Index
POLICIES:

Disposition Policy Section
1. Criteria for Death or Withholding Resuscitation
2. Deceased Subjects
3. Discontinuation of Prehospital Resuscitation
4. Disposition (Patient Instructions)
5. DNR, MOST and Advanced Directives
6. Patient Without A Protocol
7. Physician on Scene
8. Deceased Subjects – No ROSC Transport

Documentation Policy Section
1. Documentation and Data Quality
2. Documentation of Vital Signs
3. Documentation of ePCR
4. Documentation of Multiple Providers

EMS Dispatch Policy Section
1. EMS Dispatch Center Time

Medical Policy Section
1. Drug Assisted Airway
2. Atypical Protocol Utilization and Medical Control Direction
3. Vidant Activation
4. Ketamine Pilot Project Policy

Pediatric Policy Section
1. Children with Special Healthcare Needs
2. Infant Abandonment

Service Metric Policy Section
1. Back In Service Time
2. Wheels Rolling Turn-Out Time
3. Readiness for Response
4. Non-Paramedic Transport
5. Non-Emergency Transports (NonE)
6. Equipment Failure
7. Emergency Medical Dispatch Response

Toxic Environmental Policy Section
1. Poison Control

Transport Policy Section
1. Air Transport
2. Safe Transport of Pediatric Patients
3. Transport and Care Plans
PROCEDURES:

Airway Section
ASP-1. Airway BIAD / Combitube (Removed)
ASP-2. Airway BIAD King
ASP-3. Airway BIAD LMA (Removed)
ASP-4. Airway BIAD i-Gel
ASP-5. Airway Cricothyrotomy
ASP-6. Airway Intubation Oral
ASP-7. Airway Intubation Nasal
ASP-8. Airway Video Laryngoscopy
ASP-9. Airway Drug Assisted Airway
ASP-10. Airway Tracheostomy Tube Change
ASP-11. Airway Endotracheal Tube Introducer
ASP-12. Airway Intubation Confirmation CO2 Detector (Removed)
ASP-13. Airway Foreign Body Obstruction

Assessment / Screening Section
ASP-1. Assessment Adult
ASP-2. Assessment Pain
ASP-3. Assessment Pediatric
ASP-4. Blood Glucose Analysis
ASP-5. Capnography
ASP-6. Pulse Oximetry
ASP-7. Reperfusion Checklist
ASP-8. Stroke Screen LA Prehospital
ASP-9. Temperature Management
ASP-10. Orthostatic VS

Cardiac Section
CSP-1. 12 Lead ECG
CSP-2. Cardioversion
CSP-3. Cardiac Pacing External Pacing
CSP-4. Cardiopulmonary Resuscitation
CSP-5. Defibrillation Automated
CSP-6. Defibrillation Manual
CSP-7. Defibrillation Dual Sequential

Parenteral Access Section
PAS-1. Arterial Access Blood Draw
PAS-2. Arterial Access Line Maintenance
PAS-3. Venous Access Blood Draw
PAS-4. Venous Access Central Line Maintenance
PAS-5. CNS Catheter Epidural Maintenance
PAS-6. CNS Catheter Intraventricular Catheter Maintenance
PAS-7. Venous Access Existing Catheters
PAS-8. Venous Access External Jugular Access
2019 Policy Procedure Protocol Index

PAS-9. Venous Access Extremity
PAS-10. Venous Access Femoral Line
PAS-11. Venous Access Intraosseous
PAS-12. Venous Access Swanz Ganz Maintenance

Respiratory Section
RSP-1. Airway Suctioning Advanced
RSP-2. Airway Suctioning Basic
RSP-3. Airway Nebulizer Inhalation Therapy
RSP-4. Airway NIPPV
RSP-5. Airway Respirator Operation
RSP-6. Airway Ventilator Operation

Universal Section
USP-1. Childbirth
USP-2. Decontamination
USP-3. Gastric Tube Insertion
USP-4. Injections
USP-5. Restraints Physical
USP-6. Urinary Catheterization

Wound Care / Trauma Section
WTP-1. Chest Decompression
WTP-2. Spinal Motion Immobilization
WTP-3. Splinting
WTP-4. Wound Care General
WTP-5. Wound Care Hemostatic Agent
WTP-6. Wound Care Conducted Electrical Weapon Probe Removal
WTP-7. Wound Care Tourniquet

PROTOCOLS:

Protocol Introduction PI (Black)
PI-1. Introduction
PI-2. Key to Protocol Utilization

Universal Protocols UP (Green 4)
UP-1. Universal Patient Care Protocol
UP-2. Triage
UP-3. Abdominal Pain / Vomiting and Diarrhea
UP-4. Altered Mental Status
UP-5. Back Pain
UP-6. Behavioral (rev 01/01/17 – Ketamine Pilot) Updated 2/5/19
UP-7. Dental
UP-8. Emergencies Involving Indwelling Central Lines
UP-9. Epistaxis
UP-10. Fever / Infection Control
2019 Policy Procedure Protocol Index

UP-11. Pain Control (rev. 01/16/19 – Ketamine Pilot) Updated 2/5/19
UP-12. Police Custody
UP-13. Seizure
UP-14 Suspected Stroke
UP-15. Suspected Sepsis
UP-16. Syncope

Airway Respiratory Section AR (Blue 7)
AR-1. Adult Airway
AR-2. Adult, Failed Airway
AR-3. Airway, Drug Assisted Intubation
AR-4. COPD / Asthma
AR-5. Pediatric Airway
 AR-6. Pediatric Failed Airway (Removed)
AR-7. Pediatric Respiratory Distress
AR-8 Post-intubation / BIAD Management
AR-9. Ventilator Emergencies
AR-10. Tracheostomy Tube Emergencies

Adult Cardiac Section AC (Blue 8)
AC-1. Asystole / Pulseless Electrical Activity
AC-2. Bradycardia; Pulse Present
AC-3. Cardiac Arrest
AC-4. Chest Pain: Cardiac and STEMI
AC-5. CHF / Pulmonary Edema
AC-6. Adult Tachycardia Narrow Complex (≤ 0.11 sec)
AC-7. Adult Tachycardia Wide Complex (≥ 0.12 sec)
AC-8. Ventricular Fibrillation Pulseless Ventricular Tachycardia
AC-9. Post Resuscitation
 AC-10. Targeted Temperature Management with ROSC (Removed)
AC-11. Adult Team Focused CPR
AC-12. On-scene Resuscitation / Termination of CPR

Adult Medical Section AM (Blue 9)
AM-1. Allergic Reaction / Anaphylaxis
AM-2. Diabetic; Adult
AM-3. Dialysis / Renal Failure
AM-4. Hypertension
AM-5. Hypotension / Shock
 AM-6. Stroke; Activase / t-PA Transfer (Removed)

Adult Obstetrical Section AO
AO-1. Childbirth / Labor
AO-2. Newly Born
AO-3. Obstetrical Emergency
2019 Policy Procedure Protocol Index

Trauma and Burn Section TB (Red 2)
TB-1. Blast Injury / Incident
TB-2. Chemical and Electrical Burn
TB-3. Crush Syndrome Trauma
TB-4. Extremity Trauma
TB-5. Head Trauma
TB-6. Multiple Trauma
TB-7. Radiation Incident
TB-8. Spinal Motion Restriction
TB-9. Thermal Burn
TB-10. Traumatic Arrest

Pediatric Cardiac Section PC (Purple Accent 3)
PC-1. Pediatric Asystole / PEA
PC-2. Pediatric Bradycardia
PC-3. Pediatric CHF / Pulmonary Edema
PC-4. Pediatric Pulseless Arrest
PC-5. Pediatric Tachycardia
PC-6. Pediatric Ventricular Fibrillation / Pulseless VT
PC-7. Pediatric Post Resuscitation

Pediatric Medical Section PM (Purple Accent Darker 50%)
PM-1. Pediatric Allergic Reaction
PM-2. Pediatric Diabetic
PM-3. Pediatric Hypotension / Shock

Toxin-Environmental Section TE (Orange 3)
TE-1. Bites and Envenomation
TE-2. Carbon Monoxide / Cyanide
TE-3. Drowning
TE-4. Hyperthermia
TE-5. Hypothermia / Frostbite
TE-6. Marine Envenomation / Injury
TE-7. Overdose / Toxic Ingestion
TE-8. WMD – Nerve Agent Protocol

Special Circumstances Section SC
SC-1. Ebola; Suspected

Special Operations Section SO
SO-1. Scene Rehabilitation: General
Criteria for Death / Withholding Resuscitation

Policy:

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

Indications:

- 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
- If arrest is traumatic in origin, go to TB-10 - Traumatic Arrest protocol.

Procedure:

Do not resuscitate any patient who meets the above criteria. If resuscitation efforts are in progress, consider discontinuing the resuscitation efforts (Paramedic Only).

Notify law enforcement of the patient’s death (or a patient’s physician if patient is in a medical facility with continual physician or nursing care during its hours of operation; e.g. hospital, nursing home, physician’s office).

Note:

If you are unsure whether the patient meets the above criteria, begin resuscitation and follow the appropriate protocol(s).
Policy:

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

Purpose:

The purpose of this policy is to:

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

Procedure:

1. Do not remove lines or tubes from unsuccessful cardiac arrests/codes unless directed below.
2. Notify the law enforcement agency with jurisdiction if applicable.
3. If subject was found deceased by EMS, the scene is turned over to law enforcement.
4. If EMS has attempted to resuscitate the patient and then terminated the resuscitative efforts, the EMS personnel should contact the family physician (medical cases) or medical examiner (traumatic cases or family physician unavailable) to provide information about the resuscitative efforts.
5. Transport arrangements should be made in concert with law enforcement and the family’s wishes.
6. If the deceased subject’s destination is other than the county morgue, any line(s) or tube(s) placed by EMS should be removed prior to transport.
7. Document the situation, name of Physician or Medical Examiner contacted, the agency providing transport of the deceased subject, and the destination on the patient care report form (PCR).
Policy:

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

Purpose:

The purpose of this policy is to:

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

Procedure:

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

   - Patient must be 18 years of age or older, or family of a minor is agreeable after consultation with the lead Paramedic
   - Adequate CPR has been administered.
   - Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, nasotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy.
   - IV or IO access has been achieved.
   - Rhythm appropriate medications and defibrillation have been administered according to protocol.
   - Persistent asystole or agonal rhythm is present and no reversible causes are identified after a minimum of 25 minutes of resuscitation; or
   - Failure to establish sustained palpable pulses or persistent/recurring ventricular fibrillation/tachycardia or lack of any continued neurological activity such as eye opening or motor responses.
   - All EMS paramedic personnel involved in the patient’s care agree that discontinuation of the resuscitation is appropriate

2. If all of the above criteria are not met and discontinuation of pre-hospital resuscitation is possibly indicated or desired, contact Medical Control.

3. The Deceased Subjects Policy should be followed.

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

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

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

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

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

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

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

- Patients are considered to be capable of refusing care if they do not endorse suicidal or homicidal ideation, are oriented to person, place and time (or to their baseline mental status in a nursing home), and can express understanding of the risks of refusal.

- The use of alcohol or other drugs should not be used solely as a criterion for rendering a person incapable of making a medical decision. Rather, the circumstances of the event should be taken into account. For example, the patient who has used alcohol or other drugs with a potential for head trauma and altered mental status will require transport based on implied consent whereas the substance-using patient in their home with no evidence of trauma who meets the capacity criteria listed above may be capable of making a medical decision.

- Patients treated for hypoglycemia under the altered mental status protocol do not require a refusal form.

Documentation:

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

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

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

Purpose:

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

Procedure:

1. When confronted with a cardiac arrest patient, the following conditions must be present in order to honor the DNR request and withhold CPR and ALS therapy:
   - Original North Carolina DNR form (yellow form - not a copy) – or – DNR box is checked in section A of the MOST form (pink form – not a copy). (NOTE: If in a medical facility, see the “Deceased Persons” procedure for additional guidance regarding other methods of documenting DNR status)
   - Form signed by physician, physician’s assistant, or nurse practitioner

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

3. When confronted with a seriously ill patient who is not in cardiac arrest and has a MOST form, the MOST form Section B shall be utilized as follows:
   - Full Scope of Treatment box is checked: Use all appropriate measures included in System Protocols to stabilize/resuscitate the patient
   - Limited Scope of Treatment box is checked: The maximum airway intervention is non-rebreather mask and airway suctioning. All appropriate IV medications may be utilized. No electrical therapies are to be provided.
   - Comfort Measures is checked: The maximum airway intervention is non-rebreather mask and airway suctioning. IV pain medications may be administered. Medical control may be contacted reference appropriate treatment.

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

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

6. Living wills or other documents indicating the patients desire to withhold CPR or other medicare may be honored only in consultation with the patient’s family.
Standards Policy: Disposition Section

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 County EMS System patient care protocol, is to be initiated by protocol.

2. When confronted with an emergency or situation that does not fit into an existing County EMS System 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.
Policy:

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

Purpose:

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

Procedure:

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

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

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

4. Orders received from an authorized (as determined by this policy) physician may be followed, even if they conflict with existing local protocols, provided the orders encompass skills and/or medications approved by both the County EMS System Medical Director and the State Medical Board for a provider’s credential level. Under no circumstances shall EMS personnel perform procedures or give medications that are outside their scope of practice and/or credential as per the County EMS System Standards Document (this document) and the North Carolina Medical Board.
Purpose: To establish a protocol to be utilized in instances when resuscitation was attempted and unsuccessful or an unsuspicious DOA leaves EMS in the presence of a dead body

Procedure:

1. **Patient’s physician does not agree to sign the death certificate & law enforcement agrees that the body can go directly to the Medical Examiner (ME).**

   EMS telephones the Medical Examiner’s (ME) office, which is open 8am-5pm, Monday - Friday and will answer the phone when the office is occupied. After-hours the phone number rolls over to the answering service. Ask for the ME to call EMS on scene. EMS explains the circumstances to the ME who answers the page. ME will agree that EMS can deliver the body directly to the morgue and will ask for an ETA. Once at the morgue the ME employee will ask EMS to help package the body into a body bag, and will take possession of the body. EMS shall document in the PCR narrative the name of the ME employee & time of transfer, as well as capture the ME employee’s signature in the “Hospital/Receiving Agent Signature” section.

2. **Patient’s physician agrees to sign the death certificate & law enforcement agrees that the body can be removed but the family cannot/does not have a funeral home to receive the body.**

   In these circumstances the ME agrees to have the morgue act as a storage facility and will receive the body unit proper arrangements are made by family. EMS telephones the ME’s office, which is open 8-5, Monday - Friday and will answer the phone when the office is occupied. After-hours the phone number rolls over to the answering service. Ask for the ME to call EMS on scene. EMS explains the circumstances to the ME who answers the page. ME will agree that EMS can deliver the body directly to the morgue and will ask for an ETA. Once at the morgue the ME employee will ask EMS to help package the body into a body bag, and will take possession of the body. EMS shall document in the PCR the name of the ME employee & time of transfer, as well as capture the ME employee’s signature in the “Hospital/Receiving Agent Signature” section.

* The ME may at their discretion send a contracted transport company to pick up the deceased. The decedent will be signed over to the transport company.

** Contact Communications Center for ME phone number, if needed.
Policy:

The complete EMS documentation associated with an EMS event’s 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 Continuum 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)

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.
Policy:

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

Purpose:

To ensure:
- Objective evaluation of every patient’s general clinical status
- Documentation of a complete set of vital signs

Procedure:

1. An initial complete set of vital signs includes:
   - Pulse rate and Respiratory rate
   - Systolic AND diastolic blood pressure (BP). Cap refill may be substituted in children < 3.
   - Pain / severity (when appropriate to patient complaint), and GCS for Injured Patients

2. When no ALS care is provided, palpated BP’s are acceptable for REPEAT vital signs.

3. Based on patient condition, complaint, and protocol used, vital signs may also include: Pulse Oximetry, Temperature, End Tidal CO2, Breath Sounds, Level of Response

4. If the patient refuses evaluation, an assessment of capacity and a patient disposition form must also be completed. In addition, providers should record any vital signs that the patient or situation allows (e.g. a respiratory rate may be obtained by observation alone), and include an explanation of the clinical situation and refusal in the PCR narrative.

5. When any components of vital signs were obtained using the cardiac monitor, the data should be exported electronically to the PCR. Where values are inconsistent with manually obtained values, values may be appropriately edited to reflect the manually obtained values.

6. EMT personnel may attend patients who have the four-lead cardiac monitor attached for the purpose of collecting vital signs. However, cardiac rhythm interpretation is only within scope of practice for AEMT and above. Patients who require repeat or continuous 12 lead monitoring should be attended by a Paramedic.

6. Document situations that preclude the evaluation of a complete set of vital signs. Generally, children > 3 years of age should have a BP measured, and cap refill measured for < 3 years of age. For young children, the need for BP measurement should be determined on a case-by-case basis considering the provider’s rapport with the child and the child’s clinical condition. Blood pressure measurement is not required for all patients, but should be measured if possible, especially in critically ill patients in whom blood pressure measurement may guide treatment decisions.

7. Record the time vital signs were obtained; any abnormal vital sign should be repeated and monitored closely.
Standards Policy: Documentation Section

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

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

The purpose of this policy is to:

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

Policy:

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

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

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

   a. The primary transport unit will complete a full PCR to include patient name, demographics, narrative, all procedures and care provided by all providers on the call.

   b. If there is any dispute over documentation, the first attempt to reconcile will be accomplished via conversation between the crewmembers and the primary provider.

   c. Corrections will be placed in an addendum. If the dispute cannot be resolved in this manner, the Division of EMS office shall be contacted for mediation with the Medical Director or his designee.
Standards Policy: Dispatch Section

EMS Dispatch Center Time

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

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

Purpose:
The purpose of this policy is to:

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

Procedure:
The following procedures shall be implemented to assure policy compliance:

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

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

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

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

5. EMS Units may, at their discretion, request for a First Responder on Non-First Responder calls in situations where additional resources are required such as manpower, extreme response time of the EMS Unit, need for forcible entry, etc.
6. EMS Units dispatched with a cold (no lights and sirens) response, will not upgrade to a hot (with lights and sirens) response **UNLESS:** • Public Safety personnel on-scene requests a hot (with lights and sirens) response. • Communications Center determines that the patient’s condition has changed, and requests you to upgrade to a hot (with lights and sirens) response.

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

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

9. All EMS Dispatch Delays will be reviewed regularly within the EMS System Peer Review Committee.
Drug Assisted Intubation (DAI) requires an EMS System or Agency to follow these guidelines to ensure that this invasive procedure is performed in a safe and effective manner to benefit the citizens and guest of North Carolina.

**Purpose:**

The purpose of this policy is to:

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

**Procedure:**

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

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

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

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

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

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

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

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

### Regional Office Addresses

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

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

- **Eastern Regional Office**
  - 3802 NC Hwy 58 North
  - Kinston, NC 27504
  - Telephone: 252-208-2456
  - Fax: 252-208-2027

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

The purpose of this policy is to:

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

Definition of a Patient:

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

Policy:

1. Clinical encounters requiring use of this protocol may be divided into two types:

   a. those whose clinical situation is covered by existing protocol but who are presenting an operational/administrative challenge (e.g., patient refusals) and require non-medical control guidance, Atypical Protocol Utilization (APU), or
   
   b. those whose clinical situation is not covered by existing protocol (e.g., modification of drug dosage, termination of resuscitation not covered in current policy) and thus require medical control orders via on-line medical direction (OLM).

2. Patients (b) requiring OLM shall contact medical control via as described below. The provider requesting OLM must be at the scene with the patient.

3. Request OLM from a physician at the most appropriate receiving hospital via radio. Only physicians may provide medical direction. (Other staff, including PA’s and nurses, may not provide online medical direction.

4. Document in the electronic patient care report, the name of the individual and MD number (if applicable) providing OLM in the narrative section.

Automatic Notification of the Medical Director

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

See next page
Automatic Notification of the Medical Director

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

These events that require this notification include:

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

Other patient care concerns, potential adverse events, follow-up questions, or clinical issues outside of the above seven urgent issues may be communicated without HIPPA information via email, text or phone call to the Medical Director, EMS Specialist or the Division of EMS Office during regular business hours.
Ketamine Usage – Ketamine Pilot Project

Policy:
Ketamine has been approved to be administered in Pitt County under a pilot project endorsed by NCOEMS and the NC Medical Board.

Purpose:
To describe the steps needed to administer Ketamine in Pitt County and necessary documentation

Procedure:

1. Administer Ketamine per approved county protocols UP 6 and UP11. Ketamine may not be administered for any other indications or in any other dosage regardless of online medical control.
2. “Pain Control” protocol use is restricted to patients that do not fit in on Pediatric length-based Resuscitation Tape or ≤ 65 years of age.
   a. The only route of administration for pain control is intravenous.
   b. Ketamine must be diluted in 50-250 ml of NS and infuse over 10 minutes.
3. “Behavioral” protocol use is restricted to patients that do not fit in on Pediatric length-based Resuscitation Tape.
   a. The only route of administration for Excited Delirium is intramuscular
4. Administration requires the use of cardiac monitor, pulse oximeter, continuous ETCO2 monitoring.
5. Complete “NC EMS Ketamine Evaluation Form” as soon as transport is completed.
   a. It is the responsibility of the lead Paramedic to complete the form.
   b. Form must be signed by the receiving physician or health care provider
6. The form MUST be turned in into the Office of the Medical Director within 24 hours. (Scanned & emailed to ECUEMS@ecu.edu)
7. The Office of the Medical Director will review all cases of Ketamine administration and incorporate findings within the system Peer Review process.
8. A “NC EMS Ketamine Hospital Evaluation form” will be completed for each case where Ketamine has been administered.

ANY of the following adverse reactions after Ketamine administration MUST be reported to the Office of the Medical Director within 24 hours of event:

- Cardiac Arrest
- Respiratory depression requiring advance airway placement
- Laryngospasm
- Agitation/Emergence reaction that results in further injury to patient and/or provider

Other patient care concerns, potential adverse events, follow-up questions, or clinical issues beyond the above adverse reactions may be reported via email or calling a member of the Medical Director’s Office.

The Office of the Medical Director will notify the above adverse reactions to NCOEMS within 48 hours.
Policy:

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

Purpose:

The purpose of this policy is to:

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

Procedure:

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

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

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

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

Child with Special Health Care Needs

Policy:

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

Purpose:

The purpose of this policy is to:

- Provide quality patient care and EMS services to children with special health care needs.
- Understand the need to communicate with the parents and caregivers regarding healthcare needs and devices that EMS may not have experience with.
- Promote, request, and use the “Kidbase” form that catalogs the health care problems, needs, and issues of each child with a special healthcare need.

Procedure:

- Caregivers who call 911 to report an emergency involving a child with special health care needs may report that the emergency involves a special needs child.
- 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.
- 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.
Standards Policy: Pediatric Section

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 protocol.
7. Assure infant is secured in appropriate child restraint device for transport.
8. Document protocols, procedures, and agency notifications in the PCR.
Standards Policy: Service Metric Section

EMS Back in Service Time

Policy:

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

Definition:

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

Purpose:

The purpose of this policy is to:

- Assure that the care of each EMS patient transported to a medical facility is transferred to the medical facility staff in a timely manner.
- Assure that the EMS unit is cleaned, disinfected, restocked, and available for the next EMS event in a timely manner.
- Assure that the EMS patient care report (PCR) is completed and left with the receiving medical facility (This requirement may be waived under emergency or low system resource conditions when approved by the facility at the request of a System chief officer. Where this occurs it should be documented in the subsequent patient care report).
- Provide quality EMS service and patient care to the county’s citizens. Provide a means for continuous evaluation to assure policy compliance.

Procedure:

The following procedures shall be implemented to assure policy compliance:

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

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

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

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

5. All EMS Turn-Around Delays will be reviewed regularly within the EMS System Peer Review Committee.
Standards Policy: Service Metric Policy Section

EMS Wheels Rolling (Turn-Out Time)

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

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

Purpose:
The purpose of this policy is to:
- Provide a timely and reliable response for all EMS events within the EMS System.
- Provide quality EMS service and patient care to the county’s citizens.
- Provide a means for continuous evaluation to assure policy compliance.

Procedure:
The following procedures shall be implemented to assure policy compliance:

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

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

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

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

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

6. All EMS Response Delays will be reviewed regularly within the EMS System Peer Review Committee.
Standards Policy: Service Metric Section

Readiness for Response

Purpose:
To ensure the provision of a safe and well-organized EMS response by:
1. Selection and dispatch of the closest appropriate EMS resource(s)
2. Establishing the minimum amount of rest an EMS provider must have to promote health, safety in vehicle operations, and safety in patient care.

Policy:

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

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

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

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

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

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

SUGGESTED:

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

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

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

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

   Ex 1. A provider works a 24-hour shift that ends at 0700. He/She then wishes to work overtime from 0900 to 2100 and then return to the 24-hour shift at 0700 the next day. This could be scheduled, as there is more than an 8-hour period of continuous rest from the conclusion of the overtime shift and beginning of the next shift.

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

In general, scheduling variances from this suggested policy are at the sole discretion of the employer.

Suggested consecutive work hours for EMS should act as a guide for staffing and excessive work hours should not be encouraged. Employers are responsible for scheduling and the outcomes of excessive consecutive work hours. There are extreme circumstances (such as an invocation of the EMS Emergency Rule) or a declared “State of Emergency,” but these should be specific, time-limited exceptions.

The Medical Director and Assistant Medical Director’s, along with the Division of EMS will not be responsible for work related, operational scheduling and personnel issues that do not involve patient care.
Standards Policy: Service Metric Section

Non-Paramedic Transport of Patients

Policy:

(This policy applies only to Paramedic level systems)

- A Paramedic resource will be dispatched to every request for 911 EMS service.
- For the purposes of this policy, “Paramedic” refers to a County EMS System credentialed Paramedic with no current restrictions on their clinical practice.
- At least one Paramedic will be on-board the ambulance during transport of all patients unless natural disaster or other exceptions as approved by policy or the Medical Director.
- The provider with the highest level of County EMS System Credential on scene shall conduct a detailed physical assessment and subjective interview with the patient to determine his or her chief complaint and level of distress. If this provider determines that the patient is stable and ALL patient care needs can be managed by a provider with a lower level credential, patient care may be transferred to a technician of lower certification for care while in en-route to the hospital. All personnel are encouraged to participate in patient care while on-scene, regardless of who “attends” with the patient while en-route to the hospital. The determination of who attends should be based upon the patient’s immediate treatment needs and any reasonably anticipated treatment needs while en-route to the hospital. The highest-credentialed provider on scene retains the right to make the decision to personally attend to any patient transported based on his or her impression of the patient’s clinical condition or needs. The paramedic performing the paramedic assessment must document the findings of that assessment.
- Other documentation may be completed by the transporting provider. As with all documentation, both all providers are responsible for the content of the report.

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

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

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

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

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

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

Non-Emergency Transports

Policy:

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

Purpose:

The purpose of this policy is to:

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

Procedure:

1. Vital signs must be taken on all patients prior to transport.
2. Any patient experiencing the following symptoms must be referred to an ALS unit:
   a. Chest pain present
   b. Respiratory distress present
   c. Altered mental status (if different than baseline)
   d. Fall
   e. Abdominal Pain with hypotension
   f. Headache with abnormal vital signs
   g. Abnormal Vital Signs (age adjusted) RR <8, RR >20, HR <50, HR >100, BPs <90, BPs >180, Temp >100.4F, FSBS >400, 02 sat RA <95%, EtCO2 less than 30 or >50.
3. The transporting EMT should ensure that all appropriate documentation accompanies the patient.
4. During transport the EMT must follow all County medical policies, procedures and protocols.
5. If the patient deteriorates, the transferring facility should be notified via radio or cell phone and an appropriate ALS unit must be dispatched to rendezvous with the transporting unit.
6. If the ETA of responding ALS unit is greater than the BLS unit ETA to the receiving facility, the BLS unit should continue to transport except in the case of Cardiac Arrest.
7. Vital signs (BP, pulse, respiratory rate, O2 saturation) must be taken every 5 minutes and documented.
8. A County supervisor must be contacted if any concerns about a transport exist.

Important:

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

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

Procedure:

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

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

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

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

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

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

Emergency Medical Dispatch Response

**Purpose:** *(when EMD is provided by or for the system)*

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

**Policy:**

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

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

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

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

**Procedures:**

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

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

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

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

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

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

An ambulance may by-pass what appears to be a lower priority situation and continue to the originally assigned call. The communications center should be notified so that another EMS resource may be assigned to the lower priority situation.
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 911 center and communicate these recommendations.
4. If the patient is determined to need EMS transport, the poison center Specialist will contact the receiving hospital and provide information regarding the poisoning, including treatment recommendations. EMS may contact medical control for further instructions or to discuss transport options.
5. If the patient is determined not to require EMS transport, personnel will give the phone number of the patient/caller to the Poison Center Specialist. The Specialist will initiate a minimum of one follow-up call to the patient/caller to determine the status of patient.
6. Minimal information that should be obtained from the patient for the state poison center includes:
   - Name and age of patient
   - Time of exposure
   - Signs and symptoms
   - Substance(s) involved
   - Any treatment given
7. Minimal information which should be provided to the State Poison Center for mass poisonings, including biochemical terrorism and HazMat, includes:
   - Substance(s) involved
   - Time of exposure
   - Signs and symptoms
   - Any treatment given
### Indications:

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

1. Patient meets criteria for transport to a specialized destination center according to the System Destination Plan.

2. The ground transport time is greater than 45 minutes.

3. The patient is **not** in cardiac arrest.

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

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

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

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

### Procedure:

1. The highest certified technician on the crew (usually the Paramedic or AEMT) will determine that a helicopter may be needed for the patient.

2. That technician will request that the 911 center contact a helicopter service for a scene transport. The 911 center will determine which air ambulance is nearest and utilize this resource.

3. A safe landing zone should be established.

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

5. Under NO circumstances will transport of a patient be delayed to use a helicopter.
Policy:

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

Purpose:

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

Procedure:

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

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

Procedure:

All sick or injured persons requesting transport who do not express a preference shall be transported to the closest most appropriate emergency department.

(In Pitt County, Vidant Medical Center)

1. The patient may request to be transported to an appropriate hospital's emergency department contiguous to the county boundaries. Transport to hospitals beyond the contiguous boundaries are only with MC contact and approval.

2. All trauma patients with significant mechanism or history for multiple system trauma will be transported as soon as possible. The scene time should be 10 minutes or less.

3. All acute Stroke and acute ST-Elevation Myocardial Infarction patients will be transported as soon as possible. The scene time should be 10 minutes or less for acute Stroke patients. Other Medical patients will be transported in the most efficient manner possible considering the medical condition. Advanced life support therapy should be provided at the scene if it would positively impact patient care. Justification for scene times greater than 20 minutes should be documented.

4. Patients whose conditions are covered by a formal Destination Plan (Pediatric, 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.

5. No patients will be transported in initial response non-transport vehicles unless an MCI.

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

7. Alternative destinations (deviation from the Destination Plan) may ONLY be authorized by the System Medical Director, Assistant Medical Director or their designee. On-line Medical Control may not authorize any deviation unless in unusual and extreme circumstances.
Procedures
Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be unconscious.

Procedure:

1. Preoxygenate the patient.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Grasp the patient’s tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
6. Inflated the pilot balloon with 45-90 ml of air depending on the size of the device used.
7. Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
10. MUST Confirm tube placement using Capnography upon insertion.
11. It is required that all E-911 responders MUST continuously monitor a placed advanced airway with Capnography and Pulse Oximetry.
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 local EMS System. Assessment should include direct observation at least once per certification cycle.
Clinical Indications for Blind Insertion Airway Device (BIAD) Use:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Do not leave in place for ≥ 4 hours.
- This airway does not prevent aspiration of stomach contents.

Clinical Contraindications:

- Deforming Facial Trauma
- Pulmonary Fibrosis
- Morbid Obesity

Procedure:

1. Pre-Oxygenate the patient with 100% Oxygen
2. Select the appropriate tube size for the patient.
3. Remove the device from the protective cradle and carefully for any signs of damage.
4. Place water-soluble jelly in the middle of the protective cradle.
5. Lubricate the back of the i-Gel on the non-inflatable cuff and ensure no lubricant is in the cuff. (Lubricate each side and the tip of the non-inflatable cuff).
6. Grasp along the integral bite block and face the cuff outlet toward the patient’s chin.
7. Insert the i-Gel into the mouth in the direction of the hard palate.
8. Glide the device down and back along the hard palate with continuous, gentle pressure, until resistance is met. Tape to secure or use a commercial tube holder.
9. Connect the i-Gel to an BVM and assess for breath sounds and air entry.
10. MUST confirm tube placement using Capnography upon insertion.
11. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
12. It is required that all E-911 responders MUST continuously monitor a placed advanced airway with Capnography and Pulse Oximetry.
13. Re-verify I-Gel placement after every move and upon arrival in the ED
14. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation once per certification cycle.
Standards Procedure (Skill) Airway Section

Airway: Cricothyrotomy-Surgical

Clinical Indications:

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient ≥ 12 years old.

Procedure:

1. Have suction and supplies available and ready.
2. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Prep the area with an antiseptic swab (Betadine).
4. Attach a 5-cc syringe to an 18G - 1 & 1/2-inch needle.
5. Insert the needle (with syringe attached) perpendicularly through the cricothyroid membrane with the needle directed posteriorly.
6. During needle insertion, gentle aspiration should be applied to the syringe. Rapid aspiration of air into the syringe indicates successful entry into the trachea. Do not advance the needle any further. Attach forceps and remove syringe.
7. With the needle remaining in place, make a 1-inch vertical incision through the skin and subcutaneous tissue above and below the needle using a scalpel. Using blunt dissection technique, expose the cricothyroid membrane. This is a bloody procedure. The needle should act as a guide to the cricothyroid membrane.
8. With the needle still in place, make a horizontal stabbing incision approx. 1/2 inch through the membrane on each side of the needle. Remove the needle.
9. Using (skin hook, tracheal hook, or gloved finger) to maintain surgical opening, insert the cuffed tube into the trachea. (Cric tube from the kit or a #6 endotracheal tube is usually sufficient).
10. Inflate the cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube.
11. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, Capnography, etc.)
12. Secure the tube.
13. Apply and maintain continuous Capnography and record readings on scene, en-route to the hospital, and arrival at the hospital.
14. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient’s teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement and after each movement of the patient.
15. Consider placing an NG or OG tube to clear stomach contents after the airway is secured.
16. It is required that all E-911 responders MUST continuously monitor a placed advanced airway with Capnography and Pulse Oximetry.
17. An Airway Evaluation Form MUST be completed with all Cricothyrotomy procedures.

Certification Requirements:

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

Airway: Intubation Oral Tracheal

Clinical Indications:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.
- A component of Drug Assisted Intubation

Procedure:

1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube (and stylette, if used), have suction ready.
3. Using laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).
4. Limit each intubation attempt to 30 seconds with BVM between attempts.
5. Visualize tube passing through vocal cords.
6. **Confirm and document tube placement using Capnography.**
7. Inflate the cuff with 3-to10 cc of air; secure the tube to the patient’s face.
8. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with bag-valve mask.
9. Consider using a Blind Insertion Airway Device if intubation efforts are unsuccessful.
10. If Available apply end tidal carbon dioxide monitor (Capnography) and record readings on scene, en-route to the hospital, and at the hospital.
11. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient’s teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
12. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
13. **It is required that all E-911 responders MUST continuously monitor a placed advanced airway with Capnography and Pulse Oximetry.**
14. **An Airway Evaluation Form MUST be completed with all intubations**

Certification Requirements:

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

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

Procedure:

1. Premedicate the patient with nasal spray.
2. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage.
3. Preoxygenate the patient. Lubricate the tube. The use of a BAAM device is recommended.
4. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
5. Continue to pass the tube listening for air movement and looking for to and fro vapor condensation in the tube. As the tube approaches the larynx, the air movement gets louder.
6. Gently and evenly advance the tube through the glottic opening on the inspiration. This facilitates passage of the tube and reduces the incidence of trauma to the vocal cords.
7. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.
8. Auscultate for bilaterally equal breath sounds and absence of sounds of the epigastrium. Observe for symmetrical chest expansion. The 15mm adapter usually rests close to the nostril with proper positioning.
9. Inflate the cuff with 5-10 cc of air.
11. Secure the tube.
12. Reassess airway and breath sounds after transfer to the stretcher and during transport. These tubes are easily dislodged and require close monitoring and frequent reassessment.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).
14. It is required that all E-911 responders MUST continuously monitor a placed advanced airway with Capnography and Pulse Oximetry.
15. An Airway Evaluation Form MUST be completed with all intubations.

Certification Requirements:

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

Airway: Video Laryngoscopy Glidescope

Clinical Indications:
- Patient requires advanced airway.

Procedure:
1. Preoxygenate the patient and use in conjunction with procedure ASP - 6.
2. Select the appropriate ETT size and GlideRite Rigid Stylette for the patient. Ready suction.
3. Power on GildeScope and allow 30 seconds for anti-fog mechanism to warm.
4. Using GlideScope visualize the vocal cords and facilitate the intubation:
   - **In the mouth:** looking directly into the patient’s mouth and with the VL blade in left hand, introduce GlideScope VL into the midline of the oral pharynx. Look into the mouth to prevent soft tissue damage.
   - **At the screen:** With GlideScope VL inserted, look to monitor to identify the epiglottis, then manipulate the scope to obtain the best glottic view.
   - **In the mouth:** Looking directly into the patient’s mouth, not at screen, carefully guide the distal tip of the ETT into position near the tip of the GlideScope VL. Insert the ETT behind or adjacent to the VL blade.
   - **At the screen:** Look to the monitor to complete tracheal intubation. Gently rotate or angle the ETT to redirect as needed. Avoid excessive lifting or pushing of the glottis with the VL blade. Reducing the elevation applied to the VL blade may facilitate intubation.
   - **Advance the ETT** while simultaneously withdrawing the stylette with the thumb. Withdraw the stylette approximately 5 cm (2 inches). Do not insert the stylette into the larynx during intubation – this will prevent passing into the glottis.

   **Secure and verify the proper ETT placement.**

5. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
6. Secure the ETT tube with tape or mechanical tube holder.
7. **Confirm tube placement using Capnography.**
8. **Airway MUST be monitored continuously through Capnography and Pulse Oximetry.**
9. An Airway Evaluation Form MUST be completed.

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.
Clinical Indications:

Only for approved systems
- Need for advanced airway control in a patient who has a gag reflex or trismus (jaw clinching)
- Failure to protect the airway. Unable to ventilate and / or oxygenate. Impending airway compromise
- A minimum of 2 EMT-Paramedics on scene able to participate in patient care
- This protocol is only for use in patients with patients longer than a Length-based Resuscitation Tape except in agencies utilizing Ketamine for pediatric airway management with direct online medical control via system medical director or assistant medical director.

Clinical Contraindications:

- Refer to drug list for contraindications regarding use of Succinylcholine and Rocuronium.

Procedure:

1. Perform focused neurological exam
2. Evaluate for difficult airway (LEMON)-see appendix
3. Prepare equipment (intubation kit, BVM, suction, DAI medications, BIAD, Cricothyrotomy kit, waveform capnography, other airway adjuncts as available)
4. Pre-oxygenate patient with 100% oxygen via NRB mask or BVM. Apneic oxygenation: May continue high-flow oxygen via NC during entire procedure
5. Monitor oxygen saturation with pulse oximetry and heart rhythm with ECG
6. Ensure functioning IV / IO access. Two (2) IV sites are preferable
8. In-line c-spine stabilization by second caregiver (in setting of trauma)
9. Administer Etomidate or Ketamine by rapid IV push
10. Administer Succinylcholine or Rocuronium, await fasciculation and jaw relaxation
11. Perform external laryngeal manipulation to improve view during laryngoscopy with the right hand.
12. Intubate trachea or place BIAD if intubation unsuccessful or felt to be unsuccessful during procedure.
13. Verify ET placement through auscultation, Capnography, and Pulse Oximetry
14. May repeat Succinylcholine or Rocuronium if inadequate relaxation
15. Release cricoid pressure (if utilized) and secure tube
16. Continuous Capnography and Pulse Oximetry is required for DAI. Pre-intubation, minimal during intubation, and post-intubation readings must be recorded in the PCR.
17. Re-verify tube placement after every move and upon arrival in the ED
18. Document ETT or BIAD size, time, result (success), and placement location by the centimeter marks either at the patient’s teeth or lips on/with the patient care report (PCR). Document all devices/methods used to confirm initial tube placement initially and with patient movement.
19. Consider placing a gastric tube to clear stomach contents after the airway is secured.
20. Completion of the Airway Evaluation Form is required including a signature from the receiving physician at the Emergency Department confirming proper tube placement.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.
Standards Procedure (Skill) Airway Section
Airway: Tracheostomy Tube Change

Clinical Indications:

- Presence of Tracheostomy site.
- Urgent or emergent indication to change the tube, such as obstruction that will not clear with suction, dislodgement, or inability to oxygenate/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 difficulty placing the tube, re-attempt procedure with the smaller tube.
10. If difficulty is still encountered, use standard airway procedures such as oral bag-valve mask or endotracheal intubation (as per protocol). More difficulty with tube changing can be anticipated for tracheostomy sites that are immature – i.e., less than two weeks old. Great caution should be exercised in attempts to change immature tracheotomy sites.
11. Document procedure, confirmation, patient response, and any complications in the PCR

Certification Requirements:

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

Airway: Endotracheal Tube Introducer (Bougie)

Clinical Indications:
- Patients meet clinical indications for oral intubation
- Initial intubation attempt(s) unsuccessful
- Predicted difficult intubation

Contraindications:
- Three attempts at orotracheal intubation (utilize failed airway protocol)
- Age less than eight (8) or ETT size less than 6.5 mm

Procedure:
1. Prepare, position and oxygenate the patient with 100% oxygen;
2. Select proper ET tube without stylet, test cuff and prepare suction;
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal 1/2 of the Endotracheal Tube Introducer (Bougie) (note: Failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT);
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick's/BURP as needed;
5. Introduce the Bougie with curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized;
6. Once inserted, gently advance the Bougie until you meet resistance or “hold-up” (if you do not meet resistance you have a probable esophageal intubation and insertion should be re-attempted or the failed airway protocol implemented as indicated);
7. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie;
8. Gently advance the Bougie and loaded ET tube until you have hold-up again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie;
9. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth;
10. If you are unable to advance the ETT into the trachea and the Bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct laryngoscopy while advancing the ETT (this will require an assistant to maintain the position of the Bougie and, if so desired, advance the ETT);
11. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie;
12. Confirm tracheal placement according to the intubation protocol, inflate the cuff with 3 to 10 cc of air, auscultate for equal breath sounds and reposition accordingly;
13. When final position is determined secure the ET tube, reassess breath sounds, apply Capnography, and record and monitor readings to assure continued tracheal intubation.

Certification Requirements:
- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.
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, AEMT and Paramedic level professionals should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magill forceps.
8. Document the methods used and result of these procedures in the patient care report (PCR).

Certification Requirements:

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

Airway: Cricothyrotomy-QuickTrach

Clinical Indications:

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient > 12 years old.

Procedure:

1. Have suction and supplies available and ready.
2. Hyperextend the head of the patient and locate the cricothyroid membrane by palpation of the depression between the thyroid and cricoid cartilage. Stabilize this point with index finger and thumb for puncture.
3. Prep the area with an antiseptic swab (Betadine).
4. Puncture the cricothyroid membrane in a $90^\circ$ angle. Due to the sharp and conical needle tip, a prior incision is not necessary. The opening of the trachea is obtained by dilation which reduces the risk of bleeding.
5. Insert the Quicktrach in a $45^\circ$ angle further towards the trachea up to the stopper. The stopper helps to prevent the needle from being inserted too deep, helping to avoid a possible perforation of the rear tracheal wall.
6. Aspirate air with the syringe to determine the position of the cannula. If this is possible, the needle tip is in the trachea. Should aspiration of air be impossible because of an obese neck, then remove the stopper and carefully advance the cannula with the metal needle until it is possible to aspirate air. Proceed according to the instructions (figure 4).
7. Remove the stopper from the cannula.
8. Advance the plastic cannula along the needle until the flange rests on the neck. The metal needle serves as a guide and must not be inserted further. Now the metal needle can be removed.
9. Secure the plastic cannula with the foam necktape. Ventilate the patient directly via the 15mm connector or via the included connecting tube.
10. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, capnography, etc.) Esophageal bulb devices are not accurate with this procedure.
11. Apply and maintain continuous Capnography and record readings on scene, en-route to the hospital, and arrival at the hospital.
12. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient’s teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement and after each movement of the patient.
13. Consider placing an NG or OG tube to clear stomach contents after the airway is secured.
14. The airway MUST be monitored continuously through Capnography and Pulse Oximetry.
15. An Airway Evaluation Form must be completed with all Cricothyrotomy procedures.

Certification Requirements:

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

1. Insert the needle at a 90° angle.
2. Insert the needle at a 45° angle.

Thyroid Cartilage
Cricothyroid Membrane
Cricoid Cartilage

4. Insert the cannula.

5. Connect to oxygen source.
Clinical Indications:

- Any patient requesting a medical evaluation that is too large to be measured with a Length-based Resuscitation Tape.

Procedure:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
2. Assess need for additional resources.
3. Initial assessment includes a general impression as well as the status of a patient’s airway, breathing, and circulation.
4. Assess mental status (e.g., AVPU) and disability (e.g., GCS).
5. Control major hemorrhage and assess overall priority of patient.
6. Perform a focused history and physical based on patient’s chief complaint.
7. Assess need for critical interventions.
8. Complete critical interventions and perform a complete secondary exam to include a baseline set of vital signs as directed by protocol.
9. Maintain an on-going assessment throughout transport; to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions.
10. Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.

Certification Requirements:

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

Definitions:
- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

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

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.
Clinical Indications:

- Any child that can be measured with a Length-based Resuscitation Tape.

Procedure:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction
2. Assess patient using the pediatric triangle of ABCs:
   - Airway and appearance: speech/cry, muscle tone, inter-activeness, look/gaze, movement of extremities
   - Work of breathing: absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning
   - Circulation to skin: pallor, mottling, cyanosis
3. Establish spinal immobilization if suspicion of spinal injury
4. Establish responsiveness appropriate for age (AVPU, GCS, etc.)
5. Color code using Broselow-Luten tape
6. Assess disability (pulse, motor function, sensory function, papillary reaction)
7. Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.
8. Record vital signs (BP > 3 years of age, cap refill < 3 years of age)
9. Include Immunizations, Allergies, Medications, Past Medical History, last meal, and events leading up to injury or illness where appropriate.
10. Treat chief complaint as per protocol

Certification Requirements:

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

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

Procedure:

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

Certification Requirements:

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

- Capnography **MUST** be used with the use of all invasive airway procedures including endotracheal, nasotracheal, cricothyrotomy, or Blind Insertion Airway Devices (BIAD).
- Capnography should also be used when possible with CPAP.

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note CO₂ level and waveform changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of CO₂ detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR) and the Airway Evaluation Form.

Certification Requirements:

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

- Patients with suspected hypoxemia.

Procedure:

1. Apply probe to patient’s finger or any other digit as recommended by the device manufacturer.
2. Allow machine to register saturation level.
3. Record time and initial saturation percent on room air if possible on/with the patient care report (PCR).
4. Verify pulse rate on machine with actual pulse of the patient.
5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
7. In general, normal saturation is 97-99%. Below 94%, suspect a respiratory compromise.
8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain. Supplemental oxygen is not required if the oxyhemoglobin saturation is >= 94%, unless there are obvious signs of heart failure, dyspneic, or hypoxic to maintain to 94%.
10. Factors which may reduce the reliability of the pulse oximetry reading include but are not limited to:
   - Poor peripheral circulation (blood volume, hypotension, hypothermia)
   - Excessive pulse oximeter sensor motion
   - Fingernail polish (may be removed with acetone pad)
   - Carbon monoxide bound to hemoglobin
   - Irregular heart rhythms (atrial fibrillation, SVT, etc.)
   - Jaundice
   - Placement of BP cuff on same extremity as pulse ox probe.

Certification Requirements:

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

Reperfusion Checklist

Clinical Indications:

Rapid evaluation of a patient with suspected acute stroke and/or acute myocardial infarction (STEMI) to:

- Determine eligibility and potential benefit from fibrinolysis.
- Rapid identification of patients who are not eligible for fibrinolysis and will require interventional therapy.

Procedure:

1. Follow the appropriate protocol for the patient’s complaint to assess and identify an acute condition which could potentially benefit from fibrinolysis. If a positive finding is noted on one of the following assessments, proceed to step 2.
   - Perform a 12-lead ECG to identify an acute ST elevation myocardial infarction (STEMI).
   - Perform the Los Angeles Pre-hospital Stroke Screen to identify an acute stroke.

2. Complete the Reperfusion Check Sheet to identify any potential contraindications to fibrinolysis. (See Appendix)
   - Systolic Blood Pressure greater than 180 mm Hg
   - Diastolic Blood Pressure greater than 110 mm Hg
   - Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
   - History of structural Central Nervous System disease (age >= 18, history of aneurysm or AV-malformation, tumors, masses, hemorrhage, etc.)
   - Significant closed head or facial trauma within the previous 3 months
   - Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
   - Bleeding or clotting problem or on blood thinners
   - CPR performed greater than 10 minutes
   - Currently Pregnant
   - Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.

3. Identify if the patient is currently in heart failure or cardiogenic shock. For these patients, a percutaneous coronary intervention is more effective.
   - Presence of pulmonary edema (rales greater than halfway up lung fields)
   - Systemic hypoperfusion (cool and clammy)

4. If any contraindication is noted using the check list and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligible patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to an specialty center capable of interventional care within the therapeutic window of time.

5. Record all findings in the Patient Care Report (PCR).

Certification Requirements:

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

Procedure:

- Scores equal to or above 1 should have a STROKE ALERT called into communications as soon as the screen is completed with an ETA to the most appropriate facility designated by the Destination Plan.
- Document the Stroke activation time on your ePCR in the data field.
- Attempt to obtain the following but do not delay transport: (Document reason if unsuccessful)
  1. Blood Glucose
  2. 12-lead ECG
  3. 20ga IV (or larger) in the Right antecubital fossa (AC) to assist with medication delivery in the CT scanner
  4. Weigh the patient upon arrival - if the patient destination is Vidant Medical Center

- R.A.C.E. is based on an abbreviated version of the NIHSS, the “gold standard” for evaluating stroke victims.
- The maximum score is 9 (not 11) because the evaluation is done on the left or right side NOT both.
- The R.A.C.E. is a 5 of 6 item scale. The last item is 1 of 2 based on which side the patient has deficits on previous scale items.
- The R.A.C.E. is a universal quantitative tool that is needed to determine the severity of a stroke and to identify strokes with large vessel occlusions (LVO) which would benefit going to a Comprehensive Stroke Center (CSC).
- This is similar to a 12-lead EKG identifying a STEMI and being transported to a PCI Cardiac Center for intervention.
- The cut-score of 4 is based on the significant global accuracy of R.A.C.E. predicting an LVO and its close correlation to the NIHSS.

Certification Requirements:

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

Temperature Measurement

Clinical Indications:

- Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation efforts.

Procedure:

1. For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (steps 2 to 4 below). For infants or adults that do not meet the criteria above, a rectal temperature is preferred (steps 6 to 8 below).
2. To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient’s tongue with appropriate sterile covering.
3. Have the patient seal their mouth closed around thermometer.
4. If using an electric thermometer, leave the device in place until there is indication an accurate temperature has been recorded (per the “beep” or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least 30 seconds (usually 2 to 3 minutes). Proceed to step 8.
5. Prior to obtaining a rectal temperature, assess whether the patient has suffered any rectal trauma by history and/or brief examination as appropriate for patient’s complaint.
6. To obtain a rectal temperature, cover the thermometer with an appropriate sterile cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.
7. Follow guidelines in step 5 above to obtain temperature.
8. Record time, temperature, method (oral, rectal), and scale (C° or F°) in Patient Care Report (PCR).

Certification Requirements:

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

- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization. Orthostatic vital signs are not routinely recommended.
- Patients $\geq 8$ years of age, or patients larger than the Broselow-Luten tape
- Orthostatic Vital Signs are not sensitive nor specific for volume loss / dehydration and may induce syncope in some cases. Assessment of orthostatic vital signs are not routinely recommended. Local Medical Director should indicate and educate on situations where they may be helpful.

Procedure:

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

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Patients with mental capacity retain the right to accept or refuse medical care, even if the consequences of the refusal of care may potentially be harmful for the patient. In the event a patient attempts to refuse medical care, it is important that we should attempt to: 1) Offer transport or treatment without some (or all) of the recommended treatment(s) if that is what the patient will allow (document discussion that lead to the elected course of treatment, obtain refusal documentation including patient signature), 2) Clearly advise the patient of the possible complications of their decision, and Advise the patient to call back if they desire treatment and transport.
Pearls:

3 Special considerations regarding consent:

1) Minors:
   a) In general, patients under the age of 18 may not consent to medical treatment or transport. The following groups may consent for the treatment of a minor:
      i) Mother or Father or a Legal Guardian
      ii) An individual standing in *loco parentis*. A person stands in *loco parentis* when he or she takes on the responsibilities of a parent of the child (e.g., a step-parent)
      iii) The leader of a group of children in possession of written permission from the parent authorizing emergency medical treatment (e.g., a school field trip, a child at school where the parent is not present).
   b) In the following circumstances, no consent is required prior to initiating treatment:
      i) The parent, guardian, or person standing in *loco parentis* cannot be reached and the minor needs to receive medical treatment
      ii) The identity of the child is unknown and a delay in rendering treatment would endanger the life of the child
      iii) The effort to contact the child’s parents, guardian, or a person standing in *loco parentis* would result in a delay that would seriously worsen the condition of the child
   c) In North Carolina, a minor may consent to treatment without the knowledge of the parent under the following circumstances:
      i) Pregnancy
      ii) Treatment for sexually transmitted diseases
      iii) Alcohol or drug abuse
      iv) Emotional disturbance

2) Life-threatening situations without ability to communicate
   a) A patient of any age who is unable to communicate because of an injury, accident, illness, or unconsciousness – AND- is suffering from what reasonably appears to be a life-threatening injury or illness. This patient is treated on the principle of implied consent.
   b) The principle of implied consent presumes that if the individual with the illness or injury were conscious and able to communicate, he or she would consent to emergency treatment
   c) In these situations, patients may be transported without their consent. Law enforcement, physical restraint, and/or chemical restraint may be required

3) Potentially life-threatening situations
   a) Patients in this category generally fall into one of two groups: the alert patient who has a concerning presentation and refuses treatment and/or transport (e.g., the patient with chest pain and EKG changes) or the patient who may be intoxicated but does not have what reasonably appears to be a life-threatening injury (e.g., the patient who has consumed alcohol with a small laceration). In these situations, the following steps should be taken:
      i) Determine orientation to person, place, and time. Document results.
      ii) Determine what factor(s) is/are influencing the patient to refuse medical care. Resolve the ones in your power (e.g., patient does not want an IV – offer transport without an IV).
      iii) Attempt communication with spouse/significant other/other family members if available.
      iv) If patient continues to refuse, make contact with Online Medical Direction.
      v) If patient continues to refuse, clearly explain risks of refusal and have the patient repeat these concerns back to you. Document your results in the patient care report.
      vi) In a courteous manner, assure the patient they can call back for treatment and transport at anytime.
Standards Procedure (Skill) Cardiac Section

Cardiac: 12 Lead ECG

Clinical Indications:
- Suspected cardiac patient
- Suspected tricyclic overdose
- Electrical injuries
- Syncope

Procedure:
1. Assess patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 Lead ECG.
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12 lead ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
   - RA - Right arm
   - LA - Left arm
   - RL - Right leg
   - LL - Left leg
   - V1 - 4th intercostal space at right sternal border
   - V2 - 4th intercostal space at left sternal border
   - V3 - Directly between V2 and V4
   - V4 - 5th intercostal space at midclavicular line
   - V5 - Level with V4 at left anterior axillary line
   - V6 - Level with V5 at left midaxillary line
8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12 Lead ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 Lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data by fax to the appropriate hospital.
12. Contact the receiving hospital to notify them that a 12 Lead ECG has been sent.
13. Monitor the patient while continuing with the treatment protocol.
14. Download data as per guidelines and attach a copy of the 12 lead to the PCR.
15. Document the procedure, time, and results on/with the patient care report (PCR)

Certification Requirements:
- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Standards Procedure (Skill) Cardiac Section
Cardiac: Cardioversion

Clinical Indications:

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

Procedure:

1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
3. Consider the use of pain or sedating medications.
4. Set energy selection to the appropriate setting.
5. Set monitor/defibrillator to synchronized cardioversion mode.
6. Make certain all personnel are clear of patient.
7. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may be 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.

Certification Requirements:

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

- Patients with symptomatic bradycardia (less than 60 per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
  - Chest Pain
  - Hypotension
  - Pulmonary Edema
  - Altered Mental Status, Confusion, etc.
  - Ventricular Ectopy
- Asystole, pacing must be done early to be effective.
- PEA, where the underlying rhythm is bradycardic and reversible causes have been treated.

Procedure:

1. Attach standard four-lead monitor.
2. Apply defibrillation/pacing pads to chest and back:
   - (Follow monitor recommendations if anterior/posterior position is not recommended).
   - One pad to left mid chest (anterior) next to sternum.
   - One pad to mid left (posterior) chest next to spine.
3. Rotate selector switch to pacing option.
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
5. Note pacer spikes on EKG screen.
6. Increase output until capture of electrical rhythm on the monitor. (Start @ 100mA if in arrest).
7. If unable to capture while at maximum current output, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Consider the use of sedation or analgesia if patient is uncomfortable.
10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.

Certification Requirements:

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

- Basic life support for the patient in cardiac arrest

Procedure:

1. Assess the patient’s level of responsiveness.
2. If no response, open the patient’s airway with the head-tilt, chin-lift and look, listen, and feel for respiratory effort. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining C-spine motion restriction. For infants, positioning the head in the sniffing position is the most effective method for opening the airway.
3. Check for pulse (carotid for adults and older children, brachial for infants) for at least 10 seconds. If no pulse, begin chest compressions based on chart below:

<table>
<thead>
<tr>
<th>Age</th>
<th>Location</th>
<th>Depth</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>Over sternum, between nipples (inter-mammary line), 2-3 fingers</td>
<td>At least 1/3 AP diameter of chest About 1.5 inches 4 cm</td>
<td>Continuous compressions at least 100 – 120/minute</td>
</tr>
<tr>
<td>Child</td>
<td>Over sternum, just cephalad from xyphoid process, heel of one hand</td>
<td>At least 1/3 AP diameter of chest About 2 inches 5 cm</td>
<td>Continuous compressions at least 100 – 120/minute</td>
</tr>
<tr>
<td>Adult</td>
<td>Over sternum, just cephalad from xyphoid process, hands with interlocked fingers</td>
<td>At least 2 inches 5 cm</td>
<td>Continuous compressions at least 100 – 120/minute</td>
</tr>
</tbody>
</table>

4. If patient is an adult, go to step 5. If no respiratory effort in a pediatric patient, give two ventilations. If air moves successfully, go to step 5. If air movement fails, proceed to the Airway Obstruction Procedure.
5. Go to Cardiac Arrest Procedure. Begin ventilations in the adult as directed in the Cardiac Arrest Procedure.
6. Provide 1 breath every 6 seconds with the BVM or BIAD. Use EtCO2 to guide your ventilations as directed in the Cardiac Arrest Protocol. (DO NOT HYPERVENTILATE)
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions (< 5 seconds with a maximum of 10 seconds) are allowed for rhythm analysis, defibrillation, and performance of procedures.

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.
Clinical Indications:

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

Contraindication:

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

Procedure:

1. If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.
2. Apply defibrillator pads per manufacturer recommendations. Based on 2010 guidelines, place pads preferably in AP or AL position when implanted devices (pacemakers, AICDs) occupy preferred pad positions and attempt to avoid placing directly over device.
3. Remove any medication patches on the chest and wipe off any residue.
4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.
5. Activate AED for analysis of rhythm.
6. Stop CPR and clear the patient for rhythm analysis. Keep interruption in CPR as brief as possible.
7. Defibrillate if appropriate by depressing the “shock” button. Assertively state “CLEAR” and visualize that no one, including yourself, is in contact with the patient prior to defibrillation. The sequence of defibrillation charges is preprogrammed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.
9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
10. If “no shock advised” appears, perform CPR for two minutes and then reanalyze.
11. Transport and continue treatment as indicated.
12. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.
13. If pulse returns please use the Post Resuscitation Protocol

Certification Requirements:

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

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

Procedure:

1. Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
3. After application of an appropriate conductive agent if needed, apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles to the patient's chest in the proper position.
   - Paddles: right of sternum at 2nd ICS and anterior axillary line at 5th ICS
   - Pads: Anterior-Posterior position

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

4. Set the appropriate energy level
5. Pre-Charge the defibrillator to the selected energy level continuing chest compressions while the defibrillator is charging. (Eliminate peri-shock pauses due to charging Defib.)
6. If using paddles, assure proper contact by applying 25 pounds of pressure on each paddle.
7. Hold Compressions, assertively state, “CLEAR” and visualize that no one, including yourself, is in contact with the patient.
8. Deliver the countershock by depressing the discharge button(s) when using paddles, or depress the shock button for hands free operation.
9. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
10. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
11. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.
Clinical Indications:
- Cardiac arrest with persistent ventricular fibrillation or pulseless ventricular tachycardia.
- Refractory ventricular fibrillation or pulseless ventricular tachycardia where ≥ 3 shocks delivered.

Procedure:
1. **Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.**
2. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
3. Prepare sites for second pad set attachment and apply defibrillation hands free pads:
   - Pads: First defibrillator pads in anterior-posterior position
   - Pads: Second defibrillator pads in anterior-lateral position:
   - Ensure pads are not in contact with one another.

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

4. Set the appropriate energy level and assure controls for both defibrillator / monitors are accessible to provider performing defibrillation.
5. At next pulse / rhythm check, if refractory or persistent VF/VT continues:
   - **Charge the defibrillator to the selected energy level.**
   - **Continue chest compressions while the defibrillator is charging.**
6. Optional: Agencies may provide a single shock at this point with the second defibrillator / monitor to provide a change in energy vector delivered to the heart then move to step 7 if VF / VT persists.
7. **When both monitor / defibrillators have reached selected energy setting:**
   - Hold Compressions, assertively state, “CLEAR” and visualize that no one, including yourself, is in contact with the patient.
   - 2 options at this point:
     - **Option 1 (double simultaneous):** Provider depresses both defibrillator shock buttons simultaneously.
     - **Option 2 (dual sequential):** Provider depresses monitor 1 shock button and then immediately following, depresses monitor 2 shock button.

8. Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
9. Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
10. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

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

- Transport of a patient with an existing arterial line.

Procedure:

1. Make certain arterial line is secured prior to transport, including intersection of arterial catheter and IV/Monitoring lines.
2. Use available equipment for monitoring of arterial pressures via arterial line.
3. Do not use the arterial line for administration of any fluids or medications.
4. If there is any question regarding dislodgement of the arterial line and bleeding results, remove the line and apply direct pressure over the site for at least five minutes before checking to ensure hemostasis.

Certification Requirements:

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

- Collection of a patient’s blood for laboratory analysis

Procedure:

1. Utilize universal precautions as per OSHA.
2. Select vein and prep as usual.
3. Select appropriate blood-drawing devices.
4. Draw appropriate tubes of blood for lab testing.
5. Assure that the blood samples are labeled with the correct information (a minimum of the patient’s name, along with the date and time the sample was collected).
6. Deliver the blood tubes to the appropriate individual at the hospital.

Certification Requirements:

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

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.
Clinical Indications:

- 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).

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.
Clinical Indications:

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

Procedure:

1. Clean the port of the catheter with alcohol wipe.
2. Using sterile technique, withdraw 5-10 ml of blood and discard syringe in sharps container.
3. Using 5cc of normal saline, access the port with sterile technique and gently attempt to flush the saline.
4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 5. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.
5. Begin administration of medications or IV fluids slowly and observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Standards Procedure (Skill) Parenteral Access Section
Parenteral Access: External Jugular Access

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient ≥ 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.
- External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

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

Certification Requirements:

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

Parenteral Access: Venous-Extremity

Clinical Indications:
- Any patient where intravenous access is indicated (significant trauma, emergent or potentially emergent medical condition).

Procedure:
1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional.
2. Paramedic/AEMT can use intraosseous access where threat to life exists as provided for in the Venous Access-Intraosseous procedure.
3. Use the largest catheter bore necessary based upon the patient’s condition and size of veins.
4. Fluid and setup choice is preferably:
   - Lactated Ringers with a macro drip (10 gtt/cc) for burns
   - Normal Saline with a macro drip (10 gtt/cc) for medical conditions, trauma or hypotension
   - Normal Saline with a micro drip (60 gtt/cc) for medication infusions
5. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
6. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
7. Place a tourniquet around the patient’s extremity to restrict venous flow only.
8. Select a vein and an appropriate gauge catheter for the vein and the patient’s condition.
9. Prep the skin with an antiseptic solution.
10. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
11. Advance the catheter into the vein. Never reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
12. Draw blood samples when appropriate.
13. Remove the tourniquet and connect the IV tubing or saline lock.
14. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.
   - Rates are preferably:
     - Adult: KVO: 60 cc/hr (1 gtt/6 sec for a macro drip set)
     - Pediatric: KVO: 30 cc/hr (1 gtt/12 sec for a macro drip set)
   - If shock is present:
     - Adult: 500 cc fluid boluses repeated as long as lungs are dry and BP < 90. Consider a second IV line.
     - Pediatric: 20 cc/kg boluses repeated PRN for poor perfusion.
15. Cover the site with a sterile dressing and secure the IV and tubing.
16. Label the IV with date and time, catheter gauge, and name/ID of the person starting the IV.
17. Document the procedure, time and result (success) on/with the patient care report (PCR).

Certification Requirements:
- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Standards Procedure (Skill) Parenteral Access Section

Parenteral Access: Intraosseous

Clinical Indications:
- Rapid, regular IV access is unavailable with any of the following:
- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / Respiratory arrest.
- Burns.

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

Procedure:
1. Don personal protective equipment (gloves, eye protection, etc.).
2. **Proximal tibia:** Identify anterior-medial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this.
   - **Distal tibia:** If this site is not suitable, and patient is an adult, identify the anterior-medial aspect of the distal tibia (2 cm proximal to the medial malleolus).
   - **Distal femur:** If this site is not suitable, and patient is a pediatric, identify the patella with the leg outstretched to prevent bending of the knee. The insertion site is approximately 1 cm above the patella and approximately 1 – 2 cm medially.
   - **Proximal humerus:** Acceptable insertion site for adult patients. Locate the insertion site 1 – 2 cm above the surgical neck on the most prominent aspect of the greater tubercle. This is located on the lateral aspect of the ball of the humerus. Direct the needle at a 45 degree angle or toward the opposite hip.
3. Prep the site recommended by the device manufacturer with providone-iodine ointment or solution.
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-Io intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, power the driver until a “pop” or “give” is felt indicating loss of resistance. Do not advance the needle any further. Utilize the yellow needle for the proximal humerus. The pink needle is only intended for use in neonatal patients.
6. For the Bone Injection Gun (BIG), find and mark the manufacturers recommended site. Position the device and pull out the safety latch. Trigger the BIG at 90° to the surface and remove the injection device.
7. Remove the stylette and place in an approved sharps container.
8. Attach a syringe filled with at least 5 cc NS; aspirate bone marrow for manual devices only, to verify placement; then inject at least 5 cc of NS to clear the lumen of the needle.
9. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
10. Stabilize and secure the needle with dressings and tape.
11. Paramedic may administer 10 to 20 mg (1 to 2 cc) of 2% Lidocaine in adult patients who experience infusion-related pain. This may be repeated prn to a maximum of 60 mg (6 cc).
12. Following the administration of any IO medications, flush the IO line with 10 cc of IV fluid.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).

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

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, Combitube, tracheostomy tube, or a cricothyrotomy tube.

Procedure:

1. Ensure suction device is in proper working order.
2. Preoxygenate the patient as is possible.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. Using the suprasternal notch and the end of the airway into the catheter will be placed as guides, measure the depth desired for the catheter (judgment must be used regarding the depth of suctioning with cricothyrotomy and tracheostomy tubes).
5. If applicable, remove ventilation devices from the airway.
6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
7. Once the desired depth (measured in #4 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
8. A small amount of Normal Saline (10 ml) may be used if needed to loosen secretions for suctioning.
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient
10. Document time and result in the patient care report (PCR).

Certification Requirements:

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

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

Procedure:

1. Ensure suction device is in proper working order with suction tip in place.
2. Preoxygenate the patient as is possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device to remove any secretions, blood, or other substance.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient.
9. Record the time and result of the suctioning in the patient care report (PCR).

Certification Requirements:

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

- Patients experiencing bronchospasm.

Procedure:

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug (such as Albuterol or other approved drug) into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
7. Monitor the patient for medication effects. This should include the patient’s assessment of his/her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
8. Assess and document peak flows before and after nebulizer treatments.

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.
Clinical Indications:
- Non-Invasive Positive Airway Pressure (NIPPV) is indicated in all patients whom inadequate ventilation is suspected.
- This could be as a result of Pulmonary Edema, CHF, COPD, Pneumonia, or Asthma.
- Agencies may utilize Continuous and/or Bi-Level Positive Airway Pressure Devices

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

Procedure:
1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
6. If the Positive Pressure is adjustable on the NIPPV device adjust and slowly titrate to achieve a positive pressure as follows:
   - **Continuous pressure device:**
     5 – 25 cmH2O for Pulmonary Edema, CHF, COPD, Asthma, Drowning, possible aspiration, or pneumonia.
   - **Bi-Level pressure device:**
     IPAP 10 – 15 over EPAP 5 – 7 cmH2O for Pulmonary Edema, CHF, COPD, Asthma, Drowning, possible aspiration, or pneumonia.
     During titration keep IPAP – EPAP at least a difference of 5 cmH2O
     25 cmH2O is maximum pressure that should be utilized with NIPPV.
     Increasing positive pressure can cause hypotension.
     Use caution or remove and re-evaluate with Systolic Blood Pressures consistently < 100 mmHg.
7. Evaluate the response of the patient assessing breath sounds, oxygen saturation, and general appearance.
8. Titrate oxygen levels to the patient’s response. Many patients respond to low FIO2 (30-50%).
9. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for use of the NIPPV device.

Certification Requirements:
- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Standards Procedure (Skill) Respiratory Section

Respiratory: Respirator Operation

Clinical Indications:

- Transport of an intubated patient

Procedure:

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

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.
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, FiO₂, 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 strongly recommended that the airway (if equipment is available) be monitored continuously through 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% O₂. Contact medical control immediately.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
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.
11. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue transport to the hospital.

Certification Requirements:

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

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

Procedure:

1. In coordination with HazMAT and other Emergency Management personnel, establish hot, warm and cold zones of operation.
2. Ensure that personnel assigned to operate within each zone have proper personal protective equipment.
3. In coordination with other public safety personnel, assure each patient from the hot zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
   - Removal of patients from Hot Zone
   - Simple removal of clothing
   - Irrigation of eyes
   - Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
4. Initial triage of patients should occur after step #3. Immediate life threats should be addressed prior to technical decontamination.
5. Assist patients with technical decontamination (unless contraindicated based on #3 above). This may include removal of all clothing and gentle cleansing with soap and water. All body areas should be thoroughly cleansed, although overly harsh scrubbing which could break the skin should be avoided.
6. Place triage identification on each patient. Match triage information with each patient’s personal belongings which were removed during technical decontamination. Preserve these personnel affects for law enforcement.
7. Monitor all patients for environmental illness.
8. Transport patients per local protocol.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Standards Procedure (Skill) Universal Section
Gastric Tube Insertion

Clinical Indications:
- Gastric decompression in intubated patients or for administration of activated charcoal in patients with altered mental status.

Procedure:
1. Estimate insertion length by superimposing the tube over the body from the nose to the stomach.
2. Flex the neck if not contraindicated to facilitate esophageal passage.
3. Liberally lubricate the distal end of the tube and pass through the patient’s nostril along the floor of the nasal passage. Do not orient the tip upward into the turbinates. This increases the difficulty of the insertion and may cause bleeding.
4. In the setting of an intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred after securing airway.
5. Continue to advance the tube gently until the appropriate distance is reached.
6. Confirm placement by injecting 20cc of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.
7. Secure the tube.
8. Decompress the stomach of air and food either by connecting the tube to suction or manually aspirating with the large catheter tip syringe.
9. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Clinical Indications:
- Gastric decompression in patients with BIAD inserted.

Procedure:
1. Using the gastric tube as a measuring device, determine the length of the gastric tube to be inserted by measuring the length of the nose to the earlobe and earlobe to the xiphoid process.
2. Add the measurements together and note total distance by referencing black marks on suction tubing.
3. Remove gastric diverter, lubricate gastric tube (up to 18fr) prior to insertion in the BIAD gastric lumen.
4. Advance gastric tube total distance from measuring in step#2 and confirm placement in stomach.
5. Seat suction to gastric tube, apply only amount of suction necessary to effectively decompress the stomach.
6. Cap tubing when not in use or leave attached to suction line without suction applied (Leave port open)
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

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

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

Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The most common site for subcutaneous injection is the arm.
   - Injection volume should not exceed 1 cc.
5. The possible injection sites for intramuscular injections include the arm, buttock and thigh.
   - Injection volume should not exceed 1 cc for the arm
   - Injection volume should not exceed 2 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
7. Expose the selected area and cleanse the injection site with alcohol.
8. Insert the needle into the skin with a smooth, steady motion
   - **SQ:** 45-degree angle
   - skin pinched
   - **IM:** 90-degree angle
   - skin flattened
9. Aspirate for blood
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply pressure to the site.
13. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
14. Document the medication, dose, route, and time on/with the patient care report (PCR).

*The System Medical Director has approved the administration of Epinephrine for anaphylaxis, by IM route.*

Certification Requirements:

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

- Any patient who may harm himself, herself, or others may be gently 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 other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique.

Procedure:

1. Attempt less restrictive means of managing the patient.
2. Request law enforcement assistance and Contact Medical Control.
3. 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 cardiac and pulse oximetry monitoring.
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 on the PCR.
7. Documentation on/with the patient care report (PCR) should include the reason for the use of restraints, the type of restraints used, and the time restraints were placed. Use of the Restraint Checklist is highly recommended.
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, a law enforcement officer must accompany the patient to the hospital in the transporting EMS vehicle.

Certification Requirements:

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

- Monitoring a patient’s fluid status and/or response to therapy during transport.
- Collection of urine for laboratory analysis.
- Patients with medical (but NOT TRAUMA) complaints over the age of 16.

Procedure:

1. Explain the procedure to the patient. Maximize patient privacy. Have a second crewmember or other chaperone if performing the procedure on a member of the opposite sex.
2. If there is any question of traumatic injury in the Genitourinary (GU) region, do not perform this procedure.
3. Open the catheter kit. Test the balloon at the catheter tip. Connect the catheter to the urine collection system. Maintain the sterility of contents.
4. Use sterile gloves from the kit. Use one hand to come in contact with the patient and the other to use items from the kit. Recall that once your hand touches the patient, it is no longer sterile and cannot be used to obtain items from the kit.
5. Using the Betadine swabs from the kit, thoroughly cleanse the area surrounding the urethra. For males, this will require retracting the foreskin for uncircumcised males and cleansing of the glans for all males. For females, this will require retraction of the labia majora and cleansing of the area around the urethra.
6. Once the patient has been prepped with Betadine, place sterile sheet(s).
7. Lubricate the tip of the catheter.
8. Gently guide the catheter through the external opening of the urethra. Advance the catheter slowly until there is return of urine. Do not force the catheter through resistance. If resistance is encountered, withdraw the catheter slightly and gently re-direct the catheter.
9. Once urine is returned, gently inflate the balloon and secure the urine collection device.
10. Record procedure and amount of urine returned in the Patient Care Report (PCR).

Certification Requirements:

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

Intradermal Injection

Clinical Indications:

- When a PPD (Purified protein derivative) skin test is necessary to effectively identify early individually for prophylactic drug therapy (prevent active TB).
- EMS agencies typically require annual skin testing.

Procedure:

1. Perform according to protocol or receive and confirm medication order with Medical Control.
2. Wear appropriate universal BSI precautions, prepare equipment and medication (check for correct name of medication, dose, concentration, clarity, expiration date) expelling air from the tuberculin syringe (1 cc, 25 – to 27-gauge needle, 3/8 to one inch long). (If medication is in an ampule, use a filtered needle to draw out the medication, then switch to a regular needle for infection).
3. Explain the procedure to the patient and reconfirm patient allergies and ask whether a past positive skin testing history would nullify giving this patient a PPD test.
4. Prepare site (about 2 inches below elbow crease on inner aspect of arm) by cleansing with alcohol. Allow site to dry completely.
5. Pull the patient’s skin taunt with your non-dominant hand.
6. Insert needle, bevel up, just under the skin, at a 10 – 15° angle.
7. Slowly inject the medication (PPD, 0.10 ml); look for a small wheal/bump to form as medication is deposited and collects in the intradermal tissue.
8. Withdraw the needle and dispose in the sharps container without recapping.
9. Do not rub, scratch, or massage the injection site (remain patient) as it promotes systemic absorption and nullifies the advantage of localized effect.
10. Monitor the patient for any possible side effects.
11. Document the medication, dose, route, time, and patient response on a patient report. This report should note the due date for reading the testing results and then the testing results.
12. The injection site must be reassessed in 48-72 hours to note negative or positive results. Any 5 mm induration or greater is positive for routine and immunosuppressed patients. The patient would need to follow-up with the agency’s Infection Control Officer and their respective Standard Operating Procedures. The agency’s Infection Control Officer should contact the Medical Director and the Pitt County Health Department should the patient have a positive skin test.

Local Requirements:

- Optional procedure for those EMS agencies choosing to maintain an early identification of TB exposure and drug prophylaxis – key to preventing active TB in EMS professionals. Those EMS agencies choosing the PPD skin testing option must review the indications, contraindications, technique and possible complications of the procedure. Appropriate documentation records must be maintained for PPD skin testing.
Clinical Indications:
- Some medications are approved to be given rectally.
- Frequently used in infants and children who may not be able to swallow oral medications.
- Absorption of rectally administered drugs is generally somewhat slower than the oral route.

EMT and AEMT: (suppository administration only)

Procedure:
1. The medication should be drawn up into a syringe after checking for appropriate medication, dose, expiration date, purity, and clarity. (If a suppository, go to stop 9.)
2. For pediatrics, a 6 fr or 10 fr pediatric feeding tube should be attached to the syringe.
3. Cut the tubing so there is about 4 centimeters (1½ inches) of tubing from where it attaches to the syringe (this eliminates a lengthy tubing).
4. Lubricate the tubing end with water-soluble lubricant (i.e. KY Jelly).
5. Insert the feeding tube approximately 2 centimeters into the rectum.
6. The medication may be administered (dose per route) followed by a 2 ml saline flush.
7. Often it is necessary to hold the buttocks together to help retain the medication in the patient. Sometimes elevating the hips slightly on a non-trauma victim will assist in retention of medication.
8. Reassess.
9. If the medication to be rectally administered is a suppository, check for appropriate medication, dose, expiration date, purity, and clarity. Suppositories will liquify down if placed in a warm, heated environment or held in the hand/fingertips very long. If the suppository supplied is double the quantity needed for administration, using a sterile technique, divide the suppository in half. Place the suppository dose to be administered up into the rectum. After insertion, it will be necessary to hold the buttocks together to help retain the medication in the patient. Sometimes elevating the hips slightly on a non-trauma victim will assist in retention of medication. Reassess.

Certification Requirements:
Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Standards Procedure (Skill) Universal Section

Nitronox Administration

Clinical Indications:
Useful for relief of pain and anxiety from extremity trauma, burns and acute MI. It is self-administered which prevents over dosage, since the sedated patient will no longer be able to hold the mask. Assure that the area is well ventilated so that bystanders and EMS personnel do not become intoxicated by the fumes.

Clinical Contraindications:
- Altered mental status; alcohol intoxication; head injury
- Abdominal or chest trauma
- Shock
- Pneumothorax or pulmonary disease such as COPD or asthma

Procedure:
1. Record the tank pressures on the Nitronox® unit as both tanks are opened.
2. The Nitronox® unit delivers a 50:50 mixture of N₂O and O₂ to the demand valve.
3. Instruct the patient to hold the mask tightly to his/her face and breathe in the gas.
   You should hear the valve open with inhalation. Allow the patient to titrate himself/herself. DO NOT hold the mask for him/her.
4. Monitor vital signs closely.
5. Upon arrival at the hospital, close the nitrous oxide valve first. Have the patient continue inhaling to “clear the line”. Then close the oxygen valve and record the tank pressures.

Local Recertification Requirements:

Note: This procedure skill is applicable to those Pitt County EMS Agencies that already been approved and currently carrying for Nitronox® on their units. Paramedic agencies utilizing Nitronox® should periodically review the indications, contraindications, technique and possible complications of the procedure with all of their paramedics.
Standards Procedure (Skill) Wound Care / Trauma Section

Chest Decompression

Clinical Indications:

- Patients with hypotension (SBP <90), clinical signs of shock, and at least one of the following signs:
  - Jugular vein distention.
  - Tracheal deviation away from the side of the injury (often a late sign).
  - Absent or decreased breath sounds on the affected side.
  - Hyper-resonance to percussion on the affected side.
  - Increased resistance when ventilating a patient.

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

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
   - Locate the second intercostals space in the mid-clavicular line on the same side as the pneumothorax.
   - If unable to place anteriorly, lateral placement may be used at the fourth ICS mid-axillary line.
   - Prepare the site with providone-iodine ointment or solution.
4. Insert the catheter (14 gauge for adults) into the skin over the third rib for (anterior placement) and over the fifth rib (mid axillary placement). Direct it just over the top of the rib (superior border) into the interspace.
5. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter, then advance catheter only to chest wall.
6. Remove the needle, leaving the plastic catheter in place.
7. Secure the catheter hub to the chest wall with dressings and tape.
8. Consider placing a finger cut from an exam glove over the catheter hub. Cut a small hole in the end of the finger to make a flutter valve. Secure the glove finger with tape or a rubber band. (Note – don’t waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb.)

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation once per certification cycle.
Standards Procedure (Skill) Wound Care / Trauma Section

Spinal Motion Restriction

Clinical Indications:
- Need for Spinal Motion Restriction as determined by protocol.
- **Guidelines for appropriate use of long spine board (LSB) OR any equivalent device below:**

1. **Spine boards or similar rigid devices, should NOT be used during transport or during inter-facility transfers.** They should be utilized for extrication and/or patient transfers, as well as support for chest compressions. They **DO NOT** improve outcomes and can induce pain, agitation/anxiety, respiratory compromise, and decreased tissue perfusion at pressure points.

2. Devices such as the long or short spine board, scoop stretcher, soft-body splints, etc., should be considered extrication devices rather than transport devices. Instead, use of Spinal Motion Restriction which includes a rigid cervical collar, manual in-line spine stabilization, maintaining spinal alignment with movement and transfers, and securing to the ambulance stretcher.

3. Penetrating trauma to head, torso, or back with no evidence of spinal injury does not require Spinal Motion Restriction.

Procedure:
1. Gather LSB, scoop, ambulance cot, or other Spinal Motion Restriction device, securing devices, and appropriate C-collar.
2. Explain the procedure to the patient and assess/record neurological exam and pulse status.
3. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine by second provider. In-line stabilization should not involve traction/tension, but rather maintain the head in a neutral, midline position while the first rescuer applies the collar.
4. Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself.)
5. If indicated, place patient on a Spinal Motion Restriction device with log-roll or similar technique dependent on circumstances, if patient is supine or prone. During extrication or where otherwise unable to be placed prone or supine, place on Spinal Motion Restriction device by the safest method available that allows maintenance of in-line spinal stability.
6. Stabilize the patient with straps/head rolls/tape/other devices as needed. Once the head is secured to the Spinal Motion Restriction device/stretch, the second rescuer may release manual in-line stabilization. **Once the patient arrives at the stretcher, REMOVE the rigid Spinal Motion Restriction device while maintaining spinal alignment using log-roll or multi-rescuer lift techniques and transfer and secure to the stretcher for transport.**
7. **NOTE:** Spinal precautions may be achieved by many methods. Never force a patient into a certain position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital. Special equipment such as football players in full pads and helmet may remain immobilized with helmet and pads in place.

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.
Clinical Indications:

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

Procedure:

1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
2. Remove all clothing from the extremity.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess.
7. If a femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be followed for placement of a femoral traction splint:
   - Assess neurovascular function as in #1 above.
   - Place the ankle device over the ankle.
   - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis.
   - Extend the distal end of the splint at least 6 inches beyond the foot.
   - Attach the ankle device to the traction crank.
   - Twist until moderate resistance is met.
   - Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

Certification Requirements:

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

- Protection and care for open wounds prior to and during transport.

Procedure:

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on "compression" bandage to control bleeding. Direct pressure is much more effective.
3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
5. Monitor wounds and/or dressings throughout transport for bleeding.

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.
Clinical Indications:
- Serious hemorrhage that can not be controlled by other means.

Contraindications:
- Wounds involving open thoracic or abdominal cavities.

Procedure:
1. Apply approved non-heat-generating hemostatic agent per manufacturer’s instructions.
2. Supplement with direct pressure and standard hemorrhage control techniques.
3. Apply dressing.

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

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

Contraindications:

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

Procedure:

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

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Clinical Indications:
- Life threatening extremity hemorrhage (large vessels)
- 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. Distal SpO2 may be utilized to confirm restriction (loss of wave or value)
3. Secure tourniquet per manufacturer instructions
4. Note time of tourniquet application and communicate this to receiving care providers
5. Dress wounds per standard wound care protocol
6. If delayed or prolonged transport and tourniquet application time > 45 minutes: consider reattempting standard hemorrhage control techniques and removing tourniquet

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

Division of Emergency Medical Services
Introduction

The following medical treatment protocols are developed for North Carolina EMS agencies. The process has evolved since 2007 and continues with input from Medical Directors, EMS Administration, North Carolina Chapter of Emergency Physicians Protocol Committee, North Carolina Office of EMS, EMS field personnel and the public at large through on-line surveys, public meetings across North Carolina and direct communication with stakeholders. The 2017 update expands on the 2012 and 2009 version and continues to incorporate evidence-based guidelines, expert opinion and historically proven practices meant to ensure that citizens and visitors of North Carolina will continue to be provided the highest quality pre-hospital patient care available. The North Carolina Chapter of Emergency Physicians develops and provides final approval.

The purpose of the protocol section is to provide treatment protocols outlining permissible and appropriate assessment, delivery of care, reassessment and procedures which may be rendered by pre-hospital providers. The protocols also outline which medical situations require direct voice communication with medical control. In general treatment protocols are specific orders which may and should be initiated prior to contact with Medical Control.

Please note the medical protocols are divided into three (3) to four (4) sections. The upper section includes three (3) boxes (History, Signs and Symptoms and Differential) which serves as a guide to assist in obtaining pertinent patient information and exam findings as well as considering multiple potential causes of the patients complaint. It is not expected that every historical element or sign / symptom be recorded for every patient. It is expected that those elements pertinent to your patient encounter will be included in the patient evaluation.

The algorithm section describes the essentials of patient care. Virtually every patient should receive the care outlined in this section, usually in the order described. However each medical emergency must be dealt with individually and appropriate care determined accordingly. Professional judgment is mandatory in determining treatment modalities within the parameters of these protocols. Circumstances will arise where treatment may move ahead in the algorithm, move outside to another protocol and then re-enter later. While protocols are written based on body systems and primary complaints the patient should be treated as a whole and therefore the protocols should be considered as a whole in providing care.

Professional judgment hierarchy:

The pre-hospital provider may determine that no specific treatment is needed;

Or

The pre-hospital provider may follow the appropriate treatment protocols and then consult Medical Control;

Or

The pre-hospital provider may consult Medical Control before initiating any specific treatment.

Some protocols will encompass two (2) pages. Protocols which exist in a single page format may have page 2 added by the local medical director. The PEARLS section will either be located at the bottom of page 1 (single page protocol) or page 2 (double page protocol). The PEARLS section provides points regarding the main protocol based on evidence to date, common medical knowledge and expert medical opinion.

Information boxes highlighted in purple. These areas are editable at the local level. They will mainly involve specific medications and dosages utilized by the local EMS agency. Page 2 will have a large section highlighted in purple where the local Medical Director may edit as they see fit to provide expanded points and treatment not otherwise specified in the algorithm. If the box is not to be utilized – add “This Space Left Blank Intentionally.”

Finally these medical treatment protocols are established to ensure safe, efficient and effective interventions to relieve pain and suffering and improve patient outcomes without inflicting harm. They also serve to ensure a structure of accountability for Medical Directors, EMS agencies, pre-hospital providers and facilities to provide continual performance improvement. A recent report of the Institute of Medicine calls for the development of standardized, evidence-based pre-hospital care protocols for the triage, treatment and transport of patients. These protocols establish expectations of pre-hospital care in North Carolina.
Introduction

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Scene Safe

YES

NO

Call for help / additional resources
Stage until scene safe

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

If Indicated:
- Glucose
- 12 Lead ECG
- Temperature
- Pain scale
- CO Monitoring
- ETCO2 Monitoring

Initial assessment
BLS maneuvers
Initiate oxygen if indicated
Adult Assessment Procedure
Pediciatric Assessment Procedure
Use Broselow-Luten tape

Trauma Patient

Medical or Trauma

Medical Patient

Evaluate MOI

Significant MOI
Primary and Secondary trauma assessment

No Significant MOI
Primary and Secondary trauma assessment
Focused assessment on specific injury

Spinal Motion Restriction Procedure / Protocol TB 8 as indicated

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

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

Notify Destination or Contact Medical Control

Scene

Up 1

Universal Protocol Section

Universal Patient Care

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS
Universal Patient Care

- **Pearls**
- **Recommended Exam:** Minimal exam if not noted on the specific protocol is vital signs, mental status with GCS, and location of injury or complaint.
- Any patient contact which does not result in an EMS transport must have a completed disposition form.
- Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.
- 2 complete vital sign acquisitions should occur at a minimum with a patient encounter.
- **Patient Refusal**
  - Patient refusal is a high risk situation. Encourage patient to accept transport to medical facility.
  - Encourage patient to allow an assessment, including vital signs. Documentation of the event is very important including a mental status assessment describing the patient’s capacity to refuse care.
  - **Guide to Assessing capacity:**
    - **C:** Patient should be able to communicate a clear choice: This should remain stable over time. Inability to communicate a choice or an inability to express the choice consistently demonstrates incapacity.
    - **R:** **Relevant information is understood:** Patient should be able to display a factual understanding of the illness, the options and risks and benefits.
    - **A:** **Appreciation of the situation:** Ability to communicate an understanding of the facts of the situation. They should be able to recognize the significance of the outcome potentially from their decision.
    - **M:** **Manipulation of information in a rational manner:** Demonstrate a rational process to come to a decision. Should be able to describe the logic they are using to come to the decision, though you may not agree with decision.
- **Pediatric Patient General Considerations:**
  - A pediatric patient is defined by fitting a Length-based Resuscitation Tape, Age ≤ 15, weight ≤ 49 kg.
  - 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
Universal Protocol Section

Secondary Triage
Evaluate Infants FIRST
Repeating Triage Process

Able to Walk
YES → Minor
NO → Breathing

Breathing
YES → Reposition Upper Airway
Results in Spontaneous Breathing
Follow Adult or Ped Arm

NO → Pediatric
Adult

Pulse
NO → DECEASED
YES → 2 Rescue Breaths

Breathing
NO → IMMEDIATE
YES → IMMEDIATE

Respiratory Rate
Adult > 30 / minute
Ped < 15 or > 45 → IMMEDIATE
Adult < 30 / minute
Ped > 15 or < 45

Perfusion
Cap Refill > 2 Sec (Adult)
No palpable Pulse (Pediatric) → IMMEDIATE

Mental Status
Obeys Commands
Adult
Appropriate to AVPU
Pediatric
YES → DELAYED
NO → IMMEDIATE
Triage

Pearls

- **When approaching a multiple casualty incident where resources are limited:**
  Triage decisions must be made rapidly with less time to gather information
  Emphasis shifts from ensuring the best possible outcome for an individual patient to ensuring the best possible outcome for the greatest number of patients.

- **Scene Size Up:**
  1. Conduct a scene size up. Assure well being of responders. Determine or ensure scene safety before entering. If there are several patients with the same complaints consider HazMat, WMC or CO poisoning.
  2. Take Triage system kit.
  3. Determine number of patients. Communicate the number of patients and nature of the incident, establish command and establish a medical officer and triage officer if personnel available

- Triage is a continual process and should recur in each section as resources allow.

- **Step 1: Global sorting:**
  Call out to those involved in the incident to walk to a designated area and assess third. For those who cannot walk, have them wave / indicate a purposeful movement and assess them second. Those involved who are not moving or have an obvious life threat, assess first.

- **Step 2: Individual assessments:**
  Control major hemorrhage
  Open airway and if child, give 2 rescue breaths
  Perform Needle Chest Decompression Procedure if indicated.
  Administer injector antidotes if indicated

- **Assess the first patient you encounter using the three objective criteria which can be remembered by RPM.**
  R: Respiratory
  P: Perfusion
  M: Mental Status

- 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.
# 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

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This Protocol has been altered from the original NCCEP Protocol by the Pitt County Medical Director.
Abdominal Pain
Vomiting and Diarrhea

Pears

- **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
  - 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 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
Blood Glucose Analysis Procedure
- 12 Lead ECG Procedure
- IV / IO Procedure
Age Appropriate Diabetic Protocol(s) AM 2 / PM 2 if indicated

Signs of shock / Poor perfusion
Traumatic Injury
- YES

NO

Signs of OD / Toxicology
- YES

NO

Signs of CVA Or Seizure
- YES

NO

Signs of Hypo / Hyperthermia
- YES

NO

Arrhythmia / STEMI / CP
- YES

NO

Fever / Sepsis
- YES

NO

Notify Destination or Contact Medical Control

Exit to
Age Appropriate
Hypotension / Shock Protocol AM 5 / PM 3
Multiple Trauma Protocol TB 6
Head Injury Protocol TB 5

Exit to
Overdose / Toxic Exposure Protocol TE 7

Exit to
Suspected Stroke Protocol UP 14
Seizure Protocol UP 13

Exit to
Hypothermia Protocol TE 5
Hyperthermia Protocol TE 4

Exit to
Age Appropriate Appropriate Cardiac Protocol(s)

Exit to
Fever Protocol UP 10
Suspected Sepsis Protocol UP 15
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 medical or trauma condition precipitates a deterioration of a patient's 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 (paraspinal, 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

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

**Cardiac Monitor** *if indicated*

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

**Injury or Traumatic Mechanism**

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

**Shock Hemodynamic Instability**

**Isotonic fluid**
- Bolus 500 mL IV Titrato to SBP ≥ 90
- 2 L Maximum
- Peds: 20 mL/kg IV / IO
- Titrato age appropriate
- SBP ≥ 70 + 2 x Age
- Maximum 60 mL/kg

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

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

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

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

**Monitor and Reassess**

**Notify Destination or Contact Medical Control**

This Protocol has been altered from the original NCCEP Protocol by the Pitt County Medical Director.
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 affects more than 90% of adults at some point in their life. Back pain is also common in the pediatric population. Most often it is a benign process but in some circumstances can be life or limb threatening.
- **Consider pregnancy or ectopic pregnancy with abdominal or back pain in women of childbearing age.**
- **Consider abdominal aortic aneurysm with abdominal pain especially in patients over 50 and/or patients with shock/poor perfusion.** Patients may have abdominal pain and/or lower extremity pain with diminished pulses. Notify receiving facility early with suspected abdominal aneurysm.
- **Consider cardiac etiology in patients > 50, diabetics and/or women especially with upper abdominal complaints.**
- **Red Flags which may signal more serious process associated with back pain:**
  - Age > 50 or < 18
  - Neurological deficit (leg weakness, urinary retention, or bowel incontinence)
  - IV Drug use
  - Fever
  - History of cancer, either current or remote
  - Night time pain in pediatric patients
- **Cauda equina syndrome is where the terminal nerves of spinal cord are being compressed (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.
Pearls

**Recommended Exam:** Mental Status, Skin, Heart, Lungs, Neuro

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 Haldol or Ziprasidone 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 in such a way that could impact the patient’s respiratory or circulatory status.

**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.

**Ketamine:**

Agencies participating in the NCOEMS Ketamine Project must complete both Ketamine Evaluation Forms and submit to the Regional Specialist.

Use for Behavior limited to: Patients who no longer fit on a Pediatric Length-based Resuscitation Tape.

Ketamine administration requires continuous EICO2 monitoring.

Ketamine Dissociation syndrome:

- Treatment includes benzodiazepines such as Midazolam, Lorazepam, or Diazepam. May require repeat dosing.
- Treatment also includes decreasing ambient stimuli such as sounds, lighting, or activity.
- Ketamine can cause apnea in the geriatric population.
- Ketamine may cause hypotension, hypertension, vomiting, respiratory depression, or laryngospasms.
- Laryngospasm responds to BVM.

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 Diphenhydramine 50 mg IV / IO / IM / PO in adults or 1 mg/kg IV / IO / IM / PO in pediatrics.

May add page 3 to protocol for specific for local mental health and / or substance misuse resources or destinations.
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

**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).
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

Circulation Problem
- YES → Exit to Age Appropriate Protocol(s)
- NO

Suspect Air Embolus
- Tachypnea, Dyspnea, Chest Pain
- YES → Stop infusion if ongoing
- NO

Hemorrhage at catheter site
- YES → Apply direct pressure around catheter
- NO

Damage to catheter
- YES → Clamp catheter proximal to disruption
  - May use hemostat wrapped in gauze
  - Stop infusion if ongoing
- NO

Catheter completely or partially dislodged
- YES → Stop infusion if ongoing
- NO

Ongoing infusion
- YES → Continue infusion
  - Do not exceed 20 mL/kg
- NO → Notify Destination or Contact Medical Control

Pearls
- Always talk to family / caregivers as they have specific knowledge and skills.
- Use strict sterile technique when accessing / manipulating an indwelling catheter.
- Cardiac arrest: May access central catheter and utilize if functioning properly.
- Do not place a tourniquet or BP cuff on the same side where a PICC line is located.
- Do not attempt to force catheter open if occlusion evident.
- Some infusions may be detrimental to stop. Ask family or caregiver if it is appropriate to stop or change infusion.
- Hyperalimentation infusions (IV nutrition): If stopped for any reason monitor for hypoglycemia.
Epistaxis

History
- Age
- Past medical history
- Medications (HTN, anticoagulants, aspirin, NSAIDs)
- Previous episodes of epistaxis
- Trauma
- Duration of bleeding
- Quantity of bleeding

Signs and Symptoms
- Bleeding from nasal passage
- Pain
- Nausea
- Vomiting

Differential
- Trauma
- Infection (viral URI or Sinusitis)
- Allergic rhinitis
- Lesions (polyps, ulcers)
- Hypertension

Pearls
- Recommended Exam: Mental Status, HEENT, Heart, Lungs, Neuro
- Age specific hypotension: 0 – 28 days < 60 mmHg, 1 month – 1 year < 70 mmHg, 1 year – 10 years < 70 + (2 x age)mmHg, 11 years and greater < 90 mmHg.
- It is very difficult to quantify the amount of blood loss with epistaxis.
- Bleeding may also be occurring posteriorly. Evaluate for posterior blood loss by examining the posterior pharynx.
- Anticoagulants include warfarin (Coumadin), Apixaban (Elequis), heparin, enoxaparin (Lovenox), dabigatran (Pradaxa), rivaroxaban (Xarelto), and many over the counter headache 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
- 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

#### Contact, Droplet, and Airborne Precautions

<table>
<thead>
<tr>
<th>Contact, Droplet, and Airborne Precautions</th>
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</table>
| B | Temperature Measurement Procedure  
   **if available** |
| A | IV / IO Procedure  
   **if indicated** |

- Temperature ≥ 100.4°F (38°C)

#### 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.
- Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.
Pain Control
NCOEMS Ketamine Pilot Project

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

Consider IV Procedure if indicated

Moderate to Severe

IV / IO Procedure

Ketorolac 30 mg IV / IO
Maximum 60 mg
Peds: 0.5 mg/kg IV / IO / IM
Maximum 30 mg

Cardiac Monitor

Nitrous Oxide 50:50 Mix if available

Fentanyl 50 – 75 mcg IV / IO
Repeat 25 mcg every 20 minutes
Maximum 200 mcg
Peds: 1 mcg/kg IV / IO / IM / IN
May repeat 0.5 mcg/kg every 5 minutes
Maximum 2 mcg/kg
Or
Morphine 4 mg IV / IO / IM
Repeat 2 mg every 5 minutes as needed
Peds: 0.1 mg/kg IV / IO / IM
May repeat every 5 minutes
Maximum 10 mg

Ketamine 0.2 mg/kg IV / IO
Maximum 20 mg
Mix in 50 - 250 mL NS and
Infuse over 10 minutes
May repeat in 30 minutes as needed

Monitor and Reassess Every 10 minutes following sedative

Notify Destination or Contact Medical Control

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS
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.

Both arms of the treatment may be used in concert. For patients in Moderate pain for instance, you may use the combination of an oral medication and parenteral if no contraindications are present.

Pediatrics:

- For children use Wong-Baker faces scale or the FLACC score (see Assessment Pain Procedure)
- Use Numeric (> 9 yrs), Wong-Baker faces (4-16yrs) or FLACC scale (0-7 yrs) as needed to assess pain

Vital signs should be obtained before, 10 minutes after, and at patient hand off with all pain medications.

- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction in the event no transport occurs.
- Do not administer 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.

Ketamine:

- Agencies participating in the NCOEMS Ketamine Project must complete both Ketamine Evaluation Forms and submit to the Regional Specialist.
- Ketamine administration requires continuous EtCO2 monitoring.
- Use for pain limited to: Patients who no longer fit on a Pediatric Length-based Resuscitation Tape to ≤ 65 years of age.
- Must administer by IV / IO infusion over 10 minutes. Recommended volumes are 50 – 250 mL.
- Ketamine Dissociation syndrome:
  - With rapid push or rapid infusion side effects such as hallucinations or agitation could occur. Doses ≥ 0.2 mg/kg may also cause similar symptoms. Symptoms may occur even with slow infusion.
  - Treatment includes benzodiazepines such as Midazolam, Lorazepam, or Diazepam. May require repeat dosing.
  - Treatment also includes decreasing ambient stimuli such as sounds, lighting, or activity.
  - Ketamine can cause apnea in the geriatric population.
  - While uncommon, Ketamine may cause hypotension.

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**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

---

**Evidence of Traumatic Injury or Medical Illness?**

- **YES**
  - Utilize Age Appropriate Protocol(s) as indicated

- **NO**

**Use of Chemical Spray**

- **YES**
  - Irrigate face and eyes copiously
  - Remove contaminated clothing
  - Age Appropriate Respiratory Distress Protocol(s) AR 4, 7 if indicated

**Use of Conducted Electrical Weapon**

- **YES**
  - Wound Care-Taser Probe Removal Procedure
  - Wound Care Procedure(s) as indicated

**Excited Delerium Syndrome**

- **YES**
  - Exit to Behavioral Protocol UP 6

- **NO**

**Notify Destination or Contact Medical Control**
Police Custody

Universal Protocol Section

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 or Ziprasidone 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.
  - **If patient suspected of EDS suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early.**
- Do not position or transport any restrained patient in 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

Blood Glucose Analysis Procedure
- Loosen any constrictive clothing
- Protect patient

Altered Mental Status Protocol UP 4
- if indicated

Behavioral Protocol UP 6
- if indicated

IV / IO Procedure
- if indicated

Cardiac Monitor
- if indicated

Active Seizure Activity

YES

NOT

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

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

Midazolam 2.5 mg IV / IO
5 mg IM or 2 mg IN
Peds: 0.1 – 0.2 mg/kg
IV / IO / IM / IN
Maximum 10 mg
May repeat every 3 to 5 minutes
as needed

Monitor and Reassess

Notify Destination or Contact Medical Control

UP 13

This Protocol has been altered from the original NCCEP Protocol by the Pitt County Medical Director

2018-01-24
revised

Page 119 of 260
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

---

**Race Stroke Scale**

- **Consistent with Acute Stroke**
  - **YES**
  - **NO**

- **Time of Onset Or Time Last Seen Normal < 6.0 Hours**
  - **YES**
  - **NO**

**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
  - (At least (1) IV in the Rt. Antecubital fossa)

**P** Cardiac Monitor
- **Age Appropriate Cardiac Protocol(s)**
  - **if indicated**

**Head Trauma Protocol** TB 5
- **if indicated**

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

**Seizure Protocol** UP 13
- **if indicated**

**SBP ≥ 220**
- **DBP ≥ 120**
- after 3 readings
- at least 5 minutes apart

**Notify Destination or Contact Medical Control**

**Transport based on:**
- **STROKE**
  - EMS Triage and Destination Plan
  - Keep Scene Time to ≤ 10 Minutes
  - Immediate Notification of Facility

**Stroke Alert with ANY Stroke symptoms even if the RACE score is only 1.**

---

Upon arrival at Vidant Medical Center:
- **Weigh Patient** before proceeding into treatment area

Contact Receiving Facility Concerning Treatment of Hypertension

---

This Protocol has been altered from the original NCCEP Protocol by the EMS System Medical Director
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.
- **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 starts when patient last awake or symptom free.

- 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 6 hrs., 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 place 2 IV sites. (Priority 1 IV in Right 20 ga antecubital).**
- 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 Scale and activation time results in the data fields of the ePCR.

- **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

Exit to Age Appropriate Condition Appropriate Protocol(s)

Sepsis Screen

Positive

NO YES

Adult SIRS Criteria
- Temperature ≥ 100.4°F (38°C) or ≤ 96.8°F (36°C)
- AND
- Any 1 of the following:
  - HR > 90
  - RR > 20
  - EtCO < 25 mmHg

Adult qSOF A 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

Notify Destination or Contact Medical Control

SEPSIS ALERT
Notify Receiving Facility Immediately

Venous Access Blood Draw
- if applicable

Isotonic fluid 500 mL Bolus
- Repeat as needed
- Titrate SBP ≥ 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

MAP
(Mean Arterial Pressure)

SBP + 2(DBP) / 3

Monitor usually calculates this value on screen

2018-01-24 revised
This protocol has been altered from the original 2016 NCCEP Protocol by the local EMS Medical Director
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.
- Quantitative waveform capnography can be a reliable surrogate for lactate monitoring in detecting metabolic distress in sepsis patients. EtCO₂ < 25 mm Hg are associated with serum lactate levels > 4 mmol/L.
- Patients with a history of liver failure should not receive acetaminophen.

**Droplet precautions:**
- Include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient.
- This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected.
- A patient with a potentially infectious rash should be treated with droplet precautions.

**Airborne precautions:**
- Include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions.
- This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.

**All-hazards precautions:**
- Include standard PPE plus airborne precautions plus contact precautions.
- This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS).
- 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

Blood Glucose Analysis Procedure

IV / IO Procedure
- Consider 2 Large Bore sites

Isotonic fluid 500 mL Bolus
Repeat as needed
Titrate SBP ≥ 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

Notify Destination or Contact Medical Control
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 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.**
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

Airway Obstructed

YES ➔ Airway Foreign Body Obstruction Procedure

NO ➔ Breathing / Oxygenation Support needed?

YES ➔

Monitor / Reassess Supplemental Oxygen if indicated
Exit to appropriate protocol(s)

NO ➔

Airway Cricothyrotomy Surgical Procedure
if indicated

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

Consider Airway NIPPV Procedure
Airway BIAD Procedure if indicated

Oral / Nasotracheal Intubation Procedure

Chest Decompression Procedure if indicated

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

Notify Destination or Contact Medical Control

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

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.
Adult Airway

Pearls

- See Pearls section of protocols AR 2 and 3.
- For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of ≥ 90%, it is acceptable to continue with basic airway measures.
- Intubation Attempt is 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 (EtCO2) 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 an EtCO2 of 35-45. AVOID hyperventilation.

- Anticipating the Difficult Airway and Airway Assessment
  - Difficult BVM Ventilation (MOANS): Mask seal difficulty (hair, secretions, trauma); Obese, obstruction, OB – 2d and 3d trimesters; Age ≥ 55; No teeth; Stiff lungs or neck
  - Difficult Laryngoscopy (LEON): Look externally for anatomical problems; Evaluate 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); Obese, obstruction, OB – 2d and 3d trimesters; Neck mobility limited.
  - Difficulty BIAD (RODS): Restricted mouth opening; Obese, obstruction, OB – 2d and 3d trimesters; Distorted or disrupted airway; Stiff lungs or neck
  - Difficulty Cricothyrotomy / Surgical Airway (SMART): Surgery scars; Mass or hematoma, Access or anatomical problems; Radiation treatment to face, neck, or chest; Tumor.

- 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:** Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.
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

Continue BVM Supplemental Oxygen
Exit to Appropriate Protocol(s)

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

YES

B
Attempt
Airway Blind Insertion Airway Device Procedure

A
Airway Video Laryngoscopy Device Procedure
if available

P
Airway Cricothyrotomy 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

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): Mask seal difficulty (hair, secretions, trauma); Obese, obstruction, OB – 2d and 3d trimesters; Age ≥ 55; No teeth; Stiff lungs or neck
  - Difficult Laryngoscopy (LEON): Look externally for anatomical problems; Evaluate 3-3-2 (Mouth opening should equal 3 of patient’s 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 patient’s finger’s width); Obese, obstruction, OB – 2d and 3d trimesters; Neck mobility limited.
  - Difficulty BIAD (RODS): Restricted mouth opening; Obese, obstruction, OB – 2d and 3d trimesters; Distorted or disrupted airway; Stiff lungs or neck
  - Difficulty Cricothyrotomy / Surgical Airway (SMART): Surgery scars; Mass or hematoma, Access or anatomical problems; Radiation treatment to face, neck, or chest; Tumor.
- 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.
Airway, Drug Assisted
(Authorized Systems ONLY)

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

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.

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.

Preoxygenate 100% O2

<table>
<thead>
<tr>
<th>A</th>
<th>IV / IO Procedure (preferably 2 sites)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Assemble Airway Equipment</td>
</tr>
<tr>
<td></td>
<td>Suction equipment</td>
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<tr>
<td></td>
<td>Alternative Airway Device</td>
</tr>
</tbody>
</table>

Hypoxic Or Hypotension Or Dangerously Combative?

YES

NO

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

Intubate trachea

Placement Verified
Continuous Capnography

Consider Restraints Physical Procedure

Consider Gastric Tube Insertion Procedure

Awakening or Moving after intubation

YES

Exit to Post-intubation / BIAD Management Protocol AR 8

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 Rapid Sequence Intubation.

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

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS.

2018-01-24 revised
Page 131 of 260
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.
- This protocol is only for use in patients who are longer than the Broselow-Luten Tape.
- 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.
- KETAMINE:
  - Ketamine may be used with and without a paralytic agent in conjunction with either an 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.
- If First intubation attempt fails, make an adjustment and try again: (Consider change of provider in addition to equipment)
- Different laryngoscope blade ● Change cricoid pressure; No longer routinely recommended and may worsen your view.
- Different ETT size ● Align external auditory canal with sternal notch / proper positioning.
- Change head 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.
**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.)

---

**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

---

**Albuterol Nebulizer 2.5 – 5 mg**

- 
- Repeat as needed x 3

**Epinephrine Nebulizer**

- 1 mg (1:1000) / 2 mL NS
- May repeat x 1

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**Adult Airway Protocol(s)**

- as indicated

- **B**
  - 12 Lead ECG Procedure

- **A**
  - IV/ IO Procedure

- **P**
  - Cardiac Monitor

---

- **B**
  - Airway CPAP Procedure

- **A**
  - Consider Epinephrine 1:1000
  - 0.3 – 0.5 mg IM

- **P**
  - Methylprednisolone 125 mg IV / IO / IM
  - Infuse over 10 – 20 minutes

---

**Notify Destination or Contact Medical Control**
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 should be monitored continuously with CAPNOGRAPHY.

- **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.** Agency Medical Director may require contact of medical control prior to EMT / EMR administering any medication.
Assess Respiratory Rate, Effort, Oxygenation
Is Airway / Breathing Adequate?

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

NO

Breathing / Oxygenation Support needed

NO

Monitor / Reassess Supplemental Oxygen
if indicated

Exit to Appropriate Protocol(s)

YES

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

Exit to Appropriate Protocol(s)

Airway Foreign Body Obstruction Procedure

A Direct Laryngoscopy

P Airway Cricothyrotomy Needle Procedure
See Pearls Section

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

B Airway BIAD Device Procedure
if indicated

Chest Decompression Procedure
if indicated

BIAD Management Protocol AR 8
if indicated

Notify Destination or Contact Medical Control
Pearls

- For this protocol, pediatric is defined as any patient which can be measured within a length based 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.
- Capnometry is mandatory with all methods of advanced airway utilization. Document results.
- Continuous capnography (EtCO2) is required with BIAD. 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 pediatric BIAD.
- Gastric tube placement should be considered in all intubated patients.
- **Airway Cricothyrotomy Needle Procedure:**
  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.
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

12 Lead ECG Procedure

IV / IO Procedure
if indicated

Cardiac Monitor

WHEEZING / Asthma

Following Assessment

STRIDOR / Croup

Albuterol Nebulizer
1.25 - 2.5 mg

B

Albuterol Nebulizer
1.25 - 2.5 mg

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

A

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

A

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

P

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

P

Notify Destination or
Contact Medical Control

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS
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. Agency medical director may require Contact of Medical Control prior to administration.
Post-intubation / BIAD Management

Protocols AR 1, 2, 3, and 5 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

YES

NO

Exit to Appropriate Adult or Pediatric Airway Protocol(s) 1 – 7

B

12 Lead ECG Procedure

as indicated

A

IV / IO Procedure (preferably 2 sites)

Continue Airway Adjuncts
Maintain SpO2 ≥ 90 %
Preferably ≥ 94 %
EtCO2 35 – 45
Ventilate 8 – 10 breaths / minute
May require faster rate
See Pearls

Preferably

≥

P

Cardiac Monitor

Transport Ventilator Procedure
If available

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

YES

NO

PROTOCOLS AR 1, 2, 3, AND 5 SHOULD BE UTILIZED TOGETHER (EVEN IF AGENCY IS NOT USING DRUG ASSISTED AIRWAY PROTOCOL) AS THEY CONTAIN USEFUL INFORMATION FOR AIRWAY MANAGEMENT.

Ketamine 1.5 – 2.0 mg / kg IV / IO
Fentanyl 50 mcg IV / IO
Repeat every 5 minutes as needed
Maximum 500 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
If needed for patient movement.
Not indicated in Pediatrics

Notify Destination or Contact Medical Control

Propofol
Interfacility Transfer Protocol / Policy
If available

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Interfacility Transfer Protocol / Policy
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Notify Destination or Contact Medical Control

Propof0
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 as tachycardia and / or hypertension can provide clues to inadequate sedation, however they both are not always reliable indicators of patient’s lack of adequate sedation.
- Pain must be addressed first, before anxiety. Opioids are typically the first line agents before benzodiazepines. Ketamine is also a reasonable first choice agent.
- Ventilator / Ventilation strategies 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 cmH2O.
- Continuous pulse oximetry and **CAPNOGRAPHY MUST** 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:** Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment 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

---

**Problem with Airway, Ventilation or Oxygenation**

- **YES**: Oxygen saturation ≥ 90% (Preferably ≥ 94%) (Ask Caregiver: What is baseline saturation for patient)
  - Or
  - EtCO2 35 – 45 mmHg

- **NO**: Detached Oxygen Source

---

**Problem with Circulation / Other problems**

- **YES**: Correct cause
- **NO**: Transport on patient’s ventilator and maintain current settings

---

**P**

- NO: Cause corrected
- YES: Remove patient from ventilator and manually ventilate with BVM

---

**Notify Destination or Contact Medical Control**

---

**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 Capnography 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.
**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

**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 EICO2 monitoring if available.
- **DOPE:** Displaced tracheostomy tube / ETT, Obstructed tracheostomy tube / ETT, Pneumothorax and Equipment failure.

**Tracheostomy Tube in place**
- YES → Remove Obturator *If in place*
- NO → YES

**Tracheostomy Tube available**
- YES → Allow Caregiver to insert Tracheostomy Tube Or Place Tracheostomy Tube Or Appropriately sized ETT into stoma
- NO

**Advanced Suctioning Procedure**
- Tracheostomy Tube Procedure
- NO

**Inner Cannula in place (Double lumen)**
- YES → Speaking Valve / Decannulation plug in place
- NO → YES

**Remove Inner Cannula Or Remove Speaking Valve Remove Decannulation plug**

**Assist Ventilations via Tracheostomy Tube / ETT**
- Age Appropriate Respiratory Distress Protocol

**Notify Destination or Contact Medical Control**

**Continued Respiratory Distress**
- YES

**Remove Obturator *If in place***

**Advanced Suctioning Procedure Tracheostomy Tube Procedure**

**A**

**Tracheostomy Tube**

**Operations**

- Inner Cannula in place (Double lumen)
- Speaking Valve / Decannulation plug in place
- Remove Inner Cannula Or Remove Speaking Valve Remove Decannulation plug

**Art of Respiratory Protocol**

- Airway Respiratory Protocol Section
- History
- Signs and Symptoms
- Differential
- Pearls
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

NO

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches)
Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 seconds
30:2 Compression:Ventilation if no Advanced Airway
Monitor EtCO2
if available

AED Procedure
if available

Search for Reversible Causes

Consider Chest Decompression Procedure

Cardiac Monitor

IV / IO Procedure

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

Isotonic fluid Bolus 500 mL IV / IO
May repeat as needed
Maximum 2 L

Adult Rhythm Appropriate Protocol(s)
*as indicated*

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

---

**Reversible Causes**

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia
Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary
(PE)
Thrombosis; coronary (MI)

---

**AT ANY TIME**

Return of Spontaneous Circulation

---

Go to Post Resuscitation Protocol AC 9

---

NO

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

---

Return of Spontaneous Circulation

---

Go to Post Resuscitation Protocol AC 9

---

NOTIFY DESTINATION OR CONTACT MEDICAL CONTROL

---

This Protocol has been altered from the original NCCEP Protocol by the Pitt County Medical Director
Adult Asystole / Pulseless Electrical Activity

**Pearls**
- Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.
- Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.
- **DO NOT HYPERVENTILATE:** If no advanced airway (BIAD, ETT), compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.
- Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation.
- **Defibrillation:** Follow manufacture’s recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO2 (EtCO2)**
  - If EtCO2 is < 10 mmHg, improve chest compressions.
  - If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient’s left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - **Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - **Opioid Overdose** - Naloxone 2 mg IM / IV / IO / IN. EMT may administer Naloxone via IN route only. May give from EMS supply.
  - **Drowning / Suffocation / Asphyxiation / Hanging / Lightening Strike** – Hypoxic associated cardiac arrest and prompt attention to airway and ventilation is priority followed by high-quality and continuous chest compressions and early defibrillation.
- **Transcutaneous Pacing:**
  - Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival
  - Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
  - Discussion with Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
**Bradycardia; Pulse Present**

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

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

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

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

---

**Exit to Appropriate Protocol(s)**

**NO**

**YES**

- Airway Protocol(s) AR 1, 2, 3 *if indicated*
- Respiratory Distress Protocol AR 4 *if indicated*
- Chest Pain: Cardiac and STEMI Protocol AC 4 *if indicated*

**Search for Reversible Causes**
- 12 Lead ECG Procedure

**IV / IO Procedure**
- Cardiac Monitor
- Isotonic fluid Fluid Bolus
  - 500 mL – 2 L NS IV / IO
  - *(Unless Acute CHF)*
  - Maximum 2 L
- Atropine 0.5 mg IV / IO
  - *May repeat every 3 – 5 minutes*
  - Maximum 3 mg
- Epinephrine Push-dose
  - 2 – 3 mcg IV / IO
  - *Repeat every 2 – 3 minutes*
  - Titrate to SBP ≥ 90 mmHg
  - Or
  - Epinephrine 1 - 10 mcg/min IV / IO
  - Titrate to SBP ≥ 90 mmHg

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

---

**Consider Sedation**
- Midazolam 2 – 2.5 mg IV / IO / IM / IN
  - *Maximum 10 mg*
Bradycardia; Pulse Present

Preferred:

1. **Mix 1mg of Epinephrine 1:1000 in a 250mL NS or D$_5$W Bag** (60gtt set)

<table>
<thead>
<tr>
<th>mcg/min</th>
<th>gtt/min (mL/hr)</th>
<th>mcg/min</th>
<th>gtt/min (mL/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15 gtt/min</td>
<td>6</td>
<td>90 gtt/min</td>
</tr>
<tr>
<td>2</td>
<td>30 gtt/min</td>
<td>7</td>
<td>105 gtt/min</td>
</tr>
<tr>
<td>3</td>
<td>45 gtt/min</td>
<td>8</td>
<td>120 gtt/min</td>
</tr>
<tr>
<td>4</td>
<td>60 gtt/min</td>
<td>9</td>
<td>135 gtt/min</td>
</tr>
<tr>
<td>5</td>
<td>75 gtt/min</td>
<td>10</td>
<td>150 gtt/min</td>
</tr>
</tbody>
</table>

**Label Bag and tubing – Epi Drip: 1mg/250ml (4mcg/mL)**

Options:

2. 
1. Take your epinephrine 1:1,000 (or 1:10,000 **ONLY if 1:1,000** not available).
2. Inject the full 1 mg into a 1,000 mL normal saline bag (1 mcg/mL).
3. Run to hemodynamics stabilize. (1-10mcg/min)
   
   Drip sets: 10 gtts/mL/min = 1mcg/min
   15 gtts/mL/min = 1mcg/min
   20 gtts/mL/min = 1mcg/min

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

Pearls:
- **Recommended Exam:** Mental Status, Neck, Heart, Lungs, Neuro
- Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.
- Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.
- Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.
- 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.)
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 CPR Compressions
Push Hard (≥ 2 inches)
Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(sooners if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 seconds
30:2 Compression:Ventilation if no Advanced Airway
Monitor EtCO2 if available

AT ANY TIME
Return of Spontaneous Circulation
Go to Post Resuscitation Protocol AC 9

ALS Available

YES

NO

AED Procedure
if available

Cardiac Monitor

YES

NO

Shockable Rhythm

YES

NO

AED Procedure

Repeat and reassess

Airway
Protocol(s) AR 1, 2, 3

Asystole / PEA
Protocol AC 1
as indicated

Airway
Protocol(s) AR 1, 2, 3

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

Airway
Protocol(s) AR 1, 2, 3

Continue CPR
2 Minutes

Termination on Scene
Protocol AC 12
as indicated

Notify Destination or
Contact Medical Control
Cardiac Arrest; Adult

**Pearls**

- **Team Focused Approach / Pit-Crew Approach required;** assign responders to predetermined tasks. Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.
- **DO NOT HYPERVENTILATE:** If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.
- Reassess and document BIAD and / or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- **IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation.**
- **Defibrillation:** Follow manufacture's recommendations concerning defibrillation / cardioversion energy when specified.
- **End Tidal CO2 (EtCO2)**
  - If EtCO2 is < 10 mmHg, improve chest compressions.
  - If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient’s left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - **Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - **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 / vardenafl, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- Palliation / Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / Radiation / Referred
- Severity (1-10)
- Time (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

### 12 Lead ECG Procedure

<table>
<thead>
<tr>
<th>Aspirin 81 mg x 4 PO (chewed)</th>
<th>Or 325 mg PO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitroglycerin 0.3 / 0.4 mg Sublingual</td>
<td></td>
</tr>
</tbody>
</table>

Repeat every 5 minutes x 3 if prescribed to patient and (BP ≥ 100)

### Cardiac Monitor

#### Acute MI / STEMI or Scarbossa
(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 if capable
Keep Scene Time to ≤ 10 Minutes

If transporting to Non PCI Center
Reperfusion Checklist

### IV / IO Procedure

| Nitroglycerin 0.3 / 0.4 mg SL |

Repeat every 5 minutes as needed

### Morphine 2 – 4 mg IV / IO
Repeat every 5 minutes as needed
Maximum 10 mg
Or
Fentanyl 50 – 100 mcg IV / IO
Repeat 50 mcg every 20 minutes as needed
Maximum 500 mcg

### Hypotension / Shock
Protocol AM 5 if indicated

### CHF / Pulmonary Edema
Protocol AC 5 if indicated

Notify Destination or Contact Medical Control
Chest Pain: Cardiac and STEMI

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
- **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.
- **STEMI (ST-Elevation Myocardial Infarction)**
  Positive Reperfusion Checklist should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.
  - Consider placing 2 IV sites in the left arm: Many PTCI centers use the right radial vein for intervention.
  - Consider placing defibrillator pads on patient as a precaution.
  - Consider Normal Saline or Lactated Ringers bolus of 250 – 500 mL as pre-cath hydration.
- If CHF / Cardiogenic shock resulting from inferior MI (II, III, aVF), consider Right Sided ECG (V3 or V4). If ST elevation noted Nitroglycerin and / or opioids may cause hypotension requiring isotonic fluid boluses.
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and narcotics (Morphine, Fentanyl, or Dilaudid).
- Diabetic, geriatric and female patients often have atypical pain, or only generalized complaints.
- 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.

---

Concordant ST-segment elevation \( \geq 1 \text{ mm} \) in any lead
Concordant ST-segment depression \( \geq 1 \text{ mm} \) in lead V1 – V3
Discordant ST/S Ratio \( \leq -0.25 \)

**Modified Scarbossa Criteria**

- **Concordant ST-segment elevation** \( \geq 1 \text{ mm} \) in any lead
- **Concordant ST-segment depression** \( \geq 1 \text{ mm} \) in lead V1 – V3
- **Discordant ST/S Ratio** \( \leq -0.25 \)

**Scarbossa E et al. Electrocardiographic Diagnosis of Ischemic Acute Myocardial Infarction in the Presence of Left Bundle Branch Block. NEJM 2011; 364: 1741-7**

<table>
<thead>
<tr>
<th>Scarbossa ECG Criteria for LBBB</th>
<th>ST Segment Elevation ( \geq 1 \text{ mm} ) Concordant with the QRS Complex</th>
<th>ST segment depression ( \geq 1 \text{ mm} ) in lead V1–3</th>
<th>ST segment elevation ( \geq 5 \text{ mm} ) and discordant with the QRS complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concordant STE ( \geq 1 \text{ mm} )</td>
<td>73%</td>
<td>29%</td>
<td>31%</td>
</tr>
<tr>
<td>Non-concordant STE ( \geq 1 \text{ mm} ) in V1 – V3</td>
<td>92%</td>
<td>96%</td>
<td>92%</td>
</tr>
<tr>
<td>Discordant STE ( \geq 5 \text{ mm} )</td>
<td>0.09</td>
<td>6.25</td>
<td>5.88</td>
</tr>
<tr>
<td>Discordant STE ( \geq 0.1 \text{ mm} ) in V1 – V3</td>
<td>0.29</td>
<td>0.78</td>
<td>0.75</td>
</tr>
</tbody>
</table>

---

**Concordant ST-segment elevation**
- \( R_{A} \) 10 mm
- \( R_{B} \) 10 mm
- \( R_{C} \) 10 mm
- \( R_{D} \) 10 mm
- \( R_{E} \) 10 mm
- \( R_{F} \) 10 mm
- \( R_{G} \) 10 mm
- \( R_{H} \) 10 mm
- \( R_{I} \) 10 mm
- \( R_{J} \) 10 mm
- \( R_{K} \) 10 mm
- \( R_{L} \) 10 mm
- \( R_{M} \) 10 mm
- \( R_{N} \) 10 mm
- \( R_{O} \) 10 mm
- \( R_{P} \) 10 mm
- \( R_{Q} \) 10 mm
- \( R_{R} \) 10 mm
- \( R_{S} \) 10 mm
- \( R_{T} \) 10 mm
- \( R_{U} \) 10 mm
- \( R_{V} \) 10 mm
- \( R_{W} \) 10 mm
- \( R_{X} \) 10 mm
- \( R_{Y} \) 10 mm
- \( R_{Z} \) 10 mm

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

- **Concordant ST-segment elevation** \( \geq 1 \text{ mm} \) in any lead
- **Concordant ST-segment depression** \( \geq 1 \text{ mm} \) in lead V1 – V3
- **Discordant ST/S Ratio** \( \leq -0.25 \)
**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

**12 Lead ECG Procedure**

**Cardiac Monitor**

**IV / IO Procedure**

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

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

**12 Lead ECG Procedure**

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

**Cardiac Monitor**

**IV / IO Procedure**

**Assess Symptom Severity**

**MILD**
- Normal Heart Rate
- Elevated or Normal BP

- Nitroglycerin 0.3 / 0.4 mg SL
Repeat every 5 minutes

- Improving NO

**NO**

**YES**

**MODERATE / SEVERE**
- Elevated Heart Rate
- Elevated BP

- Airway NIPPV Procedure

- Nitroglycerin 0.3 / 0.4 mg SL
Repeat every 5 minutes

- P
- Nitroglycerin Paste

- Consider Furosemide 40 mg IV ONLY IF
Transport time > 30 minutes Known CHF / Daily Lasix Afebrile

- P
- Notify Destination or Contact Medical Control

**CARDIOGENIC SHOCK**
- Tachycardia followed by bradycardia
- Hypertension followed by hypotension

- B
- Remove NIPPV if in place

- Adult Hypotension / Shock Protocol AM 5 if indicated
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.
- Contraindications to opioids include severe COPD and respiratory distress. Monitor the patient closely.
- Consider myocardial infarction in all 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 NIPPV application using the NIPPV procedure in the PCR. Document 12 Lead ECG using the 12 Lead ECG procedure.
- EMT may administer Nitroglycerin to patients already prescribed medication. May give from EMS supply.
- Agency medical director may require Contact of Medical Control.
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

NO

B
12 Lead ECG Procedure

A
IV / IO Procedure

Cardiac Monitor

Attempt Vagal Maneuvers Procedure

Adenosine 6 mg IV / IO
- Rapid IV push with flush
- If no response:
- May repeat twice 12 mg

If no rhythm change with Adenosine

Diltiazem 0.25 mg/kg IV / IO
- Over 2 – 3 minutes
- (Maximum 25 mg)
- If age ≥ 60 give 10 mg then repeat, 10 mg in 5 min if SBP ≥ 100

If rate not controlled: repeat in 15 minutes if SBP ≥ 100;

Diltiazem 0.35 mg/kg IV / IO
- (Maximum 25 mg)
- If age ≥ 60 give 15 mg then repeat, 10 mg in 5 min if SBP ≥ 100
- or
- Metoprolol 5mg IV/IO
- Every 5 minutes as required
- (Maximum 15mg)

If contraindication to Diltiazem or history or presence of WPW, instead use:

Amiodarone 150 mg in 100 mL of D5W IV / IO
- Infuse over 10 minutes
- May repeat if tachycardia recurs

Cardioversion Procedure

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

Consider Sedation Prior to Cardioversion

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

Fentanyl is an ALTERNATIVE to Midazolam for pain/sedation for cardioversion, especially in the hypotensive patient.

DO NOT give BOTH Fentanyl and Midazolam.

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

Exit to Appropriate Protocol(s)

Notify Destination or Contact Medical Control

Single lead ECG able to diagnose and treat arrhythmia

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

Cardioversion Procedure

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

Consider Sedation Prior to Cardioversion

- Midazolam 5 mg IV / IO / IM
  - May repeat as needed
  - (Maximum 10 mg)

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

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

Attempt Vagal Maneuvers Procedure

- Diltiazem 0.25 mg/kg IV / IO
  - Over 2 – 3 minutes
  - (Maximum 25 mg)
  - If age ≥ 60 give 10 mg then repeat, 10 mg in 5 min if SBP ≥ 100

  If rate not controlled: repeat in 15 minutes if SBP ≥ 100;
  
  Diltiazem 0.35 mg/kg IV / IO
  - (Maximum 25 mg)
  - If age ≥ 60 give 15 mg then repeat, 10 mg in 5 min if SBP ≥ 100
  
  or
  
  Metoprolol 5mg IV/IO
  - Every 5 minutes as required
  - (Maximum 15mg)

  If contraindication to Diltiazem or history or presence of WPW, Instead use:
  
  Amiodarone 150 mg in 100 mL of D5W IV / IO
  - Infuse over 10 minutes
  - May repeat if tachycardia recurs

Exit to Appropriate Protocol(s)
if 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.
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 Control. 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

B 12 Lead ECG Procedure
A IV / IO Procedure
P Cardiac Monitor

REGULAR RHYTHM and
Monomorphic QRS Complex

Amiodarone 150 mg
in 100 mL of D5W IV / IO
Infuse over 10 minutes
May repeat if wide complex tachycardia recurs
Or
Procainamide 20 – 50 mg / min IV / IO
(Maximum 17 mg / kg)
Procainamide 1 – 4 mg / min
Or
Lidocaine 1 mg / kg IV / IO
If infusion is initiated > 15 minutes from
first bolus, repeat 1 mg / kg bolus
Lidocaine infusion (1-4 mg / min)

P Consider consultation with medical control if
patient is stable

RHYTHM CONVERTS
YES
B 12 Lead ECG Procedure
Monitor and Reassess

Notify Destination or
Contact Medical Control

Cardioversion Procedure

Wide and Regular: 100 J
(Attempt to Sync, If no Sync and
unstable patient, Defibrillate)

May repeat and increase dose with
subsequent cardioversion attempts

P

Consider Sedation Prior to
Cardioversion
Midazolam 5 mg IV / IO / IM
May repeat as needed
Maximum 10 mg

Fentanyl is an ALTERNATIVE to
Midazolam for pain/sedation for
cardioversion, especially in the
hypotensive patient.
DO NOT give BOTH
Fentanyl and Midazolam.
Fentanyl 1 mcg/kg IV / IO / IM / IN
(Max dose 100 mcg),
give SLOW over 2-3 mins

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

- **Cardioversion Procedure**
  - **Wide and Irregular: 200J**
    - Attempt to Sync, If no Sync and unstable patient, Defibrillate
    - May repeat if needed, check pulse and eval for cardiac arrest if no conversion
  - **Consider Sedation Prior to Cardioversion**
    - Midazolam 5 mg IV / IO / IM
      - May repeat as needed
      - Maximum 10 mg
  - **Fentanyl** is an ALTERNATIVE to Midazolam for pain/sedation for cardioversion, especially in the hypotensive patient. **DO NOT** give BOTH Fentanyl and Midazolam.
    - Fentanyl 1 mcg/kg IV / IO / IM / IN
      - (Max dose 100 mcg),
      - give SLOW over 2-3 mins

- **12 Lead ECG Procedure**
  - **B RHYTHM CONVERTS**
    - Monitor and Reassess
  - **NO**
    - Monitor and Reassess

- **Notify Destination or Contact Medical Control**

---

**IRREGULAR RHYTHM and MONOMORPHIC QRS Complex**

- **Amiodarone** 150 mg in 100 mL of D5W IV / IO
  - Infuse over 10 minutes
  - May repeat if wide complex tachycardia recurs
  - Or
  - **Procainamide** 20 – 50 mg / min IV / IO
    - Maximum 17 mg / kg
  - Procainamide 1 – 4 mg / min
    - Or
    - **Lidocaine** 1 mg / kg IV / IO.
      - If infusion is initiated > 15 minutes from first bolus, repeat 1 mg / kg bolus
      - Lidocaine Infusion 1-4 mg / min

- **IRREGULAR RHYTHM and POLYMORPHIC QRS Complex**

- **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.
Adult Cardiac Section

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:**
- 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.
    - 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

Cardiac Arrest Protocol AC 3

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches) Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

At the end of each 2 minute cycle
Check AED / ECG Monitor
If shockable rhythm, deliver shock and immediately
continue chest compressions

Search for Reversible Causes

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

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

Continue CPR Compressions
Push Hard (≥ 2 inches) Push Fast (100 - 120 / min)
Change Compressors every 2 minutes
(sooner if fatigued)
(Limit changes / pulse checks ≤ 10 seconds)

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

Amiodarone 300 mg IV / IO
May repeat if refractory
Amiodarone 150 mg IV / IO

Refractory
Consider Lidocaine 1.0 mg/kg IV / IO
May repeat if refractory
Lidocaine 0.75 mg/kg IV / IO

Refractory
Magnesium 2 gm IV / IO

Refractory after 3 Defibrillations Attempts
Consider Dual Sequential Defibrillation Procedure
if available

Notify Destination or
Contact Medical Control

Reversible Causes
Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia
Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

AT ANY TIME
Return of Spontaneous Circulation
Go to Post Resuscitation Protocol AC 9
Pearls

- Recommended Exam: Mental Status, neuro, heart, and lung
- Team Focused Approach / Pit-Crew Approach recommended; assigning responders to predetermined tasks.
- Refer to optional protocol or development of local agency protocol.
- 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: If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Passive oxygenation optional in agencies practicing Team Focused Approach / Pit-Crew Approach.
- Reassess and document BIAD and/or endotracheal tube placement and EtCO2 frequently, after every move, and at transfer of care.
- IV / IO access and drug delivery is secondary to high-quality chest compressions and early defibrillation.
- Defibrillation: Follow manufacture’s recommendations concerning defibrillation / cardioversion energy when specified.
- End Tidal CO2 (EtCO2)
  - If EtCO2 is < 10 mmHg, improve chest compressions.
  - If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- Avoid Procainamide in CHF or prolonged QT.
- 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
- If no IV / IO, with drugs that can be given down ET tube, double dose and then flushed with 5 ml of Normal Saline followed by 5 quick ventilations. IV / IO is the preferred route when available.
- Return of spontaneous circulation: Heart rate should be > 60 when initiating anti-arrhythmic infusions.
**Post Resuscitation**

**Return of Spontaneous Circulation**

- Repeat Primary Assessment

<table>
<thead>
<tr>
<th>B</th>
<th>Optimize Ventilation and Oxygenation</th>
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<tbody>
<tr>
<td></td>
<td>- Maintain SpO2 ≥ 94%</td>
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<td></td>
<td>- ETCO2 ideally 35 – 45 mm Hg</td>
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<tr>
<td></td>
<td>- Respiratory Rate 10 / minute</td>
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<td></td>
<td>- Remove Impedance Threshold Device</td>
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<tr>
<td></td>
<td>- <strong>DO NOT HYPERVENTILATE</strong></td>
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</tbody>
</table>

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

**B**  
- 12 Lead ECG Procedure

**A**  
- IV / IO Procedure

**P**  
- Cardiac Monitor
- Monitor Vital Signs / Reassess

**Chest Pain and STEMI**  
- Protocol AC 4  
  *if indicated*

**Hypotension / Shock**  
- Protocol AM 5  
  *as indicated*

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

**Post Intubation BIAD Management**  
- Protocol AR 8

**Reversible Causes**
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypothermia
- Hypo / Hyperkalemia
- Tension pneumothorax
- Tamponade; cardiac
- Toxins
- Thrombosis; pulmonary (PE)
- Thrombosis; coronary (MI)

**Notify Destination or Contact Medical Control**

**Arrhythmias are common and usually self limiting after ROSC**

If Arrhythmia Persists follow Rhythm Appropriate Protocol
Post Resuscitation

Preferred:

1. **Mix 1mg of Epinephrine 1:1000 in a 250mL NS or D5W Bag** (60gtt set)

<table>
<thead>
<tr>
<th>mcg/min</th>
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<tr>
<td>1</td>
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<td>30 gtt/min</td>
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<tr>
<td>5</td>
<td>75 gtt/min</td>
<td>10</td>
<td>150 gtt/min</td>
</tr>
</tbody>
</table>

**Label Bag and tubing – Epi Drip: 1mg/250ml (4mcg/mL)**

Options:

2. 1. Take your epinephrine 1:1,000 (or 1:10,000 **ONLY if 1:1,000 not available**).
2. Inject the full 1 mg into a 1,000 mL normal saline bag (1 mcg/mL).
3. Run to hemodynamics stabilize. (1-10mcg/min)
   - Drip sets: 10 gtts/mL/min = 1mcg/min
   - 15 gtts/mL/min = 1mcg/min
   - 20 gtts/mL/min = 1mcg/min

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

- Pearls
- **Recommended Exam:** Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro
- Continue to search for potential cause of cardiac arrest during post-resuscitation care.
- Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs. Titrate FiO2 to maintain SpO2 of ≥ 94%.
- Initial End tidal CO2 may be elevated immediately post-resuscitation, but will usually normalize. While goal is 35 – 45 mmHg avoid hyperventilation to achieve.
- Most patients immediately post resuscitation will require ventilatory assistance.
- **Titrates 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 with evidence of STEMI on 12 Lead ECG.
- Consider transport to facility capable of managing the post-arrest patient including hypothermia therapy, cardiology / cardiac catheterization, intensive care service, and neurology services.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post-resuscitation management may best be planned in consultation with medical control.
Team Focused CPR

### Criteria for Death / No Resuscitation
Review DNR / MOST Form

- **NO**
  - Begin Continuous CPR Compressions
    - Push Hard (≥ 2 inches)
    - Push Fast (100 - 120 / min)
    - Change Compressors every 2 minutes
      (sooner if fatigued)
      (Limit changes / pulse checks ≤ 10 seconds)
  - Ventilate 1 breath every 6 seconds
    - 30:2 Compression:Ventilation if no Advanced Airway
    - Monitor EtCO2 if available

### AT ANY TIME
Return of Spontaneous Circulation

- **Go to Post Resuscitation Protocol AC 9**

---

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

---

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

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

### Third Arriving Responder
- **BLS or ALS**

### Fourth / Subsequent Arriving Responders
- Take direction from Team Leader

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

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

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

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

### Fourth / Subsequent Arriving Responders
- Establish Defibrillation Automated Procedure
- Establish IV / IO
- Administer Appropriate Medications
- Establish Airway with BIAD if not in place

### Third Arriving Responder
- Complete Cardiac Arrest Protocol AC 3

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

---

### BLS

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### ALS

---

### Continuous Cardiac Arrest Protocol AC 3

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Pearls

- Team Focused Approach / Pit-Crew Approach recommended; assign responders to predetermined tasks. Refer to optional protocol or development of local agency protocol.
- Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated.
- DO NOT HYPERVENTILATE: If no advanced airway (BIAD, ETT) compression to ventilation ratio is 30:2. If advanced airway in place, ventilate 10 breaths per minute with continuous, uninterrupted compressions.
- Do not interrupt compressions to place endotracheal tube. Consider BIAD first to limit interruptions.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
On Scene Resuscitation
Termination of CPR

TIME FROM BLS or ALS CPR

Exit to Cardiac Arrest Protocol(s) AC 1, 3, 8

20 Minutes

Exit to Pediatric Cardiac Arrest Protocol(s) PC 1, 4, 6

Age ≤ 18

YES

Exit to Pediatric Cardiac Arrest Protocol(s) PC 1, 4, 6

NO

Downtime ≥ 15 minutes

YES

AED / ECG Monitor
Initial Rhythm Asystole / PEA
No shock indicated

YES

Exit to Cardiac Arrest Protocol(s) AC 1, 3, 8

NO

Do not begin resuscitation
Follow Deceased Subjects Policy

FR / EMS BLS + ALS CPR > 20 minutes

Continue Cardiac Arrest Protocol(s) AC 1, 3, 8

FR / EMS BLS + ALS CPR > 45 minutes

Continue Cardiac Arrest Protocol(s) AC 1, 3, 8

Contact Medical Control

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol AC 9

2018-01-24
This Protocol has been altered from the original NCCEP Protocol by the EMS System Medical Director

Page 165 of 260
Pearls.

- **General approach:**
  1. Determine if a terminal disease is involved?
  2. Is there an advanced directive such as a DNR / MOST form?
  3. Did the patient express to your historian any desires regarding resuscitation and if so what measures?
  4. Remember a living will is not a DNR.

Obtain a history while resuscitation efforts are ongoing. Determine the most legitimate person on scene as your information source such as a spouse, child, or sibling or Durable Health Care Power of Attorney.
Pearls

- **Recommended Exam:** Mental Status, Skin, Heart, Lungs, Abdominal
- **Anaphylaxis** is an acute and potentially lethal multisystem allergic reaction.
- **Epinephrine administration:**
  - Drug of choice and the FIRST drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.)
  - IM Epinephrine should be administered in priority before or during attempts at IV or IO access.
  - Diphenhydramine and steroids have no proven utility in Moderate / Severe anaphylaxis and may be given only After Epinephrine. Diphenhydramine and steroids should NOT delay repeated Epinephrine administration.
  - In Moderate and Severe anaphylaxis Diphenhydramine may decrease mental status. Oral Diphenhydramine should NOT be given to a patient with decreased mental status 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

---

**Blood Glucose Analysis Procedure**

**A**

**B**
12 Lead ECG Procedure *if indicated*

**P**
Cardiac Monitor

**D**
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*

---

**Blood Sugar**

- **≤ 69 mg / dl**
  - Consider Oral Glucose Solution *if available*
  - Consider Oral Solution (Juices / Food)
  - Dextrose Infusion
    - D10W in 250mL Bag, Titrate to patient condition and response
    - May repeat until Blood Glucose ≥ 70 mg/dL
  - If no improvement

- **70 – 249 mg / dl**
  - Blood Glucose Analysis Procedure *if condition changes*

- **≥ 250 mg / dl**
  - Blood Glucose Analysis Procedure

**Exit to Appropriate Protocol(s)**

---

**Blood Glucose ≤ 69 mg / dl and symptomatic**

- No venous access
- Glucagon 1 – 2 mg IM
- Repeat in 15 minutes if needed

**Blood Sugar 70 – 249 mg / dl**

**Blood Sugar ≥ 250 mg / dl**

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

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

**Notify Destination or Contact Medical Control**

---

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

2018-01-24 revised

Page 169 of 260
Adult Medical Protocol Section

**Pearls**
- **Recommended exam:** Mental Status, Skin, Respirations and effort, Neuro.
- **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.**
- **Patient's refusing transport to medical facility after treatment of hypoglycemia:**
  - Blood sugar must be ≥ 80, patient has ability to eat and availability of food with responders on scene.
  - Patient must have known history of diabetes and not taking any oral diabetic agents.
  - Patient returns to normal mental status and has a normal neurological exam with no new neurological deficits.
  - Must demonstrate capacity to make informed health care decisions. See Universal Patient Care Protocol UP-1. Otherwise contact medical control.
- **Hypoglycemia with Oral Agents:**
  - Patient’s taking oral diabetic medications should be encouraged to allow transportation to a medical facility. 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.
  - In extreme circumstances with no IV / IO access and no response to glucagon, D50 can be administered rectally. Contact medical control for advice.

**D10 / D25 Preparation from D50 if needed:**
- D10: Remove 10 mL of D50 from a D50 vial. Add 40 mL of NS with the 10 mL of D50 – total volume 50 mL.
- D10: Alternative, Discard 40 mL from the D50 vial and draw up 40 mL of NS – total volume 50 mL.
- D25: Remove 25 mL of D50 and draw up 25 mL of NS – total volume 50 mL.
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

---

**Blood Glucose Analysis Procedure**

| A | IV / IO Procedure |
| B | 12 Lead ECG Procedure |
| P | Cardiac Monitor |

**CHF / Pulmonary Edema**

Protocol AC 5

---

**Systolic Blood Pressure < 90**

- YES: Isotonic fluid Bolus 250 mL
  - Repeat as needed
  - Maximum 1 L
  - If lungs remain clear
- NO: Hypotensive / Shock Protocol AM 5
  - as indicated

**Peaked T Wave QRS ≥ 0.12 sec**

- YES: Calcium Gluconate 2 gm IV / IO
  - (Or Calcium Chloride 1 gm IV / IO)
  - Sodium Bicarbonate 50 mEq IV / IO
- NO: Notify Destination or Contact Medical Control

---

**Cardiac Arrest**

- YES: Calcium Gluconate 2 gm IV / IO
  - (Or Calcium Chloride 1 gm IV / IO)
  - Sodium Bicarbonate 50 mEq IV / IO
- NO:
  - 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

---

**Shunt / Fistula Bleeding**

- YES: Calcium Gluconate 2 gm IV / IO
  - (Or Calcium Chloride 1 gm IV / IO)
  - Sodium Bicarbonate 50 mEq IV / IO
- NO: Isotonic fluid Bolus 250 mL
  - Repeat as needed
  - Maximum 1 L
  - If lungs remain clear

---

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

| Beaufort County EMS | See Destination Plan |

Page 171 of 260
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 Isotonic fluid. 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 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.

### 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

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

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

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

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

---

**Blood Glucose Analysis Procedure**

- **A**
  - 12 Lead ECG Procedure

- **B**
  - IV / IO Procedure

- **P**
  - Cardiac Monitor

- **Airway Protocol(s)**
  - *if indicated*

- **Diabetic Protocol AM 2**
  - *if indicated*

---

**History and Exam Suggest Type of Shock**

- **Cardiogenic**
- **Hypovolemic**
- **Distributive**
- **Obstructive**

---

**Cardiogenic**

- Chest Pain: Cardiac and STEMI
  - Protocol AC 4
  - Appropriate Cardiac Protocol(s)
    - *if indicated*

---

**Hypovolemic**

- Allergy Protocol AM 1
  - *if indicated*

- Suspected Sepsis
  - Protocol UP 14
    - *if indicated*

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

---

**Isotonic fluid Bolus 500 mL IV**
- Repeat to effect SBP > 90
- 2 L Maximum

---

**Epinephrine 1 – 10 mcg/min IV / IO**
- To effect SBP > 90

---

**Notify Destination or Contact Medical Control**
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 Epinephrine when hypotension unresponsive to fluid resuscitation.
- **Hypovolemic Shock:**
  - Hemorrhage, trauma, GI bleeding, ruptured aortic aneurysm or pregnancy-related bleeding.
  - **Transamnic Acid (TXA):** Agencies utilizing TXA must have approval from your T-RAC.
- **Cardiogenic Shock:**
- **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 or Dexamethasone 10mg IM/IV/IO. Use steroid agent specific to your drug list. May administer prescribed steroid carried by patient IM / IV / IO. Patient may have Hydrocortisone (Cortef or Solu-Cortef). Dose: < 1y.o. give 25 mg, 1-12 y.o. give 50 mg, and > 12 y.o. give 100 mg or dose specified by patient's physician.

<table>
<thead>
<tr>
<th>Preferred:</th>
<th><strong>Mix 1mg of Epinephrine 1:1000 in a 250mL NS or D5W Bag</strong> (60gtt set)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mcg/min</td>
<td>gtt/min (mL/hr)</td>
</tr>
<tr>
<td>1</td>
<td>15 gtt/min</td>
</tr>
<tr>
<td>2</td>
<td>30 gtt/min</td>
</tr>
<tr>
<td>3</td>
<td>45 gtt/min</td>
</tr>
<tr>
<td>4</td>
<td>60 gtt/min</td>
</tr>
<tr>
<td>5</td>
<td>75 gtt/min</td>
</tr>
</tbody>
</table>

**Label Bag and tubing – Epi Drip: 1mg/250ml (4mcg/mL)**

**Option #2.**
1. Take your epinephrine 1:1,000 (or 1:10,000 ONLY if 1:1,000 not available).
2. Inject the full 1 mg into a 1,000 mL normal saline bag (1 mcg/mL).
3. Run to hemodynamics stabilize. (1-10mcg/min)

| Drip sets: | 10 gtt/mL/min = 1mcg/min | 15 gtt/mL/min = 1mcg/min | 20 gtt/mL/min = 1mcg/min |

**Option 3.**
1. Take a 10 ml syringe with 0 mL of NS
2. Into this syringe, draw up 1 mL of epinephrine 10,000 (cardiac amp contains Epinephrine 100 mcg/mL)
3. Now you have 10 mL’s of Epinephrine (10 mcg/ml)
Dose: 0.2-1 mL every 1-5 minutes (dose 2-10 mcg)
Any of following:
- Severe headache
- Worsening of neurological exam
- Nausea / Vomiting
- Allergic reaction
- Excessive bleeding

Stop IV Activase / t-PA infusion

Patient must be stabilized BEFORE transport initiated
- SBP < 185
- DBP < 110

Obtain BP readings in limb without infusion

SBP ≥ 185 and/or DBP ≥ 110

YES

Assess / Document GCS / Pupil exam
- Nothing by mouth / NPO
- Prehospital Stroke Screen
- Maintain SaO2 ≥ 94%
- Cardiac Monitor
- Verify Activase / t-PA bolus dose
- Verify total dose
- Document time infusion initiated
- Document estimated time of dose completion
- Reassess VS every 15 minutes
- Repeat neurological exam every 15 minutes
- Obtain BP readings in limb without infusion

SBP ≥ 180 and/or DBP ≥ 105
- And
- NO antihypertensive medication infusion initiated by transferring hospital

YES

Labetalol 10 mg IV / IO
- Contact Medical Control or Receiving Facility

NO

Antihypertensive medication infusion initiated by transferring hospital

YES

Labetalol: Increase 2 mg/min every 10 minutes
- Titrate SBP < 180 mmHg
- DBP < 105 mmHg
- Maximum 8mg/min
- Or
- Nicardipine: Increase 2.5 mg/hr every 5 minutes
- Titrate SBP < 180 mmHg
- DBP < 105 mmHg
- Maximum 15 mg/hr

YES

SBP < 140 and/or DBP < 80

Notify Destination or Contact Medical Control

NO

Stop Anti-hypertensive agent

Continue Activase / t-PA infusion

Reassess VS every 15 minutes
- Repeat neurological exam every 15 minutes
- Obtain BP readings in limb without infusion
Suspected Stroke: Activase / t-PA
(Optional)

Pearls
- This protocol is optional and given only as an example. Agencies may and are encouraged to develop their own.
- This protocol is intended for interfacility transfer patients only. Medication must be started at initial treating hospital.
- Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- Items in Red Text are key performance measures used in protocol compliance.
- The Reperfusion Checklist should be completed for any suspected stroke patient.
- Onset of symptoms is defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time when the patient went to sleep or last time known to be symptom free.)
- 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.
- Infusion Pump Alarm / No Flow:
  - Remove drip chamber from Activase / t-PA bag.
  - Spike Activase / t-PA drip chamber to NS bag.
  - Restart infusion to complete medication remaining in IV tubing.
- Medication dosing safety:
  - When IV Activase / t-PA dose administration will continue en route, verify estimated time of completion.
  - Verify with sending hospital that excess Activase / t-PA has been withdrawn from the bottle and wasted.
  - This ensures the bottle will be empty when the full dose is finished. For example, if the total dose is 70 mg, then 30 cc should be withdrawn and wasted since a 100 mg bottle of Activase / t-PA contains 100 mL of fluid when reconstituted.
  - Sending hospital should apply a label to Activase / t-PA bottle with the number of mL of fluid that should be in the bottle in case of pump failure during transit.
- Allergy / Anaphylaxis:
  - Activase / t-PA, is structurally identical to endogenous t-PA and therefore should not induce allergy, single cases of acute hypersensitivity reactions have been reported.
  - Angioedema:
    - Rapid swelling (edema) of the dermis, subcutaneous tissue, mucosa and submucosal tissues. Typically involves the face, lips, tongue and neck.
    - Almost always self limiting but may progress to interfere with airway / breathing so close monitoring is warranted.
    - Utilize the Allergy / Anaphylaxis Protocol as indicated and also for angioedema. Infusion should be stopped.
    - Give all medications related to the Allergy / Anaphylaxis Protocol by IV route only as patient should remain NPO.
Childbirth / Labor

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

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

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

---

**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***

**Prolapsed Cord**

- Shoulder Dystocia
  - Hips Elevated
  - Knees to Chest
  - Insert fingers into vagina to relieve pressure on cord
  - Saline Dressing Over cord

**Breech Birth**

- Transport Unless delivery imminent
  - Encourage Mother to refrain from pushing
  - Support Presenting Parts
  - Do Not Pull
  - Place 2 fingers along nose and push tissue from face

**Delivery**

Go to Newly Born Protocol AO 2

---

**Notify Receiving Facility Immediately**

**High Flow Oxygen to Mother**

Monitor and Reassess

**Notify Destination or Contact Medical Control**
Childbirth / Labor

Pearls

- **Recommended Exam (of Mother):** Mental Status, Heart, Lungs, Abdomen, Neuro
- **Record APGAR at 1 minute and 5 minutes after birth.**
- **After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.**
- **Document all times (delivery, contraction frequency, and length).**
- **Transport or Delivery?**
  Decision to transport versus remain and deliver is multifactorial and difficult. Generally it is preferable to transport. Factors that will impact decision include: number of previous deliveries; length of previous labors; frequency of contractions; urge to push; and presence of crowning.
- **Maternal positioning for labor:**
  Supine with head flat or elevated per mother’s choice. Maintain flexion of both knees and hips. Elevated buttocks slightly with towel. If delivery not imminent, place mother in the left, lateral recumbent position with right side up about 10 – 20°.
- **Umbilical cord clamping and cutting:**
  Place first clamp about 10 cm from infant’s abdomen and second clamp about 5 cm away from first clamp.
- **Multiple Births:**
  Twins occur about 1/90 births. Typically manage the same as single gestation. If imminent delivery call for additional resources, 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

**NO**
- Supplemental Oxygen
  - Maintain SpO2 per Pearls
  - Maintain warmth
  - Monitor and Reassess

---

**Heart Rate < 100**

**YES**
- Check chest movement
  - Change airway position
  - Change BVM Technique

**NO**
- Supplemental Oxygen
  - Maintain SpO2 per Pearls
  - Maintain warmth
  - Monitor and Reassess

---

**Heart Rate < 60**

**YES**
- Chest Compressions
  - Pediatric Airway Protocol(s) AR 5, 6

**NO**
- IV / IO Procedure
  - Epinephrine 1:10,000
    - 0.01 mg /kg IV / IO
    - Every 3 to 5 minutes as needed
  - Isotonic fluid Bolus
    - 10 mL / kg IV / IO
    - May repeat x 1

---

**Notify Destination or Contact Medical Control**
Pearls
- **Recommended Exam:** Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro
- Document 1 and 5 minute Apgars in PCR
- **Most newborns requiring resuscitation respond to ventilations / BVM, 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 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).
- D10 = D50 diluted (1 ml of D50 with 4 ml of Normal Saline)
**Obstetrical Emergency**

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

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

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

---

**Known or Suspected Pregnancy**
- Missed Period
- Vaginal Bleeding
- Abdominal Pain

**Option**
- YES
  - Left lateral recumbant position
  - Blood Glucose Analysis Procedure
  - IV / IO Procedure
  - Cardiac Monitor
  - Abdominal Pain
  - Vomiting and Diarrhea
  - Protocol UP 3 if indicated
  - Diabetic
  - Protocol AM 2 / PM 2 if indicated
  - Hypertension / Shock
  - Protocol AM 5 / PM 5 if indicated

**Seizure Activity**
- YES
  - Midazolam 5 mg IM/IV/IO
  - May repeat every 3 to 5 minutes as needed
  - Maximum 10 mg
  - Magnesium Sulfate 2 g IV / IO
  - Over 2 – 3 minutes
  - May repeat x 1

**Notify Destination or Contact Medical Control**
Pearls

- **Recommended Exam:** Mental Status, Abdomen, Heart, Lungs, Neuro
- **Midazolam 5 – 10 mg IM** is effective in termination of seizures. Do not delay IM administration with difficult IV or IO access.
- **Magnesium Sulfate** should be administered as quickly as possible. May cause hypotension and decreased respiratory drive, but typically in doses higher than 6 g.
- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation. Greater than 20 weeks generally require 4 to 6 hours of fetal monitoring. **DO NOT** suggest the patient needs an ultrasound.

- **Ectopic pregnancy:**
  Implantation of fertilized egg outside the uterus, commonly in or on the fallopian tube. As fetus grows, rupture may occur. Vaginal bleeding may or may not be present. Many women with ectopic pregnancy do not know they are pregnant. Usually occurs within 5 to 10 weeks of implantation. Maintain high index of suspicion with women of childbearing age experiencing abdominal pain.

- **Preeclampsia:**
  Occurs in about 6% of pregnancies. Defined by hypertension and protein in the urine. RUQ pain, epigastric pain, N/V, visual disturbances, headache, and hyperreflexia are common symptoms.
  In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
  Risk factors: < 20 years of age, first pregnancy, multigestational pregnancy, gestational diabetes, obesity, personal or family history of gestational hypertension.

- **Eclampsia:**
  Seizures occurring in the context of preeclampsia. Remember, women may not have been diagnosed with preeclampsia.
  Maintain patient in a left lateral position, right side up 10 - 20° to minimize risk of supine hypotensive syndrome.
  Ask patient to quantify bleeding - number of pads used per hour.
Blast Injury / Incident

**History**
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history / Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

**Signs and Symptoms**
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezeing / 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**

<table>
<thead>
<tr>
<th>Triage Protocol UP 2 as indicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 as indicated</td>
</tr>
<tr>
<td>Multiple Trauma Protocol TB 6 if indicated</td>
</tr>
<tr>
<td>IV / IO Procedure if indicated</td>
</tr>
<tr>
<td>Cardiac Monitor if indicated</td>
</tr>
<tr>
<td>Thermal Burn Protocol TB 9 Chemical and Electrical Burn Protocol TB 2 if indicated</td>
</tr>
<tr>
<td>Crush Injury Protocol TB 3 if indicated</td>
</tr>
<tr>
<td>Radiation Incident Protocol TB 7 if indicated</td>
</tr>
</tbody>
</table>

**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
  - **Rapid Transport** to appropriate destination using **Trauma and Burn:** **EMS Triage and Destination Plan**

- **Notify Destination or Contact Medical Control**
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) blistersing
- 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

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

2017-12-13 revised
Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS
Chemical and Electrical Burn

Pearls

- **Recommended Exam:** Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro
- **Green, Yellow and Red In burn severity do not apply to Triage systems.**
- **Refer to Rule of Nines:** 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.
- **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

### Differential Diagnoses
- Entrapment without crush syndrome
- Vascular injury with perfusion deficit
- Compartment syndrome
- Altered mental status

### Treatment
- **Sodium Bicarbonate**
  - 50 mEq IV / IO
  - Pediatric: 1 mEq / kg IV / IO
- **Calcium Gluconate**
  - 2 g IV / IO
  - Or
  - Calcium Chloride 1 g IV / IO
  - Pediatric: 20 mg / kg IV / IO
  - Over 2-3 minutes
- **Albuterol Nebulizer**
  - 2.5 – 5 mg
  - May repeat x 3

### Protocols
- Age Appropriate Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7
- **12 Lead ECG Procedure**
- **IV / IO Procedure**
- **Cardiac Monitor**
- **Multiple Trauma Protocol TB 6 if indicated**
- **Thermal Burn Protocol TB 9 Chemical and Electrical Burn Protocol TB 2 if indicated**
- **Pain Control Protocol UP 11 as indicated**

### Decision Tree
- **Entrapped < 2 hours**
- **Entrapped > 2 hours**
  - **Abnormal ECG**
    - Peaked T Waves
    - QRS ≥ 0.12 seconds
    - QT ≥ 0.46 seconds
    - Loss of P wave
    - Hemodynamically Unstable
    - Asystole / PEA / VF / VT

### Exit to
- **Age Appropriate Cardiac Arrest Protocol AC 3 / PC 4 Arrhythmia Protocol(s) if indicated**

### Medications
- **Sodium Bicarbonate**
  - 50 mEq IV / IO
  - Pediatric: 1 mEq / kg IV / IO
- **Calcium Gluconate**
  - 2 g IV / IO
  - Or
  - Calcium Chloride 1 g IV / IO
  - Pediatric: 20 mg / kg IV / IO
  - Over 2-3 minutes
- **Albuterol Nebulizer**
  - 2.5 – 5 mg
  - May repeat x 3

### Transport
- **Rapid Transport** to appropriate destination using
  - **Trauma and Burn: EMS Triage and Destination Plan**

### Notification
- **Notify Destination or Contact Medical Control**
Crush Syndrome Trauma

Pearls
- Recommended exam: Mental Status, Musculoskeletal, Neuro
- Scene safety is of paramount importance as typical scenes pose hazards to rescuers. Call for appropriate resources.
- Lowest blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: 70 + 2 x age in years.
- Pediatric IV Fluid maintenance rate: 4 mL per first 10 kg of weight + 2 mL per second 10 kg of weight + 1 mL for every additional kg in weight.
- Crush syndrome typically manifests after 2 – 4 hours of crush injury, but may present in < 1 hour.
- Fluid resuscitation:
  - If access to patient and initiation of IV fluids occurs after 2 hours, give 2 liters of IV fluids in adults and 20 mL/kg of IV fluids in pediatrics and then begin > 2 hour dosing regimen.
- Consider all possible causes of shock and treat per appropriate protocol. Majority of decompensation in pediatrics is airway related.
- Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.
- Shock may be present with a normal blood pressure initially.
- Shock often is present with normal vital signs and may develop insidiously. Tachycardia may be the only manifestation.
- Consider all possible causes of shock and treat per appropriate protocol.
- Patients may become hypothermic even in warm environments.
- Hyperkalemia from crush syndrome can produce ECG changes described in protocol, but may also be a bizarre, wide complex rhythm. Wide complex rhythms should also be treated using the VF/Pulseless VT Protocol.
### Trauma and Burn Protocol Section

#### 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

---

**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.

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**Wound care**
- Control Hemorrhage with Direct Pressure
- Splinting as indicated

- Consider
  - **Topical Hemostatic Agent / Dressing** *if available*

- **Wound Care - Tourniquet Procedure** *if indicated*

- **IV / IO 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*

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**Amputation and / or Open Fracture**

- **YES**
  - Clean amputated part, Wrap part in sterile dressing soaked in normal saline and place in air tight container.
  - Place container on ice if available.

- **NO**

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**Monitor and Reassess**

**Notify Destination or Contact Medical Control**
# 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

## Procedure

### Obtain and Record GCS
- Supplemental oxygen
- Maintain SpO2 ≥ 90%
- Preferably ≥ 94%
- Prevent Oxygen desaturation events < 90%
- Maintain EtCO2 35 – 45 mmHg

**Blood Glucose Analysis Procedure**

**IV / IO Procedure**
- if indicated

**Cardiac Monitor**
- if indicated

**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**

### Rapid Transport
to appropriate destination using
- Trauma and Burn: EMS Triage and Destination Plan

### Notify Destination or
Contact Medical Control

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**DO NOT ROUTINELY HYPERVENTILATE**

**Evidence of Brain Herniation:**
- Unilateral or Bilateral Dilation of Pupils / Posturing

Hyperventilate to maintain EtCO2 30 – 35 mmHg
See Pearls
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 blood pressure by age: < 31 days: > 60 mmHg. 31 days to 1 year: > 70 mmHg. Greater than 1 year: 70 + 2 x age in years.
- An important item to monitor and document is a change in the level of consciousness by serial examination.
- Consider Restraints if necessary for patient’s and/or personnel’s protection per the Restraint Procedure.
- **Concussions:**
  - Traumatic brain injuries involving any of a number of symptoms including confusion, LOC, vomiting, or headache.
  - Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.
  - EMS Providers should not make return-to-play decisions when evaluating an athlete with suspected concussion. This is outside the scope of practice.
Multiple Trauma

History
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / protective equipment
- Past medical history
- Medications

Signs and Symptoms
- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Arrest

Differential (Life threatening)
- Chest: Tension pneumothorax
  - Flail chest
  - Pericardial tamponade
  - Open chest wound
  - Hemothorax
- Intra-abdominal bleeding
- Pelvis / Femur fracture
- Spine fracture / Cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia

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

Control External Hemorrhage
Consider Pelvic Binding
Splint Suspected Fractures

Chest Decompression-Needle Procedure if indicated

Obtain and Record GCS

IV / IO Procedure
Cardiac Monitor

Head Injury Protocol TB 5 if indicated

Altered Mental Status Protocol UP 4 if indicated

Spinal Motion Restriction Procedure / Protocol TB 8 if indicated

Pain Control Protocol UP 11 if indicated

Normal

Repeat Assessment Adult Procedure
Monitor and Reassess

VS / Perfusion / GCS

Abnormal

Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 if indicated

TXA 1 gm over 10 minutes IV / IO if indicated

Monitor and Reassess

Rapid Transport to appropriate destination using

Trauma and Burn: EMS Triage and Destination Plan
Limit Scene Time ≤ 10 minutes
Provide Early Notification

Notify Destination or Contact Medical Control
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%
- **Tranexamic Acid (TXA):**
  - Agencies utilizing TXA must have approval from your T-RAC.
- **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.
- See Regional Trauma Guidelines when declaring Trauma Activation.
- 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 (Don’t include in TBSA)
- Partial Thickness (2nd Degree) blistering
- Full Thickness (3rd Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

---

**Scene Safety / Quantify and Triage Patients / Load and Go with Assessment / Treatment Enroute**

- **Assess Burn / Concomitant Injury Severity**
  - **Minor Burn**
    - < 5% TBSA 2nd/3rd Degree Burn
      - No inhalation injury, Not Intubated, Normotensive
      - GCS 14 or Greater
  - **Serious Burn**
    - 5-15% TBSA 2nd/3rd Degree Burn
      - Suspected inhalation injury or requiring intubation for airway stabilization
      - Hypotension or GCS 13 or Less
      - (When reasonably accessible, transport to a Burn Center)
  - **Critical Burn**
    - >15% TBSA 2nd/3rd Degree Burn
      - Burns with Multiple Trauma
      - Burns with definitive airway compromise
      - (When reasonably accessible, transport to a Burn Center)

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**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)**
- AR 1, 2, 3, 4, 5, 6, 7 if indicated

**Age Appropriate Cardiac Protocol(s)**
- as indicated

**Thermal Burn Protocol**
- TB 9 if indicated

**Rapid Transport**
- to appropriate destination using
  - Trauma and Burn: EMS Triage and Destination Plan
- Notify Destination or Contact Medical Control

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**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.
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.

Pearls:
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**Trauma and Burn Protocol Section**

**Neuro Exam:** Any focal deficit?
- **NO**

**Significant mechanism of injury?**
- **High-energy events such as ejection, high falls, and abrupt deceleration crashes**
- **NO**

**Alertness: Alteration in mental status?**
- **YES**

**Intoxication: Any evidence?**
- **Includes Drugs and / or Alcohol**
- **NO**

**Distractions:** Any painful injury that might distract the patient from the pain of a c-spine injury?
- **YES**

**Spinal Exam:** Point tenderness over the spinous process(es) or pain to ROM?
- **YES**

**Spinal Motion Restriction Not Required**

**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.**
- **Immobilization on a long spine board is not necessary where:** Penetrating trauma to the head, neck or torso with no signs / symptoms of spinal injury.
- **Concerning mechanisms that may result in spinal column injury:**
  - Fall from ≥ 3 feet and/or ≥ 5 stairs or steps
  - MVC ≥ 30 mph, rollover, and/or ejection
  - Motorcycle, bicycle, other mobile device, or pedestrian-vehicle crash
  - Diving or axial load to spine
  - Electric shock

**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.

**Exit to Appropriate protocol(s)**

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*Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS*
### Trauma and Burn Protocol Section

#### 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 (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

---

#### 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

---

#### Treatment Protocols

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

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

- **Remove Rings, Bracelets / Constricting Items**

- **Dry Clean Sheet or Dressings**

- **IV / IO Procedure**
  - Consider 2 IV sites if greater than 15 % TBSA

- **Isotonic fluid**
  - 0.25 mL / kg (x % TBSA) / hr
  - for up to the first 8 hours.
  - (More info below)
  - Lactated Ringers if available

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

- **Carbon Monoxide / Cyanide Protocol TE 2**
  - if indicated

- **Monitor and Reassess**

- **Rapid Transport** to appropriate destination using
  - Trauma and Burn:
  - EMS Triage and Destination Plan

- **Notify Destination or Contact Medical Control**

---

1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.
2. Formula example; an 80 kg (196 lbs.) patient with 50% TBSA will need 1000 cc of fluid per hour.
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.

### 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 demnis, penetrates muscle tissue, and involves tissue around the bone.
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- 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.
Traumatic Arrest

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES

NO

Blunt Arrest

YES

NO

Apnea

YES

NO

Pulseless

YES

NO

Asystole or PEA < 40

YES

NO

Do not begin resuscitation
Follow Deceased Subjects Policy

Penetrating Arrest

YES

NO

Apnea

YES

NO

Pulseless

YES

NO

Asystole or PEA < 40

YES

NO

Do not begin resuscitation
Follow Deceased Subjects Policy

Control External Hemorrhage

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

Cardiopulmonary Resuscitation Procedure

Splint Suspected Fractures
Consider Pelvic Binding

Chest Decompression-Needle Procedure
if indicated

Spinal Motion Restriction Procedure
Protocol TB 8
if indicated

P

A

IV / IO Procedure

Rapid Transport to Nearest ER or appropriate destination using
Trauma and Burn: EMS Triage and Destination Plan
Limit Scene Time ≤ 10 minutes
Provide Early Notification

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

2017-12-13
revised

Page 200 of 260
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.
- If transport time to Trauma Center is < 15 minutes use of ECG monitor may delay resuscitation.
- Rhythm determination is more helpful in rural settings or where transport to nearest facility is > 15 minutes. Omit from algorithm where appropriate.
- Organized rhythms for the purposes of this protocol include Ventricular Tachycardia, Ventricular Fibrillation and PEA.
- Wide, bizarre rhythms such as Idioventricular and severely brachycardic rhythms < 40 BPM are not organized rhythms.
- First arriving EMS personnel should make the assessment concerning agonal respirations, pulselessness, asystole or PEA < 40, pupillary reflexes and spontaneous body movements.
- Efforts should be directed at high quality and continuous compressions with limited interruptions and early defibrillation when indicated. Consider early IO placement if available and difficult IV anticipated.
- **DO NOT HYPERVENTILATE:** 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 rapid transport.
- **Time considerations:**
  - From the time cardiac arrest is identified, if CPR is performed ≥ 15 minutes with no ROSC consider termination of resuscitation.
  - From the time cardiac arrest is identified, if transport time to closest Trauma Center is > 15 minutes consider termination of resuscitation.
- Lightning strike, drowning or in situations causing hypothermia resuscitation should be initiated.
- Where multiple lightning strike victims are found used Reverse Triage: Begin CPR where apneic / pulseless
- Agencies utilizing Targeted Temperature Management Protocol should not cool the trauma patient, but rather make every effort to maintain warmth.
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

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

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Begin Continuous CPR Compressions
- Push Hard (1.5 inches Infant / 2 inches in Children)
  (≥ 1/3 AP Diameter of Chest)
- Push Fast (100 - 120 / min)
- Change Compressors every 2 minutes
  (Limit changes / pulse checks ≤ 10 seconds)

Ventilate 1 breath every 6 seconds
15:2 Compression:Ventilation if no Advanced Airway

AED Procedure
if available

Search for Reversible Causes

Blood Glucose Analysis Procedure

Cardiac Monitor

Consider Chest Decompression-Needle Procedure

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

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

Consider
Epinephrine 0.1 – 1 mcg / kg / min IV / IO
See Pearls

Notify Destination or Contact Medical Control

Pediatric Cardiac Protocol Section

Pediatric Asystole / PEA

This Protocol has been altered from the original NCCEP Protocol by the EMS System Medical Director
Pediatric Asystole / PEA

Preferred:

1. **Mix 1mg of Epinephrine 1:1000 in a 250mL NS or D5W Bag** (60gtt set)

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**Label Bag and tubing – Epi Drip: 1mg/250ml (4mcg/mL)**

Options:

2. 1. Take your epinephrine 1:1,000 (or 1:10,000 **ONLY if 1:1,000** not available).
2. Inject the full 1 mg into a 1,000 mL normal saline bag (1 mcg/mL).
3. Run to hemodynamics stabilize. (1-10mcg/min)
   - Drip sets: 10 gtt's/mL/min = 1mcg/min
   - 15 gtt's/mL/min = 1mcg/min
   - 20 gtt's/mL/min = 1mcg/min

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

Pearls

- **Recommended Exam: Mental Status**
- 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.
- **High-Quality CPR:**
  - Make sure chest compression rate is 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 < 10 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. Refer to optional protocol.

**Vasopressor agents:**
- Epinephrine 0.1 – 1 mcg / kg / min IV / IO
- Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
- **Dose Calculation:** mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)
  - In order to be successful in pediatric arrests, a cause must be identified and corrected.
  - If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (Maximum 2.5 mg)
Pediatric Bradycardia
With Poor Perfusion

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

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

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

---

**Bradycardia**
Causing Hypotension / AMS
Poor Perfusion / Shock
Typically HR < 50/min

- Identify underlying cause
- Blood Glucose Analysis Procedure
- Cardiac Monitor
- Search for reversible causes
  - IV / IO Procedure
  - Isotonic fluid Bolus
    - 20 ml / kg IV / IO
    - Repeat as needed x 3
    - Maximum 60 mL / kg
  - Epinephrine 0.1 – 1 mcg / kg / min IV / IO
    - Titrate to age appropriate
    - SBP ≥ 70 + 2 x Age
  - Atropine 0.02 mg / kg IV / IO
    - May repeat x 1
    - Minimum single dose 0.1 mg
    - Maximum single dose 0.5 mg
  - Consider Cardiac Pacing Procedure

---

**Suspected Beta-Blocker or Calcium Channel Blocker**
Follow Pediatric Toxicology Protocol

**Reversible Causes**
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypothermia
- Hypo / Hyperkalemia
- Tension pneumothorax
- Tamponade; cardiac
- Toxins
- Thrombosis; pulmonary (PE)
- Thrombosis; coronary (MI)

---

Bradycardia / Heart Rate < 60 Persists
AND
Poor Perfusion / Shock
Cardiac arrest?

**NO**
- Notify Destination or Contact Medical Control

**YES**
- Exit to Pediatric Cardiac Arrest Protocol(s)

---

Pediatric Airway Protocol(s) AR 5
as indicated
Pediatric Bradycardia
With Poor Perfusion

**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 given Atropine first.
- Transcutaneous pacing: Indicated if bradycardia is due to complete heart block or other AV blocks which are not responsive to oxygenation, ventilation, chest compressions, or medications. Indicated with known congenital or acquired heart disease.
  - Transcutaneous pacing is not indicated for asystole or bradycardia due to postarrest hypoxic / ischemic myocardial insult or respiratory failure.
  - Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturers guidelines.
- Do not delay therapy when bradycardia is evident and no ECG monitor is available.
- **Vasopressor agents:**
  - Epinephrine 0.1 – 1 mcg / kg / min IV / IO
  - Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
  - Dose Calculation: mL / hour = kg x dose(mcg / kg / min) x 60 (min / hr) / concentration (mcg / mL)
- The majority of pediatric arrests are due to airway problems.
- Most maternal medications pass through breast milk to the infant so maintain high-index of suspicion for OD-toxins.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia. Many other agents a child ingests can cause bradycardia, often is a single dose.

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**Label Bag and tubing – Epi Drip: 1mg/250ml (4mcg/mL)**

Options:

2. Take your epinephrine 1:1,000 (or 1:10,000 **ONLY if 1:1,000 not available**).
   2. Inject the full 1 mg into a 1,000 mL normal saline bag (1 mcg/mL).
   3. Run to hemodynamics stabilize. (1-10mcg/min)
      - Drip sets: 10 gtt /mL /min = 1mcg/min
        - 15 gtt /mL /min = 1mcg/min
        - 20 gtt /mL /min = 1mcg/min

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

**Mix 1mg of Epinephrine 1:1000 in a 250mL NS or D2W Bag** (60gtt set)
**Pediatric Pulmonary Edema / CHF**

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

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

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

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

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

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

**Notify Destination or Contact Medical Control**
Pediatric Cardiac 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

---

**Criteria for Death / No Resuscitation**

[Flowchart]

- Review DNR / MOST Form
- Yes: Do not begin resuscitation. Follow Deceased Subjects Policy
- No: Follow Deceased Subjects Policy

**Newly Born / ≤ 31 days old**

- Yes: Exit to Newly Born Protocol AO 2
- No: ≥ 16 years old

**≥ 16 years old**

- Yes: Exit to Adult Cardiac Arrest Protocol AC 3
- No: Begin Continuous CPR Compressions

---

**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)
- Change Compressors every 2 minutes
- Ventilate 1 breath every 6 seconds
- 15:2 Compression:Ventilation if no Advanced Airway

---

**Defibrillation Automated if available**

- Yes: Pediatric VF / VT Protocol PC 6
- No: Pediatric Asystole / PEA Protocol PC 1

---

**Notify Destination or Contact Medical Control**

---

This Protocol has been altered from the original NCCEP Protocol by the EMS System Medical Director
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 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 BIAD, limit interruptions.
- **Defibrillation:** First defibrillation is 4 J/kg, subsequent shocks ≥ 4 J/kg (Maximum 10 J/kg or adult dose)
- **End Tidal CO2 (EtCO2)**
  - If EtCO2 is < 10 mmHg, improve chest compressions.
  - If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Special Considerations**
  - **Maternal Arrest** - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport preferably to obstetrical center if available and proximate. Place mother supine and perform Manual Left Uterine Displacement moving uterus to the patient’s left side. IV/IO access preferably above diaphragm. Defibrillation is safe at all energy levels.
  - **Renal Dialysis / Renal Failure** - Refer to Dialysis / Renal Failure protocol caveats when faced with dialysis / renal failure patient experiencing cardiac arrest.
  - **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. Refer to optional protocol.
  - In order to be successful in pediatric arrests, a cause must be identified and corrected.
  - If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (Maximum 2.5 mg)
Pediatric Cardiac Protocol Section

**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

---

**Cardioversion Procedure**
- 1 J / kg
- Repeat and increase to 2 J / Kg
- May increase to 4 J / Kg
- Or adult maximum

---

**Consider sedation**
- Do NOT delay cardioversion
- Midazolam 0.2 mg / kg IV / IO / IN
- May repeat if needed
- Maximum Single Dose 2 mg
- Maximum Total Dose 5 mg

---

**Probable Sinus Tachycardia**

- Identify and Treat Underlying Cause
- Exit to Appropriate Protocol(s)

---

**Probable SVT**

---

**Possible VT**

- Unstable Hypotension / AMS / Poor perfusion
- Adenosine 0.1 mg / kg IV / IO
- Maximum 6 mg
- May repeat
- Adenosine 0.2 mg / kg IV / IO
- Maximum 12 mg

---

**AT ANY TIME**

- Pulseless
- Go to Pediatric Pulseless Arrest Protocol

---

**Notify Destination or Contact Medical Control**
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):**
  - 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.

  - **Amiodarone 5 mg / kg over 20 – 60 minutes or Procainamide 15 mg / kg over 30 – 60 minutes IV / IO** are recommended agents. They should not be administered together. Consultation with Medical Control is advised when these agents are considered.

- **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 paddles should be used in children < 10 kg or Broselow-Luten color Purple if available.

  - Monitor for respiratory depression and hypotension associated if Diazepam, Lorazepam, or Midazolam is used.

  - Continuous pulse oximetry is required for all SVT Patients if available.

  - 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

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<th><strong>Return of Spontaneous Circulation</strong></th>
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<td>Go to Post Resuscitation Protocol</td>
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**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)
  - Change Compressors every 2 minutes
  - *(Limit changes / pulse checks ≤ 10 seconds)*

  Ventilate 1 breath every 6 seconds
  15:2 Compression:Ventilation if no Advanced Airway

---

**Defibrillation Automated if available**

---

**IV / IO Procedure**

---

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

---

**Defibrillation Manual Procedure 4 J / Kg**

---

**If Rhythm Refractory**
- Continue CPR and give Agency specific Anti-arrhythmic(s). Continue epinephrine during compressions.
- Continue CPR up to point where you are ready to defibrillate with device charged.
- Repeat pattern during resuscitation.

---

**Defibrillation Manual Procedure 4 J / Kg**
- Subsequent shocks ≥ 4 J / kg
- Maximum 10 J / kg or adult dose

---

**Consider Defibrillation Dual Sequential Manual Procedure if available and rhythm refractory**

---

**Notify Destination or Contact Medical Control**

---

**Persistent VF / VT**
- Or
  - **Torsades de Points**
  - Magnesium Sulfate
  - 40 mg/kg IV / IO over
    - 1 – 2 minutes
    - May repeat every 5 minutes
    - Maximum 2 g
Pediatric Ventricular Fibrillation
Pulseless Ventricular Tachycardia

Pearls

- **Recommended Exam:** Mental Status
- **Beginning compressions first** is recommended in pediatric patients during CPR. However, the majority of pediatric arrests stem from a respiratory insult or hypoxic event. Compressions should be coupled with ventilations.
- 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 4 J/kg, subsequent shocks ≥ 4 J/kg (Maximum 10 J/kg or adult dose)
- **End Tidal CO2 (EtCO2)**
  - If EtCO2 is < 10 mmHg, improve chest compressions.
  - If EtCO2 spikes, typically > 40 mmHg, consider Return of Spontaneous Circulation (ROSC)
- **Antiarrhythmic agents:**
  - Adenosine: First dose: 0.1 mg / kg (Maximum 6 mg) Second dose: 0.2 mg / kg (Maximum 12 mg)
  - Amiodarone 5 mg / kg IV / IO (single dose Maximum 300 mg). May repeat x 2 to a Maximum of 15 mg / kg.
  - Lidocaine 1 mg / kg IV / IO. Infusion 20 – 50 mcg / kg / min. If infusion is initiate > 15 minutes from first bolus, repeat 1 mg / kg bolus.
  - Magnesium Sulfate 40 mg / kg IV / IO over 10 – 20 minutes. In Torsades de pointes give over 1 – 2 minutes. Max 2g.
  - Procainamide 15 mg / kg IV / IO over 30 – 60 minutes. Monitor for increased QRS and increased QT.
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- 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.
- If no IV / IO access may use **Epinephrine 1:1000 0.1 mg/kg (0.1 mL/kg)** via ETT (Maximum 2.5 mg)
Pediatric Cardiac Protocol Section

**Pediatric Cardiac Protocol Section**

**History**
- Respiratory arrest
- Cardiac arrest

**Signs/Symptoms**
- Return of pulse

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

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**Arrhythmias are common and usually self limiting after ROSC**

If Arrhythmia Persists follow Rhythm Appropriate Protocol

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**Pediatric Antiarrhythmic Medication Given During Arrest**

- **Yes**
  - Continue Antiarrhythmic Utilized
  - Refer to Appropriate Pediatric Arrhythmia Protocol

- **No**
  - Post-intubation / BIAD Management Protocol AR 8

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**Hypotension**

**Age Based**

- **0 – 31 Days**
  - < 60 mmHg

- **1 Month to 1 Year**
  - < 70 mmHg

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

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**B**

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

- **Monitor Vital Signs / Reassess**

- **Blood Glucose Analysis Procedure**

- **Optimize Ventilation and Oxygenation**
  - Maintain SpO2 ≥ 90%
  - Preferably SpO2 ≥ 94%
  - Advanced airway if indicated
  - ETCO2 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

---

**P**

- **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**

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**Notify Destination or Contact Medical Control**

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Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS
### 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 $\geq 94\%$. 100 % FiO2 is not necessary, titrate oxygen accordingly.
- EtCO2 should be continually monitored with advanced airway in place.
- Administer resuscitation fluids and vasopressor agents to maintain SBP at targets listed on page 1. This table represents minimal SBP targets.
- **Antiarrhythmic agents:**
  - Adenosine: First dose: 0.1 mg / kg (Maximum 6 mg) Second dose: 0.2 mg / kg (Maximum 12 mg)
  - Amiodarone 5 mg / kg IV / IO (single dose Maximum 300 mg). May repeat x 2 to a Maximum of 15 mg / kg.
  - Lidocaine 1 mg / kg IV / IO. Infusion 20 – 50 mcg / kg / min. If infusion is initiated $> 15$ minutes from first bolus, 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.
  - Procaainamide 15 mg / kg IV / IO over 30 – 60 minutes. Monitor for increased QRS and increased QT.
- **Vasopressor agents:**
  - Dopamine 2 – 20 mcg / kg / min IV / IO
  - Epinephrine 0.1 – 1 mcg / kg / min IV / IO
  - Norepinephrine 0.1 – 2 mcg / kg / min IV / IO
- **Dose Calculation:** $\text{mL} / \text{hour} = \text{kg} \times \text{dose (mcg / kg / min)} \times 60 \text{ (min / hr) / concentration (mcg / mL)}$
- 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.
- Appropriate post-resuscitation management may best be planned in consultation with medical control.

### Pediatric Cardiac Protocol Section

#### Preferred:

1. **Mix 1 mg of Epinephrine 1:1000 in a 250mL NS or D5W Bag** (60gtt set)

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<tr>
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**Label Bag and tubing – Epi Drip: 1mg/250ml (4mcg/mL)**

#### Options:

2. 1. Take your epinephrine 1:1,000 (or 1:10,000 **ONLY if 1:1,000** not available).
2. Inject the full 1 mg into a 1,000 mL normal saline bag (1 mcg/mL).
3. Run to hemodynamics stabilize. (1-10mcg/min)

<table>
<thead>
<tr>
<th>Drip sets</th>
<th>10 gtt/mL /min</th>
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<td>1mcg/min</td>
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3. 1. Take a 10 ml syringe with **9 ml** of normal saline
2. Into this syringe, draw up **1 ml** of epinephrine 10,000 (cardiac amp contains Epinephrine 100 mcg/ml)
3. Now you have 10 mL’s of Epinephrine (10 mcg/ml)

Dose: 0.2-1 ml every 1-5 minutes (2-10 mcg)
Pediatric Medical Protocol Section

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

A
Diphenhydramine
1 mg / kg PO

B
IV Procedure
If indicated

Monitor and Reassess Monitor for Worsening Signs and Symptoms

MODERATE
2+ Body Systems

Epinephrine 1:1000 IM
≥ 30 kg 0.3 – 0.5 mg IM
< 30 kg 0.15 mg IM
If indicated

Diphenhydramine
1 mg / kg PO

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

Diphenhydramine
1 mg / kg IV / IM / IO / PO
If not already given PO

SEVERE
2 + Body Systems + hypotension
Or Isolated Hypotension

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

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

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

No improvement with IM Epinephrine
Epinephrine IV / IO

Methylprednisolone
2 mg/kg IV
Maximum 125 mg

Notify Destination or Contact Medical Control

This Protocol has been altered from the original NCCEP Protocol by the EMS System Medical Director
Pediatric Allergic Reaction

Pearls
- **Recommended Exam:** Mental Status, Skin, Heart, Lungs
- **Anaphylaxis** is an acute and potentially lethal multisystem allergic reaction.
- **Epinephrine administration:**
  - Drug of choice and the FIRST drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms.). IM Epinephrine should be administered in priority before or during attempts at IV or IO access.
  - Diphenhydramine and steroids have no proven utility in Moderate / Severe anaphylaxis and may be given only After Epinephrine. Diphenhydramine and steroids should NOT delay repeated Epinephrine administration.
  - In Moderate and Severe anaphylaxis Diphenhydramine may decrease mental status. Oral 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 and poor perfusion.
- Allergic reactions may occur with only respiratory and gastrointestinal symptoms and have no rash / skin involvement.
- Angioedema is seen in moderate to severe reactions and is swelling involving the face, lips or airway structures. This can also be seen in patients taking blood pressure medications like Prinivil / Zestril (lisinopril)-typically end in -il.
- Fluids and Medication titrated to maintain a SBP >70 + (age in years x 2) mmHg.
- EMR / EMT may administer Epinephrine IM and may administer from EMS supply.
- EMT may administer diphenhydramine by oral route only and may administer from EMS supply.
- EMT may administer Albuterol if patient already prescribed and may administer from EMS supply.
- Patients with moderate and severe reactions should receive a 12 lead ECG and should be continually monitored, but this should NOT delay administration of epinephrine.
- The shorter the onset from exposure to symptoms the more severe the reaction.
## Pediatric Medical Protocol Section

### 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

**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
- 70 – 249 mg / dl
- ≥ 250 mg / dl

**Oral Glucose**
- ½ to 1 Tube
- If age appropriate

**Dextrose Infusion**
- Use D10W in 250mL
- < 50kg:
  - D10W: 5 mL/kg IV / IO
  - Repeat as needed, titrate to condition and effect. BG > 69
- > 50kg:
  - D10W: 5 mL/kg IV / IO
  - Maximum 25 g per dose
  - Repeat as needed BG > 69

**Consider Oral Solution (Juices / Food)**

#### Blood Glucose Analysis Procedure

**if condition changes**

**Exit to Appropriate Protocol(s)**

#### Monitor and Reassess

- Every 5 minutes
- Until Blood Glucose ≥ 80 mg / dl

**Notify Destination or Contact Medical Control**

#### Normal Saline Bolus

- 10 - 20 mL/kg IV / IO
- Maximum 20 mL/kg

This Protocol has been altered from the original NCCEP document by the EMS Medical Director.
Pediatric Diabetic

Pediatric Medical Protocol Section

Pearls

- **Recommended Exam:** Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- **Patients with prolonged hypoglycemia my not respond to glucagon.**
- **Do not administer oral glucose to patients that are not able to swallow or protect their airway.**
- **Quality control checks should be maintained per manufacturers recommendation for all glucometers.**
- **D10 / D25 Preparation:**
  - D10: Remove 10 mL of D50 from a D50 vial. Add 40 mL of NS with the 10 mL of D50 – total volume 50 mL.
  - D10: Alternative, Discard 40 mL from the D50 vial and draw up 40 mL of NS – total volume 50 mL.
  - D25: Remove 25 mL of D50 and draw up 25 mL of NS – total volume 50 mL.
- **In extreme circumstances with no IV and no response to glucagon Dextrose 50 % can be administered rectally. Contact medical control for advice.**
- **Patient’s refusing transport to medical facility after treatment of hypoglycemia:**
  - Adult caregiver must be present with pediatric patient.
  - Blood sugar must be $\geq 80$, 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

Blood Glucose Analysis Procedure
- IV / IO Procedure
- Cardiac Monitor

Pediatric Airway Protocol(s)
- if indicated

Diabetic Protocol PM 2
- if indicated

History and Exam Suggest Type of Shock

Cardiogenic
- Chest Pain: Cardiac and STEMI Protocol AC 4
- Appropriate Pediatric Arrhythmia Protocol(s)
- if indicated

Hypovolemic
- Normal Saline Bolus
  - 5 – 10 mL / kg IV / IO
  - Titrated to age appropriate
  - SBP ≥ 70 + 2 x Age
  - Maximum 10 mL / kg

- Pediatric Allergy Protocol PM 1
  - if indicated

- Pediatric Sepsis Protocol
  - if indicated

- Multiple Trauma Protocol TB 6
  - if indicated

- Normal Saline Bolus
  - 20 mL / kg IV / IO
  - Titrated to age appropriate
  - SBP ≥ 70 + 2 x Age
  - Maximum 60 mL / kg

- Epinephrine
  - 1-10 mcg/kg IV/I0
  - Titrated to age appropriate
  - SBP ≥ 70 + 2 x Age

Obstructive
- Chest Decompression-Needle Procedure
  - if indicated

Notify Destination or Contact Medical Control
Hypotension / Shock

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

### Preferred:

1. **Mix 1mg of Epinephrine 1:1000 in a 250mL NS or D5W Bag** (60gtt set)

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**Label Bag and tubing – Epi Drip: 1mg/250ml (4mcg/mL)**

### Options:

2. 1. Take your epinephrine 1:1,000 (or 1:10,000 **ONLY if 1:1,000 not available**).
2. Inject the full 1 mg into a 1,000 mL normal saline bag (1 mcg/mL).
3. Run to hemodynamics stabilize. (1-10mcg/min)
   - Drip sets: 10 gtt /mL /min = 1mcg/min
   - 15 gtt /mL /min = 1mcg/min
   - 20 gtt /mL /min = 1mcg/min

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

History
- Type of bite / sting
- Description / photo for identification
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic vs. Wild
- Tetanus and Rabies risk
- Immunocompromised patient

Signs and Symptoms
- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

Differential
- Animal bite
- Human bite
- Snake bite (poisonous)
- Spider bite (poisonous)
- Insect sting / bite (bee, wasp, ant, tick)
- Infection risk
- Rabies risk
- Tetanus risk

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

Muscle Spasm
Midazolam 2.5 mg IV / IO / IM / IN
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

Monitor and Reassess

Mammal Bite

Transport

NO

Contact and Document contact with Animal Control Officer

YES

Notify Destination or Contact Medical Control

If Needed
Carolinias Poison Control
1-800-222-1222
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 multicaudata).
- **Snake bites:**
  - Poisonous snakes in this area are generally of the pit viper family: rattlesnake and copperhead.
  - Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
  - Amount of envenomation is variable, generally worse with larger snakes and early in spring.
  - If no pain or swelling, envenomation is unlikely. About 25% of snake bites are "dry" bites.
- **Spider bites:**
  - Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hourglass on belly).
  - Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).
### 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

### 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.

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<th>Immediately Remove from Exposure</th>
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<td>High Flow Oxygen</td>
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<td>Blood Glucose Analysis Procedure</td>
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<td>IV/ IO Procedure</td>
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<td>Cardiac Monitor / CO Monitor</td>
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<td>Protocol UP 4</td>
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<tr>
<td>if indicated</td>
<td>Age Appropriate Diabetic</td>
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<tr>
<td>Protocol AM 2 / PM 2</td>
<td>if indicated</td>
</tr>
<tr>
<td>Age Appropriate Multiple Trauma Protocol TB 6</td>
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<tr>
<td>Head Injury TB 5</td>
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<td>Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3</td>
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<table>
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<tr>
<th>YES</th>
<th>Hydroxocobalamin 70 mg / kg IV / IO</th>
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<tr>
<td></td>
<td>Maximum 5 g</td>
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</table>

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High Suspicion of Cyanide

NO

Continue Care
- Continue High Flow Oxygen
- Monitor and Reasses

Notify Destination or Contact Medical Control

---

2017-12-13 revised

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS
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

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.

Dive Accident / Barotrauma
Divers Alert Network
1-919-684-9111
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

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

- Age Appropriate
- Diabetic Protocol AM 2 / PM 2
- as indicated

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

- Isotonic fluid 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

Temperature Measurement Procedure
if available

Temperature Measurement should NOT delay treatment of hyperthermia

Remove from heat source to cool environment

Cooling measures

Remove tight clothing

Blood Glucose Analysis Procedure

Age Appropriate
Diabetic Protocol AM 2 / PM 2
as indicated

Assess Symptom Severity

Temperature Measurement
Procedure

if available

Normal to elevated body temperature
Warm, moist skin
Weakness, Muscle cramping

PO Fluids as tolerated

Monitor and Reassess

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS
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, barbituates
- Infections / Sepsis
- Length of exposure / Wetness / Wind chill

**Signs and Symptoms**
- Altered mental status / coma
- Cold, clammy
- Shivering
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

**Differential**
- Sepsis
- Environmental exposure
- Hypothyroidism
- Hypoglycemia
- CNS dysfunction
  - Stroke
  - Head injury
  - Spinal cord injury

**Temperature Measurement Procedure**
*if available*
- Temperature Measurement should NOT delay treatment of hypothermia

**Hypothermia / Frostbite**

**Localized Cold Injury**
- General Wound Care
- DO NOT Rub Skin to warm
- DO NOT Massage Skin to warm
- DO NOT allow refreezing

**Unresponsive**

**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

**A**
- Isotonic fluid Bolus
  - 500 mL IV / IO
  - Repeat to titrate SBP > 90 mmHg
    - Maximum 2 L
  - Pediatric: 20 mL / kg IV / IO
  - Repeat to titrate Age Appropriate SBP ≥ 70 + 2 x Age
    - Maximum 60 mL / kg

**P**
- Cardiac Monitor
- Age Appropriate
  - Hypotension/ Shock
  - Protocol AM 5 / PM 3
  - Multiple Trauma Protocol TB 6
  - as indicated
- Monitor and Reassess

**Notify Destination or Contact Medical Control**

**Systemic Hypothermia**

**B**
- Remove wet clothing
  - Dry / Warm Patient
- Passive warming measures

**Blood Glucose Analysis Procedure**
- Age Appropriate
  - Diabetic Protocol AM 2 / PM 2
  - as indicated
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. Intubation and CPR techniques should not be withheld 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 be utilized.
  - Consider withholding CPR if patient has organized rhythm or has other signs of life. Contact Medical Control.
  - If the patient is below 86°F (30°C) then defibrillate 1 time if defibrillation is required. Deferring further attempts until more warming occurs is controversial. Contact medical control for direction.
  - Hypothermia may produce severe bradycardia so take at least 60 seconds to palpate a pulse.
- **Active Warming:**
  - Remove from cold environment and to warm environment protected from wind and wet conditions.
  - Remove wet clothing and provide warm blankets / warming blankets.
  - Hot packs can be activated and placed in the armpit and groin area if available. Care should be taken not to place the packs directly against the patient's skin.
Marine Envenomations / Injury

**History**
- Type of bite / sting
- Identification of organism
- Previous reaction to marine organism
- Immunocompromised
- Household pet

**Signs and Symptoms**
- Intense localized pain
- Increased oral secretions
- Nausea / vomiting
- Abdominal cramping
- Allergic reaction / anaphylaxis

**Differential**
- Jellyfish sting
- Sea Urchin sting
- Sting ray barb
- Coral sting
- Swimmers itch
- Cone Shell sting
- Fish bite
- Lion Fish sting

---

General Wound Care Procedure

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

**P**
- Cardiac Monitor *if indicated*

- Drowning Protocol TE 3 *if indicated*

- Age Appropriate Allergy / Anaphylaxis Protocol AM 1 / PM 1 *if indicated*

- Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3 *if indicated*

- Pain Control Protocol UP 11 *if indicated*

---

Identification of Sea Creature

- Jelly Fish
  - Anemone
  - Man-O-War
- Sting Ray
  - Lion Fish
  - Urchin / Starfish
- Large Organism

---

**Immovilize 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

**Immovilize 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*

---

Monitor and Reassess

**Notify Destination or Contact Medical Control**

---

If Needed
Carolinas Poison Control
1-800-222-1222
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)

---

**Inadequate Respirations / Oxygenation / Ventilation**

**YES**

- Naloxone 0.4 – 2 mg IN
  - Peds: 0.1 mg/kg IN

**NO**

**Poor Perfusion**

**YES**

- Age Appropriate Hypotension / Shock Protocol AM 5 / PM 3

**NO**

**Alerted Mental Status**

**YES**

- Contact Carolinas Poison Control
  - 1-800-222-1222

**NO**

- Normal Mental Exam
- Normal Neurological Exam
- Stable Condition
- No other medical concerns

**NO**

- Follow Transport / Hospital Evaluation ARM

**Contact**

**YES**

- Poison Control Advises
  - Need for Transport / Hospital Evaluation
  - Need for EMS Intervention

**NO**

- Following ALS Assessment and consultation with Poison Control

If patient is deemed suitable for home monitoring and telephone follow-up:

- It is appropriate for patient to remain at home with close telephone follow-up provided by Poison Control.

- Disposition per local agency policy

---

**Age Appropriate Airway Protocol(s) as indicated**

**B**

12 Lead ECG Procedure

**A**

IV / IO Procedure

**P**

Cardiac Monitor

See Page 2 For Specific Treatment Options
Beta Blocker or Calcium Channel Blocker

QRS ≥ 0.12 sec or Peds: 0.09 sec

Sodium Bicarbonate
50 mEq IV / IO
Peds: 1 mEq/kg IV / IO
Repeat in 10 minutes as needed

Consider
Cardiac External Pacing Procedure for Severe Cases

Calcium Gluconate - 2 g IV / IO
(Pediatric - 60 mg / kg IV / IO)
Or
Calcium Chloride 1 g IV / IO
Over 2-3 minutes
(Pediatric: 20 mg / kg IV / IO)
Over 10 minutes

Age Appropriate Hypotension / Shock
Protocol AM 5 / PM 3
if indicated

P

YES

Glucagon 2 – 4 mg IV / IO / IM
Peds: 0.1 mg/kg IV / IO / IM
May repeat in 15 minutes as needed

Calcium Gluconate - 2 g IV / IO
(Pediatric - 60 mg / kg IV / IO)
Or
Calcium Chloride 1 g IV / IO
Over 2-3 minutes
(Pediatric: 20 mg / kg IV / IO)
Over 10 minutes

Exit to Carbon Monoxide / Cyanide Protocol TE 2

Exit to WMD / Nerve Agent Protocol TE 8

YES

YES

YES

YES

NO

NO

NO

NO

YES

Tricyclic Antidepressant

Organophosphate WMD / Nerve Agent Exposure

Cyanide / Carbon Monoxide

B

If Time of Ingestion ≤ 1 Hour
Activated Charcoal 1 gm/kg PO
if available

QRS ≥ 0.12 sec or Peds: 0.09 sec

Sodium Bicarbonate
50 mEq IV / IO
Peds: 1 mEq/kg IV / IO
Repeat in 10 minutes as needed

Sodium Bicarbonate
100 mEq in 1 L
Normal Saline
200 mL/hr IV / IO

Notify Destination or Contact Medical Control

Symptomatic Care as needed
Monitor and Reassess
Overdose / Toxic Ingestion

Calcium Channel Blockers

- Amlodipine (Norvasc, Lotrel)
- Bepridil (Vascor)
- Clevidipine (Cleviprex)
- Diltiazem (Calan, Calan SR, Cardizem, Covera HS, Isotopin SR, Verelan, Verelan PM)
- Felodipine (Plendil)
- Lacidipine (Caldine, Lacinem, Lacipil, Midoten, Motens)
- Lercanidipine (Lercadip, Zanidip)
- Nifedipine (Adalat, Nifediac, Nifedical, Procardia)
- Verapamil (Calan, Calan SR, Covera-HS, Isotopin SR, Verelan, Verelan PM)

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<th>Nonselective beta-blockers</th>
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<td>Carvedilol (Coreg, Coreg CR)</td>
<td>Atenolol</td>
<td>Nadolol (Corgard)</td>
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<td>Labetalol (Trandate)</td>
<td>Betaxolol</td>
<td>Propranolol (Inderal LA, InnoPran XL)</td>
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<td>Beta-blockers with intrinsic sympathomimetic activity</td>
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<td>Betoprolol</td>
<td>Timolol (Blocadren)</td>
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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** and the substance and amount ingested and any co-ingestants.
2. Every effort should be made to elicit this information before leaving the scene.

- **Beat Blockers**: Beta-adrenergic blocking agents, reducing BP by rate control.
- 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 76 mL / hour)
- Bring bottles, contents, emesis to ED.

**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 respiration, 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.

**Approved FR agencies, EMR and EMT may administer naloxone by IN route only and may administer from EMS supply.**

- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.

**TCAs** - Tricyclic Antidepressants

- Amitriptyline (Elavil, Endep), Levate
- Amoxapine (Asendin)
- Clomipramine (Anafranil)
- Desipramine (Norpramin)
- Pertofrane
- Dosulepin (Prothiadien, Thaden)
- Doxepin (Adapin, Sinequan)
- Imipramine (Tofranil)
- Lofepramine (Gamaril, Lomont)
- Maprotiline (Depriplet, Ludiomil, Peymion)
- Mianserin (Bolvidon, Norval, Tolvan)
- Nortriptyline (Pamelor)
- Protriptyline (Vivactil)
- Trimipramine (Surmontil)

**THIS MEDICATION LIST IN NOT ALL-INCLUSIVE**
### SNRIs – Serotonin & Noradrenaline
- Desvenlafaxine (Pristiq)
- Duloxetine (Cymbalta)
- Levomilnacipran (Fetzima)
- Milnacipran (Savella)
- Venlafaxine (Effexor, Effexor XR)

### SSRI
- Citalopram (Celexa)
- Escitalopram (Lexapro, Cipralex)
- Fluoxetine (Prozac, Sarafem; Pexeva)
- Fluvoxamine (Luvox)
- Paroxetine (Paxil, Paxil CR)
- Sertraline (Zoloft)
- Vilazodone (Viibryd)

### NDRI - Norepinephrine & Dopamine
- Bupropion (Wellbutrin, Wellbutrin SR, Wellbutrin XL, Zyban; Aplenzin)

### MAOIs
- Isocarboxazid (Marplan)
- Moclobemide (Manerix)
- Phenelzine (Nardil)
- Tranylcypromine (Parnate)
- Selegiline (Emsam (transdermal patch))

### Mood
- Lithium (Eskalith, Lithane, Lithobid)
- Quetiapine (Seroquel, Xeroquel, Ketipinor)

### Miscellaneous Antidepressants
- Atomoxetine (Norepinephrine reuptake Inhibitor) (Strattera)
- Agomelatine (5-HT2C receptor antagonist) (Valdoxan)
- Buspirone (5HT1A receptor agonist) (Buspar)
- Nefazodone (5HT2-receptor antagonist) (Nefadar, Serzone)
- Tandospirone (azapirone, 5HT1A receptor agonist) (Sediel)
- Tianeptine (Serotonin reuptake enhancer) (Stablon)
- Trazodone (5HT2-receptor antagonist, triazolopyridine-derivative) (Desyrel, Apo-Trazodone, Oleptro)
- Reboxetine (Norepinephrine Reuptake Inhibitor) (Edronax, Vestra)

### Serotonin Modulator and Stimulator
- Vortioxetine (Brintellix)

### Combinations
- Fluoxetine/Olanzapine (SSRI/antipsychotic) (Symbyax)
- Amitriptyline/Perphenazine (TCA/antipsychotic) (Etrafon, Triavil)
WMD-Nerve Agent Protocol

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

Signs and Symptoms
- Salivation
- Lacrimation
- Urination; increased, loss of control
- Defecation / Diarrhea
- GI Upset; Abdominal pain / cramping
- Emesis
- Muscle 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.

Symptom Severity

Asymptomatic
- Monitor and Reassess Every 15 minutes for symptoms
- Initiate Treatment per Appropriate Arm

Minor Symptoms: Respiratory Distress + SLUDGEM
- IV / IO Procedure
  - Nerve Agent Kit IM
  - 2 Doses Rapidly if available

Major Symptoms: Altered Mental Status, Seizures, Respiratory Distress, Respiratory Arrest
- IV / IO Procedure
  - Nerve Agent Kit IM
  - 3 Doses Rapidly if available

Seizure Activity
- Go to Seizure Protocol

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.)

Priorities
- 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. Give if available.
  - 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.

Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS

Page 235 of 260

2017-12-13 revised
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?

Ensure Personal Protective Equipment

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
   Abdominal Pain
   Weakness, Fatigue
   Vomiting and/or Diarrhea
   Anorexia
   Bleeding

EMS Personnel / Equipment /
Transport Unit Requires Decontamination

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

Revised 2017-12-13
Any local EMS System changes to this document must follow the NC OEMS Protocol Change Policy and be approved by OEMS

Page 236 of 260
Suspected Viral Hemorrhagic Fever
Ebola

PARTICULAR ATTENTION MUST BE PAIRED 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.

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

Suspected Viral Hemorrhagic Fever
Ebola

EMS Personal
Requires Decontamination

If EMS personnel are exposed 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:
**Suspected Viral Hemorrhagic Fever**

**Ebola**

**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.

**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 Tyvek-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:
  

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Scene Rehabilitation: General

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

Exit to Scene Rehabilitation Responder Protocol

VITAL SIGN CAVEATS

Blood Pressure: Prone to inaccuracy on scenes. Must be interpreted in context.
Firefighters have elevated blood pressure due to physical exertion and is not typically pathologic.
Firefighters with Systolic BP ≥ 160 or Diastolic BP ≥ 100 may need extended rehabilitation. However this does not necessarily prevent them from returning to duty.

Temperature: Firefighters may have increased temperature during rehabilitation.

Rehabilitation Techniques
12 – 32 oz Oral Fluid over 20 minutes Oral Rehydration may occur along with Active Cooling Measures
Firefighters should consume 8 ounces of fluid between SCBA change-out

Reassess responder after 20 Minutes in General Rehabilitation Section Reassess VS

Significant Injury
Cardiac Complaint: Signs / Symptoms
Respiratory Complaint: Serious Signs / Symptoms
Respiratory Rate < 8 or > 40
Systolic Blood Pressure ≤ 80

YES

Discharge Responder from General Rehabilitation Section Reports for Reassignment

HEAT STRESS
Active Cooling Measures
Paunch immersion, cool water, cool mist fans etc.
Read 10 – 20 Minutes

YES

COLD STRESS
Active Warming Measures
Dry responder, place in warm area
Hot packs to axilla and / or groin
Read 10 – 20 Minutes

Rehabilitation Techniques
12 – 32 oz Oral Fluid over 20 minutes Oral Rehydration may occur along with Active Warming Measures
Firefighters should consume 8 ounces of fluid between SCBA change-out

YES

Discharge Responder from General Rehabilitation Section Reports for Reassignment

Revised 01/1/2017

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Page 240 of 260
Scene Rehabilitation: General

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 and may adjust rest/rehabilitation time frames depending on existing conditions.
- Rehabilitation goals:
  - Relief from climatic conditions.
  - Rest, recovery, and hydration prior to incident, during, and following incident.
  - Active and/or passive cooling or warming as needed for incident type and climate conditions.
- May be utilized with adult responders on fire, law enforcement, rescue, EMS and training scenes.
- Responders taking anti-histamines, blood pressure medication, diuretics or stimulants are at increased risk for cold and heat stress.
- General indications for rehabilitation:
  - 20-minute rehabilitation following use of a second 30-minute SCBA, 45-minute SCBA or single 60-minute SCBA cylinder.
  - 20-minute rehabilitation following 40 minutes of intense work without SCBA.
- General work-rest cycles:
  - 10-minute self-rehabilitation following use of one 30-minute SCBA cylinder or performing 20 minutes of intense work without SCBA.
- Serious signs/symptoms:
  - Chest pain, dizziness, dyspnea, weakness, nausea, or headache.
  - Symptoms of heat stress (cramps) or cold stress.
  - Changes in gait, speech, or behavior.
  - Altered Mental Status.
  - Abnormal Vital Signs per agency SOP or Policy/Procedure.
- Rehabilitation Section:
  - Integral function within the Incident Management System.
  - Establish section such that it provides shelter/shade, privacy and freedom from smoke or other hazards.
  - Large enough to accommodate expected number of personnel.
  - Separate area to remove PPE.
  - Accessible to EMS transport units and water supply.
  - Away from media agencies and spectators/bystanders.
The EMS Patient Disposition Information (PDI) form has been designed to be used by EMS personnel to legally document a variety of situations. This duplicate form consists of a single page. The front of the page is used to describe the situation and the back lists a variety of specific patient instructions by complaint.

The form should be used to document any refusal of care by a patient (complete refusal or refusal of specific aspects of care) and to document the patient / guardian’s understanding of medical instructions.

To understand the intent of this form, it is probably simplest to walk through several common patient encounter situations.

1. **Complete refusal of EMS care or transport**: The first box “Patient Refusal” should be marked. In the first section, the appropriate blocks for “paramedic recommendation” should also be marked. This section should be explained to the patient or guardian, who should understand that their refusal may result in complications up to and including death. The patient or guardian should be asked to sign the form, indicating that he/she understands the seriousness of the situation and the information provided. If the situation warrants, the paramedic should explain the risks of the refusal using the patient instructions section and the back of the form for assistance. If the instructions section is used, the appropriate blocks should also checked.

2. **Refusal of a specific procedure (IV therapy, for example)**: The first box “Patient Refusal” should be marked. In the first section, the specific refused procedure should be marked. The first section should be explained to the patient or guardian, who should understand the potential consequences of their refusal. The patient or guardian should be asked to sign the form, indicating that he/she understands the seriousness of the situation.

3. **The box “Patient Instructions” and the appropriate blocks in that section should be marked. This section and the specific instructions (on the back) should all be carefully explained to the patient and/or guardian, who must understand them. The patient or guardian should be asked to sign the form, indicating that he/she understands the instructions and the seriousness of the situation.**

In all situations, the top part of the form should be completed, and as much of the signature portion as necessary. It is preferable to have witnesses, particularly if the patient or guardian refuses to sign. The original form should be kept on file, while a duplicate copy should be provided for the patient or guardian.
Emergency Medical Services (EMS)  
Patient Disposition Information

Patient's Name | Name of call | Loc
--- | --- | ---

Patient's Address | Phone | EMS Professionals Name | No.
--- | --- | --- | ---

This section only applies if this box is marked

The Paramedic has recommended:
- Measuring the patient's blood pressure
- A backboard and neck collar for the patient
- Ambulance transportation for the patient
- A complete physical exam of the patient
- Giving the patient oxygen
- Starting an IV for the patient
- Giving the patient medicine
- A backboard and neck collar for the patient
- 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.

This section only applies if this box is marked

You have not been evaluated by a doctor.

You should contact or see your doctor immediately.

The patient is being released to:
- Family member
- Guardian
- Law Enforcement Officer
- Other:

Follow the instructions (printed on the back of this form) indicated:
- Abdominal Pain
- Head Injury
- Extremity Injury
- Universal
- Back Pain
- Insect Bite/Sting
- Respiratory Distress
- Fever
- Vomiting / Diarrhea
- Wound Care

Other instructions:

Guardian's name (printed) | Patient / Guardian Signature
--- | ---

Guardian's address | Date of Signatures | EMS Personnel's Signature
- | --- | ---

Witness Signature | Patient's Physician Name / Phone Number
--- | ---
Discharge Instructions

**UNIVERSAL INSTRUCTIONS:**
- YOU HAVE NOT RECEIVED A COMPLETE MEDICAL EVALUATION. SEE A PHYSICIAN AS SOON AS POSSIBLE.
- IF AT ANY TIME AFTER YOU HAVE TAKEN ANY MEDICATION, YOU HAVE TROUBLE BREATHING, START WHEEZING, GET HIVES OR A RASH, OR HAVE ANY UNEXPECTED REACTION, CALL 911 IMMEDIATELY.
- IF YOUR SYMPTOMS WORSEN AT ANY TIME, YOU SHOULD SEE YOUR DOCTOR, GO TO THE EMERGENCY DEPARTMENT OR CALL 911.

### ABDOMINAL PAIN:
- Abdominal pain is also called belly pain. Many illnesses can cause abdominal pain and it is very difficult for EMS to identify the cause.
- Take your temperature every 4 hours.
- Call or see a physician, go to the emergency department, or call 911 immediately if:
  - Your pain gets worse or is now only in 1 area
  - You vomit (throw up) blood or find blood in your bowel movement
  - You become dizzy or faint
  - Your abdomen becomes distended or swollen
  - You have a temperature over 100° F
  - You have trouble passing urine
  - You have trouble breathing

### BACK PAIN:
- Apply heat to the painful area to help relieve pain.
  - You may use a warm heating pad, whirlpool bath, or warm, moist towels for 10 to 20 minutes every hour.
  - Stay in bed as much as possible the first 24 hours.
  - Begin normal activities when you can do them without causing pain.
  - When picking things up, bend at the hips and knees. Never bend from the waist only.
- Call or see a physician, go to the emergency department, or call 911 immediately if:
  - You have shooting pains into your buttocks, groin, legs, or arms or the pain increases.
  - You have trouble urinating or lose control of your stool or urine.
  - You have numbness or weakness in your legs, feet, arms, or hands.

### HEAD INJURY:
- Immediately after a blow to the head, nausea, and vomiting may occur.
- Individuals who have sustained a head injury must be checked, and if necessary awakened, every 2 hours for the first 24 hours.
- Ice may be placed on the injured area to decrease pain and swelling.
- Only drink clear liquids such as juices, soft drinks, or water the first 12 hours after injury.
- Acetaminophen (Tylenol) or Ibuprofen only may be used for pain.
- Call or see a physician, go to the emergency department, or call 911 immediately if:
  - The injured person has persistent vomiting, is not able to be awakened, has trouble walking or using an arm or leg, has a seizure, develops unequal pupils, has a clear or bloody fluid coming from the ears or nose, or has strange behavior.

### INSECT BITE/STING:
- A bite or sting typically is a red lump which may have a hole in the center. You may have pain, swelling and a rash. Severe stings may cause a headache and an upset stomach (vomiting).
- Some individuals will have an allergic reaction to a bite or sting. Difficulty breathing or chest pain is an emergency requiring medical care.
- Elevation of the injured area and ice (applied to the area 10 to 20 minutes each hour) will decrease pain and swelling.
- Diphenhydramine (Benadryl) may be used as directed to control itching and hives.
- Call or see a physician, go to the emergency department, or call 911 immediately if:
  - The area becomes red, warm, tender, and swollen beyond the area of the bite or sting.
  - You develop a temperature above 101° F.

### FEVER:
- Always take medications as directed. Tylenol and Ibuprofen can be taken at the same time.
- If you are taking antibiotics, take them until they are gone, not until you are feeling better.
- Drink extra liquids (1 glass of water, soft drink or gatorade per hour of fever for an adult)
- If the temperature is above 103° F, it can be brought down by a sponge bath with room temperature water. Do not use cold water, a fan, or an alcohol bath.
- Call or see a physician, go to the emergency department, or call 911 immediately if:
  - Temperature is greater than 101° F for 24 hours
  - A child becomes less active or alert.
  - The Temperature does not come down with Acetaminophen (Tylenol) or Ibuprofen with the appropriate dose.

### EXTREMITY INJURY:
- Extremity Injuries may consist of cuts, scrapes, bruises, sprains, or broken bones (fractures).
- Apply ice on the injury for 15 to 20 minutes each hour for the first 1 to 2 days.
- Elevate the extremity above the heart as possible for the first 48 hours to decrease pain and swelling.
- Use the extremity as pain allows.
- Call or see a physician, go to the emergency department, or call 911 immediately if:
  - Temperature is greater than 101° F
  - The bruising, swelling, or pain gets worse despite the treatment listed above.
  - Any problems listed on the Wound Care instructions are noted.
  - You are unable to move the extremity or if numbness or tingling is noted.
  - You are not improved in 24 to 48 hours or you are not normal in 7 to 10 days.

### VOMITING/DIARRHEA:
- Vomiting (throwing up) can be caused by many things. It is common in children, but should be watched closely.
- Diarrhea is most often caused by either a food reaction or infection.
- Dehydration is the most serious problem associated with vomiting or diarrhea.
- Drink clear liquids such as water, apple juice, soft drinks, or gatorade for the first 12 hours or until things improve. Adults should drink 8 to 12 glasses of fluids per day with diarrhea.
- Children should drink 1 cup of fluid for each loose bowel movement.
- Call or see a physician, go to the emergency department, or call 911 immediately if:
  - Temperature is greater than 101° F.
  - Vomiting or Diarrhea lasts longer than 24 hours, gets worse, or blood is noted.
  - You cannot keep fluids down or no urination is noted in 8 hours.

### WOUND CARE:
- Wounds include cuts, scrapes, bites, abrasions, or puncture wounds.
- If the wound begins to bleed, apply pressure over the wound with a clean bandage and elevate the wound above the heart for 5 to 10 minutes.
- Unless instructed otherwise, clean the wound twice daily with soapy water, and keep the wound dry. It is safe to take a shower but do not place the wound in bath or dish water.
- See a physician for a tetanus shot if it has been 10 years or more since your last one.
- Call or see a physician, go to the emergency department, or call 911 immediately if:
  - See the Extremity Injury instructions.
  - Temperature is greater than 101° F.
  - Bruising, swelling, or pain gets worse or bleeding is not controlled as directed above.
  - Any signs of infection, such as redness, drainage of yellow fluid or pus, red streaks extending from the wound, or a bad smell is noted.
This EMS service would like to thank you for your effort and assistance. Please be advised that the EMS Professionals are operating under strict protocols and guidelines established by their medical director and the State of North Carolina. As a licensed physician, you may assume medical care of the patient. In order to do so, you will need to:

1. Receive approval to assume the patient’s medical care from the EMS Agencies Online Medical Control physician.
2. Show proper identification including current North Carolina Medical Board Registration/Licensure.
3. Accompany the patient to the hospital.
4. Carry out any interventions that do not conform to the EMS Agencies Protocols. EMS personnel cannot perform any interventions or administer medications that are not included in their protocols.
5. Sign all orders on the EMS Patient Care Report.
6. Assume all medico-legal responsibility for all patient care activities until the patient’s care is transferred to another physician at the destination hospital.
7. Complete the “Assumption of Medical Care” section of this form below.

## Assumption of Medical Care

I, ________________________________, MD; License #: ____________________________ ,

(Please Print your Name Here)

have assumed authority and responsibility for the medical care and patient management for

__________________________________________________________ .

(Insert Patient’s Name Here)

I understand that I must accompany the patient to the Emergency Department. I further understand that all EMS personnel must follow North Carolina EMS Rules and Regulations as well as local EMS System protocols.

_______________________________ , MD Date: ___ / ___ / ___ Time: ___ AM/PM

(Physician Signature Here)

_______________________________ , EMS ________________________________ Witness

(EMS Lead Crew Member Signature Here) (Witness Signature Here)
The Apgar score should be obtained and recorded initially and at 5 minutes with the birth of delivery of any infant.

- Each of the 5 parameters should be scored and then totaled.
- The Minimum score is 0
- The Maximum score is 10

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<thead>
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<th>Sign</th>
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<th>1</th>
<th>2</th>
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</thead>
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<td>Heart Rate</td>
<td>Absent</td>
<td>&lt;100 min.</td>
<td>&gt;100 min.</td>
</tr>
<tr>
<td>Respiratory Effort</td>
<td>Absent</td>
<td>Weak Cry</td>
<td>Strong Cry</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>Limp</td>
<td>Some Flexion</td>
<td>Good Flexion</td>
</tr>
<tr>
<td>Reflex Irritability</td>
<td>No Response</td>
<td>Some Motion</td>
<td>Cry</td>
</tr>
<tr>
<td>(when feet stimulated)</td>
<td>Blue; Pale</td>
<td>Body Pink Extremities Blue</td>
<td>Pink</td>
</tr>
</tbody>
</table>
## RACE Stroke Scale
### Rapid Arterial Occlusion Evaluation Scale

**EMS R.A.C.E. Stroke Scale**
Rapid Arterial Occlusion Evaluation Scale

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

**RACE SCALE TOTAL**
If you are having pain, tell your doctor or nurse. Use these pain scales to describe your pain.

Si tiene dolor, digaselo a su doctor o enfermera. Use esta escala para describir su dolor.

Patient’s Name: ________________________________

PCR Number: _______________ Date: ________________

**It is recommended that a Restraint Checklist be completed with any restraint use.**

1. Reason for restraint (check all that apply):
   - □ Patient attempting to hurt self
   - □ Patient attempting to hurt others
   - □ Patient attempting to remove medically necessary devices

2. Attempted verbal reassurance / redirection?
   - □ Yes
   - □ No

3. Attempted environmental modification? (i.e. remove patient from stressful environment)
   - □ Yes
   - □ No

4. Received medical control order for restraints?
   - □ Yes ________________________________ , MD
   - □ No ________________________________ (Medical Control Physician Name Here)

5. Time and Type of restraint applied (check all that apply):
   Date: ___ / ___ / ___ Time: ___ AM/PM

<table>
<thead>
<tr>
<th>Limb restraints:</th>
<th>Chemical Restraint:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ LUE</td>
<td>□ Yes</td>
</tr>
<tr>
<td>□ RUE</td>
<td>□ No</td>
</tr>
<tr>
<td>□ LLE</td>
<td></td>
</tr>
<tr>
<td>□ RLE</td>
<td>If Yes: Drug Used: ________________________________</td>
</tr>
</tbody>
</table>

   Total Dose: _____

6. Vital signs and extremity neurovascular exam should be taken every 15 minutes.

7. Transport Position (Patient should NOT be in prone position)
   - □ Supine position for transport
   - □ Lateral recumbent position for transport

Signature: ________________________________
(EMS Lead Crew Member)
The following is a list of approved medical abbreviations. In general, the use of abbreviations should be limited to this list.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;O x 3</td>
<td>alert and oriented to person, place and time</td>
</tr>
<tr>
<td>A&amp;O x 4</td>
<td>alert and oriented to person, place, time and event</td>
</tr>
<tr>
<td>A-FIB</td>
<td>atrial fibrillation</td>
</tr>
<tr>
<td>AAA</td>
<td>abdominal aortic aneurysm</td>
</tr>
<tr>
<td>ABC</td>
<td>airway, breathing, circulation</td>
</tr>
<tr>
<td>ABD</td>
<td>abdomen (abdominal)</td>
</tr>
<tr>
<td>ACLS</td>
<td>advanced cardiac life support</td>
</tr>
<tr>
<td>AKA</td>
<td>above the knee amputation</td>
</tr>
<tr>
<td>ALS</td>
<td>advanced life support</td>
</tr>
<tr>
<td>AMA</td>
<td>against medical advice</td>
</tr>
<tr>
<td>AMS</td>
<td>altered mental status</td>
</tr>
<tr>
<td>AMT</td>
<td>amount</td>
</tr>
<tr>
<td>APPROX</td>
<td>approximately</td>
</tr>
<tr>
<td>ASA</td>
<td>aspirin</td>
</tr>
<tr>
<td>ASSOC</td>
<td>associated</td>
</tr>
<tr>
<td>BG</td>
<td>blood glucose</td>
</tr>
<tr>
<td>BILAT</td>
<td>bilateral</td>
</tr>
<tr>
<td>BKA</td>
<td>below the knee amputation</td>
</tr>
<tr>
<td>BLS</td>
<td>basic life support</td>
</tr>
<tr>
<td>BM</td>
<td>bowel movement</td>
</tr>
<tr>
<td>BP</td>
<td>blood pressure</td>
</tr>
<tr>
<td>BS</td>
<td>breath sounds</td>
</tr>
<tr>
<td>BVM</td>
<td>bag-valve-mask</td>
</tr>
<tr>
<td>C-SECTION</td>
<td>caesarean section</td>
</tr>
<tr>
<td>C-SPINE</td>
<td>cervical spine</td>
</tr>
<tr>
<td>C/O</td>
<td>complaint of (complains of)</td>
</tr>
<tr>
<td>CA</td>
<td>cancer</td>
</tr>
<tr>
<td>CABG</td>
<td>coronary artery bypass graft</td>
</tr>
<tr>
<td>CAD</td>
<td>coronary artery disease</td>
</tr>
<tr>
<td>CATH</td>
<td>catheter</td>
</tr>
<tr>
<td>CC</td>
<td>chief complaint</td>
</tr>
<tr>
<td>CEPH</td>
<td>cephalic</td>
</tr>
<tr>
<td>CHF</td>
<td>congestive heart failure</td>
</tr>
<tr>
<td>CNS</td>
<td>central nervous system</td>
</tr>
<tr>
<td>COPD</td>
<td>chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>CP</td>
<td>chest pain</td>
</tr>
<tr>
<td>CPR</td>
<td>cardiopulmonary resuscitation</td>
</tr>
<tr>
<td>CSF</td>
<td>cerebrospinal fluid</td>
</tr>
<tr>
<td>CT</td>
<td>cat scan</td>
</tr>
<tr>
<td>CVA</td>
<td>cerebrovascular accident (stroke)</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>D5W</td>
<td>5% dextrose in water</td>
</tr>
<tr>
<td>DKA</td>
<td>diabetic ketoacidosis</td>
</tr>
<tr>
<td>DNR</td>
<td>do not resuscitate</td>
</tr>
<tr>
<td>DOA</td>
<td>dead on arrival</td>
</tr>
<tr>
<td>DT</td>
<td>delirium tremens</td>
</tr>
<tr>
<td>Dx</td>
<td>diagnosis</td>
</tr>
<tr>
<td>ECG</td>
<td>electrocardiogram</td>
</tr>
<tr>
<td>EEG</td>
<td>electroencephalogram</td>
</tr>
<tr>
<td>ET</td>
<td>endotracheal</td>
</tr>
<tr>
<td>ETOH</td>
<td>ethanol (alcohol)</td>
</tr>
<tr>
<td>ETT</td>
<td>endotracheal tube</td>
</tr>
<tr>
<td>EXT</td>
<td>external (extension)</td>
</tr>
<tr>
<td>FB</td>
<td>foreign body</td>
</tr>
<tr>
<td>FLEX</td>
<td>flexion</td>
</tr>
<tr>
<td>Fx</td>
<td>fracture</td>
</tr>
<tr>
<td>g</td>
<td>gram(s)</td>
</tr>
<tr>
<td>GI</td>
<td>gastrointestinal</td>
</tr>
<tr>
<td>GSW</td>
<td>gunshot wound</td>
</tr>
<tr>
<td>gtts</td>
<td>drops</td>
</tr>
<tr>
<td>GU</td>
<td>gastrourinary</td>
</tr>
<tr>
<td>GYN</td>
<td>gynecology (gynecological)</td>
</tr>
<tr>
<td>H/A</td>
<td>headache</td>
</tr>
<tr>
<td>HEENT</td>
<td>head, eyes, ears, nose, throat</td>
</tr>
<tr>
<td>HR</td>
<td>heart rate (hour)</td>
</tr>
<tr>
<td>HTN</td>
<td>hypertension</td>
</tr>
<tr>
<td>Hx</td>
<td>history</td>
</tr>
<tr>
<td>ICP</td>
<td>intracranial pressure</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>IM</td>
<td>intramuscular</td>
</tr>
<tr>
<td>IV</td>
<td>intravenous</td>
</tr>
<tr>
<td>JVD</td>
<td>jugular vein distension</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram</td>
</tr>
<tr>
<td>KVO</td>
<td>keep vein open</td>
</tr>
</tbody>
</table>
### Approved Medical Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-SPINE</td>
<td>lumbar spine</td>
</tr>
<tr>
<td>L/S-SPINE</td>
<td>lumbarsacral spine</td>
</tr>
<tr>
<td>L&amp;D</td>
<td>labor and delivery</td>
</tr>
<tr>
<td>LAT</td>
<td>lateral</td>
</tr>
<tr>
<td>lb</td>
<td>pound</td>
</tr>
<tr>
<td>LLQ</td>
<td>left lower quadrant</td>
</tr>
<tr>
<td>LMP</td>
<td>last mestrual period</td>
</tr>
<tr>
<td>LOC</td>
<td>level of consciousness (loss of consciousness)</td>
</tr>
<tr>
<td>LR</td>
<td>lactated ringers</td>
</tr>
<tr>
<td>LUQ</td>
<td>left upper quadrant</td>
</tr>
<tr>
<td>MAST</td>
<td>military anti-shock trousers</td>
</tr>
<tr>
<td>mcg</td>
<td>microgram(s)</td>
</tr>
<tr>
<td>MED</td>
<td>medicine</td>
</tr>
<tr>
<td>mg</td>
<td>milligram(s)</td>
</tr>
<tr>
<td>MI</td>
<td>myocardial infarction (heart attack)</td>
</tr>
<tr>
<td>min</td>
<td>minimum / minute</td>
</tr>
<tr>
<td>MS</td>
<td>mental status</td>
</tr>
<tr>
<td>MS</td>
<td>mental status change</td>
</tr>
<tr>
<td>MSO4</td>
<td>morphine</td>
</tr>
<tr>
<td>MVC</td>
<td>motor vehicle crash</td>
</tr>
<tr>
<td>N/V</td>
<td>nausea/vomiting</td>
</tr>
<tr>
<td>N/V/D</td>
<td>nausea/vomiting/diarrhea</td>
</tr>
<tr>
<td>NAD</td>
<td>no apparaent distress</td>
</tr>
<tr>
<td>NC</td>
<td>nasal cannula</td>
</tr>
<tr>
<td>NEB</td>
<td>nebulizer</td>
</tr>
<tr>
<td>NKDA</td>
<td>no known drug allergies</td>
</tr>
<tr>
<td>NRB</td>
<td>non-rebreather</td>
</tr>
<tr>
<td>NS</td>
<td>normal saline</td>
</tr>
<tr>
<td>NSR</td>
<td>normal sinus rhythm</td>
</tr>
<tr>
<td>OB/GYN</td>
<td>obstetrics/gynecology</td>
</tr>
<tr>
<td>PALP</td>
<td>palpation</td>
</tr>
<tr>
<td>PAC</td>
<td>premature atrial contraction</td>
</tr>
<tr>
<td>PE</td>
<td>pulmonary embolus</td>
</tr>
<tr>
<td>PEARL</td>
<td>pupils equal and reactive to light</td>
</tr>
<tr>
<td>PMHx</td>
<td>past medical history</td>
</tr>
<tr>
<td>PO</td>
<td>orally</td>
</tr>
<tr>
<td>PRB</td>
<td>partial rebreather</td>
</tr>
<tr>
<td>PRN</td>
<td>as needed</td>
</tr>
<tr>
<td>PT</td>
<td>patient</td>
</tr>
<tr>
<td>PVC</td>
<td>premature ventricular contraction</td>
</tr>
</tbody>
</table>
## Approved Medical Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLQ</td>
<td>right lower quadrant</td>
</tr>
<tr>
<td>RUQ</td>
<td>right upper quadrant</td>
</tr>
<tr>
<td>Rx</td>
<td>medicine</td>
</tr>
<tr>
<td>RXN</td>
<td>reaction</td>
</tr>
<tr>
<td>S/P</td>
<td>status post</td>
</tr>
<tr>
<td>SOB</td>
<td>shortness of breath</td>
</tr>
<tr>
<td>SQ</td>
<td>subcutaneous</td>
</tr>
<tr>
<td>ST</td>
<td>sinus tachycardia</td>
</tr>
<tr>
<td>SVT</td>
<td>supraventricular tachycardia</td>
</tr>
<tr>
<td>Sx</td>
<td>symptom</td>
</tr>
<tr>
<td>SZ</td>
<td>seizure</td>
</tr>
<tr>
<td>T-SPINE</td>
<td>thoracic spine</td>
</tr>
<tr>
<td>T</td>
<td>temperature</td>
</tr>
<tr>
<td>TIA</td>
<td>transient ischemic attack</td>
</tr>
<tr>
<td>TKO</td>
<td>to keep open (refers to IV’s - same as KVO)</td>
</tr>
<tr>
<td>Tx</td>
<td>treatment</td>
</tr>
<tr>
<td>UOA</td>
<td>upon our arrival</td>
</tr>
<tr>
<td>URI</td>
<td>upper respiratory infection</td>
</tr>
<tr>
<td>UTI</td>
<td>urinary tract infection</td>
</tr>
<tr>
<td>VF</td>
<td>ventricular fibrillation</td>
</tr>
<tr>
<td>VS</td>
<td>vital signs</td>
</tr>
<tr>
<td>VT</td>
<td>ventricular tachycardia</td>
</tr>
<tr>
<td>WAP</td>
<td>wandering atrial pacemaker</td>
</tr>
<tr>
<td>WNL</td>
<td>within normal limits</td>
</tr>
<tr>
<td>YO (YOA)</td>
<td>years old (years of age)</td>
</tr>
<tr>
<td>M or ♂</td>
<td>male</td>
</tr>
<tr>
<td>F or ♀</td>
<td>female</td>
</tr>
<tr>
<td>+</td>
<td>positive</td>
</tr>
<tr>
<td>-</td>
<td>negative</td>
</tr>
<tr>
<td>?</td>
<td>questionable</td>
</tr>
<tr>
<td>Ψ</td>
<td>psychiatric</td>
</tr>
<tr>
<td>~</td>
<td>approximately</td>
</tr>
<tr>
<td>&gt;</td>
<td>greater than</td>
</tr>
<tr>
<td>&lt;</td>
<td>less than</td>
</tr>
<tr>
<td>=</td>
<td>equal</td>
</tr>
</tbody>
</table>
Approved Medical Abbreviations

↑ - upper (increased)

a - before

p - after

c - with

s - without

Δ - change

L - left

R - right

↓ - lower (decreased)

1° - primary

2° - secondary
The Reperfusion Checklist is an important component in the initial evaluation, treatment, and transport of patients suffering from an acute ST-elevation myocardial infarction (STEMI) or acute Stroke. Both of these conditions can be successfully treated using fibrinolysis (thrombolytics) if the patient arrives at the appropriate hospital within the therapeutic window of time.

This form should be completed for all acute STEMI and acute Stroke patients.

Patient's Name: ____________________________________________________________

PCR Number: __________________________ Date: ______________________________

1. Has the patient experienced chest discomfort for greater than 15 minutes and less than 12 hours?
   □ Yes □ No

2. Has the patient developed a sudden neurologic deficit with a \( \geq 1 \) RACE score?
   □ Yes □ No

3. Are there any contraindications to fibrinolysis?

   If any of the following are checked “Yes”, fibrinolysis MAY be contraindicated.
   □ Yes □ No Systolic Blood Pressure greater than 180 mm Hg
   □ Yes □ No Diastolic Blood Pressure greater than 110 mm Hg
   □ Yes □ No Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
   □ Yes □ No History of structural Central Nervous System disease (tumors, masses, hemorrhage, etc.)
   □ Yes □ No Significant closed head or facial trauma within the previous 3 months
   □ Yes □ No Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding
   □ Yes □ No Bleeding or clotting problem or on blood thinners
   □ Yes □ No CPR performed greater than 10 minutes
   □ Yes □ No Currently Pregnant
   □ Yes □ No Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.

4. (STEMI Patients Only) Does the patient have severe heart failure or cardiogenic shock?
   These patients may benefit more from a percutaneous coronary intervention (PCI) capable hospital.
   □ Yes □ No Presence of pulmonary edema (rales greater than halfway up lung fields)
   □ Yes □ No Systemic hypoperfusion (cool and clammy)

If any contraindication is checked as “Yes” and an acute Stroke is suspected by exam or a STEMI is confirmed by ECG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligible patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to an specialty center capable of interventional care within the therapeutic window of time.
Difficult Airway Evaluation

Evaluating for the difficult airway

Between 1 – 3% of patients who require endotracheal intubation have airways that make intubation difficult. Recognizing those patients who may have a difficult airway allows the paramedic to proceed with caution and to keep as many options open as possible. It also allows the paramedic to prepare additional equipment (such as a cricothyrotomy kit) that may not ordinarily be part of a standard airway kit. The pneumonic LEMON is useful in evaluating patients for signs that may be consistent with a difficult airway and should raise the paramedic’s index of suspicion.

Look externally

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

Evaluate 3-3-2 Rule

3 fingers between the patient’s teeth (patient’s mouth should open adequately to permit three fingers to be placed between the upper and lower teeth)
3 fingers between the tip of the jaw and the beginning of the neck (under the chin)
2 fingers between the thyroid notch and the floor of the mandible (top of the neck)

Mallampati

This scoring system is based on the work of Mallampati et al published in the Canadian Anaesthesia Society Journal in 1985. The system takes into account the anatomy of the mouth and the view of various anatomical structures when the patient opens his mouth as wide as possible. This test is performed with the patient in the sitting position, the head held in a neutral position, the mouth wide open, and the tongue protruding to the maximum. Inappropriate scoring may occur if the patient is in the supine position (instead of sitting), if the patient phonates or if the patient arches his or her tongue.

Class I (easy) = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.
Class II = visualization of the soft palate, fauces and uvula.
Class III = visualization of the soft palate and the base of the uvula.
Class IV (difficult) = soft palate is not visible at all.

Obstruction?

Besides the obvious difficulty if the airway is obstructed with a foreign body, the paramedic should also consider other obstructions such as tumor, abscess, epiglottis, or expanding hematoma.

Neck Mobility

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

Formula for Fluid Resuscitation of the Burn Patient (Also known as the Parkland Formula)

\[ \text{Pts Wt} \times \% \text{TBSA} \times 4.0 \text{cc LR infused over 24 hours with half given in the first 8 hours.} \]

(For the equation, the abbreviations are: \( \text{PW} \times \text{TBSA} \times 4.0 \text{ cc } \))

EMS focuses on the care given during the 1st hour or several hours following the event. Thus the formula as adapted for EMS and the first 8 hours is:

\[ \text{PW} \times \text{TBSA} \times 4.0 \text{ cc, divide by 2} \]

to take this to the hourly rate, divide that solution by 8 and the equation becomes:

\[ \text{PW} \times \text{TBSA} \times 4.0 \text{cc} / 2 / 8 = \text{total to be infused for each of the first 8 hours.} \]

Another way to state the equation is to use:

\[ \text{PW} \times \text{TBSA} \times 0.25 \text{cc} = \text{total to be infused for each hour of the first 8 hours.} \]

**Example, 80 kg patient with 50 %TBSA \times 0.25 cc = 1000 cc/hr.**

Remember:
- Patient’s Weight in kg (2.2 lbs = 1.0 kg) example: 220 lbs adult = 100 kg
- \% TSBA = Rule of Nine Total Body Surface Area
- Factor for the 1st hr. and each hr. for the 1st 8 hrs. = 0.25

(Reminder, if two IV’s are running, divide total amount to be infused each hr. by 2)

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<th>Factor</th>
<th>/Hr for 1st 8 Hrs of Care</th>
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**Critical (Red)**
- 15% TBSA 2nd/3rd Degree Burn
- Burns with Multiple Trauma
- Burns with definitive airway compromise (When reasonable accessible, transport to a Burn Center)

**Serious (Yellow)**
- >15% TBSA 2nd/3rd Degree Burn
- Suspected Inhalation injury or requiring intubation for airway stabilization
- Hypotension
- GCS < 14
- (When reasonable accessible, transport to either a Level I Burn Center or a Trauma Center)

**Minor (Green)**
- < 5% TBSA 2nd/3rd Degree Burn
- No inhalation injury. Not Intubated. Normotensive
- GCS > 14
- (Transport to the Local Hospital)
*Remember, EMS DOES NOT activate Trauma or state trauma "color” activations.*

**Medical Yellow Alert Guidelines**

- Airway Compromise: includes basic or advanced airway attempts or placement.
- Ongoing BVM ventilations.
- Non-invasive ventilation support (NIPPV or BiPAP).
- Uncontrolled bleeding not otherwise covered by Trauma Team Activation.
- Hypotension (SBP<90 for adults) with symptoms.
- Any potentially unstable cardiac rhythm including HR: (<60 or >150), V-tach or SVT.
- CPR, defibrillation, or cardioversion prior to arrival.
- Altered Mental Status (GCS<10).
- Active Seizure.

**Trauma Reporting Guidelines for Injuries/Conditions**

**Trauma Red:**

- ADULT Shock: Blood Pressure <90 at any time
- PEDIATRIC Shock: SBP < 70mmHg + (2 x age in years)
- ADULT Respiratory Distress: respiratory rate <10 or >29 at any time in Adults
- PEDIATRIC Respiratory Distress: Infant <2; RR (<30 or >60), Toddler 2-5 (<24 or >40),
- School Age 6-12 (<13 or >30) and Adolescent >12 years of age (<12 or >26)
- Airway Compromise and/or intubation
- Unresponsive – Glasgow Coma Scale Score <9 with mechanism attributed to trauma
- Gunshot/penetrating wounds to the head, neck, chest, or abdomen or extremities including the elbow/knee or proximal.

**Trauma Yellow:**

- Depressed skull fracture
- Paralysis (Spinal cord injury-confirmed or suspected).
- Pulseless extremity (Vascular compromise or suspected).
- Amputation above the wrist or the ankle (proximal).
- Crush, Instability, or flail of chest.
- Crush or unstable pelvis.
- Two or more proximal long bone fractures (femur and /or humerus).
- Burns > 10% TBSA (second or third degree) and/or inhalation injury
- GCS 9 – 12 with traumatic mechanism.
- Crushed, degloved or mangled extremity.
- Patients with upper/ lower extremity deformities/ or large soft tissue injury with significant mechanism: Falls > 20 feet, Pedestrian hit (thrown or run over), Motorcycle crash > 20 mph with separation of rider and bike, Motor vehicle crash with: ejection, rollover, speed > 40 mph, or a death at the scene.
## Weight Conversion Tables

### (1-250) Pounds to Kilograms (0.5-113)

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This Document is unique to the County EMS System

**Appendix L**

Page 260 of 260

2017-12-13 revised

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2017-12-13 revised

Page 260 of 260

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2017-12-13 revised

Page 260 of 260
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
* Complete a reperfusion checklist (unless being transported directly to a PCI hospital) to determine thrombolytic eligibility
* 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 15 minutes or less (including a 12 lead ECG)
* Provide quality EMS service and patient care to the EMS System's citizens
* Continuously evaluate the EMS System based on North Carolina's STEMI EMS performance measures

**STEMI Patient**
(ST Elevation Myocardial Infarction)

* Cardiac symptoms greater than 15 minutes and less than 12 hours
  
  And
* 12 lead ECG criteria of 1 mm ST elevation in 2 or more contiguous leads
  
  or
* Left Bundle Branch Block NOT KNOWN to be present in the past

**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
* Consider implementing a prehospital thrombolytic program if a STEMI patient cannot reach a hospital within 90 minutes using air or ground EMS transport.
* PCI (Percutaneous Coronary Intervention) Capable Hospital = a hospital with an emergency interventional cardiac catheterization laboratory capable of providing the following services to acute STEMI patients. Free standing emergency departments and satellite facilities are not considered part of the PCI Capable Hospital.
  * 24/7 PCI capability within 30 minutes of notification (interventional cardiologist present at the start of the case)
  * Single Call Activation number for use by EMS
  * Accepts all patients regardless of bed availability
  * Provides outcome and performance measure feedback to EMS including case review
* Non-PCI Hospital = a local hospital within the EMS System's service area which provides emergency care, including thrombolytic administration, to an acute STEMI patient but does NOT provide PCI services.
* Specialty Care Transport Program = an air or ground based specialty care transport program which can assume care of an acute STEMI patient from EMS or a Non-PCI hospital and transport the patient to a PCI capable hospital.
**Stroke EMS Triage and Destination Plan**

**Stroke Patient**
- A 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. the time of onset for a patient awakening with stroke symptoms would be the last time he/she was known to be symptom free before the sleep period)

The Purpose of this plan is to:
- Rapidly identify acute Stroke patients who call 911 or present to EMS
- Minimize the time from onset of Stroke symptoms to definitive care
- Quickly diagnose a Stroke using validated EMS Stroke Screen
- Complete a reperfusion checklist (unless being transported directly to a Stroke Capable Hospital) to determine thrombolytic eligibility
- 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 quality EMS service and patient care to the EMS System's citizens
- Continuously evaluate the EMS System based on North Carolina’s Stroke EMS performance measures

---

**Symptoms of Acute Stroke**
- Positive Stroke Screen

**Transport to closest Primary Stroke Center or Stroke Capable Hospital Listed**
- Early Notification/Activation
- Vidant Medical Center

**Reperfusion Checklist**
- Contraindications to Thrombolysis

**Transport to closest Community Hospital Listed**
- Vidant Medical Center

**Pearls and Definitions**
- **All Stroke Patients** must be triaged and transported using this plan. This plan is in effect 24/7/365
- **All Patient Care** is based on the EMS Suspected Stroke Protocol
- **Primary Stroke Center** = a hospital that is currently accredited by the Joint Commission as a Primary Stroke Center. Free standing emergency departments and satellite facilities are not considered part of the Primary Stroke Center.
- **Stroke Capable Hospital** = a hospital which provides emergency care with a commitment to Stroke and the following capabilities:
  - CT availability with in-house technician availability 24/7/365
  - Ability to rapidly evaluate an acute stroke patient to identify patients who would benefit from thrombolytic administration
  - Ability and willingness to administer thrombolytic agents to eligible acute Stroke patients
  - Accepts all 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 for a Primary Stroke Center or Stroke Capable Hospital
- **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acute Stroke patient from EMS or a Hospital and transport the patient to a Primary Stroke Center

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**Pitt County EMS System Revised: 1/2019**
The Purpose of this plan is to:
* Rapidly identify injured or burned patients who call 911 or present to EMS
* Minimize the time from injury to definitive care for critical injuries or burns
* Quickly identify life or limb threatening injuries for EMS treatment and stabilization
* Rapidly identify the best hospital destination based on time of injury, severity of injury, and predicted transport time
* Early activation/notification to the hospital of a critically injured or burned patient prior to patient arrival
* Minimize scene time to 10 minutes or less from patient extrication with a "load and go" approach
* Provide quality EMS service and patient care to the EMS Systems citizens
* Continuously evaluate the EMS System based on North Carolina's EMS performance measures

### Acutely Injured or Burned Patient

**Evidence of extreme shock or un-manageable airway**
- Yes → Transport to the Nearest Hospital for Stabilization Unless Minimal Additional Time to a Trauma Center
- No → Any Abnormal Vital Signs?

**Any Abnormal Vital Signs?**
- Yes → Air Medical SCTP within 30 minutes of patient's location or helipad?
- No → Critical Injury by Assessment?

**Critical Injury by Assessment?**
- Yes → Activate Air or Ground SCTP
- No → Special Considerations?

**Special Considerations?**
- Yes → Transport to closest Community Hospital Listed Unless Trauma Center can be reached in a near equal time
- No → Significant Mechanism?

**Significant Mechanism?**
- Yes → Early Notification/Activation
  - Vidant Medical Center
  - CarolinasEast Medical Center (Craven)
  - Lenoir Memorial Hospital
  - Martin General Hospital
  - Wilson Medical Center
- No → Pearls and Definitions

**Pearls and Definitions**
* All Injury and 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 EMS Trauma Protocols
* Designated Trauma Center = a hospital that is currently designated as a Trauma Center by the North Carolina Office of Emergency Medical Services. Trauma Centers are designated as Level 1, 2, or 3 with Level 1 being the highest possible designation. Free standing emergency departments and satellite facilities are not considered part of the Trauma Center.
* Burn Center = a ABA verified Burn Center co-located with a designated Trauma Center
* Community Hospital = a local hospital within the EMS System's service area which provides emergency care but has not been designated as a Trauma Center
* Specialty Care Transport Program = an air or ground based specialty care transport program which can assume care of an acutely injured patient from EMS or a Community Hospital and transport the patient to a designated Trauma Center.
Pediatric EMS Triage and Destination Plan

Pediatric Patient
* Any patient less than 16 years of age with a life-threatening illness (Not Trauma)

Life Threatening Illness
* Decreased Mental Status (GCS<13)
* Non-Responsive Respiratory Distress
* Intubation
* Post Cardiac Arrest
* Non-Responsive Hypotension (shock)
* Severe Hypothermia or Hyperthermia
* 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 quality EMS service and patient care to the EMS community
* Continuously evaluate the EMS System based on North Carolina's EMS performance measures

Pediatric Patient with Life Threatening Illness (Not Trauma/Injury)

Pediatric Patient too unstable to transport beyond closest hospital?

Transport to closest Community Hospital Listed Early Notification/Activation If Life Threatening

Consider:
Vidant Beaufort Hospital
Lenoir Memorial Hospital

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.
* The Trauma and Burn Triage and Destination Plan should be used for all injured patients regardless of age.
* All Patient Care is based on the EMS 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 available in-house or on call 24/7/365)
  * 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.