightning strike, drowning or in situations causing hypothermia resuscitation should be initiated.
- Where multiple lightning strike victims are found used Reverse Triage: Begin CPR where apneic / pulseless
- Agencies utilizing Targeted Temperature Management Protocol should not cool the trauma patient, but rather make every effort to maintain warmth.

Bites / 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
- **A** IV / IO Procedure ***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>Muscle Spasm</u>**
  Midazolam 2 – 2.5 mg IV / IO
  Over 2 to 3 minutes
  Maximum 10 mg
  Pediatrics:
  Midazolam 0.1 – 0.2 mg / kg
  IV / IO / IM / IN
  Over 2 to 3 minutes
  Maximum 5 mg IM

Snake Bite
- 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 / Envenomations

Black Widow Spider

Brown Recluse Spider

Copperhead

Water Moccasin

Eastern Diamondback Rattlesnake

Eastern Coral Snake

Toxin-Environmental Protocol Section

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.**
- **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.
- **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

SCENE SAFETY IS A PRIORITY

	Immediately Remove from Exposure
	Appropriate Airway Protocol(s) 1 - 7 ***as indicated***
	High Flow Oxygen
	Blood Glucose Analysis Procedure
B	12 Lead ECG Procedure
A	IV/ IO Procedure
P	Cardiac Monitor / CO Monitor
	Altered Mental Status Protocol UP 4 ***if indicated***
	Age Appropriate Diabetic Protocol AM 2 / PM 2 ***if indicated***
	Age Appropriate Multiple Trauma Protocol TB 6 Head Injury TB 5 ***if indicated***
	Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***if indicated***

High Suspicion of Cyanide → YES → Appropriate Airway, Cardiac, Seizure Protocol

NO

	Continue Care Continue High Flow Oxygen
	Monitor and Reasses

Notify Destination or Contact Medical Control

Toxin-Environmental Protocol Section

Carbon Monoxide / Cyanide

- Use of RAD-57 device should be utilized under this protocol.

Pearls

- **Recommended exam: Neuro, Skin, Heart, Lungs, Abdomen, Extremities**
- **Scene safety is priority.**
- Consider CO and Cyanide with any product of combustion
- Normal environmental CO level does not exclude CO poisoning.
- Symptoms present with lower CO levels in pregnancy, children and the elderly.
- Continue high flow oxygen regardless of pulse ox readings.
- **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 evaluation for any CO exposed pregnant person.**
- The absence (or low detected levels of) of COHb is not a reliable predictor of firefighter or victim exposure to other toxic byproducts of fire
- In obtunded fire victims, consider Cyanide ingestion.
- The differential list for CO Toxicity is extensive. Attempt to evaluate other correctable causes when possible

Drowning

History
- Submersion in water regardless of depth
- Possible history of trauma; slammed into shore wave break
- Duration of submersion / immersion
- Temperature of water or possibility of hypothermia

Signs and Symptoms
- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Foaming / Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor
- Apnea

Differential
- Trauma
- Pre-existing medical problem
  - Hypoglycemia
  - Cardiac Dysrhythmia
- Pressure injury (SCUBA diving)
  - Barotrauma
  - Decompression sickness
- Post-immersion syndrome

Awake and Alert

- Supplemental Oxygen ***as tolerated***
- Spinal Motions Restriction Procedure / Protocol TB 8 ***if indicated***
- Remove wet clothing Dry / Warm Patient
- Monitor and Reassess
- **Encourage transport and evaluation even if asymptomatic or with minimal symptoms** *Asymptomatic drowning patients (refusing transport) should be instructed to seek medical care/call 911 if they develop any symptoms within 6 hours*
- A: IV / IO Procedure ***if indicated***
- P: Cardiac Monitor & $ETCO_2$ ***as indicated***

Consider CPAP for Respiratory Distress

Awake but with AMS

- 5 Breaths via BVM / mouth-to-mouth ***as tolerated***
- Supplemental Oxygen ***as tolerated***
- Age Appropriate Airway Protocol(s) 1-7 ***as indicated***
- Spinal Motion Restriction Procedure / Protocol TB 8 ***if indicated***
- Altered Mental Status Protocol UP 4 ***as indicated***
- Remove wet clothing Dry / Warm Patient
- A: IV / IO Procedure
- P: Cardiac Monitor & $ETCO_2$

Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***

Notify Destination or Contact Medical Control

Unresponsive

5 Breaths via BVM / mouth-to-mouth ***as tolerated***

Pulse
- YES → Age Appropriate Airway Protocol(s) 1-7 ***as indicated***
- NO → Exit to Age Appropriate Cardiac Arrest Protocol(s) AC 3 / PC 4 Airway Protocol(s) AR 1 - 7 Spinal Motion Restriction Protocol TB 8 ***as indicated***

Dive Accident / Barotrauma
Divers Alert Network
1-919-684-9111

Toxic-Environmental Protocol Section

Pearls
- **Recommended Exam: Respiratory, Mental status, Trauma Survey, Skin, Neuro**
- **Drowning is the process of experiencing respiratory impairment (any respiratory symptom) from submersion / immersion in a liquid.**
- **Begin with BVM ventilations, if patient does not tolerate then apply appropriate mode of supplemental oxygen.**
- **Ensure scene safety. Drowning is a leading cause of death among would-be rescuers.**
- **When feasible, only appropriately trained and certified rescuers should remove patients from areas of danger.**
- **Regardless of water temperature – resuscitate all patients with known submersion time of ≤ 25 minutes.**
- **Regardless of water temperature – If submersion time ≥ 1 hour consider moving to recovery phase instead of rescue.**
- **Foam is usually present in airway and may be copious, DO NOT waste time attempting to suction. Ventilate with BVM through foam (suction water and vomit only when present.)**
- **Cardiac arrest in drowning is caused by hypoxia, airway and ventilation are equally important to high-quality CPR.**
- **Encourage transport of all symptomatic patients (cough, foam, dyspnea, abnormal lung sounds, hypoxia) due to potential worsening over the next 6 hours.**
- Predicting prognosis in prehospital setting is difficult and does not correlate with mental status. Unless obvious death, transport.
- Hypothermia is often associated with drowning and submersion injuries even with warm ambient conditions.
- Drowning patient typically has <1 – 3 mL/kg of water in lungs (does not require suction) Primary treatment is reversal of hypoxia.
- Spinal motion restriction is usually unnecessary. When indicated it should not interrupt ventilation, oxygenation and / or CPR.

Hyperthermia

History
- Age, very young and old
- Exposure to increased temperatures and/ or humidity
- Past medical history / Medications
- Time and duration of exposure
- Poor PO intake, extreme exertion
- Fatigue and / or muscle cramping

Signs and Symptoms
- Altered mental status / coma
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

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

Temperature Measurement Procedure ***if available***

Temperature Measurement should NOT delay treatment of hyperthermia

- Remove from heat source to cool environment
- Cooling measures
- Remove tight clothing
- **B** 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
- **A** IV / IO Procedure
- **P** Cardiac Monitor & $EtCO_2$
- **A** **Normal Saline Bolus**
  500 mL IV / IO
  Repeat to effect SBP > 90
  Maximum 2 L
  PED: Bolus 20 mL/kg IV / IO
  Repeat to effect Age appropriate
  SBP ≥ 70 + 2 *x* Age
  Maximum 60 mL/kg
- Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 ***as indicated***
- Monitor and Reassess

Notify Destination or Contact Medical Control

Seizure Activity
Go to
Seizure Protocol

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.
  - **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, barbiturates
- Infections / Sepsis
- Length of exposure / wetness / wind chill

Signs and Symptoms
- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

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

Temperature Measurement Procedure ***if available***

Temperature Measurement should NOT delay treatment of hypothermia

Remove wet clothing
Dry / Warm Patient

Passive warming measures

B Blood Glucose Analysis Procedure

Age Appropriate
Diabetic Protocol AM 2 / PM 2
as indicated

Hypothermia / Frost Bite

Localized Cold Injury

General Wound Care

DO NOT Rub Skin to warm
DO NOT Massage
Skin to warm

DO NOT allow refreezing

Systemic Hypothermia

Awake with / without AMS

Age Appropriate
Airway Protocol(s) AR 1 - 7
as indicated

Altered Mental Status
Protocol UP 4
as indicated

Active warming measures

B 12 Lead ECG Procedure

IV / IO Procedure

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 & $ETCO_2$

Age Appropriate
Hypotension/ Shock
Protocol AM 5 / PM 3
Multiple Trauma Protocol TB 6
as indicated

Monitor and Reassess

Unresponsive

Pulse

YES → Age Appropriate Airway Protocol(s) AR 1 - 7 ***as indicated***

NO → Exit to Age Appropriate Cardiac Protocol(s) ***See Pearls***

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:**
  - **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. Airway 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 Envenomation / Injury

History
- Type of bite / sting
- Identification of organism
- Previous reaction to marine organism
- Immunocompromised
- Household pet

Signs and Symptoms
- Intense localized pain
- Increased oral secretions
- Nausea / vomiting
- Abdominal cramping
- Allergic reaction / anaphylaxis

Differential
- Jellyfish sting
- Sea Urchin sting
- Sting ray barb
- Coral sting
- Swimmers itch
- Cone Shell sting
- Fish bite
- Lion Fish sting

General Wound Care Procedure

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

P — Cardiac Monitor & $EtCO_2$ ***if indicated***

Drowning Protocol TE 3 ***if indicated***

Age Appropriate Allergy / Anaphylaxis Protocol AM 1 / PM 1 ***if indicated***

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

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

If Needed
Carolinas Poison Control
1-800-222-1222

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

Sting Ray / Lion Fish / Urchin / Starfish
- Immobilize injury
- Remove Barb or Spine If large Barb in thorax or abdomen stabilize object
- Immerse in Hot Water 110 – 114°F (43 - 46°C) ***if available***

Large Organism
- Immobilize injury
- Multiple Trauma Protocol TB 6 ***if indicated***
- Extremity Trauma Protocol TB 4 ***if indicated***

Monitor and Reassess

Notify Destination or Contact Medical Control

Toxic-Environmental Protocol Section

Marine Envenomation / Injury

Pearls

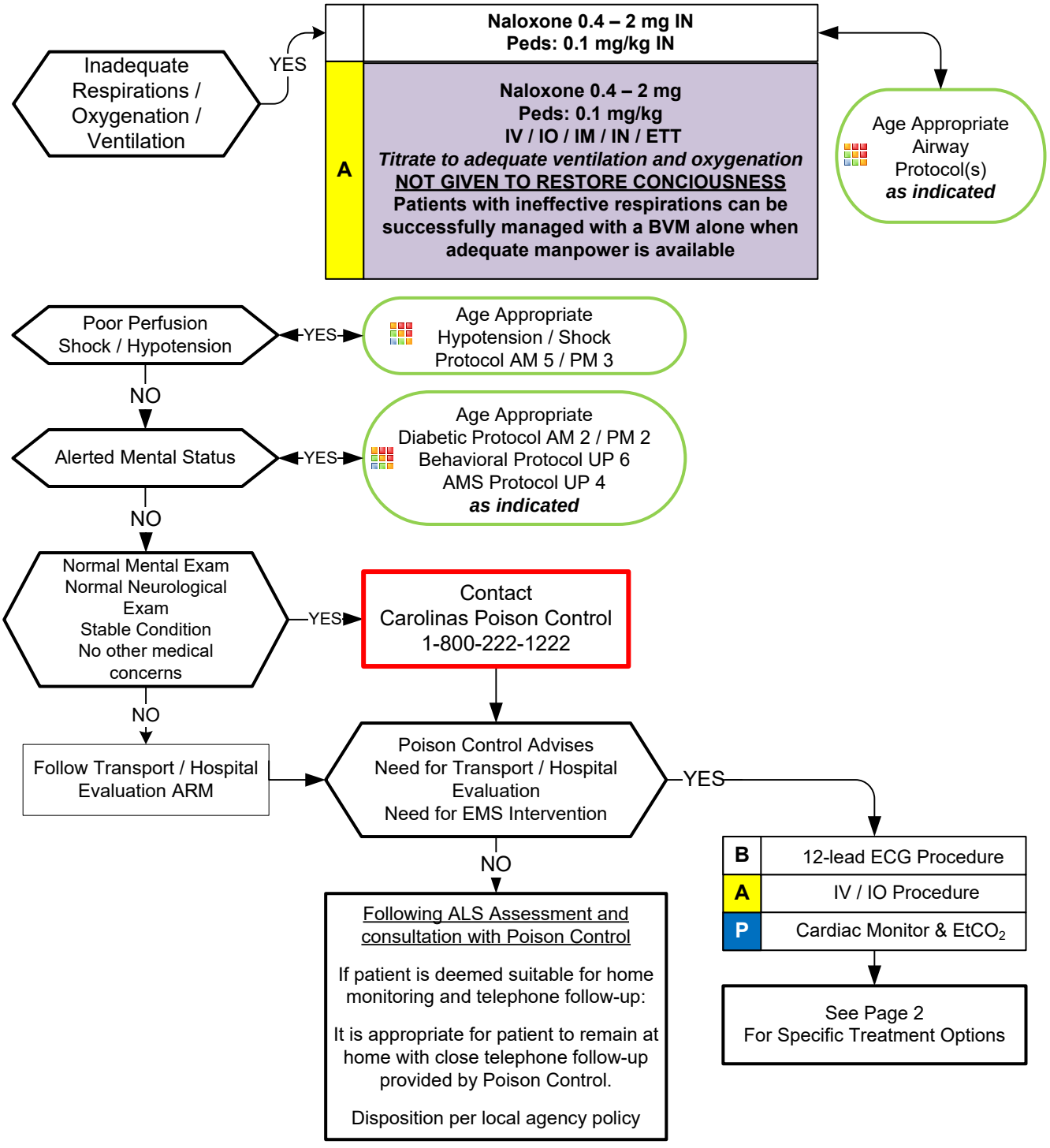
- **Ensure your safety: Avoid the organism or fragments of the organism as they may impart further sting / injury.**
- **Priority is removal of the patient from the water to prevent drowning.**
- **Coral:**
  - Coral is covered by various living organisms which are easily dislodged from the structure.
  - 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

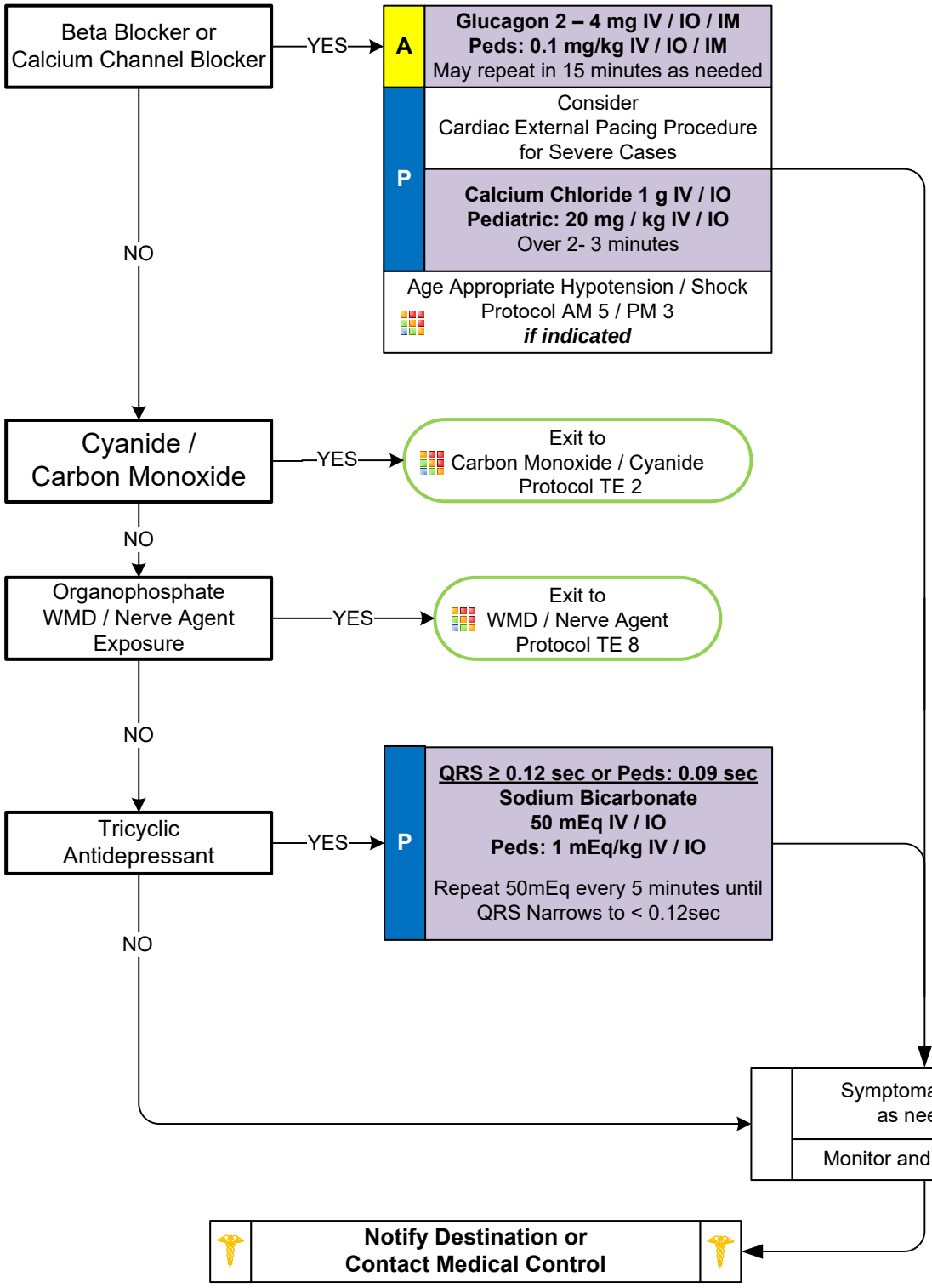
Signs and Symptoms
- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- S.L.U.D.G.E.
- D.U.M.B.B.E.L.S

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



Overdose
Toxic Ingestion

Common Beta Blockers:

Atenolol	Coreg
Labetalol	Propanolol
Inderal	Metoprolol
Nadolol	Tenormin

Common Calcium Channel Blockers:

Amlodipine	Cardene
Nicardipine	Norvasc
Adalat	Diltiazem
Verapamil	Isoptin

Common Tricyclics:
Amitriptyline. Imipramine, Clomipramine, Doxepin and Nortryptyline.

Pearls

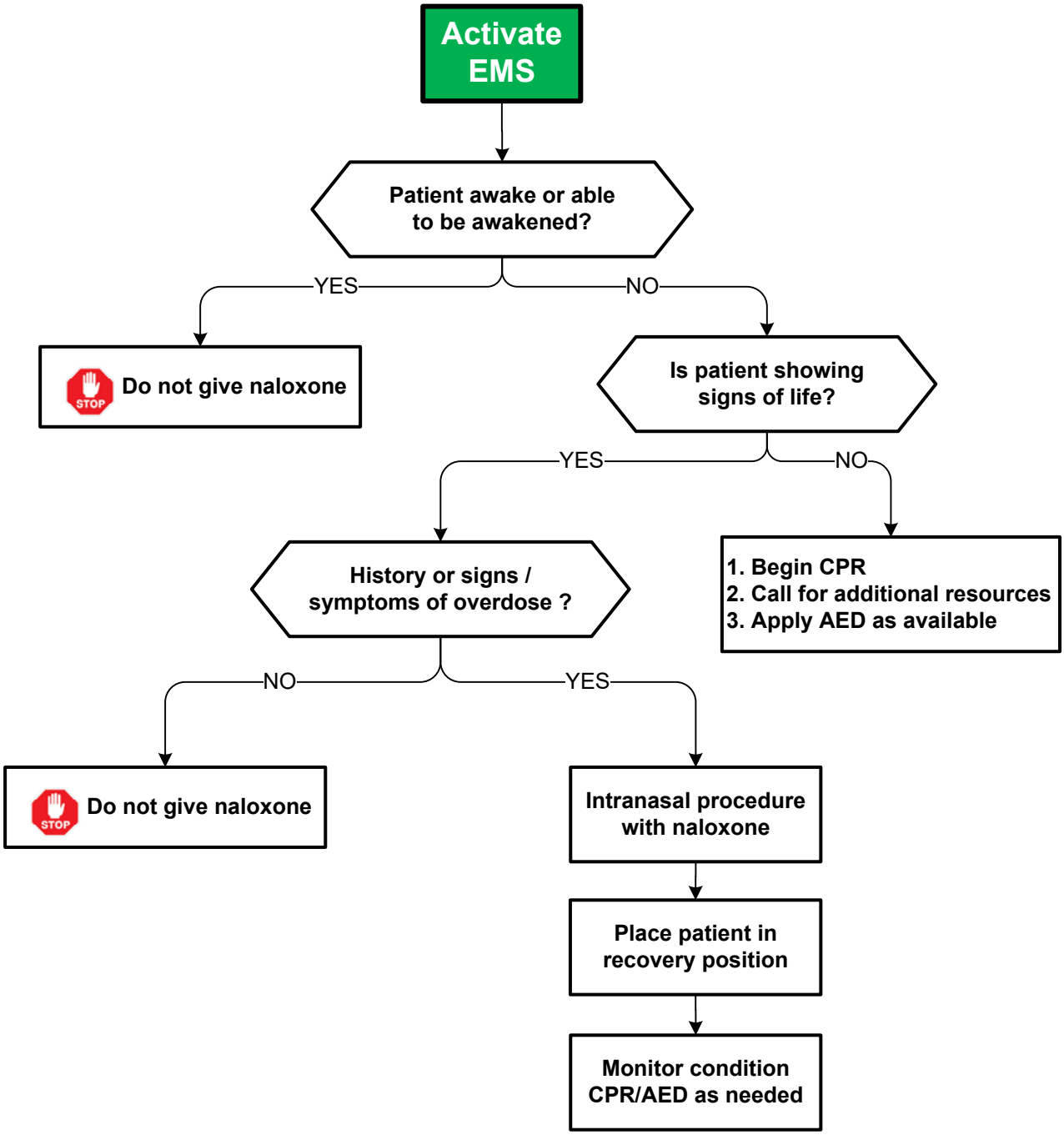
- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro**
- **Opioids and opiates may require higher doses of Naloxone to improve respiration, in certain circumstances up to 10 mg.**
- **Time of Ingestion:**
  1. **Most important aspect is the TIME OF INGESTION, the substance, 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.**
- **Pediatric:**
  - **Age specific blood pressure 0 – 28 days > 60 mmHg, 1 month - 1 year > 70 mmHg, 1 - 10 years > 70 + (2 x age) mmHg and 11 years and older > 90 mmHg.**
  - **Maintenance IV Rate: By weight of child: First 10 kg = 4 mL, Second 10 kg = 2 mL, Additional kg = 1 mL. (Example: 36 kg child: First 10 kg = 40 mL, Second 10 kg = 20 mL, 16 kg remaining at 1 mL each. Total is 76mL / hour)**
- **Bring bottles, contents, emesis to ED.**
- **S.L.U.D.G.E: Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis**
- **D.U.M.B.B.E.L.S: Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation.**
- **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure
- **Aspirin**: Early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema among other things can take place later.
- **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils
- **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures
- **Anticholinergic:** increased HR, increased temperature, dilated pupils, mental status changes
- **Cardiac Medications:** dysrhythmias and mental status changes
- **Solvents:** nausea, coughing, vomiting, and mental status changes
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils
- **Nerve Agent Antidote kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self-administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
- **EMR and EMT may administer naloxone by IN / IM route only and may administer from EMS supply. Agency medical director may require Contact of Medical Control prior to administration and may restrict locally.**
- **When appropriate contact the North Carolina Poison Control Center for guidance, reference Policy 18.**
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.

Law Enforcement Officer
Naloxone (Narcan)

History
- Previous drug history
- Paraphernalia
- Known access to narcotics

Signs and Symptoms
- Altered mental status
- Unconscious
- Decreased breathing
- Pin-point pupils
- Blue (cyanotic lips
- Pale skin
- Track marks

Differential
- Narcotic overdose
- Trauma/ assault
- Mixed overdose
- Alcohol intoxication
- Lack of a pulse
- Obvious death



Toxic-Environmental Protocol Section

Law Enforcement Officer
Naloxone (Narcan)

Procedure for intranasal naloxone administration:

1. Confirm the correct medication, expiration date, and dosage.
2. Naloxone is carried as 2mg medication in 2ml volume.
3. Attach the MAD (Mucosal Atomizer Device) nasal atomizer.
4. Place the atomizer ½ inch into patient's nostril.
5. Briskly compress the syringe to administer ½ of the medication.
6. For adults, remove and repeat into the other nostril until all of the medication has been administered.
7. Volumes greater than 1ml are too large and will lead to failure because the drug cannot be absorbed through the nasal mucosa fast enough.
8. Monitor the patient for signs of improvement, such as increased respiratory effort, improving level of consciousness, and purposeful movements.

Prefilled naloxone syringe in box


Prefilled naloxone prepared for use


Patient in recovery position

Pearls:

- **Subjects may become combative after naloxone administration.**
- **Subjects may vomit after naloxone administration; move quickly to the recovery position**
- **The nostril can only absorb 1ml of fluid.**
- **Factors that may affect mucosal absorption of the medication may include recent use of vasoconstrictors (i.e. cocaine or Afrin), nosebleeds, or nasal congestion and/or discharge.**

WMD Nerve Agent

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

Signs and Symptoms
- **S**alivation
- **L**acrimation
- **U**rination; increased, loss of control
- **D**efecation / Diarrhea
- **G**I Upset; Abdominal pain / cramping
- **E**mesis
- **M**uscle Twitching
- Seizure Activity
- Respiratory Arrest

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

Call for help / additional resources
Stage until scene safe

Obtain history of exposure
Observe for specific toxidromes
Initiate triage and/or decontamination as indicated.

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

A	IV / IO Procedure
	Nerve Agent Kit IM **2 Doses Rapidly** ***if available***

Major Symptoms:
Altered Mental Status, Seizures, Respiratory Distress, Respiratory Arrest

A	IV / IO Procedure
	Nerve Agent Kit IM **3 Doses Rapidly** ***if available***
P	**Atropine 2 mg IV / IO / IM** **Pediatric: See Pearls** **IV / IO / IM** Repeat every 3 to 5 minutes until symptoms resolve
P	**Pralidoxime (2PAM)** **600 mg IV / IO / IM** **Pediatric: 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 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. Agency medical director may require Contact of Medical Control prior to administration.

Universal Patient Care

Scene Safe

NO → Call for help / additional resources
Stage until scene safe

YES →
- 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 Broselow-Luten tape

Required VS:
Blood pressure
Palpated pulse rate
Respiratory rate
SpO_2 if available

If Indicated:
Glucose
12-lead ECG
Temperature
Pain scale
CO Monitoring
$EtCO_2$ Monitoring

Medical or Trauma

Trauma Patient

Evaluate MOI

- Significant MOI → Primary and Secondary trauma assessment
- No Significant MOI → Primary and Secondary trauma assessment
  Focused assessment on specific injury

Medical Patient

Mental Status Exam

- Unresponsive → Primary and secondary assessment
  Obtain history of present illness from available sources / scene survey
- Responsive → 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(s), and public. Identify number of patients and utilize triage protocol if indicated. Observe patient position and surroundings; maintain situational awareness.
- **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 (SBP) 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, hypoxia, 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
- **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. Recent research demonstrates a clear link with increased mortality when given in overdose (hyperoxia / hyperventiation) in cardiac arrest. Utilize oxygen when indicated and not because it is available. A reasonable target oxygen 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 physical exam that fully evaluates the patient's complaint.**
- **Any patient contact which does not result in an EMS transport must have a completed disposition form.**
- **Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.**
- **Two (2) complete vital sign acquisitions should occur at a minimum with a patient encounter.**
- **Patient Refusal**
  - Patient refusal is a high risk situation. Encourage patient to accept transport to medical facility.
  - Encourage patient to allow an assessment, including vital signs. Documentation of the event is very important including a mental status assessment describing the patient's capacity to refuse care.
  - Guide to Assessing capacity:
    C:***Patient should be able to communicate a clear choice:*** This should remain stable over time. Inability to communicate a choice or an inability to express the choice consistently demonstrates incapacity.
    R: ***Relevant information is understood:*** Patient should be able to display a factual understanding of the illness, the options and risks and benefits.
    A: ***Appreciation of the situation:*** Ability to communicate an understanding of the facts of the situation. They should be able to recognize the significance of the outcome potentially from their decision.
    M: ***Manipulation of information in a rational manner:*** Demonstrate a rational process to come to a decision. Should be able to describe the logic they are using to come to the decision, though you may not agree with decision.
- **Pediatric Patient General Considerations:**
  - **A pediatric patient is defined by fitting a Length-based Resuscitation Tape, Age ≤ 15, weight ≤ 49 kg.**
  - Patients off the Broselow-Luten tape should have weight based medications until age ≥ 16 or weight ≥ 50 kg.
  - Special needs children may require continued use of Pediatric based protocols regardless of age and weight.
  - Initial assessment should utilize the Pediatric Assessment Triangle which encompasses Appearance, Work of Breathing and Circulation to skin.
  - The order of assessment may require alteration dependent on the developmental state of the pediatric patient.
  - Generally the child or infant should not be separated from the caregiver unless absolutely necessary during assessment and treatment.
- Timing of transport should be based on patient's clinical condition and the transport policy.
- Never hesitate to contact medical control for patient who refuses transport.
- Blood Pressure is defined as a Systolic / Diastolic reading. A palpated Systolic reading may be necessary at times.
- SAMPLE: Signs / Symptoms; Allergies; Medications; PMH; Last oral intake; Events leading to illness / injury

Patient Safety

Follow Universal Patient Care Protocol

↓

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

↓

Document at least once per shift the presence of all equipment, medications, and supplies listed on the appropriate agency EMS unit daily check sheet

↓

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 nearest unit.

↓

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

↓

If there is an equipment failure, observe the equipment failure policy and complete a Johnston County EMS System Special Report

↓

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

↓

Treat per appropriate protocol

↓

Patient hand-off to the receiving facility/ unit follows the SBAR and includes patient information, personal property, summary of care and response to care

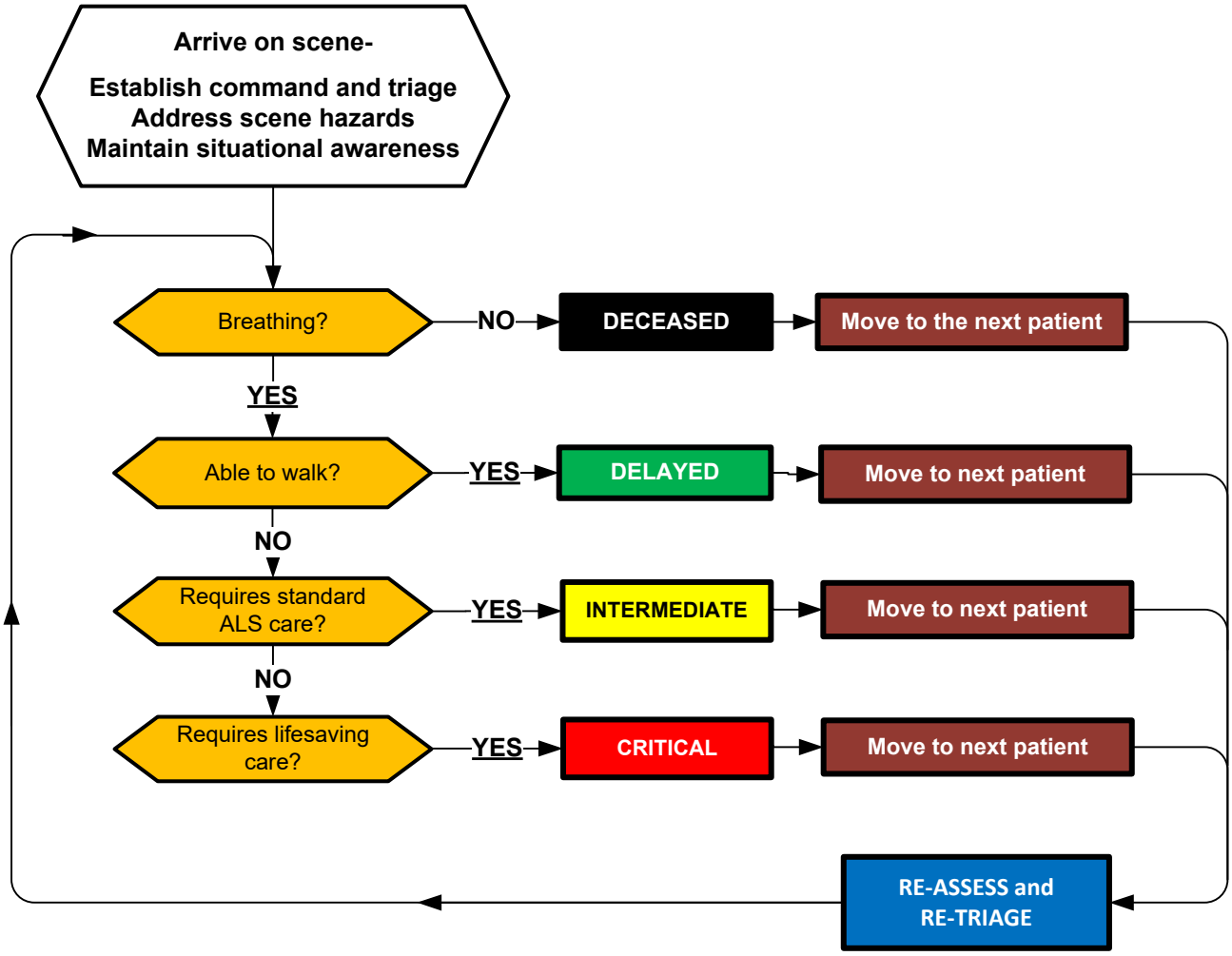
↓

Transport patient per transport policy and appropriate destination plan

Medical Director Notification Policy:

- Utilize the Automatic Medical Director Notification Policy to determine when immediate notification of the Medical Director by phone must occur. If no answer, contact JCEMS District Supervisor for assistance.
- For other adverse clinical outcomes, notify the Medical Director or Assistant Medical Director as soon as possible via email and/or cell phone. The probability of utilization of disciplinary action 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 Johnston County EMS Special Report, and contact the Medical Director, JCEMS District Supervisor, and JCEMS Assistant Chief of Training and Clinical Affairs via email or cell phone. For further information access the Contact List.

Triage



TRIAGE TAKES NO MORE THAN 10-15 SECONDS PER PATIENT

Triage

Pearls

- **Triage is a subjective process**
- All children who did not or cannot walk are to be triaged RED and moved off of the scene as soon as possible.
- Injured responders are to be triaged RED and moved off of the scene as soon as possible
- Pregnant patients are to triaged RED and moved off of the scene as soon as possible
- **When approaching a multiple casualty incident where resources are limited:**
  - Triage decisions must be made rapidly with less time to gather information
  - Emphasis shifts from ensuring the best possible outcome for an individual patient to ensuring the best possible outcome for the greatest number of patients.
- **Scene Size Up:**
  1. **Conduct a scene size up. Assure well being of responders. Determine or ensure scene safety before entering. If there are several patients with the same complaints consider HazMat, WMC or CO poisoning.**
  2. **Take Triage system kit.**
  3. **Determine number of patients. Communicate the number of patients and nature of the incident, establish command and establish medical branch and triage supervisor if personnel available**
- **Triage is a continual process and should be repeated in each section as resources allow.**
- **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.**
- If your patient falls into the RED TAG category, stop, place RED TAG and move on to next patient. Attempt only to correct airway problems, treat uncontrolled bleeding, or administer an antidote before moving to next patient.
- **Treatment:**
  - Once casualties are triaged focus on treatment can begin. You may need to move patients to treatment areas.
  - RED TAGs are moved / treated first followed by YELLOW TAGs. BLACK TAGs should remain in place.
  - You may also indicate deceased patients by pulling their shirt / clothing over their head.
  - As more help arrives then the triage / treatment process may proceed simultaneously.
- 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 with injuries deemed to be incompatible with life may be designated as DECEASED.
- Current triage tags have designated areas for recording data, however this should be deferred until secondary or tertiary triage.

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 & $EtCO_2$

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 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

P
Odansetron 4 mg
IV / IO / IM
Peds: 0.15 mg/kg IV / IV / IM
Peds Maximum 4 mg
May repeat in 15 minutes

Age Appropriate
Hypotension / Shock
Protocol AM 5 / PM 3
if indicated

NO ↓

A
Normal Saline IV TKO
Or Saline Lock

P
Odansetron 4 mg
IV / IO / IM
Peds: 0.15 mg/kg IV / IV / IM
Peds Maximum 4 mg
May repeat in 15 minutes
If no response
Promethazine
6.25 mg IV/ IO / IM
May repeat x 1 as needed
No peds dose for promethazine

Monitor and Reassess

Notify Destination or
Contact Medical Control

Universal Protocol Section

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

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.**
- **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.**
- **Promethazine (Phenergan) may cause sedative effects in pediatric patients and ages ≥ 60 and the debilitated, etc.) When giving promethazine IV dilute with 10 mL of normal saline and administer slowly in a large vein as it can also harm the veins.**
- Beware of vomiting only in children. Pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures) all often present with vomiting.
- Document the mental status and vital signs prior to administration of Promethazine (Phenergan).
- Isolated vomiting may be caused by pyloric stenosis, bowel obstruction, and CNS processes (bleeding, tumors, or increased CSF pressures).
- 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.

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

B Blood Glucose Analysis Procedure

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

Pearls

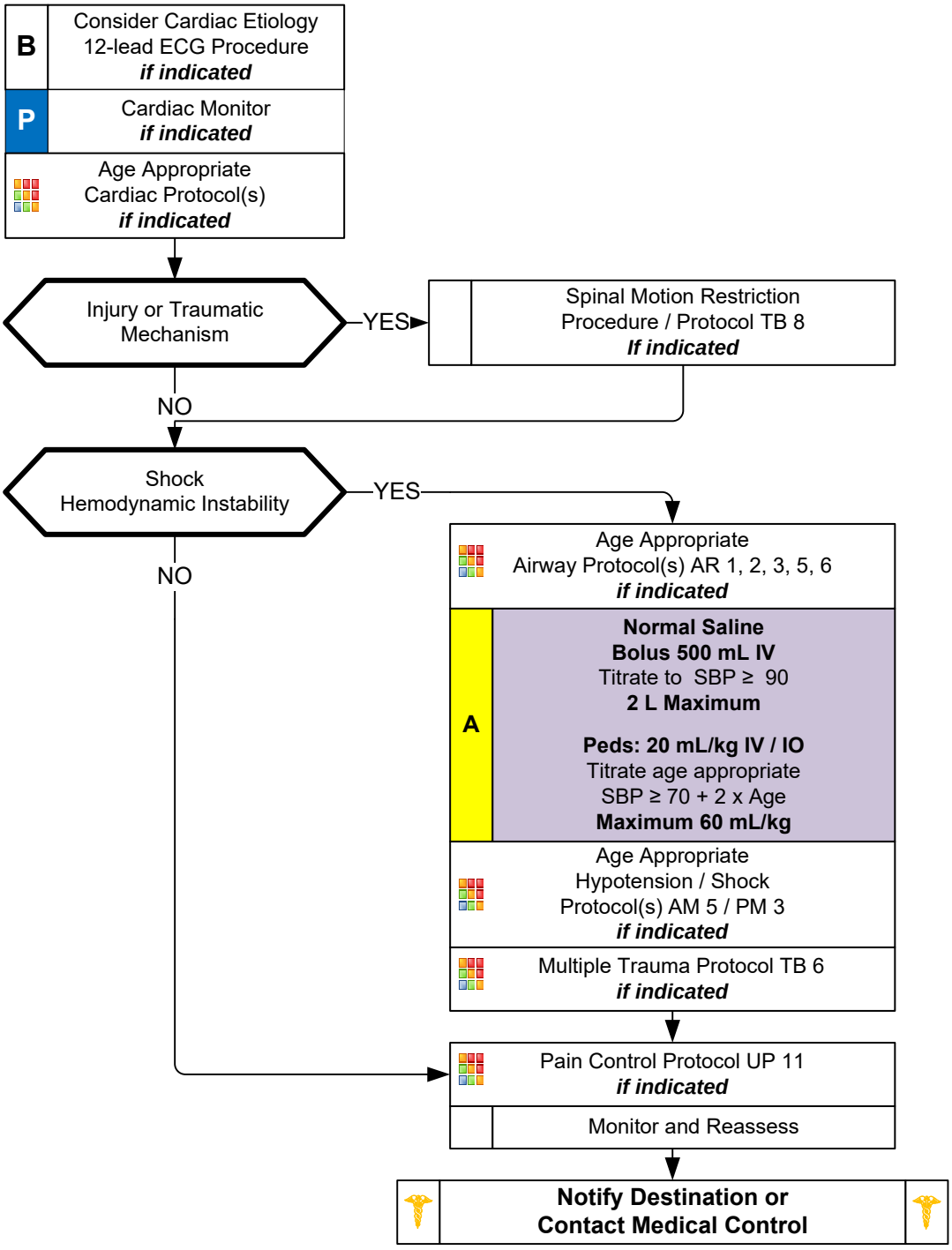
- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro.**
- **AMS may present as a sign of an environmental toxin or Haz-Mat exposure - protect personal safety.**
- **General:**
  - **The patient with AMS poses one of the most significant challenges.**
  - **A careful assessment of the patient, the scene and the circumstances should be undertaken.**
  - **Assume the patient has a life threatening cause of their AMS until proven otherwise.**
  - **Pay careful attention to the head exam for signs of bruising or other injury.**
  - **Information found at the scene must be communicated to the receiving facility.**
- **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.
- **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 medial 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



Universal Protocol Section

Back Pain

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 or upper back pains.**
- **Red Flags which may signal more serious process associated with back pain:**
  - Age > 50 or < 18
  - Neurological deficit (leg weakness, urinary retention, or bowel incontinence)
  - IV Drug use
  - Fever
  - History of cancer, either current or remote
  - Night time pain in pediatric patients
- **Cauda equina syndrome is where the terminal nerves of spinal cord are being compressed (Symptoms include):.**
  - Saddle anesthesia
  - Recent onset of bladder and bowel dysfunction. (Urine retention and bowel incontinence)
  - Severe or progressive neurological deficit in the lower extremity.
  - Motor weakness of thigh muscles or foot drop
- **Back pain associated with infection:**
  - Fever / chills.
  - IV Drug user (consider spinal 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.

Behavioral

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

Blood Glucose Analysis Procedure ***if indicated***

Age Appropriate Diabetic Protocol AM 3 / PM 2 if indicated

Altered Mental Status Protocol UP 4
Overdose / Toxic Ingestion Protocol TE 7 if indicated

Head Trauma Protocol TB 5
Multiple Trauma Protocol TB 6 if indicated

Call for help / additional resources
Stage until scene safe

Excited Delirium Syndrome
Paranoia, disorientation, hyper-aggression, hallucination, tachycardia, increased strength, hyperthermia

YES

NO

Aggressive, Violent, Agitation

Threat to Self / others
Setting of Psychosis

YES

NO

P — Evaluation and Screening Mental Health and Substance Use Protocol CIT Paramedic Only ***if available***

Crisis Intervention Protocol

Consider Restraint Physical Procedure

Monitor per restraint procedure ***if indicated***

A — IV / IO Procedure

P — Age ≥ 12
Haloperidol 2 - 5 mg IM
Age ≥ 65
2.5 mg IM
May repeat every 5 as needed
Maximum 10 mg

P — **Midazolam 2.5 mg IV / IO / IN**
5 mg IM
Age ≥ 65
1 – 2.5 mg IV / IO / IN
2.5 mg IM
Peds: 0.1 – 0.2 mg/kg IV / IO / IM / IN
Repeat every 2-3 minutes as needed

B — **Obtain and record patient's temperature**

P — **Sodium Bicarbonate 50 mEq IV/IO see pearls regarding possible Wide Complex Tachycardia**

P — **Midazolam 2.5 mg IV / IO / IN**
5 mg IM
Age ≥ 65
1 – 2.5 mg IV / IO / IN
2.5 mg IM
Peds: 0.1 – 0.2 mg/kg IV / IO / IM / IN
Repeat every 2-3 minutes as needed

A — IV / IO Procedure
Preferably 2 large bore

A — **Normal Saline 1 L Bolus**
Then **150 – 200 mL / hr**
May repeat **500 mL** Bolus as needed
Maximum 2 L
Peds: 20 – 60 mL/kg IV / IO
Maximum 60 mL/kg

External Cooling Measures

Consider Restraint Physical Procedure

Monitor per restraint procedure ***if indicated***

Cardiac Monitor & $EtCO_2$

P — Age ≥ 12 Consider
Haloperidol 2 - 5 mg IM
Age ≥ 65
2.5 mg IM
May repeat every 5 as needed
Maximum 10 mg

Monitor and Reassess

Notify Destination or Contact Medical Control

Universal Protocol Section

Behavioral

How to de-escalate a crisis situation

The first impression is most critical when starting the de-escalation process. Just as you, the medical provider, are assessing the situation upon arrival, the patient is also assessing you. Your first impression can determine how the encounter proceeds. There are seven steps to the de-escalation process:

1. INTRODUCE YOUR SELF – start to create a relationship (make a good, genuine, first impression),
2. LISTEN – actively listen to the patient, relay back what you have heard, assess the situation as your listen, and encourage the patient to talk by asking open ended questions,
3. MINIMAL ENCOURAGERS – nod your head, say “OK” or “I see”, demonstrate to the patient that you are listening and paying attention early in the encounter, use positive body language,
4. REFLECTING / MIRRORING – repeat what has been said to you, usually the last 3-4 words. DO NOT INTERRUPT!
5. RE-STATING / PARAPHRASING – Demonstrate that you understand what is being said to you by calmly putting it into your own words, and refrain from using a mocking tone,
6. EMOTIONAL LABELING – Help the patient put their feelings into words,
7. “I” STATEMENTS – Begin your statements with “I”. Do not put the patient on the defensive.

If other steps have been successful, this stem sets the stage for a transition to a resolution.

Transition to the Three-Step Assertive Intervention:

1. Empathy statement – reinforce that the patient is being heard.
2. Conflict Statement – address the situation at hand and present your view.
3. Action Statement – a specific request from the provider to the patient.

Source: CIT presentation by SGT Hardin Brown, Cumberland County Sheriff’s Office, Cumberland County EMS

Reference: Compton, Michael T., Kotwicki, Raymond J. (2007), Responding to Individuals with Mental Illness, Sudbury, MA; Jones and Bartlett Publishers

Pearls

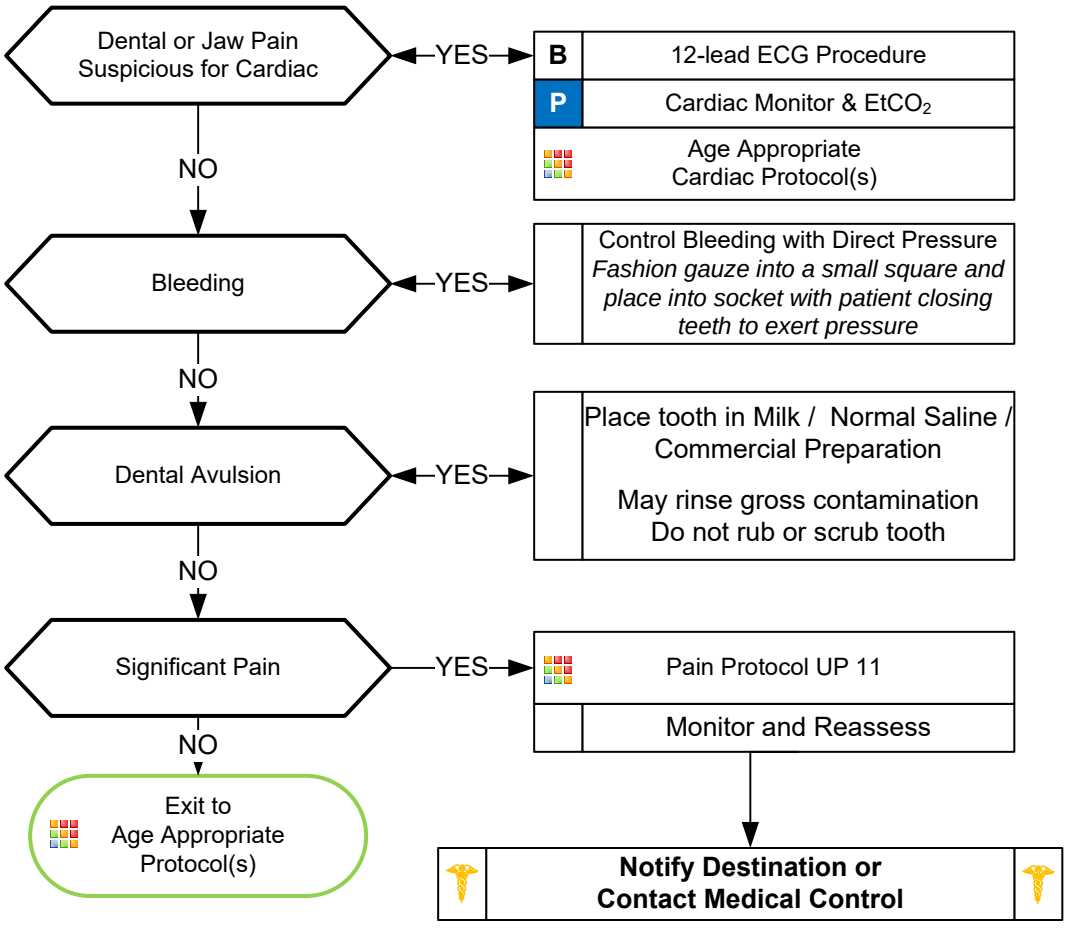
- **Recommended Exam: Mental Status, Skin, Heart, Lungs, Neuro, Pupils, Abdominal, Neck, Temperature**
- **Crew / responders safety is the main priority.**
- **Any patient who is handcuffed or restrained by Law Enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.**
- **Consider haloperidol for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **Haldol is acceptable treatment in pediatric patients ≥12 years old. Safety and efficacy is not established in younger ages.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence, child, or geriatric abuse.
- Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.
- **Excited Delirium Syndrome:** Medical emergency: **Give 50meq sodium bicarbonate IV x 1 dose; if patient is in a wide complex tachycardia, repeat sodium bicarbonate dosing x 2-3 or until QRS narrows, and consider contacting medical control 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. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition.
- **If patient is suspected of EDS suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early**
- **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 d**iphenhydramine 50 mg IV/ IO/ IM/ PO** in adults or **1 mg/kg IV/ IO/ IM/ PO** in pediatrics.

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).
- Obtain history of anticoagulant use.

Emergencies Involving Indwelling Central Lines

History

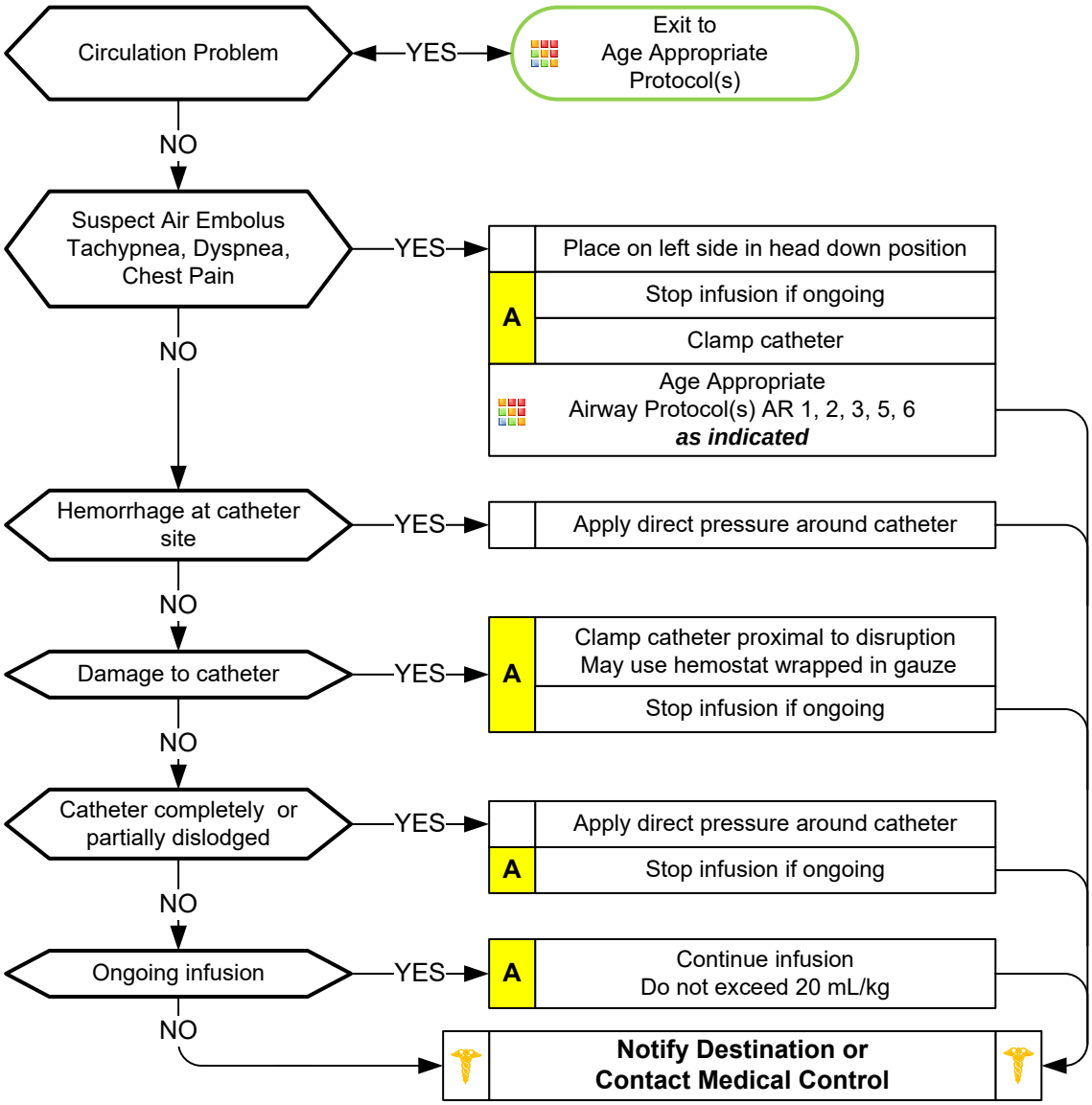
- Central Venous Catheter Type Tunneled Catheter (Broviac / Hickman)
- PICC (peripherally inserted central catheter
- Implanted catheter (Mediport / Hickman)
- Occlusion of line
- Complete or partial dislodge
- Complete or partial disruption

Signs and Symptoms

- External catheter dislodgement
- Complete catheter dislodgement
- Damaged catheter
- Bleeding at catheter site
- Internal bleeding
- Blood clot
- Air embolus
- Erythema, warmth or drainage about catheter site indicating infection

Differential

- Fever
- Hemorrhage
- Reactions from home nutrient or medication
- Respiratory distress
- Shock



Universal Protocol Section

Pearls

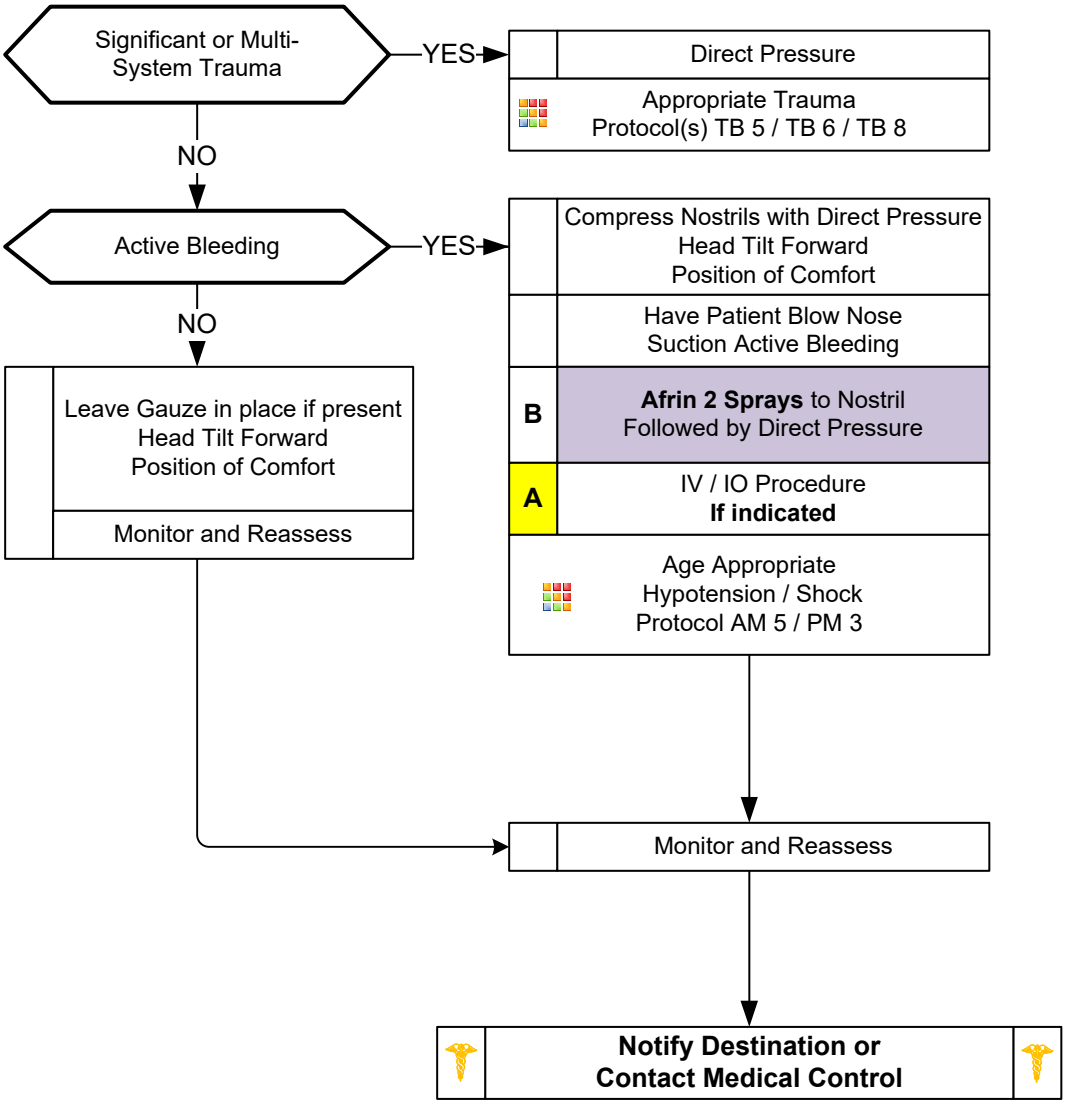
- **Always talk to family / caregivers as they have specific knowledge and skills.**
- **Use strict sterile technique when accessing / manipulating an indwelling catheter.**
- **Cardiac arrest: May access central catheter and utilize if functioning properly.**
- Do not attempt to force catheter open if occlusion evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason monitor for hypoglycemia.

Epistaxis

History
- Age
- Past medical history
- Medications (HTN, anticoagulants, aspirin, NSAIDs)
- Previous episodes of epistaxis
- Trauma
- Duration of bleeding
- Quantity of bleeding

Signs and Symptoms
- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

Differential
- Trauma
- Infection (viral URI or Sinusitis)
- Allergic rhinitis
- Lesions (polyps, ulcers)
- Hypertension



Universal Protocol Section

Pearls
- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro**
- **Age specific hypotension (systolic pressures): 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.

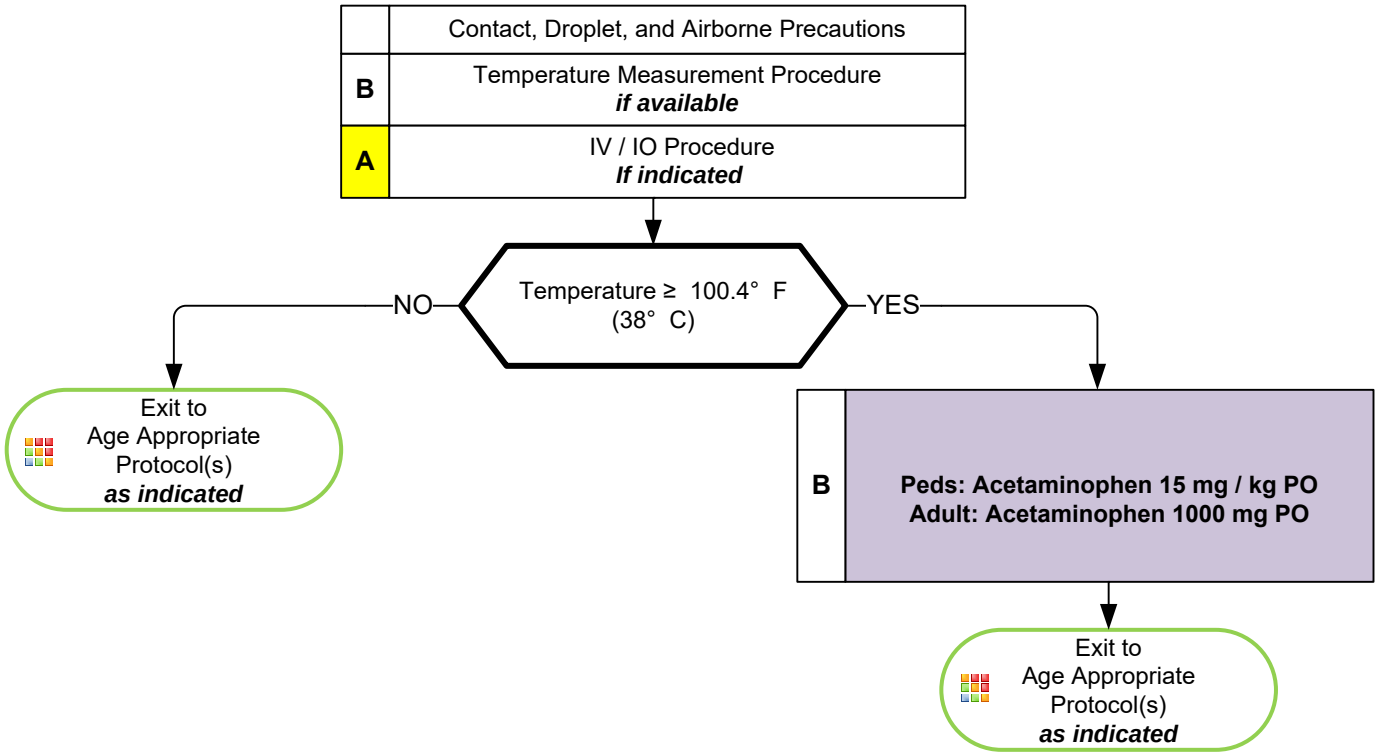
Fever / Infection Control

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

Pearls
- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Patients with a history of liver failure should not receive acetaminophen.
- **Droplet precautions** include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected. A patient with a potentially infectious rash should be treated with droplet precautions.
- **Airborne precautions** include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions** include standard PPE plus airborne precautions plus contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS).
- Rehydration with fluids increases the patient's ability to sweat and improves heat loss.
- 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. Do not give to patients who have renal disease or renal transplant.
- NSAIDs should not be used in the setting of environmental heat emergencies.
- **Do not** give aspirin to a child, age ≤ 15 years.

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

B

Acetaminophen 15 mg/kg
(1000 mg typical adult)
Peds: 15 mg/kg
Maximum 1000 mg
Or
Aspirin 324 to 650 mg PO
(≥ 16 only)

A

Consider IV Procedure
if indicated

Moderate to Severe

IV / IO Procedure

A

Ketorolac 30 mg IV / IO
60 mg IM
Maximum 60 mg
Peds: 0.5 mg/kg IV / IO / IM
Maximum 30 mg

P

Cardiac Monitor & $EtCO_2$

ADULT DOSING
Morphine 0.1 mg/kg IV / IO / IM initial dose
Max initial dose 10 mg; give SLOW over 2-3 minutes
After 10 minutes, may repeat **2 mg** every 5 minutes as needed until improvement.
Maximum total dose 20 mg, *Or*
Fentanyl 1 mcg/kg IV / IO / IM / IN initial dose
Max initial dose 100 mcg; give SLOW over 2-3 minutes
After 10 minutes, may repeat **25 mcg** every 5 minutes as needed until improvement.
Maximum total dose 200 mcg

PEDS DOSING
Morphine 0.1 mg/kg IV / IO / IM
May repeat every 5 minutes
Maximum single dose 5 mg
Maximum dose 10 mg
Or
Fentanyl 1 mcg/kg IV / IO / IM / IN
May repeat 0.5 mcg/kg every 5 minutes
Maximum initial dose 75 mcg
Maximum total dose 150 mcg

Monitor and Reassess
Every 5 minutes following sedative

Monitor and Reassess

Notify Destination or
Contact Medical Control

Universal Protocol Section

Pain Control

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, **THE MAXIMUM TOTAL DOSE OF FENTANYL is 300mcg AND THE MAXIMUM TOTAL DOSE OF MORPHINE IS 50mg**.

For Pediatric Burn Patients contact Medical Control for maximum dosing.

Pearls

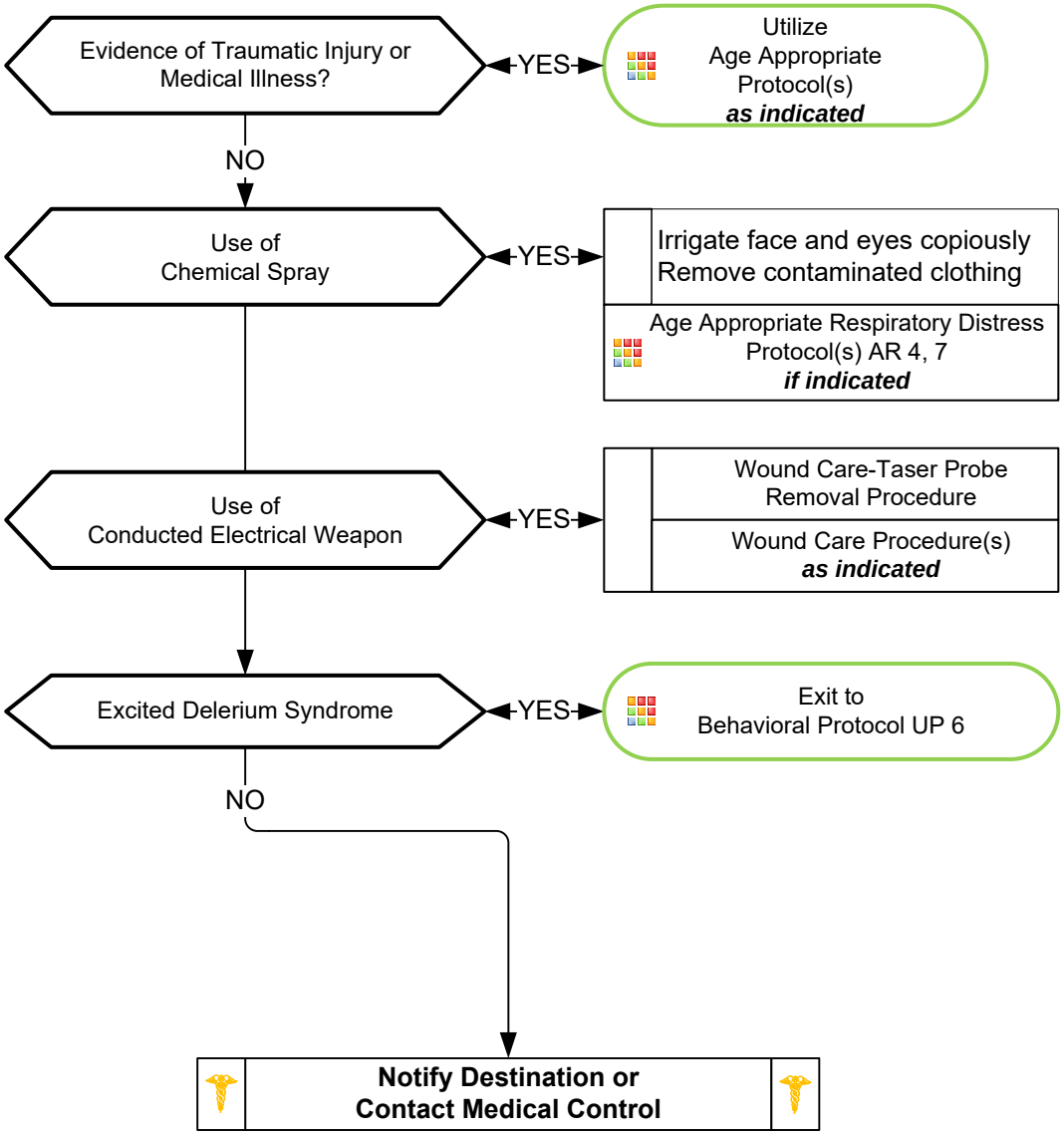
- **Recommended Exam: Mental Status, Area of Pain, Neuro**
- **Pain severity (0-10) is a vital sign to be recorded before and after PO, IV, IO or IM medication delivery and at patient hand off. Monitor BP closely as sedative and pain control agents may cause hypotension.**
- **Patients may display a 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 cause respiratory depression in the elderly, opiate naïve, and possibly intoxicated patients**
- **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.**
- **DO NOT administer Ketorolac to patients who are pregnant.**
- **Any patient given a narcotic should have ETCO2 monitoring in place. Respiratory depression is common with narcotics which can be easily monitored with ETCO2.**
- **Both arms of the treatment may be used in concert. For patients in Moderate pain for instance, you may use the combination of an oral medication and parenteral if no contraindications are present.**
- **Pediatrics:**
  - For children use Wong-Baker faces scale or the FLACC score (see Assessment Pain Procedure)
  - Use Numeric (> 9 yrs), Wong-Baker faces (4-16yrs) or FLACC scale (0-7 yrs) as needed to assess pain
- **Vital signs should be obtained before, 5 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 PO medications for patients who may need surgical intervention such as open fractures or fracture deformities, headaches, or abdominal pain.
- **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, headaches, abdominal pain, stomach ulcers or in patients who may need surgical intervention such as open fractures or fracture deformities.**
- Do not administer **Acetaminophen** to patients with a history of liver disease.
- Burn patients may required higher than usual opioid doses to titrate adequate pain control.
- Consider agency-specific anti-emetic(s) for nausea and/or vomiting.

Police Custody

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

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

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



Universal Protocol Section

Police Custody

Pearls

- **Patient does not have to be in police custody or under arrest to utilize this protocol.**
- **Local EMS agencies should formulate a policy with local law enforcement agencies concerning patients requiring EMS and Law Enforcement simultaneously. Agencies should work together to formulate a disposition in the best interest of the patient.**
- **Patients restrained by law enforcement devices must be transported accompanied by a law enforcement officer in the patient compartment who is capable of removing the devices. However when rescuers have utilized restraints in accordance with Restraint Procedure, the law enforcement agent may follow behind the ambulance during transport.**
- **All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.**
- The responsibility for patient care rests with the highest authorized medical provider on scene per North Carolina law.
- If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/difficulty breathing occurs.
- All patients with decision-making capacity in police custody retain the right to participate in decision making regarding their care and may request care or refuse care of EMS.
- If extremity / chemical / law enforcement restraints are applied, follow Restraint Procedure.
- **Consider Haldol for patients with history of psychosis or a benzodiazepine for patients with presumed substance abuse.**
- **Haldol is acceptable treatment in pediatric patients ≥ 12 years old. Safety and efficacy is not established in younger ages.**
- **Excited Delirium Syndrome:** Medical emergency: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent / bizarre behavior, insensitivity to pain, hyperthermia and increased strength. Potentially life-threatening and associated with use of physical control measures, including physical restraints and Tasers. Most commonly seen in male subjects with a history of serious mental illness and/or acute or chronic drug abuse, particularly stimulant drugs such as cocaine, crack cocaine, methamphetamine, amphetamines or similar agents. Alcohol withdrawal or head trauma may also contribute to the condition. I**f patient suspected of EDS suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early.**
- Do not position or transport any restrained patient is such a way that could impact the patients respiratory or circulatory status.
- Patients exposed to chemical spray, with or without history of respiratory disease, may develop respiratory complaints up to 20 minutes post exposure.

Seizure

History
- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy
- Time of seizure onset
- Document number of seizures
- Alcohol use, abuse or abrupt cessation
- Fever

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

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

	Loosen any constrictive clothing Protect patient
B	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 & $EtCO_2$ ***if indicated***

Active Seizure Activity

YES

	Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 ***as indicated***
	Obstetrical Emergency Protocol AO 1 Childbirth Protocol AO 3 ***if indicated***
P	**Adult:** **If patient is actively seizing upon EMS arrival administer Midazolam 5-10mg IM x1; do not wait to obtain IV access** **If patient begins seizing after EMS arrival and treatment is indicated, administer Midazolam 2-5mg IV/IM/IN/IO** **May repeat midazolam q3-5 minutes for continued sz activity to max 20mg** **Peds:** **Midazolam 0.1 mg/kg IV / IO** **Midazolam 0.2 mg/kg IM / IN** **Maximum 5 mg IM/IN initial dose or Maximum 2.5mg IV/IO initial dose** **Repeat q5mins as needed until seizure stops or max total dose of 1 mg/kg**

NO

Monitor and Reassess

Notify Destination or Contact Medical Control

Universal Protocol Section

Seizure

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Adult:**
  - **Midazolam 5 – 10 mg IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- **Pediatrics:**
  - **Midazolam 0.2 mg/kg (Maximum 10 mg) IM is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access. IM Preferred over IO.**
- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures (generalized)** are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures** affect only a part of the body and are not usually associated with a loss of consciousness, but can propagate to generalized seizures with loss of consciousness.
- Be prepared 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.
- Midazolam is 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

Prehospital Stroke Screen

Consistent with Acute Stroke

YES → **Time of Onset Or Time Last Seen Normal < 24 Hours**

YES → **Transport based on:**
STROKE
EMS Triage and Destination Plan
Keep Scene Time to ≤ 10 Minutes
Immediate Notification of Facility

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

NO →

B	Blood Glucose Analysis Procedure
	Altered Mental Status Protocol UP 4 ***if indicated***
	Reperfusion Checklist Procedure
B	12-lead ECG Procedure
A	IV / IO Procedure Preferably 2 Sites
A	Venous Access Blood Draw Procedure ***if applicable***
P	Cardiac Monitor & $EtCO_2$
	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***

Notify Destination or Contact Medical Control

Universal Protocol Section

Suspected Stroke

STROKE NOTIFICATION:

Contact the receiving facility via radio contact receiving facility for "STROKE NOTIFICATION". Information provided includes-

Age and sex of patient

Level of consciousness/ GCS

Last Known Well Time

(*provide as a 'time' not 'hours ago'; if patient awakens with symptoms, 'last know well' is defined as previous night when patient was symptom free***)**

Estimated Time of Arrival

Provide updates from scene as needed. Provide update via radio or phone when approximately 10-15 minutes out.

Cincinnati Pre-hospital Stroke Scale

1. FACIAL DROOP: *Have patient show teeth or smile.*

Normal: both sides of the face move equally

Abnormal: one side of face does not move as well as the other side

2. ARM DRIFT: *Patient closes eyes & holds both arms out for 10 sec.*

Normal: both arms move the same or both arms do not move at all

Abnormal: one arm does not move or drifts down compared to the other

3. ABNORMAL SPEECH: *Have the patient say "you can't teach an old dog new tricks."*

Normal: patient uses correct words with no slurring **Abnormal:** patient slurs words, uses the wrong words, or is unable to speak

INTERPRETATION: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%.

ASLS Advanced Stroke Life Support

MICHAEL S. GORDON CENTER FOR RESEARCH IN MEDICAL EDUCATION

WWW.ASLS.NET WWW.GCRME.MIAMI.EDU (305) 243-6491

MEND EXAMINATION - PREHOSPITAL

Green Boxes Contain Basic Exam (CPSS / FAST)

MENTAL STATUS

- Level of Consciousness (AVPU)
- **Speech: "You can't teach an old dog new tricks"**
- Questions (age, month)
- Commands (close, open eyes)

CRANIAL NERVES

- **Facial Droop (show teeth or smile)**
- Visual Fields (four quadrants)
- Horizontal Gaze (side to side)

LIMBS

- **Drift – Arm (close eyes, extend arms palms down)**
- Drift – Leg (open eyes, lift each leg separately)
- Sensory - Arm (close eyes & touch, pinch)
- Sensory - Leg (close eyes & touch, pinch)
- Coordination – Arm (finger-nose)
- Coordination - Leg (heel-shin)

1

ASLS Advanced Stroke Life Support

HISTORY

- Last time patient was without symptoms

T-PA EXCLUSIONS

- Head trauma at onset
- Seizure (shaking or staring spell) at onset
- Taking blood thinners
- History of bleeding problems
- ? Brain hemorrhage (stiff neck, ↓ LOC)

MANAGEMENT

- Do NOT allow aspiration (NPO, head up)
- Do NOT give glucose (unless glucose < 60 mg/dL)
- Do NOT treat hypertension

ED REPORT KEY ITEMS

SYMPTOM ONSET

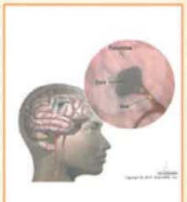
- Time (last time w/o sxs)
- Trauma (history)
- Headache (severe)
- Seizure (staring, shaking)

NEUROLOGIC EXAM

- LOC
- Speech / language
- Visual fields
- Motor strength

WITNESS

- with patient (Yes/No)
- have contact information



Time is Brain

2

Universal Protocol Section

Suspected Stroke

- **With the evolution of stroke care and advancements of mechanical thrombectomy, the receiving facility may elect to treat the patient outside of the normal stroke window. Due to these advancements, any patient with a last known well time < 24 hours should be transported to a facility that has an interventionalist 24/7/365. Advise the receiving facility of time of last known well to see if they want to activate a stroke alert.**
- **If the symptoms are > 6 hours, consider a routine transport. If < 6 hours a SAFE transport may be necessary.**
- **Any signs and symptoms > 24 hours, transport the patient to the facility of choice with the patient's well being in consideration.**

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. Time of onset / last seen normal may be changed at any time depending on the capabilities and resources of your hospital based on Stroke: EMS Triage and Destination Plan.**
- **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 at facility.**
  - **Wake up stroke: Time that the patient was last witnessed to be neurologically at baseline.**
- **You are often in the best position to determine the actual Time of Onset while you have family, friends or caretakers available. Often these sources of information may arrive well after you have delivered the patient to the hospital. Delays in decisions due to lack of information may prevent an eligible patient from receiving thrombolytics.**
- **The Reperfusion Checklist should be completed for any suspected stroke patient. With a duration of symptoms of less than 24 hours , scene times should be limited to ≤ 10 minutes, early notification / activation of receiving facility should be performed and transport times should be minimized.**
- **If possible establish two (2) IV sites.**
- **Blood Draw: Many systems utilize EMS venous blood samples. Follow your local policy and procedures.**
- 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.
- Agencies may use validated pre-hospital stroke screen of choice.
- **Pediatrics:** Strokes do occur in children, they are slightly more common in ages < 2, in boys, and in African-Americans. Newborn and infant symptoms consist of seizures, extreme sleepiness, and using only one side of the body. Children and teenagers symptoms may consist of severe headaches, vomiting, sleepiness, dizziness, and/or loss of balance or coordination.

Suspected Sepsis

History
- Duration and severity of fever
- Past medical history
- Medications / Recent antibiotics
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Indwelling medical device
- Last acetaminophen or ibuprofen
- Recent Hospital / healthcare facility
- Bedridden or immobile
- Elderly and very young – at risk
- Prosthetic device / indwelling device

Signs and Symptoms
- Warm
- Flushed
- Sweaty
- Chills / Rigors
- Delayed cap refill
- Mental status changes

Associated Symptoms (Helpful to localize source)
- Myalgias, cough, chest pain, headache, dysuria, abdominal pain, rash

Differential
- Infections: UTI, Pneumonia, skin/wound
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease: Arthritis, Vasculitis
- Hyperthyroidism
- Heat Stroke
- Meningitis
- Hypoglycemia/hypothermia
- MI / CVA

Consider: Contact, Droplet, and Airborne Precautions

Temperature Measurement Procedure ***if available***

Fever / Infection Control Protocol UP 10 ***if needed***

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

B 12-lead ECG Procedure

A IV / IO Procedure ***If indicated***

P Cardiac Monitor

Sepsis Screen Positive

NO → Exit to Age Appropriate Condition Appropriate Protocol(s)

YES → **SEPSIS ALERT**
Notify Receiving Facility Immediately

Adult SIRS Criteria
Temperature
≥ 100.4° F (38° C)
Or
≤ 96.8° F (36° C)
AND
Any 1 of the following:
HR > 90
RR > 20
$EtCO_2$ < 25 mmHg

Adult qSOFA Criteria
SBP ≤ 100 mmHg
RR ≥ 22
AMS or new mental status change

Pediatrics SIRS Criteria
Temperature
Same as adult

AND
Heart Rate
1 month – 1 year > 180
2 – 5 years > 140
6 – 12 years > 130
13 – 18 years > 120

MAP (Mean Arterial Pressure)
$\frac{SBP + 2(DBP)}{3}$
Monitor usually calculates this value on screen

A

Venous Access Blood Draw ***if applicable***

Normal Saline
500 mL Bolus
OR
Lactated Ringers
500 mL Bolus
Repeat as needed
Titrate SPB ≥ 90 mmHg
MAP > 65 mmHg
Maximum 2 L

Peds: 20 mL/kg IV / IO
Repeat to titrate
Age Appropriate
SBP ≥ 70 + 2 x Age
Maximum 60 mL/kg

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3

Notify Destination or Contact Medical Control

Universal Protocol Section

Suspected Sepsis

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Recommended Exam Pediatrics: In childhood, physical assessment reveals important clues for sepsis. Look for mental status abnormalities such as anxiety, restlessness, agitation, irritability, confusion, or lethargy. Cardiovascular findings to look for include cool extremities, capillary refill >3 seconds, or mottled skin.**
- **Sepsis is a life threatening condition where the body's immune response to infection injures its own tissues and organs.**
- **Severe sepsis is a suspected infection and 2 or more SIRS criteria (or qSOFA) with organ dysfunction such as AMS or hypotension.**
- **Septic shock is severe sepsis and poor perfusion unimproved after fluid bolus.**
- **Agencies administering antibiotics should inquire about drug allergies specific to antibiotics or family of antibiotics.**
- **Following each fluid bolus, assess for pulmonary edema. Consider administration of agency specific vasopressor.**
- **Supplemental oxygen should be given and titrated to oxygenation saturation ≥94%.**
- **EKG should be obtained with suspected sepsis, but should not delay care in order to obtain.**
- **Abnormally low temperatures increase mortality and found often in geriatric patients.**
- Septic patients are especially susceptible to traumatic lung injury and ARDS. If artificial ventilation is necessary, avoid ventilating with excessive tidal volumes. **If CPAP is utilized, airway pressure should be limited to 5 cmH_2O.**
- Quantitative waveform capnography can be a reliable surrogate for lactate monitoring in detecting metabolic distress in sepsis patients. $EtCO_2$ < 25 mm Hg are associated with serum lactate levels > 4 mmol/L.
- Patients with a history of liver failure should not receive acetaminophen.
- **Droplet precautions:**
  - Include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O_2 mask for the patient.
  - This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected.
  - A patient with a potentially infectious rash should be treated with droplet precautions.
- **Airborne precautions:**
  - Include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions.
  - This level of precaution is utilized when multi-drug resistant organisms (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 drug allergies documented prior to administering pain medications.
- Allergies to NSAIDs (non-steroidal anti-inflammatory medications) are a contraindication to Ibuprofen.
- Agency Medical Director may require contact of medical control prior to EMT / MR administering any medication.
- **Sepsis Screen:**
  - Agencies may use Adult / Pediatric Systemic Inflammatory Response Syndrome (SIRS) criteria or quickSOFA (qSOFA) criteria.
  - Receiving facility should be involved in determining Sepsis Screen utilized by EMS.

Syncope

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

Signs and Symptoms
- Loss of consciousness with recovery
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

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

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

B Blood Glucose Analysis Procedure

B 12 Lead ECG Procedure

I IV / IO Procedure

P Cardiac Monitor & $ETCO_2$

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**

A IV / IO Procedure
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

San Francisco Syncope Rule

Can be used to predict patients having a high-risk for serious outcome *(defined as death, myocardial infarction, arrhythmia, pulmonary embolism, stroke, subarachnoid hemorrhage, significant hemorrhage, or return visit to hospital)*.

- History of CHF
- Hematocrit <30% (usually not known to EMS providers)
- Any ECG abnormality
- Any shortness of breath
- Systolic blood pressure <90 mm Hg on initial evaluation

Patients with one or more of the above findings should be evaluated in an emergency department.

For patients under the age of 30 with none of the above findings and no other concerning symptoms or pre-existing medical conditions, non-transport may be a reasonable consideration.

Abdominal Aortic Aneurysm (AAA)

- Signs/ Symptoms
- Poor perfusion in lower extremities
- Pulsus parydoxus (unequal pulses on left versus right)
- Different blood pressure measurements in each arm
- Abdominal/ chest pain described “tearing” or “moving down the back”
- Pulsating abdominal mass

Pearls

- **Recommended Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- **Syncope is both loss of consciousness and loss of postural tone. Symptoms preceding the event are important in determining etiology.**
- **Syncope often is due to a benign process but can be an indication of serious underlying disease in both the adult and pediatric patient.**
- **Often patients with syncope are found normal on EMS evaluation. In general patients experiencing syncope require cardiac monitoring and emergency department evaluation.**
- **Differential should remain wide and include:**

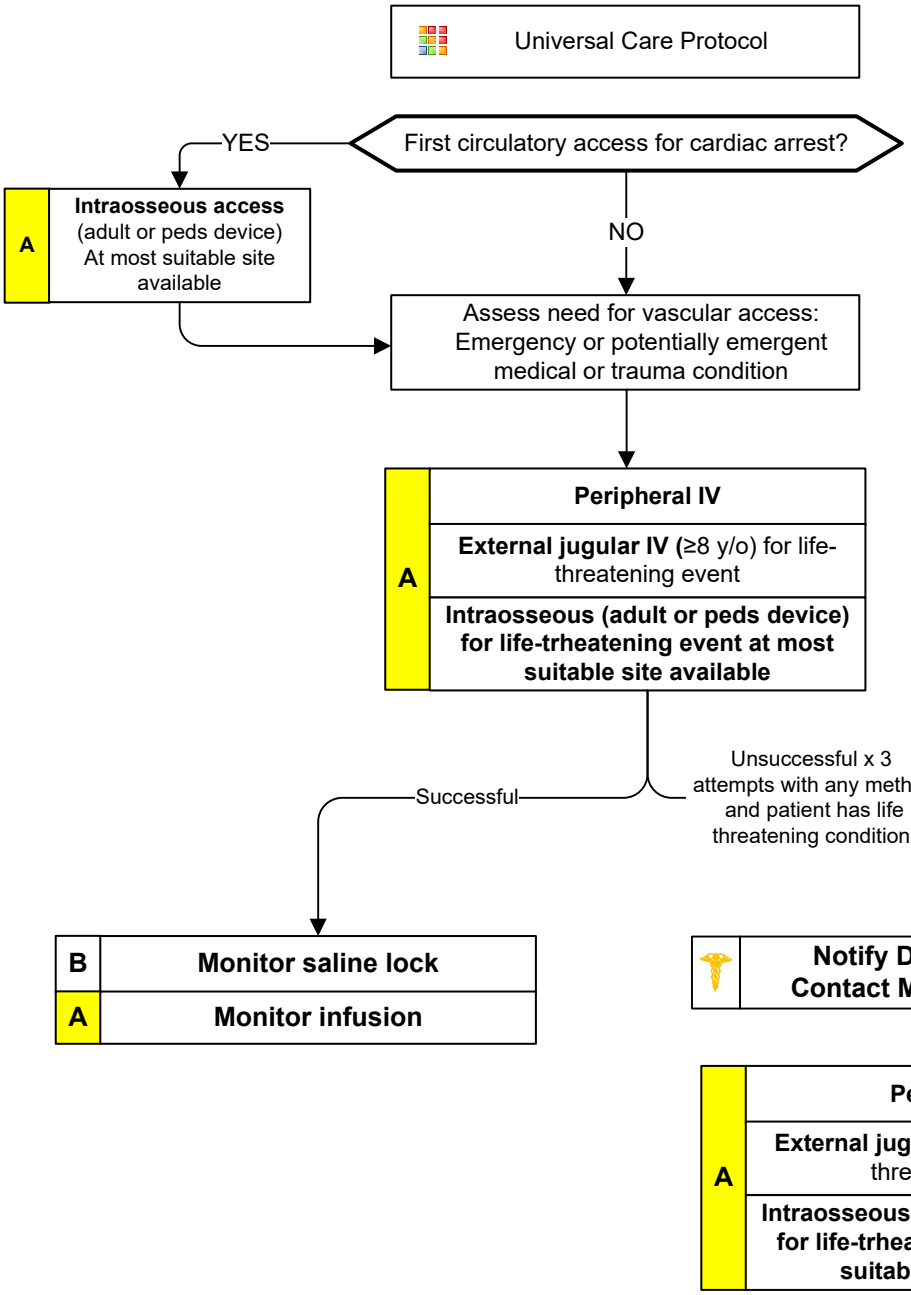
Cardiac arrhythmia	Neurological problem	Choking	Pulmonary embolism
Hemorrhage	Stroke	Respiratory	Hypo or Hyperglycemia
GI Hemorrhage	Seizure	Sepsis	

- **High-risk patients:**

Age ≥ 60	Syncope with exertion
History of CHF	Syncope with chest pain
Abnormal ECG	Syncope with dyspnea

- **Age specific systolic 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, very 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.
- These patients should be transported. Patients who experience syncope associated with headache, neck pain, chest pain, abdominal pain, back pain, dyspnea, or dyspnea on exertion need prompt medical evaluation.
- More than 25% of geriatric syncope is cardiac dysrhythmia based.

Vascular Access



Universal Protocol Section

Pearls

- In the setting of **cardiac arrest**, any preexisting dialysis shunt or external central venous catheter may be used.
- In patients who are hemodynamically unstable or in extremis, contact medical control prior to accessing dialysis shunts or external central venous catheters.
- Any working venous catheter already accessed prior to EMS arrival may be used for EMS IV fluids and medications.
- Intraosseous access should be obtained only with the appropriate adult or pediatric device (e.g. IO drill).
- Any prehospital fluids or medications approved for IV use may also be given through an intraosseous IV.
- External jugular access is only indicated for patients ≥ 8 years of age.
- All IV rates should be at KVO (minimal rate to keep vein open) unless administering fluid bolus.
- Use micro drip sets for all patients 6 years old or less.
- Upper extremity IV sites are preferable to lower extremity (LE) sites; LE IVs are discouraged in patients with vascular disease or diabetes.
- In post-mastectomy patients and patients with a working dialysis fistula, avoid IV attempts, blood draws, injections, and blood pressure measurements in the upper extremity on the affected side.

Johnston County EMS System
Standards and Practice Document

Appendix

Approved Medical Abbreviations

a – before
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)
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 – degrees Celsius
c - with
C-SECTION - caesarean section
C-SPINE - cervical spine
CC- chief complaint
C/O - complaint of (complains of)
CA - cancer
CABG - coronary artery bypass graft
CAD - coronary artery disease
CATH - catheter
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)

D5W - 5% dextrose in water
D10W – 10% 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)

°F – degrees Fahrenheit
FB - foreign body
FLEX – flexion
FSBG – finger stick, blood glucose
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 - hour
HR - heart rate
HTN - hypertension
hx – history

ICP - intracranial pressure
ICU - intensive care unit
IM – intramuscular
IO - intraosseous
IV – intravenous

JVD - jugular vein distension

kg – kilogram
KVO - keep vein open

L – liter
L-SPINE – lumbar spine
L/S SPINE - lumbarsacral spine
L&D - labor and delivery
LAT - lateral
lb - pound
LLQ - left lower quadrant
LMP - last menstrual period
LOC - level of consciousness (loss of consciousness)
LR - lactated ringers
LUQ - left upper quadrant

mcg - microgram(s)
MED - medicine
mg - milligram(s)
MI - myocardial infarction (heart attack)
min - minimum / minute
mL – milliliter(s)
MVC - motor vehicle crash

N/V - nausea/vomiting
N/V/D - nausea/vomiting/diarrhea
NAD - no apparent 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

p – after
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

RLQ - right lower quadrant
RUQ - right upper quadrant
Rx - medicine
RXN – reaction

s – without
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

WNL - within normal limits

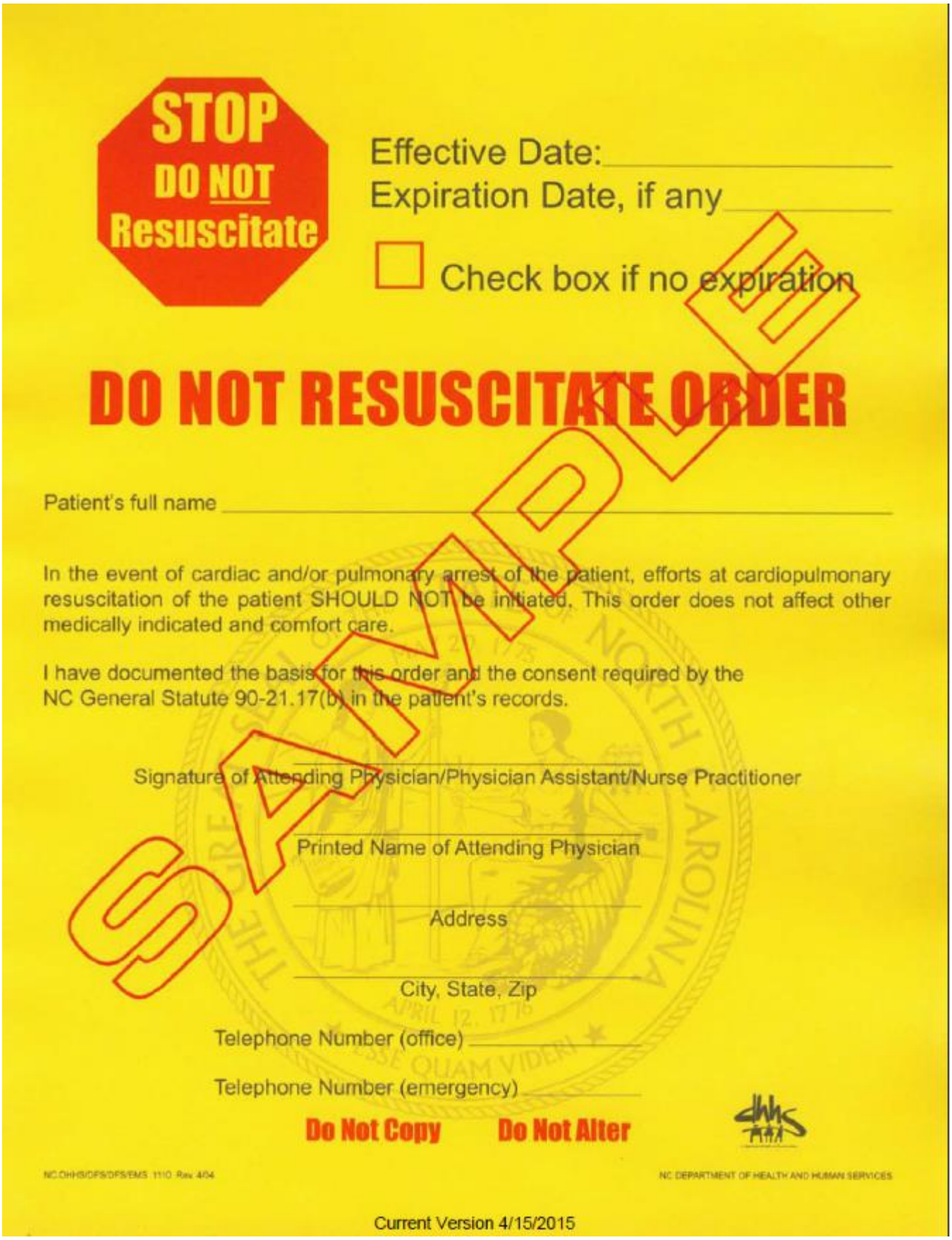
YO (YOA) - years old (years of age)

♂ - male
♀ - female
+ - positive
- - negative
? - questionable
Ψ -psychiatric

@ - at
° - degree
≈ - almost equal to
≠ - not equal to
~ - approximately

> - greater than
< - less than
= - equal
≥ - equal to or more than
≤ - equal to or less than

Do Not Resuscitate
(DNR)



Medical Orders for Scope of Treatment (MOST)

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 person'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: _____ *Form must be reviewed at least annually.*
Patient's First Name, Middle Initial:	Patient's Date of Birth:

Section A *Check One Box Only*

CARDIOPULMONARY RESUSCITATION (CPR): Person 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: Person 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; 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 life can be prolonged.**
☐ **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 long-term if indicated**
☐ **IV fluids for a defined trial period**
☐ **No IV fluids** (provide other measures to ensure comfort)

☐ **Feeding tube long-term if indicated**
☐ **Feeding tube for a defined trial period**
☐ **No feeding tube**

Other Instructions _____

Section E *Check The Appropriate Box*

DISCUSSED WITH AND AGREED TO BY:

Basis for order must be documented in medical record.

☐ Patient
☐ Parent or guardian if patient is a minor
☐ Health care agent
☐ Legal guardian of the person
☐ 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

MD/DO, PA, or NP Name (Print):	MD/DO, PA, or NP Signature (Required):	Phone #:

Signature of Person, 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

Medical Orders for Scope of Treatment (MOST)

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 reviewed and signed 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 their 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. Gen. Stat. 90-21.17.

Reviewing MOST

This MOST must be reviewed at least annually or earlier if:

- The patient is admitted and/or discharged from a health care facility;
- There is a substantial change in the patient's health status; or
- 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

This MOST may be revoked by the patient or the patient's representative.

Review of MOST

Review Date	Reviewer and Location of Review	MD/DO, PA, or NP Signature (Required)	Signature of Patient or Representative (Required)	Outcome of Review
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, no new form
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, no new form
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, no new form
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, no new form
				☐No Change ☐FORM VOIDED, new form completed ☐FORM VOIDED, no new form

SEND FORM WITH PATIENT/RESIDENT WHEN TRANSFERRED OR DISCHARGED

DO NOT ALTER THIS FORM!

NCDHHS/DHSR/DHSR/EMS 1112 Rev. 10/07

North Carolina Department of Health and Human Services

Restraint Checklist

Patient's Name: _____

PCR Number: _____ **Date:** _____

It is recommended that a Restraint Checklist be completed with any restraint use.

1. Reason for restraint (check all that apply):

- ☐ Patient attempting to hurt self
- ☐ Patient attempting to hurt others
- ☐ Patient attempting to remove medically necessary devices

2. Attempted verbal reassurance / redirection?

- ☐ Yes
- ☐ No

3. Attempted environmental modification? (i.e. remove patient from stressful environment)

- ☐ Yes
- ☐ No

4. Received medical control order for restraints?

- ☐ Yes _____, MD
  (Medical Control Physician Name Here)
- ☐ No

5. Time and Type of restraint applied (check all that apply):

Date: _____/_____/_____Time: _____AM/PM

Limb restraints:

- ☐ LUE
- ☐ RUE
- ☐ LLE
- ☐ RLE

Chemical Restraint:

- ☐ Yes
- ☐ No

If Yes: Drug Used: _____

Total Dose: _____

6. Vital signs and extremity neurovascular exam should be taken every 10 minutes.

7. Transport Position (Patient should <u>NOT</u> be in prone position)

- ☐ Supine position for transport
- ☐ Lateral recumbent position for transport

Signature: _____ Print name: _____
(EMS Lead Crew Member)

Patient Disposition Form

PCR Number	Johnston County EMS System Patient Discharge Information	2016

Patient's Name	Date of Birth	Today's Date
Patient's Address	Phone	EMS Provider's Name (print)

PATIENT REFUSAL

☐ This section apples only if this box is marked.

The paramedic has recommended:

- ○ A complete exam of the patient
- ○ Providing oxygen to the patient
- ○ Starting an IV for the patient
- ○ Give the patient medicine _____
- ○ Transport to a hospital _____
- ○ Other _____

I refuse the care that the paramedic has recommended. I understand that my refusal may result in serious injury or death to the patient. I accept full responsibility for this decision. I assume all risks and consequences resulting from my refusal of care. I will not hold the EMS service or its officers, agents, or employees responsible for any bad things that happen to the patient because of my refusal.

My signature below attests that I understand what has been recommended, what the consequences may be if that is not done, and I still refuse to have the recommended care provided by the EMS service.

PATIENT INSTRUCTIONS

☐ This section apples only if this box is marked.

You have not been evaluated by a physician.

You should contact your doctor immediately.

The patient is being released to:
- ○ Family member
- ○ Guardian
- ○ Law Enforcement Officer
- ○ Other: _____

Follow the instructions (printed on the back of this form or attached sheet) as indicated:

- ⊗ Universal
- ○ Abdominal pain
- ○ Back pain
- ○ Fever
- ○ Head injury
- ○ Insect bite/ sting
- ○ Respiratory distress
- ○ Extremity injury
- ○ Vomiting/ diarrhea
- ○ Wound care

Other instructions: _____

Guardian's Name (printed)	○ Patient ○ Guardian ○ Refused to sign	Patient/Guardian Signature
Guardian's Address		EMS Provider's Signature
Witness Signature		Date of signatures
Witness Signature		Patient's Physician Name/ Phone Number

Patient Disposition Form

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 WHEEXING, DEVELOP A RASH OR HIVES, OR HAVE ANY UNEXPECTED REATION, CALL 9-1-1 IMMEDIATELY.**
- **IF YOUR SYMPTOMS WORSEN AT ANYTIME, YOU SHOULD SEE A DOCTOR, GO TO AN EMERGENCY DEPARTMENT, OR CALL 911.**

ABDOMINAL PAIN:

- Abdominal pain is also called belly pain. Many illnesses cause abdominal pain and it is very difficult for EMS to identify the cause.
- Take your temperature every four (4) hours.
- **Call or see a physician, go to an emergency department, or call 911 immediately if-**
  - Your pain gets worse or is now in only one 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 10-20 minutes every hour.
- Stay in bed as much as possible the first 24 hours.
- Begin normal activities when you can perform them without pain.
- When picking things up, bend at the hips and knees; never bend from the waist only.
- **Call or see a physician, go to an emergency department, or call 911 immediately if-**
  - You have shooting pains into your buttocks, groin, legs, arms, or if pain increases.
  - You have trouble urinating or lose control of your stools and/ or urine.
  - You have numbness in your legs, feet, arms, and/ or hands.

FEVER:

- Always take medications as directed. Tylenol (acetaminophen) and Motrin (ibuprofen) can be taken at any time.
- If you are taking antibiotics, take them until they are gone; do not stop taking them when you feel better.
- Drink extra fluids (1 glass of water or Gatorade per hour of fever for an adult).
- If the temperature is above 103F it can be brought down with a sponge bath with room temperature water. Do not use cold water, a fan, or an alcohol bath.
- **Call or see a physician, go to an 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 Tylenol or Motrin with the appropriate dose.

HEAD INJURY:

- Apply heat to the painful area to help relieve pain. You may use a warm heating pad, whirlpool bath, or warm & moist towels for 10-20 minutes every hour.
- Stay in bed as much as possible the first 24 hours.
- Begin normal activities when you can perform them without pain.
- When picking things up, bend at the hips and knees; never bend from the waist only.
- **Call or see a physician, go to an emergency department, or call 911 immediately if-**
  - You have shooting pains into your buttocks, groin, legs, arms, or if pain increases.
  - You have trouble urinating or lose control of your stools and/ or urine.
  - You have numbness in your legs, feet, arms, and/ or hands.

INSECT BITE/ STING:

- Apply heat to the painful area to help relieve pain. You may use a warm heating pad, whirlpool bath, or warm & moist towels for 10-20 minutes every hour.
- Stay in bed as much as possible the first 24 hours.
- Begin normal activities when you can perform them without pain.
- When picking things up, bend at the hips and knees; never bend from the waist only.
- **Call or see a physician, go to an emergency department, or call 911 immediately if-**
  - You have shooting pains into your buttocks, groin, legs, arms, or if pain increases.
  - You have trouble urinating or lose control of your stools and/ or urine.
  - You have numbness in your legs, feet, arms, and/ or hands.

RESPIRATORY DISTRESS:

- Apply heat to the painful area to help relieve pain. You may use a warm heating pad, whirlpool bath, or warm & moist towels for 10-20 minutes every hour.
- Stay in bed as much as possible the first 24 hours.
- Begin normal activities when you can perform them without pain.
- When picking things up, bend at the hips and knees; never bend from the waist only.
- **Call or see a physician, go to an emergency department, or call 911 immediately if-**
  - You have shooting pains into your buttocks, groin, legs, arms, or if pain increases.
  - You have trouble urinating or lose control of your stools and/ or urine.
  - You have numbness in your legs, feet, arms, and/ or hands.

EXTREMITY INJURY:

- Extremity injuries may consist of cuts, scrapes, bruises, sprains, or broken bones.
- Apply ice to the injury for 15-20 minutes every hour for the first 1-2 days.
- Elevate the extremity above the heart as possible during the 48 hours to decrease pain and swelling.
- Use the extremity a pain allows.
- **Call or see a physician, go to an emergency department, or call 911 immediately if-**
  - Temperature greater than 101°F.
  - Bruising, swelling, or pain gets worse despite treatment above.
  - Any problems on WOUND CARE are noted.
  - You are unable to use the extremity or numbness/ tingling is noted.
  - You are not improved 24-48 hours or you are not normal in 7-10 days.

VOMITING/ DIARRHEA:

- Vomiting (throwing up) may be caused by many things. It is common in children but should be watched closely.
- Diarrhea is most often caused by a food reaction or infection.
- Dehydration is the most common problem associated with vomiting/ diarrhea.
- Drink clear liquid such as water, apple juice, or Gatorade for the first 12 hours or until situation improves. Adults should drink 8-12 glasses per day with diarrhea; children should drink one cup of fluid for each loose bowel movement.
- **Call or see a physician, go to an emergency department, or call 911 immediately if-**
  - Temperature greater than 101°F.
  - Vomiting/ 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.
- Unless otherwise directed, clean the wound twice daily with soapy water and keep it dry. It is safe to shower but do not place the wound in dish or bath 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 an emergency department, or call 911 immediately if-**
  - Temperature greater than 101°F.
  - Bruising, swelling, or pain gets worse, or bleeding is not controlled as directed above.
  - See the EXTREMITY INJURY instructions.
  - Any signs of infection such as redness, drainage, red streaks extending from the wound, or a bad smell is detected.

On Scene Physician

The Johnston County EMS System 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 System's Online Medical Control Physician.

2. Show proper identification including a current North Carolina Medical Board licensure.

3. Accompany the patient to the hospital.

4. Carry out interventions that do not conform to the EMS System's protocols and guidelines. EMS personnel cannot perform any interventions or administer medications that are not included in their protocols and guidelines.

5. Sign all orders in the electronic 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 # _____,
(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 destination emergency department. I further understand that all EMS personnel must follow North Carolina EMS Rules and Regulations, as well as the Johnston County EMS System protocols and guidelines.

_____, MD Date: _____ Time: _____ AM/PM
(Physician's signature)

_____, EMS
(EMS lead paramedic signature)

_____
(Witness signature)

JOHNSTON COUNTY EMS SYSTEM
Adult PRE-ROSC CARDIAC ARREST CHECKLIST

CARDIAC ARRESTS ARE WORKED IN PLACE

1	☐	COMMAND has been established, named, and JC911 notified by radio ✱ MEDICAL BRANCH established and identified
2	☐	Lack of DNR/MOST has been confirmed
3	☐	Monitor is visible and dedicated provider is viewing rhythm with all leads attached ✱ ECG strip is printed for all rhythm changes, defibrillations, post medication administration, and any other changes ✱ Code markers are being recorded for all interventions
4	☐	Confirmed continuous / effective chest compressions are ongoing ✱ Metronome is in use and rate set at 116 *if available* ✱ At least 2 inches depth ✱ 116-120 per minute ✱ Full chest recoil **Q-CPR DEVICE IS DEPLOYED AND IN USE** **AUDIBLE FEEDBACK IS 'ON'** ✱ Verify femoral &/or carotid pulse w/ compressions; mark location ✱ Interruptions ≤5-10 seconds ✱ Pulse √ ≤5-10 seconds ONLY if organized rhythm at rhythm check ✱ JOCO Switch procedure is being utilized
5	☐	Defibrillations occurring at 2 minute intervals for shockable rhythms ✱ Compressions continue while EMS defibrillator is charging ✱ Compressions resume immediately after shock delivered
6	☐	Defibrillation vector changed at shock #4 ✱ DSED considered beginning at shock #5 in case of refractory VF/ pulseless VT with no episode of ROSC, or change in rhythm ✱ If DSED converts continue to utilize in event of re-arrest
7	☐	BVM is attached to oxygen cylinder with oxygen in it
8	☐	Ventilations are controlled **BVM / EtCO2 / ITD / OPA-BIAD-ETT** ✱ Look for chest rise ✱ NO excessive volume; just enough for chest rise ✱ NO excessive rate; 6-10 ventilations per minute ✱ If no ALS airway, utilize 2-person technique if personnel available.
9	☐	BVM mask is readily available after placement of ALS airway
10	☐	$EtCO_2$ value and waveform is present and being monitored
11	☐	ITD/ ResQPod is in place
12	☐	Vascular access has been established (IV or IO)
13	☐	Underlying causes have been considered and treated early if appropriate
14	☐	Gastric distension is not a factor
15	☐	Family is receiving care and is at patient's side if desired
16	☐	JC911 notified of ROSC or field termination and time recorded in CAD

2016 v1.2

JOHNSTON COUNTY EMS SYSTEM
Adult POST-ROSC CARDIAC ARREST CHECKLIST

STOP FOR RE-ARREST AND WORK IN PLACE

1	☐	JC911 notified of ROSC and time entered into CAD
2	☐	10-minute peri-transport pause before moving patient ✱ Pause applies to each ROSC episode ✱ Verify marked pulses ✱ Acquire and transmit 12-lead ECG; provide notification to destination ✱ ITD/ ResQPod removed; remains close by ✱ Acquire baseline vital signs; attach SpO_2
3	☐	If advance airway in use, place c-collar and CIDs prior to movement
4		Second monitor accompanies patient if DSED converts refractory VF
5	☐	Tympanic temperature assessed prior to moving; if patient not following verbal commands or temperature >91.4°F initiate induced hypothermia
6	☐	Titrate SpO_2 ≥90% - ≤99%; prevent hyperoxia ≥99%
7	☐	BVM mask travels with patient regardless of airway in place
8	☐	Monitor continuous $EtCO_2$ and ventilation rate ✱ Look for chest rise ✱ NO excessive volume; just enough for chest rise ✱ NO excessive rate; 6-10 ventilations per minute ✱ Do not try to obtain "normal" $EtCO_2$ by ↑ ventilation rate ✱ If no ALS airway, utilize 2-person technique if personnel available.
9	☐	Assess and treat bradycardia <60 bpm
10	☐	If SBP <100mm Hg, augment with IV/IO NS bolus or pressor drip
11	☐	During and after movement of patient, and at regular intervals, verify pulse, ECG, $EtCO_2$ waveforms and values, breath sounds, and SpO_2
12	☐	Appropriate personnel are on board ambulance- ✱ Paramedic/ Medical Branch ✱ Airway manager ✱ Two personnel for compressions in event of re-arrest
13	☐	Ensure family care and that they have been informed- ✱ Destination hospital and route of travel ✱ Potential need to stop during transport ✱ To not follow ambulance too close and to not exceed speed limit ✱ Directions to destination hospital
14	☐	If family traveling in separate vehicle obtain phone contact number
15	☐	If patient re-arrest during transport- ✱ Pull over in a safe manner and location ✱ Notify JC911 of re-arrest and request cardiac arrest response ✱ Work arrest in place until ROSC or d/c of efforts ✱ Pre-ROSC checklist applies in event of re-arrest

2016 v1.2

North Carolina Medical Board
Approved Medications for Credentialed EMS Personnel

EMS personnel at any level who administer medications must do so within an EMS system that provides medical oversight. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies 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[13]	X
Adenosine				X
Aminophylline				X
Amiodarone				X
Anti-arrhythmic				X[12]
Antibiotics				X
Anti-emetic preparations				X
Antivirals				X
Aspirin		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[5]	X	X
Dobutamine				X
Dopamine				X
Droperidol				X
Epinephrine	X[1]	X[1]	X	X
Etomidate				X
Flumazenil				X
Furosemide				X
Glucagon			X	X
Glucose, oral	X	X	X	X
Glucose solutions			X	X
Haloperidol				X
Heparin (unfractionated and low molecular weight)			X	X
Histamine 2 blockers			X	X
Hydroxocobalamin				X

Medications	EMR	EMT	AEMT	MEDIC
Immunizations			X[6]	X[6]
Insulin				X
Ipratropium			X	X
Isoproterenol				X
Ketamine				X[7]
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[3]	X[3]	X[3]	X[3]
Oxytocin				X
Paralytic agents				X[7]
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
Vasopressor				X[16]
Whole blood and components				X
Ziprasidone				X

[1] EMR and EMT use of epinephrine is limited to the treatment 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. EMTs may administer these medications from EMS supplies. EMT use of beta-agonists may be through any inhaled method of medication administration.

[3] 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] Can only be used as induction agent for RSI or for post intubation sedation.

[8] Can only be used for interfacility transport where infusion has already been started at transferring facility. **EMS units cannot carry 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 Responder agencies are allowed to administer Naloxone with the following requirements:

a. They must administer the Naloxone under the medical oversight of the County EMS Medical Director, and be incorporated into the respective EMS System in which they are administering the Naloxone.
b. They must receive appropriate training and continuing education as approved by the County EMS Medical Director.
c. The Naloxone must be administered as part of a protocol and procedure approved by the County EMS Medical Director, and the NC Office of EMS.
d. All administration of Naloxone must be reviewed by the EMS Peer Review/Quality Management Committee of the EMS System, which functions under the supervision of the local County EMS Medical Director.

[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] EMT-Intermediate/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.

North Carolina Medical Board
Approved Skills for Credentialed EMS Personnel

EMS personnel performing these skills must do so within an EMS system. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies 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.

Skills	EMR	EMT	AEMT	MEDIC
12-Lead ECG Acquisition & Transmission		X	X	X
12-Lead ECG Interpretation				X
15-Lead ECG Acquisition				X
Arterial Access - Blood Draw				X
Arterial Line maintenance				X
Blind Insertion Airway Device (BIAD)		X[1]	X	X
Capnography (Waveform)		X	X	X
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
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
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
Intubation Confirmation - Esophageal Bulb			X	X
Medication Administration	X[2]	X[2]	X[2]	X[2]
Nebulizer Inhalation Therapy		X	X	X
Non-Invasive Positive Pressure Ventilation		X	X	X

Skills	EMR	EMT	AEMT	MEDIC
Orthostatic Blood Pressure	X	X	X	X
Oxygen Administration	X	X	X	X
Patient Assessment	X	X	X	X
Pulse Oximetry	X	X	X	X
Rapid Sequence Induction (RSI)				X[5,6]
Reperfusion Checklist	X	X	X	X
Respirator Operation		X	X	X
Restraints		X	X	X
Spinal Motion Restriction	X	X	X	X
Splinting	X	X	X	X
Stroke Screen	X	X	X	X
Suction	X	X	X	X
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
Wound Care	X	X	X	X

[1] EMTs using blind insertion airway devices must be functioning in EMS systems with medical direction and written treatment protocols.

[2] EMS personnel at any level who administer medications must do so within an EMS system that provides medical oversight. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies must be reviewed and approved by the Medical Director of the Office of EMS. The approved medication list is found at the beginning of this document. 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 rapid sequence induction 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] All EMT-Intermediate/AEMT and Paramedic systems must use either capnometry (color) or waveform capnography to confirm every intubation and invasive airway. Paramedic systems performing rapid sequence induction (RSI) must use waveform capnography to confirm tube placement.

[7] Pediatric intubation is an optional skill/procedure.

-As of 1 January 2017, NCOEMS will be transitioning all EMT-Intermediates to the Advanced EMT Level in order to align with the National Education Standards. The EMT-I and AEMT will have the same scope of practice. All EMR personnel performing skills beyond the National Education Standards, must do so under approved medical direction.

-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

Weight Conversion Chart

1 lb. / 0.5 kg. – 150 lbs. / 68.0 kg.

lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.
1	0.5	26	11.8	51	123.1	76	34.5	101	45.8	126	57.2
2	0.9	27	12.2	52	23.6	77	34.9	102	46.3	127	57.6
3	1.4	28	12.7	53	24.0	78	35.4	103	46.7	128	58.1
4	1.8	29	13.2	54	24.5	79	35.8	104	47.2	129	58.5
5	2.3	30	13.6	55	24.9	80	36.3	105	47.6	130	59.0
6	2.7	31	14.1	56	25.4	81	36.7	106	48.1	131	59.4
7	3.2	32	14.5	57	25.9	82	37.2	107	48.5	132	59.9
8	3.6	33	15.0	58	26.3	83	37.6	108	49.0	133	60.3
9	4.1	34	15.4	59	26.8	84	38.1	109	49.4	134	60.8
10	4.5	35	15.9	60	27.2	85	38.6	110	49.9	135	61.2
11	5.0	36	16.3	61	27.7	86	39.0	111	50.3	136	61.7
12	5.4	37	16.8	62	28.1	87	39.5	112	50.8	137	62.1
13	5.9	38	17.2	63	28.6	88	39.9	113	51.3	138	62.6
14	6.4	39	17.7	64	29.0	89	40.4	114	51.7	139	63.0
15	6.8	40	18.1	65	29.5	90	40.8	115	52.2	140	63.5
16	7.3	41	18.6	66	29.9	91	41.3	116	52.6	141	64.0
17	7.7	42	19.1	67	30.4	92	41.7	117	53.1	142	64.4
18	8.2	43	19.5	68	30.8	93	42.2	118	53.5	143	64.9
19	8.6	44	20.0	69	31.3	94	42.6	119	54.0	144	65.3
20	9.1	45	20.4	70	31.8	95	43.1	120	54.4	145	65.8
21	9.5	46	20.9	71	32.2	96	43.5	121	54.9	146	66.2
22	10.0	47	21.3	72	32.7	97	44.0	122	55.3	147	66.7
23	10.4	48	21.8	73	33.1	98	44.5	123	55.8	148	67.1
24	10.9	49	22.2	74	33.6	99	44.9	124	56.2	149	67.6
25	11.3	50	22.7	75	34.0	100	45.4	125	56.7	150	68.0

151 lbs. / 68.5 kg. – 300 lbs. / 136.1 kg.

lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.
151	68.5	176	79.8	201	91.2	226	102.5	251	113.9	276	125.2
152	68.9	177	80.3	202	91.6	227	103.0	252	114.3	277	125.6
153	69.4	178	80.7	203	92.1	228	103.4	253	114.8	278	126.1
154	69.9	179	81.2	204	92.5	229	103.9	254	115.2	279	126.6
155	70.3	180	81.6	205	93.0	230	104.3	255	115.7	280	127.0
156	70.8	181	82.1	206	93.4	231	104.8	256	116.1	281	127.5
157	71.2	182	82.6	207	93.9	232	105.2	257	116.6	282	127.9
158	71.7	183	83.0	208	94.3	233	105.7	258	117.0	283	128.4
159	72.1	184	83.5	209	94.8	234	106.1	259	117.5	284	128.8
160	72.6	185	83.9	210	95.3	235	106.6	260	117.9	285	129.3
161	73.0	186	84.4	211	95.7	236	107.0	261	118.4	286	129.7
162	73.5	187	84.8	212	96.2	237	107.5	262	118.8	287	130.2
163	73.9	188	85.3	213	96.6	238	108.0	263	119.3	288	130.6
164	74.4	189	85.7	214	97.1	239	108.4	264	119.7	289	131.1
165	74.8	190	86.2	215	97.5	240	108.9	265	120.2	290	131.5
166	75.3	191	86.7	216	98.0	241	109.3	266	120.7	291	132.0
167	75.7	192	87.1	217	98.4	242	109.8	267	121.1	292	132.4
168	76.2	193	87.6	218	98.9	243	110.2	268	121.6	293	132.9
169	76.7	194	88.0	219	99.3	244	110.7	269	122.0	294	133.4
170	77.1	195	88.5	220	99.8	245	111.1	270	122.5	295	133.8
171	77.6	196	88.9	221	100.2	246	111.6	271	122.9	296	134.3
172	78.0	197	89.4	222	100.7	247	112.0	272	123.4	297	134.7
173	78.5	198	89.8	223	101.2	248	112.5	273	123.8	298	135.2
174	78.9	199	90.3	224	101.6	249	112.9	274	124.3	299	135.6
175	79.4	200	90.7	225	102.1	250	113.4	275	124.7	300	136.1

Weight Conversion Chart

301 lbs. / 136.5 kg. – 450 lbs. / 204.1 kg.

lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.
301	136.5	326	147.9	351	159.2	376	170.6	401	181.9	426	193.2
302	137.0	327	148.3	352	159.7	377	171.0	402	182.3	427	193.7
303	137.4	328	148.8	353	160.1	378	171.5	403	182.8	428	194.1
304	137.9	329	149.2	354	160.6	379	171.9	404	183.3	429	194.6
305	138.3	330	149.7	355	161.0	380	172.4	405	183.7	430	195.0
306	138.8	331	150.1	356	161.5	381	172.8	406	184.2	431	195.5
307	139.3	332	150.6	357	161.9	382	173.3	407	184.6	432	196.0
308	139.7	333	151.0	358	162.4	383	173.7	408	185.1	433	196.4
309	140.2	334	151.5	359	162.8	384	174.2	409	185.5	434	196.9
310	140.6	335	152.0	360	163.3	385	174.6	410	186.0	435	197.3
311	141.1	336	152.4	361	163.7	386	175.1	411	186.4	436	197.8
312	141.5	337	152.9	362	164.2	387	175.5	412	186.9	437	198.2
313	142.0	338	153.3	363	164.7	388	176.0	413	187.3	438	198.7
314	142.4	339	153.8	364	165.1	389	176.4	414	187.8	439	199.1
315	142.9	340	154.2	365	165.6	390	176.9	415	188.2	440	199.6
316	143.3	341	154.7	366	166.0	391	177.4	416	188.7	441	200.0
317	143.8	342	155.1	367	166.5	392	177.8	417	189.1	442	200.5
318	144.2	343	155.6	368	166.9	393	178.3	418	189.6	443	200.8
319	144.7	344	156.0	369	167.4	394	178.7	419	190.1	444	201.4
320	145.1	345	156.5	370	167.8	395	179.2	420	190.5	445	201.8
321	145.6	346	156.9	371	168.3	396	179.6	421	191.0	446	202.3
322	146.1	347	157.4	372	168.7	397	180.1	422	191.4	447	202.8
323	146.5	348	157.9	373	169.2	398	180.5	423	191.9	448	203.2
324	147.0	349	158.3	374	169.6	399	181.0	424	192.3	449	203.7
325	147.4	350	158.8	375	170.1	400	181.4	425	192.8	450	204.1

APPENDIX B2: JCEMSS PEDIATRIC DRUG VOLUME QUICK CHART- DOSES BY VOLUME PAGE 1

1. Verify dose for appropriate age as per each individual protocol and verify that the **CONCENTRATION** listed here is the drug concentration you currently have in front of you that you are about to administer.

2. Use the **B**roselow tape to estimate weight and this color coded chart to verify correct volume for weight range.

3. If all verifications are correct, and your partner agrees, administer the appropriate drug volume per the chart below.

✱✱ In this chart a "▶" indicates a maximum or minimum dosage or volume that may not correlate to weight ✱✱

✱✱ This reference may include minimal rounding of doses and/or volumes for weight ranges and drug safety ✱✱

Medication Charts MC-2 (page 2 of 2)

DRUG CONCENTRATION CURRENTLY IN SERVICE If applicable / available	DRUG NAME	Usual dose: CHECK PROTOCOL	Volume in mL to be administered by approximate weight at given concentration								
		BROSELOW COLOR→→	GRAY	PINK	RED	PURPLE	YELLOW	WHITE	BLUE	ORANGE	GREEN
			4.0 kg	6.5 kg	8.5 kg	10.5 kg	13.0 kg	17.0 kg	21.0 kg	27.0 kg	36.0 kg
160mg/5mL (=32mg/mL)	Acetaminophen	15 mg/kg	2	3	4	5	6	8	10	12.5	17
12mg/4mL (=3mg/mL)	Adenosine 1st dose	0.1 mg/kg	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.2
12mg/4mL (=3mg/mL)	Adenosine 2nd dose	0.2 mg/kg	0.3	0.5	0.6	0.7	0.9	1.2	1.4	1.8	2.4
CARDIAC ARREST 1st DOSE 150mg/3mL (=50mg/mL)	Amiodarone	5 mg/kg			0.85	1	1.3	1.7	2.1	2.7	3.6
CARDIAC ARREST 2nd DOSE 150mg/3mL (=50mg/mL)	Amiodarone	5 mg/kg			0.85	1	1.3	1.7	2.1	2.7	▶3.0
VENTRICULAR TACHYCARDIA 150mg/3mL (=50mg/mL)	Amiodarone	5 mg/kg			0.85	1	1.3	1.7	2.1	2.7	▶3.0
1mg/10mL (=0.1mg/mL)	Atropine	0.02 mg/kg	▶1	1.3	1.7	2	2.6	3.4	4.2	5.4	7.2
1g/10mL (=100mg/mL)	Calcium Chloride	20 mg/kg	0.8	1.3	1.7	2	2.6	3.4	4.2	5.4	7.2
✱✱✱	Defibrillation	2 – 4 J/kg	8-16	13-26	17-34	21-42	26-52	34-68	42-84	54-108	72-144
D10W 250ml bag	Dextrose 10%	5mL/kg	20	30	40	50	65	85	105	135	180
50mg/mL	Diphenhydramine	1 mg/kg			0.17	0.2	0.25	0.35	0.4	0.6	0.7
400mg/250mL or 400mg/500mL(=1,600mcg/mL)	Dopamine *see separate chart	5-20 mcg/kg/min	SEE PROTOCOL DRIP CHART								
1mg/mL (30mg vial caution✱)	EPI 1:1,000 IM	0.01 mg/kg	0.04	0.065	0.085	0.1	0.13	0.17	0.21	0.27	▶0.3
0.1mg/mL (=1mg/10mL)	EPI 1:10,000 IV/IO	0.01 mg/kg	0.4	0.65	0.85	1	1.3	1.7	2.1	2.7	3.6
1mg in 250cc NS	Epi Infusion	0.1-1 mcg/kg/min	SEE PROTOCOL DRIP CHART								
100mcg/2mL (=50mcg/mL)	Fentanyl 1st dose	1 mcg/kg	0.08	0.13	0.18	0.2	0.25	0.35	0.4	0.55	0.75
100mcg/2mL (=50mcg/mL)	Fentanyl 2nd dose	0.5 mcg/kg	0.04	0.07	0.09	0.1	0.13	0.18	0.2	0.28	0.38
1mg/mL	Glucagon	0.1 mg/kg	0.4	0.65	0.85	1	▶1	▶1	▶1	▶1	▶1
30mg/mL	Ketorolac	0.5 mg/kg	0.05	0.1	0.15	0.17	0.2	0.3	0.35	0.45	0.6
100mg/5mL (=20mg/mL)	Lidocaine	1 mg/kg	0.2	0.3	0.4	0.5	0.65	0.85	1	1.35	1.8
5g/10mL (=500mg/mL)	Magnesium Sulfate	40 mg/kg over 20 min	0.3	0.5	0.7	0.8	1	1.4	1.7	2	3
125mg*/2mL (62.5mg/mL)	Methylprednisolone	2 mg/kg	0.1	0.2	0.3	0.35	0.4	0.5	0.7	0.9	1.2
5mg/1mL	Midazolam	✱0.2mg/kg IM/IN/IR✱	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1	▶1
5mg/5mL (=1mg/mL)	Midazolam	✱ 0.1 mg/kg IV / IO ✱	0.4	0.6	0.8	1	1.3	1.7	2	▶2	▶2
10mg/mL	Morphine	0.1 mg/kg	0.04	0.07	0.09	0.1	0.13	0.17	0.21	0.27	0.36
2mg/2mL (=1mg/mL)	Naloxone	0.1 mg/kg	0.4	0.6	0.8	1	1.3	1.7	▶2	▶2	▶3
4mg/2mL (=2mg/mL)	Ondansetron	0.15 mg/kg	0.3	0.5	0.6	0.8	1	1.3	1.6	▶2	▶2
✱✱✱	Saline bolus	20 mL/kg	80	130	170	200	260	340	420	540	720
50mEq/50mL (=1mEq/mL)	Sodium Bicarbonate	1mEq/kg	4	6.5	8.5	10.5	13	17	21	27	36

APPENDIX B3: JCEMSS ADULT DRUG VOLUME QUICK CHART- DOSES BY VOLUME PAGE 1

1. Verify dose for appropriate age as per each individual protocol and verify that the CONCENTATION listed here is the drug concentration you currently have in front of you that you are about to administer.

2. Estimate weight (weight in kg = weight in pounds/ 2.2) and verify correct dose in kilograms for approximate weight.

3. If all verifications are correct, and your partner agrees, administer the appropriate drug volume per the chart below.

✱✱ In this chart a "▶" indicates a maximum, minimum, or initial dosage or volume that may not correlate to weight ✱✱

✱✱ This reference may include minimal rounding of doses and/or volumes for weight ranges and drug safety ✱✱

Medication Charts MC-3
(page 2 of 2)

DRUG CONCENTRATION CURRENTLY IN SERVICE If applicable / available	DRUG NAME	Usual dose: CHECK PROTOCOL	Volume in ml to be administered by approximate weight at given concentration											
			40 kg	50 kg	60 kg	70 kg	80 kg	90 kg	100 kg	110 kg	120 kg	130 kg	140 kg	150 kg
100mcg/2ml (=50mcg/ml)	Fentanyl	1 mcg/ kg	0.8	1	1.2	1.4	1.6	1.8	2.0	▶ 2.0	▶2.0	▶2.0	▶2.0	▶2.0
10mg/ml	Morphine	0.1 mg/ kg	0.4	0.5	0.6	0.7	0.8	0.9	1.0	▶1.0	▶1.0	▶1.0	▶1.0	▶1.0
100mg/	Rocuronium	1 mg/ kg	4	5	6	7	8	9	10	11	12	13	14	15
***	Induced hypothermia Cold Saline Bolus	30 ml/ kg	1200	1500	1800	2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000

DRUG CONCENTRATION CURRENTLY IN SERVICE If applicable / available	DRUG NAME	Usual dose: CHECK PROTOCOL	Volume in ml to be administered by approximate weight at given concentration											
			160 kg	170 kg	180 kg	190 kg	200 kg	210 kg	220 kg	230 kg	240 kg	250 kg	260 kg	270 kg
100mcg/2ml (=50mcg/ml)	Fentanyl	1 mcg/ kg	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0
10mg/ml	Morphine	0.1 mg/ kg	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0	▶2.0
100mg/	Rocuronium	1 mg/ kg	16	17	18	19	20	21	22	23	24	25	26	27
***	Induced hypothermia Cold Saline Bolus	30 ml/ kg	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000	▸2000

Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 250 mL (1,600 mcg/mL)

Calculations are using a 60 gtt (micro drip) set or 10 gtt (macro drip) set with a DIAL-A-FLOW device

Patient Weight (kg)	5 mcg/kg/min		10 mcg/kg/min		15 mcg/kg/min		20 mcg/kg/min	
	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr
30	150	6	300	11	450	17	600	23
40	200	8	400	15	600	23	800	30
50	250	9	500	19	750	28	1000	38
60	300	11	600	23	900	34	1200	45
70	350	13	700	26	1050	39	1400	53
80	400	15	800	30	1200	45	1600	60
90	450	17	900	34	1350	51	1800	68
100	500	19	1000	38	1500	56	2000	75
110	550	21	1100	41	1650	62	2200	83
120	600	22	1200	45	1800	68	2400	90
130	650	24	1300	49	1950	73	2600	98
140	700	26	1400	52	2100	79	2800	105
150	750	28	1500	56	2250	84	3000	112
160	800	30	1600	60	2300	90	3200	120
170	850	32	1700	64	2550	96	3400	128

Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 500 mL (800 mcg/mL)

Calculations are using a 60 gtt (micro drip) set or 10 gtt (macro drip) set with a DIAL-A-FLOW device

Patient Weight (kg)	5 mcg/kg/min		10 mcg/kg/min		15 mcg/kg/min		20 mcg/kg/min	
	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr	mcg /min	Dial–a–Flow mL / hr
30	150	11	300	22	450	34	600	45
40	200	15	400	30	600	45	800	60
50	250	19	500	38	750	56	1000	75
60	300	22	600	45	900	68	1200	90
70	350	26	700	52	1050	79	1400	105
80	400	30	800	60	1200	90	1600	120
90	450	34	900	68	1350	101	1800	135
100	500	38	1000	75	1500	112	2000	150
110	550	41	1100	82	1650	124	2200	165
120	600	45	1200	90	1800	135	2400	180
130	650	49	1300	98	1950	146	2600	195
140	700	52	1400	105	2100	158	2800	210
150	750	56	1500	112	2250	170	3000	225
160	800	60	1600	120	2300	180	3200	240
170	850	64	1710	128	2550	191	3400	255

Pediatric Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 250 mL (1,600 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	gtt / min	gtt / min	gtt / min mL / hr	gtt / min mL / hr
1	0.2 gtt/min	0.5 gtt/min	0.6 gtt/min	0.75 gtt/min
3	0.5 gtt/min	1 gtt/min	1.5 gtt/min	2.25 gtt/min
5	1 gtt/min	2 gtt/min	3 gtt/min	4 gtt/min
7	1.25 gtt/min	2.5 gtt/min	4 gtt/min	5 mL/hr
9	1.75 gtt/min	3.5 gtt/min	5 mL/hr	7 mL/hr
Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	gtt / min mL / hr	gtt / min mL / hr	mL / hr	mL / hr
10	2 gtt/min	4 gtt/min	6 mL/hr	8 mL/hr
15	3 gtt/min	6 mL/hr	8 mL/hr	11 mL/hr
20	4 gtt/min	8 mL/hr	11 mL/hr	15 mL/hr
25	5 mL/hr	9 mL/hr	14 mL/hr	19 mL/hr
30	6 mL/hr	11 mL/hr	17 mL/hr	22 mL/hr

Utilize 60 gtt/mL set for pediatric dosages
WITHOUT Dial-A-Flow device

Utilize 60 gtt/mL set for pediatric dosages
WITH Dial-A-Flow device

Pediatric Dopamine Infusion Chart

Utilize Premixed Solution 400 mg solution in 500 mL
(800 mcg/mL)

Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	gtt / min	gtt / min mL / hr	gtt / min mL / hr	gtt / min mL / hr
1	0.5 gtt/min	1 gtt/min	1.5 gtt/min	2 gtt/min
3	1 gtt/min	2 gtt/min	3 gtt/min	4 gtt/min
5	2 gtt/min	4 gtt/min	6 mL/hr	8 mL/hr
7	2.5 gtt/min	5 mL/hr	8 mL/hr	10 mL/hr
9	3 gtt/min	7 mL/hr	10 mL/hr	14 mL/hr
Patient Weight (kg)	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
	mL / hr	mL / hr	mL / hr	mL / hr
10	4 mL/hr	8 mL/hr	11 mL/hr	15 mL/hr
15	6 mL/hr	11 mL/hr	17 mL/hr	22 mL/hr
20	8 mL/hr	15 mL/hr	22 mL/hr	30 mL/hr
25	9 mL/hr	19 mL/hr	28 mL/hr	38 mL/hr
30	11 mL/hr	22 mL/hr	34 mL/hr	45 mL/hr

Utilize 60 gtt/mL set for pediatric dosages
WITHOUT Dial-A-Flow device

Utilize 60 gtt/mL set for pediatric dosages
WITH Dial-A-Flow device

Norepinephrine (Levophed)
Drip Chart

Infusion Dosage mcg / min	Infusion Rate mL / hr via Dial-a-Flow
2	30
4	60
6	90
8	125
10	150

4 mg of solution in 1,000 mL NS
Renders 4 mcg / mL

Epinephrine Infusion Drip Chart

Infusion Dosage mcg / min	Infusion Rate mL / hr via Dial-a-Flow
2	30
4	60
6	90
8	125
10	150

1 mL of 1 mg/mL (1:1,000) solution in 250 mL NS
Renders 4 mcg/mL

Pediatric Epinephrine Infusion Chart

Infusion Dosage mcg/min	Infusion Rate mL / hr via Dial-A-Flow
2	30
4	60
6	90
8	125
10	150

1 mL of 1 mg/mL (1:1,000) solution in 250 mL NS
Renders 4 mcg/mL

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Medication	Adult Dosing	Pediatric Dosing
Acetaminophen (Tylenol) **JCEMSS Protocol:** ✱ Pain Control-Adult ✱ Fever ✱ Pain Control-Pediatric **Indications/Contraindications:** • Indicated for pain and fever control • Avoid in patients with severe liver disease	✱ 1000 mg po	✱ **See Color Coded List** ✱ 15 mg/kg po
Adenosine (Adenocard) **JCEMSS Protocol:** ✱ Adult Tachycardia Narrow Complex ✱ Adult Tachycardia Wide Complex ✱ Pediatric Tachycardia **Indications/Contraindications:** ✱ Specifically for treatment or diagnosis of Supraventricular Tachycardia	✱ 12 mg IV push over 1-3 seconds. ✱ Repeat once if necessary ✱ (Use 10 ml Normal Saline flush with each dose)	✱ 0.1 mg/kg IV (Max 6 mg) push over 1-3 seconds. If no effect after 1-2 minutes, ✱ Repeat with 0.2 mg/kg IV (Max 12 mg) push over 1-3 seconds. ✱ Repeat once if necessary ✱ (use 5 ml Normal Saline flush with each dose)
Albuterol Beta-Agonist **JCEMSS Protocol:** ✱ COPD Asthma ✱ Allergic Reaction Anaphylaxis ✱ Pediatric Respiratory ✱ Pediatic Allergic Reaction **Indications/Contraindications:** ✱ Beta-Agonist nebulized treatment for use in respiratory distress with bronchospasm	✱ 2.5-5.0 mg (3cc) in nebulizer continuously x 3 doses. See local protocol for relative contraindications and/or indications to contact medical control for use of this drug.	✱ **See Color Coded List** ✱ 2.5mg (3cc) in nebulizer continuously x 3 doses. See local protocol for relative contraindications and/or indications to contact medical control for use of this drug.

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Medication	Adult Dosing	Pediatric Dosing
Amiodarone (Cordarone) **JCEMSS Protocol:** ✱ 12-VF Pulseless VT ✱ 18-Adult Tachycardia Wide Complex ✱ 46-Pediatric VF Pulseless VT ✱ 46-Pediatric Post Resuscitation ✱ 48-Pediatric Tachycardia **Indications/Contraindications:** ✱ Antiarrhythmic used mainly in wide complex tachycardia and ventricular fibrillation. ✱ Avoid in patients with heart block or profound bradycardia. ✱ Contraindicated in patients with iodine hypersensitivity	V-fib / pulseless V-tach ✱ 300 mg IV push ✱ Repeat dose of 150 mg IV push for recurrent episodes V-tach with a pulse ✱ 150 mg over 10 min	V-fib / pulseless V-tach ✱ 5 mg/kg IV push over 5 minutes ✱ May repeat up to 15mg/kg IV V-tach with a pulse ✱ 5 mg/kg IV push over 5 minutes ✱ May repeat up to 15mg/kg IV ✱ Avoid in Length Tape Color Pink
Aspirin **JCEMSS Protocol:** ✱ 4-Pain Control Adult ✱ 16-Chest Pain and STEMI **Indications/Contraindications:** ✱ An antiplatelet drug for use in cardiac chest pain	✱ 81 mg chewable (baby) Aspirin ✱ Give 4 tablets to equal usual adult dose.	Ø
Atropine **JCEMSS Protocol:** ✱ 19-Bradycardia Pulse Present ✱ 58-Pediatric Bradycardia ✱ 81-WMD Nerve Agent **Indications/Contraindications:** ✱ Anticholinergic drug used in bradycardias. ✱ In Organophosphate toxicity, large doses may be required (>10 mg)	Bradycardia ✱ 0.5 - 1.0 mg IV every 3 – 5 minutes up to 3 mg. Organophosphate ✱ 1-2 mg IM or IV otherwise as per medical control	✱ **See Color Coded List** Bradycardia ✱ 0.02 mg/kg IV, IO (Max 0.5 mg per dose, Max total dose 1mg IV) (Min 0.1 mg) per dose ✱ May repeat in 3 - 5 minutes Organophosphate ✱ 0.05 mg/kg IV or IO otherwise as per medical control

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Medication	Adult Dosing	Pediatric Dosing
Atropine and Pralidoxime Auto-Injector **Nerve Agent Kit** **JCEMSS Protocol:** ✱ WMD Nerve Agent **Indications/Contraindications:** ✱ Antidote for Nerve Agents or Organophosphate Overdose	✱ One auto-injector then per medical control	✱ **See Color Coded List** ✱ One pediatric auto-injector then as per medical control
Calcium Chloride **JCEMSS Protocol:** ✱ Dialysis Renal Failure ✱ Overdose Toxic Ingestion ✱ Ped OD Toxic Ingestion ✱ Marine Envenomations ✱ Crush Syndrome **Indications/Contraindications:** ✱ Indicated for severe hyperkalemia	✱ 1 gm IV / IO ✱ Avoid use if pt is taking digoxin	✱ **See Color Coded List** ✱ 20 mg/kg IV or IO slowly
Dextrose 10% **Glucose solutions** **JCEMSS Protocol:** ✱ Multiple **Indications/Contraindications:** ✱ Use in altered mental status or hypoglycemic states	✱ D10 IV / IO titrated to effect blood glucose level ≥70	✱ **See Color Coded List** ✱ < 50 kg 5 mL/kg IV / IO titrated to patient condition and effect ✱ ≥50 kg D10 IV/IO titrated to effect blood glucose level ≥70

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Medication	Adult Dosing	Pediatric Dosing
Diltiazem (Cardizem) Calcium Channel Blocker **JCEMSS Protocol:** ✱ 17-Adult Tachycardia Narrow Complex **Indications/Contraindications:** ✱ Calcium channel blocker used to treat narrow complex SVT ✱ Contraindicated in patients with heart block, ventricular tachycardia, and/or acute MI	✱ Diltiazem 20 mg IV / IO If age ≥ 60 give 10 mg then repeat 10 mg in 5 minutes if SBP ≥ 100 If not rate controlled repeat bolus in 15 minutes- ✱ Diltiazem 25 mg IV / IO If age ≥ 60 give 15 mg then repeat 10 mg in 5 minutes if SBP ≥ 100	Ø
Diphenhydramine (Benadryl) **JCEMSS Protocol:** ✱ 22-Allergic Reaction Anaphylaxis ✱ 58-Pediatric Allergic Reaction **Indications/Contraindications:** ✱ Antihistamine for control of allergic reactions	✱ 25-50 mg IV/IO/IM/PO	✱ **See Color Coded List** ✱ 1 mg/kg IV/IO/IM/PO ✱ Do not give in infants < 3 mo
Diprivan (Propofol) **Indications/Contraindications:** ✱ Sedation of inutbated, mechanically ventilated patients.	✱ **Only for convalescent transport**	✱ **Only for convalescent transport**
Dopamine **JCEMSS Protocol:** ✱ Multiple **Indications/Contraindications:** ✱ A vasopressor used in shock or hypotensive states	✱ 2 - 20 micrograms/kg/min IV or IO, titrate to BP systolic of 90 mmHg	✱ **See Color Coded List** ✱ 2 - 20 micrograms/kg/min IV or IO, titrate to BP systolic appropriate for age

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Medication	Adult Dosing	Pediatric Dosing
Enalapril (Vasotech) **JCEMSS Protocol:** ✱ CHF/Pulmonary Edema **Indications/Contraindications:** ✱ ACE Inhibitor used to treat CHF and Pulmonary Edema.	✱ 1.25 mg IV-avoid when systolic blood pressure <110mmHg	Ø
Epinephrine 1:1,000 **JCEMSS Protocol:** ✱ Multiple **Indications/Contraindications:** ✱ Vasopressor used in allergic reactions or anaphylaxis	✱ 0.3 mg – 0.5 mg IM ✱ See local protocol for relative contraindications and/or indications to contact medical control for use of this drug. **Nebulized Epinephrine** ✱ 3 cc	✱ **See Color Coded List** ✱ 0.01 mg/kg IM ✱ (Max dose 0.3 mg) **Nebulized Epinephrine** ✱ 1 mg mixed with 2 ml of Normal Saline
Epinephrine 1:10,000 **JCEMSS Protocol:** ✱ Multiple **Indications/Contraindications:** ✱ Vasopressor used in cardiac arrest.	✱ 1.0 mg IV / IO ✱ Repeat every 3 - 5 minutes until observe response	✱ **See Color Coded List** ✱ 0.01 mg/kg IV or IO (Max dose 1 mg) ✱ Repeat every 3 - 5 minutes per protocol
Etomidate (Amidate) **JCEMSS Protocol:** ✱ 15-Induced Hypothermia **Indications/Contraindications:** ✱ Sedative used in Drug Assisted Intubation	✱ 0.3 mg/kg IV / IO ✱ Usual adult dose = 20 mg	Ø

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Medication	Adult Dosing	Pediatric Dosing
Fentanyl (Sublimaze) **Narcotic Analgesic** **JCEMSS Protocol:** ✱ Multiple **Indications/Contraindications:** ✱ Narcotic pain relief ✱ Possible beneficial effect in pulmonary edema ✱ Avoid use if BP < 110	✱ 1 mcg/kg IV/IO/IM/IN initial dose (maximum 100 mcg initial dose); after 10 minutes may repeat 25 mcg every 5 minutes as needed until improvement (maximum total dose 200 mcg)	✱ **See Color Coded List** ✱ 1 mcg/kg IV/IO/IM/IN; May repeat 0.5 mcg/kg every 5 minutes; Maximum initial dose 75 mcg; Maximum total dose 150 mcg
Glucose Oral **Glucose Solutions** **JCEMSS Protocol:** ✱ Diabetic; Adult ✱ Pediatric Diabetic **Indications/Contraindications:** ✱ Use in conscious hypoglycemic states	✱ One tube or packet ✱ Repeat based on blood glucose results, per protocol	✱ **See Color Coded List** ✱ One Tube or packet ✱ Repeat based on blood glucose results, per protocol ✱ Consider patient's ability to swallow and follow directions based on age
Glucagon **JCEMSS Protocol:** ✱ Diabetic, Adult ✱ Overdose/ Toxic Ingestion Pediatric Diabetc ✱ Pediatric Overdose/ Toxic Ingestion **Indications/Contraindications** ✱ Hypoglycemia in adults without vascular access ✱ Beta blocker overdose	✱ 1-2 mg IM for adult diabetic; may repeat once ✱ 2 mg IV/IO for adult beta blocker OD; may repeat once	✱ 0.1 mg/kg IM; max 1.0 mg for pediatric diabetic ✱ 0.1 mg/kg IV/IO; max 2.0 mg for Beta blocker OD

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Medication	Adult Dosing	Pediatric Dosing
Haloperidol (Haldol) Phenothiazine Preperation **JCEMSS Protocol:** ✱ 6-Behavioral **Indications/Contraindications:** ✱ Medication to assist with sedation of agitated patients	✱ 2.5-10 mg IV/IM, per local protocol ✱ See local protocol for relative contraindications and/or indications to contact medical control for use of this drug.	Ø
Ipratropium (Atrovent) **JCEMSS Protocol:** ✱ 22-Allergic Reaction Anaphylaxis ✱ 21-COPD Asthma ✱ 58-Pediatric Allergic Reaction ✱ 55-Pediatric Respiratory Distress **Indications/Contraindications:** ✱ Medication used in addition to albuterol to assist in patients with asthma and COPD	✱ 2 puffs per dose of MDI (18 mcg/spray) --- OR --- ✱ 0.5 mg per nebulizer treatment	✱ Use in Pediatrics as a combined Therapy with a Beta Agonist such as Albuterol ✱ 2 puffs per dose of MDI (18 mcg/spray) --- OR --- ✱ 0.5 mg per nebulizer treatment

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Medication	Adult Dosing	Pediatric Dosing
Ketorolac (Toradol) Non-steroidal Anti-inflammatory Drug **JCEMSS Protocol:** ✱ 4-Pain Control Adult ✱ 53-Pediatric Pain Control **Indications/Contraindications:** ✱ Avoid NSAIDS in women who are pregnant or could be pregnant ✱ A nonsteroidal anti-inflammatory drug used for pain control. ✱ Not to be used in patients with history of GI bleeding (ulcers), renal insufficiency, or in patients who may need immediate surgical intervention (i.e. obvious fractures). ✱ Not to be used in patients with allergies to aspirin or other NSAID drugs such as motrin ✱ Avoid in patients currently taking anticoagulants such as coumadin	✱ 30 mg IV / IO or 60 mg IM	✱ 0.5 mg/kg IV / IO / IM Maximum 30 mg
Lactated Ringer's Solution **JCEMSS Protocol:** ✱ 69-Adult Thermal Burn ✱ 70-Pediatric Thermal Burn **Indications/Contraindications:** ✱ Crystalloid solution preferred for fluid rescuscitation and preferred in burn care. ✱ Avoid in crush syndrome patients	✱ Dosing per protocol, similar to Normal Saline	✱ Dosing per protocol, similar to Normal Saline

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Medication	Adult Dosing	Pediatric Dosing
Lidocaine **JCEMSS Protocol:** ✱ 12-VF Pulseless VT ✱ 46-Pediatric VF Pulseless VT **Indications/Contraindications:** ✱ Antiarrhythmic used for control of ventricular dysrrythmias ✱ Anesthetic used during intubation to prevent elevated intracranial pressures during intubation	✱ 1.5 mg/kg IV / IO bolus up to 3mg/kg max bolus dose ✱ May repeat at ½ original dose 1-4 mg/min IV/IO if rhythm converted by lidocaine	✱ **See Color Coded List** ✱ 1 mg/kg IV / IO Maximum 100 mg Repeat 0.5 mg/kg Maximum 3 mg/kg total
Magnesium Sulfate **JCEMSS Protocol:** ✱ 18-Wide Complex Tachycardia ✱ 21-COPD/Asthma ✱ 29-Seizure ✱ 43-OB Emergencies **Indications/Contraindications:** ✱ Elemental electrolyte used to treat eclampsia during the third trimester of pregnancy. ✱ A smooth muscle relaxor used in refractory respiratory distress resistent to beta-agonists	**Respiriatory Distress:** ✱ 2 g IV / IO over 10 minutes ✱ Repeat dosing per local protocol **Obstetrical Seizure:** ✱ 4 g IV / IO over 2-3 minutes ✱ Dose may be repeated once, or as per local protocol **Torsades de Points** ✱ 2 g IV/IO	✱ 40 mg/kg IV / IO over 20 minutes (Max 2 gms) ✱ Repeat dosing per local protocol
Methylprednisolone (Solu-medrol) Steroid Preparation **JCEMSS Protocol:** ✱ 22-Allergic Reaction Anaphylaxis ✱ 21-COPD Asthma ✱ 58-Pediatric Allergic Reaction ✱ 55-Pediatric Respiratory Distress **Indications/Contraindications:** ✱ Steroid used in respiratory distress to reverse inflammatory and allergic reactions	✱ 125 mg IV / IO	✱ **See Color Coded List** ✱ 2 mg/kg IV / IO (Max 125 mg)

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Medication	Adult Dosing	Pediatric Dosing
Midazolam (Versed) **Benzodiazepine** **JCEMSS Protocol:** ✱ Multiple **Indications/Contraindications:** ✱ Benzodiazepine used to control seizures and sedation ✱ Quick acting Benzodiazepine ✱ Preferred over Valium for IM use ✱ Use with caution if BP < 110	✱ See individual protocols for dosing ✱ Usual total dose: 2-5 mg IV / IO / IM / IN	✱ **See Color Coded List** ✱ 0.1 mg/kg IV/IO ✱ 0.2 mg/kg IM/IN/Rectal
Morphine Sulfate **Narcotic Analgesic** **JCEMSS Protocol:** ✱ Multiple **Indications/Contraindications:** ✱ Narcotic pain relief ✱ Possible beneficial effect in pulmonary edema ✱ Avoid use if BP < 110	✱ 0.1 mg/kg IM/IV/IO initial dose (maximum 10 mg initial dose); After 10 minutes may repeat 2 mg every 5 minutes as needed until improvement	✱ **See Color Coded List** ✱ 0.1 mg/kg IV / IO / IM; May repeat every 5 minutes; Maximum single dose 5 mg; Maximum dose 10 mg
Naloxone (Narcan) **Narcotic Antagonoist** **JCEMSS Protocol:** ✱ 28-Overdose Toxic Ingestion ✱ 54-Ped OD Toxic Ingestion **Indications/Contraindications:** ✱ Narcotic antagonist	✱ 0.4 - 2 mg IV / IO / IM / IN / ETT bolus titrated to patient's **respiratory** response	✱ **See Color Coded List** ✱ 0.1 mg/kg IV / IO / IN / IM / ETT (Max 2 mg) ✱ Repeat as per protocol

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Medication	Adult Dosing	Pediatric Dosing
Normal Saline Crystalloid Solutions **JCEMSS Protocol:** ✱ Multiple **Indications/Contraindications:** ✱ IV fluid for IV access or volume infusion	✱ See individual protocol for bolus dosing and/or infusion rate	✱ **See Color Coded List** ✱ See individual protocol for bolus dosing and/or infusion rate ✱ Usual initial bolus 20 mL / kg IV / IO
Nitroglycerin **JCEMSS Protocol:** ✱ 16-Chest Pain and STEMI ✱ 20 CHF/ Pulmonary Edema **Indications/Contraindications:** ✱ Vasodilator used in anginal syndromes and CHF.	✱ 0.3 / 0.4 mg SL every 5 minutes until painfree ✱ See Chest Pain Protocol for paste dosing	Ø
Ondansetron (Zofran) Anti-emetic **JCEMSS Protocol:** ✱ 31-Abdominal Pain Protocol ✱ 33-Vomiting and Diarrhea ✱ 57-Pediatric Vomiting and Diarrhea **Indications/Contraindications:** ✱ Anti-Emetic used to control Nausea and/or Vomiting ✱ Ondansetron (Zofran) is the recommended anti-emetic for EMS use since it is associated with significantly less side effects and sedation.	✱ 4 mg IV / IO / IM / PO / ODT ✱ Repeat only as per local protocol	✱ 0.15 mg/kg IV / IO / IM; Max 4mg ✱ 0.2 mg/kg PO / ODT (Max 4 mg) ✱ Repeat only as per local protocol

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Medication	Adult Dosing	Pediatric Dosing
Oxygen **JCEMSS Protocol:** * Multiple **Indications/Contraindications:** * Indicated in any condition with increased cardiac work load, respiratory distress, or illness or injury resulting in altered ventilation and/or perfusion. * Goal oxygen saturation 94-99%. * Indicated for pre-oxygenation whenever possible prior to endotracheal intubation. Goal oxygen saturation 100%.	* Titrate to SpO_2 reading no more than 99%; do not hyperoxygenate; **not indicated if SpO2 ≥94%** * 1-4 liters/min via nasal cannula * 6-15 liters/min via NRB mask * 15 liters via BVM / ETT / BIAD	* 1-4 liters/min via nasal cannula * 6-15 liters/min via NRB mask * 15 liters via BVM / ETT / BIAD
Oxymetazoline (Afrin or Otrivin) Nasal Decongestant Spray **JCEMSS Protocol:** * 35-Epistaxis **Indications/Contraindications:** * Vasoconstrictor used with nasal intubation and epistaxis * Relative Contraindication is significant hypertension	* 2 sprays in affected nostril * Usual concentration is 0.05% by volume	* **See Color Coded List** * 1-2 sprays in affected nostril * Usual concentration is 0.05% by volume
Pralidoxime (2-PAM) **JCEMSS Protocol:** * 81-WMD Nerve Agent **Indications/Contraindications:** * Antidote for Nerve Agents or * Organophosphate Overdose * Administered with Atropine	* 600 mg IV / IO / IM over 30 minutes for minor symptoms * 1800 mg IV / IO / IM over 30 minutes for major symptoms * See local protocol for minor versus major indications	* 15 – 25 mg/kg IV / IM / IO over 30 minutes * See local protocol for specific pediatric dosing recommendations

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Medication	Adult Dosing	Pediatric Dosing
Promethazine (Phenergan) Anti-emetic **JCEMSS Protocol:** ✱ 31-Abdominal Pain ✱ 33-Vomiting and Diarrhea **Indications/Contraindications:** ✱ IV Promethazine (Phenergan) should be given IV only with great caution. Extravasation of this drug can result in significant local tissue damage. ✱ Anti-Emetic used to control Nausea and/or Vomiting ✱ Ondansetron (Zofran) is the recommended Anti-emetic for EMS use since it is associated with significantly less side effects and sedation.	✱ 6.25 mg – 25 mg IV / IM / IO ✱ May repeat as per local protocol	Ø
Rocuronium Paralytic Agent **JCEMSS Protocol:** ✱ 14-Post Resuscitation ✱ 15-Induced Hypothermia **Indications/Contraindications:** • Long-acting non-depolarizing paralytic agent • Avoid in patients with chronic neuromuscular disease (e.g., muscular dystrophy).	✱ 1 mg/kg IV/IO; repeat once if needed	Ø

Johnston County EMS System Drug List

ONLY Medications that are included by name and dose in the 2015 JCEMSS Protocols are included in this document; the only purpose of this document is to serve as a reference for the 2015 JCEMSS Protocols. For a full list of medications approved for use by EMS professionals, please refer to the North Carolina Medical Board document entitled: Approved Medications for Credentialed EMS Personnel. Individual EMS Systems may or may not utilize these or other approved drugs. Individual EMS Systems are strongly encouraged to maintain a system-specific drug list for use with system-specific protocols for daily operations and training. See the Pediatric Color Coded Drug List for pediatric dosages

Medication	Adult Dosing	Pediatric Dosing
Sodium Bicarbonate **JCEMSS Protocol:** ✱ 12-VF/Pulseless VT ✱ 13-Asystole/PEA ✱ 25-Dialysis Renal Failure ✱ 28-Overdose Toxic Ingestion ✱ 54-Ped OD Toxic Ingestion ✱ 79-Crush Syndrome **Indications/Contraindications:** ✱ A buffer used in acidosis to increase the pH in Cardiac Arrest, Hyperkalemia or Tricyclic Overdose.	✱ Initial bolus 50 mEq IV / IO ✱ See individual protocol for specific dosing algorithm.	✱ **See Color Coded List** ✱ Initial bolus 1 mEq / kg IV / IO Maximum 50 mEq ✱ See individual protocol for specific dosing algorithm.
Vecuronium **Paralytic Agent** **JCEMSS Protocol:** ✱ 14-Post Resuscitation ✱ 15-Induced Hypothermia **Indications/Contraindications:** ✱ Long-acting non-depolarizing paralytic agent ✱ Avoid in patients with chronic neuromuscular disease (e.g., muscular dystrophy).	✱ 0.1 mg/kg IV / IO or 10 mg IV / IO, as per individual protocol ✱ Only may repeat dosing as per individual protocol	Ø