



# **Mecklenburg EMS Agency Patient Care Protocols**

*Doug Swanson, MD, FACEP, FAEMS  
Medical Director  
Mecklenburg EMS Agency*



## **Mission Statement**

*To save a life, hold a hand, and be prepared to respond in our community  
when and where our patients need us.*

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[Adenosine \(Adenocard®\)](#)

[Albuterol \(Proventil®\)](#)

[Aspirin](#)

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[Cefazolin \(Ancef®\)](#)

[Diltiazem \(Cardizem®\)](#)

[Diphenhydramine \(Benadryl®\)](#)

[Dopamine](#)

[Epinephrine](#)

[Fentanyl \(Sublimaze®\)](#)

[Glucagon](#)

[Glucose](#)

[Ibuprofen \(Motrin®\)](#)

[Labetalol \(Normodyne®\)](#)

[Lidocaine](#)

[Magnesium sulfate](#)

[Methylprednisolone \(Solu-Medrol®\)](#)

[Midazolam \(Versed®\)](#)

[Naloxone \(Narcan®\)](#)

[Nitroglycerin](#)

[Nitrous Oxide](#)

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# **SECTION 1**

## **Introduction**

## Introduction

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### Protocol Sections

- |                             |                                     |
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| 1. Introduction             | 4. Procedure Protocols              |
| 2. Patient Related Policies | 5. Medication Formulary (Drug List) |
| 3. Clinical Care Protocols  | 6. Appendix                         |

### Updated

- \* All Mecklenburg EMS protocols have been reviewed and updated by the Medical Director
- \* Contained are revisions of and additions to the Clinical Care Protocols dated: 2/1994, 1/1998, 8/1999, 2/2004, 4/2006, 4/2007, 4/2009, 8/2011, 01/2013, 02/2014, 08/2014, 03/2015, 08/2015, 01/2016, 08/2016, 12/2016, 07/2017, 04/2018, 10/2018, 04/2019, 10/2019, 01/2020

### Considerations

- \* The Mecklenburg EMS Agency Patient Care Protocols are designed to provide the practicing prehospital provider at all levels a set of clinical standards for performing quality, competent, and consistent medical care
- \* Protocols are designed to follow a continuum of care that is initiated by the Emergency Medical Dispatcher utilizing Medical Priority Dispatch Systems protocols through hospital arrival and coordinate with protocols developed by the North Carolina College of Emergency Physicians
- \* Protocols are provided under the authority of:
  - The North Carolina Medical Board
  - The North Carolina Medical Care Commission
  - The North Carolina Office of EMS
  - The Mecklenburg EMS Agency Medical Control Board
  - The Mecklenburg EMS Agency Medical Director
- \* These protocols are intended as a **guideline for typical care based on patient's complaint** and the presumptive diagnosis
- \* In individual clinical patient care scenarios, deviation from this guideline may be necessary and appropriate
  - Discussion with the on-duty Operations Supervisor and/or Medical Control Physician must occur prior to any deviation from any protocol
  - Any exception from protocol must be explained within the Patient Care Report to detail reason(s) for deviation
  - **Any treatment must remain within the provider's scope of practice**
- \* Cases will arise that fall outside of any protocol
  - It is the **crew's medical decision making that is paramount and is to be used in** conjunction with these protocols and consultation with Medical Control
- \* Mecklenburg EMS Agency crew members may contact Medical Control at any time with any questions regarding patient care issues

## Definitions

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### Medical Care

- \* Basic Medical Care
  - Care which can be delivered by providers at the EMT level and above
- \* Advanced Medical Care
  - Care which can be delivered at the Advanced EMT and/or Paramedic level
    - Medications/skills eligible to be performed by an AEMT must be within the scope of practice as defined by the North Carolina Medical Board

### Age

- \* Pediatric = Age  $\leq$  14 years of age
- \* Adult = age  $\geq$  15 years of age
- \* Geriatric = age  $>$  60 years of age

### Vital Signs

- \* Hypertension
  - Adult
    - Systolic blood pressure  $>$  180 mmHg
    - Diastolic blood pressure  $>$  110 mm Hg
- \* Hypotension
  - Adult
    - Systolic blood pressure  $<$  90 mmHg
  - Pediatric
    - Systolic blood pressure  $<$  70 + (2\*age in years)
- \* Tachycardia
  - Adult heart rate  $>$  100 beats per minute
  - Pediatric heart rate: age  $<$  1 year:  $>$  160 beats per minutes
  - 1-2 years:  $>$  150 beats per minutes
  - 2-5 years:  $>$  140 beats per minutes
  - 6-12 years:  $>$  120 beats per minutes
- \* Bradycardia
  - Adult heart rate  $<$  60 beats per minute
  - Pediatric heart rate - age  $<$  1 year:  $<$  100 beats per minute
  - 1-5 years:  $<$  80 beats per minute
  - $>$  6 years:  $<$  60 beats per minute
- \* Hypoxemia
  - SpO<sub>2</sub>  $<$  90%
- \* Fever
  - Temperature  $>$  101.5°F
- \* Hypothermia
  - Temperature  $<$  96° F

**Mental Status**

- \* Lethargic / Obtunded
  - Unconscious but arousable
  - Lapses back into unconsciousness without continued stimulation
- \* Delusional
  - Experiencing perceptions that are not truly present (hallucinating)
- \* Capacity for medical decision making
  - Able to make informed decisions regarding health/healthcare
  - Able to understand the nature and severity of their presumptive illness/injury
  - Able to understand the risks of refusing treatment
    - Including, but not limited to: worsening condition, debilitation, death
  - Able to understand the benefits of receiving medical care
  - NOT under the influence of any mind-altering substance
    - Clear sensorium without delusions or hallucinations
    - Oriented to person, place, time, situation
  - NOT suicidal or homicidal
  - No signs of incoordination
  - No slurred speech
  - NOT medically unstable
    - Including but not limited to: hypotensive, hypoxic, hypoglycemic, clinically intoxicated, significantly tachycardic

**Ancillary Testing**

- \* Hyperglycemia = blood glucose > 300
- \* Hypoglycemia = blood glucose < 60

**Additional Definitions**

- \* Patient
  - Any individual who has a physical or medical complaint from illness or injury
- \* Patient encounter
  - Contacting an individual who has a medical complaint or potential injury based on mechanism or historical information suggesting an illness or injury [or]
  - Initiating a conversation with a person regarding their health
- \* Multiple casualty incident
  - Any incident involving  $\geq 3$  priority patients (Priority-1 or Priority-2) or  $\geq 5$  patients of any priority
- \* Differential Diagnosis
  - List of potential conditions as the cause of the **patient's illness**
- \* Intubation attempt
  - **Insertion of laryngoscope blade past the patient's teeth during the procedure;** regardless of whether an attempt is made to insert the endotracheal tube



## Scope of Practice

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### Introduction

- \* Scope of practice describes the clinical skills that may be performed and the medications that may be administered by a healthcare provider
- \* The North Carolina Medical Board has the responsibility of defining the scope of medical practice for prehospital providers at all certification levels in North Carolina
- \* Local medical control has the final decision on the skills and medications that will be utilized by the EMS agency
- \* All Mecklenburg County prehospital personnel must adhere to the local standards outlined in these protocols
- \* Only EMT or Paramedic students that have satisfied each of the following will be permitted to perform beyond their current scope of practice:
  - The student is currently enrolled and considered in good standing with an EMT or Paramedic training program that has officially affiliated with the Agency
  - Appropriate scheduling arrangements have been previously made with Operations personnel
  - The student is assigned to and under the direct supervision of a designated Mecklenburg EMS Agency Field Training Officer or Paramedic Preceptor and is **functioning as a third crew member in the "student" (not paid provider) capacity**
- \* Any Mecklenburg EMS Agency provider or affiliated first responder not practicing within the scope of medical practice as outlined by the North Carolina Office of EMS and the Mecklenburg EMS Agency, encouraging this practice, or tolerating such behavior may be removed from patient care activities

## TITLE 10 – DEPARTMENT OF HEALTH AND HUMAN SERVICES

### CHAPTER 13 – FACILITY SERVICES

### SUBCHAPTER 13P – EMERGENCY MEDICAL SERVICES

### SECTION .0500 – EMS PERSONNEL

#### 10A NCAC 13P .0505 SCOPE OF PRACTICE FOR EMS PERSONNEL

EMS Personnel educated in approved programs, credentialed by the OEMS, and functioning under physician medical oversight may perform acts and administer intravenous fluids and medications as allowed by the North Carolina Medical Board pursuant to G.S. 143-514.

*History Note: Authority G.S. 143-508(d)(6); 143-514;  
 Temporary Adoption Eff. January 1, 2002;  
 Eff. April 1, 2003;  
 Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff.  
 February 2, 2016;  
 Amended Eff. July 1, 2018.*

**NCMB approved EMS Medications**

| <p style="text-align: center;"><b>North Carolina Medical Board</b><br/> <b>Approved Medications for Credentialed EMS Personnel</b></p> <p>EMS personnel at any level who administer medications must do so within an EMS system that provides medical oversight. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies must be reviewed and approved by the Medical Director of the Office of EMS.</p> <p>All items highlighted in "red" are required by NCCEP in all systems with EMS personnel credentialed at the specified level. Specialty Care (SCTP) required items are not listed here, as they can be found on the Specialized Ambulance Protocol Summary (SAPS) form.</p> |                |                |                    |                  |
|--|----------------|----------------|--------------------|------------------|
| Medications  | EMR            | EMT            | AEMT               | MEDIC            |
| ACE inhibitors   |                |                |                    | X                |
| Acetaminophen  | X              | X              | X <sup>1</sup>     | X                |
| Adenosine  |                |                |                    | X                |
| Aminophylline  |                |                |                    | X                |
| Amiodarone   |                |                |                    | X                |
| Anti-arrhythmic  |                |                |                    | X <sup>1</sup>   |
| Antibiotics  |                |                |                    | X                |
| Anti-emetic preparations   |                |                |                    | X                |
| Antivirals   |                |                |                    | X                |
| Aspirin  |                | X              | X                  | X                |
| Atropine   | X <sup>4</sup> | X <sup>4</sup> | X <sup>1,2,3</sup> | X                |
| Barbiturates   |                |                |                    | X                |
| Benzodiazepine preparations  |                |                |                    | X <sup>1</sup>   |
| Beta agonist preparations  |                | X <sup>2</sup> | X                  | X                |
| Beta blockers  |                |                |                    | X <sup>1,2</sup> |
| Bretylium  |                |                |                    | X                |
| CI Esterase-Inhibitors   |                |                |                    | X                |
| Calcium channel blockers   |                |                |                    | X <sup>1</sup>   |
| Calcium chloride/gluconate   |                |                |                    | X                |
| Charcoal   |                | X              | X                  | X                |
| Clonidine  |                |                |                    | X                |
| Clopidogrel  |                |                |                    | X                |
| CroFab (Crotalidae Polyvalent Immune Fab)  |                |                |                    | X <sup>8</sup>   |
| Crystalloid solutions  |                |                | X                  | X                |
| Cyanide poisoning antidote kit   |                |                |                    | X                |
| Digoxin  |                |                |                    | X                |
| Diphenhydramine  | X <sup>3</sup> | X <sup>3</sup> | X                  | X                |
| Dobutamine   |                |                |                    | X                |
| Dopamine   |                |                |                    | X                |
| Droperidol   |                |                |                    | X                |
| Epinephrine  | X <sup>1</sup> | X <sup>1</sup> | X                  | X                |
| Etomidate  |                |                |                    | X                |
| Flumazenil   |                |                |                    | X                |
| Furosemide   |                |                |                    | X                |
| Glucagon   |                |                | X                  | X                |
| Glucose, oral  | X              | X              | X                  | X                |
| Glucose solutions  |                |                | X                  | X                |
| Haloperidol  |                |                |                    | X                |
| Heparin (unfractionated and low molecular weight)  |                |                |                    | X                |

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| Medications                     | EMR               | EMT               | AEMT           | MEDIC           |
|---------------------------------|-------------------|-------------------|----------------|-----------------|
| Histamine 2 blockers            |                   |                   | X              | X               |
| Hydroxocobalamin                |                   |                   |                | X               |
| Immunizations                   |                   |                   | X <sup>6</sup> | X <sup>6</sup>  |
| Insulin                         |                   |                   |                | X               |
| Ipratropium                     |                   |                   | X              | X               |
| Isoproterenol                   |                   |                   |                | X               |
| Ketamine                        |                   |                   |                | X <sup>7</sup>  |
| Levetiracetam                   |                   |                   |                | X               |
| Lidocaine                       |                   |                   |                | X               |
| Magnesium sulfate               |                   |                   |                | X               |
| Mannitol                        |                   |                   |                | X               |
| Methylene blue                  |                   |                   |                | X               |
| Milrinone                       |                   |                   |                | X               |
| N-acetylcysteine                |                   |                   |                | X               |
| Narcotic analgesics             |                   |                   |                | X               |
| Narcotic antagonists            | X <sup>9,10</sup> | X <sup>9,10</sup> | X              | X               |
| Nasal spray decongestant        |                   | X                 | X              | X               |
| Nesiritide                      |                   |                   |                | X               |
| Nitroglycerin                   |                   | X <sup>2</sup>    | X              | X               |
| Nitroprusside sodium            |                   |                   |                | X               |
| Nitrous oxide                   |                   |                   |                | X               |
| Non-prescription medications    |                   | X                 | X              | X               |
| Non-steroidal anti-inflammatory |                   | X                 | X              | X               |
| Norepinephrine                  |                   |                   |                | X               |
| Octreotide                      |                   |                   |                | X               |
| Oxygen                          | X <sup>8</sup>    | X                 | X              | X               |
| Oxytocin                        |                   |                   |                | X               |
| Paralytic agents                |                   |                   |                | X <sup>7</sup>  |
| Phenothiazine preparations      |                   |                   |                | X               |
| Phenylephrine                   |                   |                   |                | X               |
| Phenytoin preparations          |                   |                   |                | X               |
| Plasma protein fraction         |                   |                   |                | X               |
| Platelet g-II/IIIa inhibitors   |                   |                   |                | X               |
| Potassium chloride              |                   |                   |                | X               |
| Pralidoxime                     | X <sup>4</sup>    | X <sup>4</sup>    | X <sup>4</sup> | X               |
| Procainamide                    |                   |                   |                | X               |
| Procaine                        |                   |                   |                | X               |
| Proparacaine                    |                   |                   |                | X               |
| Propofol                        |                   |                   |                | X <sup>8</sup>  |
| Proton pump inhibitors          |                   |                   |                | X               |
| Sodium bicarbonate              |                   |                   |                | X               |
| Steroid preparations            |                   |                   |                | X               |
| Thiamine                        |                   |                   | X              | X               |
| Thrombolytic agents             |                   |                   |                | X               |
| Topical hemostatic agents       | X                 | X                 | X              | X               |
| Total Parenteral Nutrition      |                   |                   |                | X               |
| Tranexamic Acid (TXA)           |                   |                   |                | X <sup>11</sup> |
| Tuberculosis skin test          |                   |                   | X <sup>6</sup> | X <sup>6</sup>  |
| Valproic acid                   |                   |                   |                | X               |
| Vasopressin                     |                   |                   | X              | X               |
| Vasopressor                     |                   |                   |                | X <sup>8</sup>  |

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| Medications                | EMR | EMT | AEMT | MEDIC |
|----------------------------|-----|-----|------|-------|
| Whole blood and components |     |     |      | X     |
| Ziprasidone                |     |     |      | X     |

- MR and EMT use of epinephrine is limited to the treatment anaphylaxis and may be administered only by auto injector, unless approved by EMS System Medical Director and OEMS.
- EMT use of beta-agonists and nitroglycerine is limited to patients who currently are prescribed the medication. EMTs may administer these medications from EMS supplies. EMT use of beta-agonists may be through any inhaled method of medication administration.
- EMR/EMT administration of diphenhydramine is limited to the oral route.
- As a component of preparedness for domestic terrorism, EMS personnel, public safety officers, and other first responders recognized by the EMS system, may carry, self-administer, or administer to a patient atropine and/or pralidoxime, based on written protocols and medical direction. All personnel except for Paramedics must administer these medications by an auto injector.
- Administration of oxygen does not require medical direction.
- Administration of immunizations and TB skin tests are not limited to public health initiatives.
- Can only be used as an induction agent for RSI or for post intubation sedation.
- Can only be used for interfacility transport where infusion has already been started at transferring facility. **EMS units cannot carry Propofol or CroFab. This medication must be provided by the transferring hospital.**
- FR, EMR, and EMT administration of Naloxone is limited to the intra-nasal (IN), intra-muscular (IM), and auto-injector routes.
- First Responder agencies, to include law enforcement are allowed to administer Naloxone with the following requirements:
  - They must administer the Naloxone under the medical oversight of the County EMS Medical Director and be incorporated into the respective EMS System in which they are administering Naloxone.
  - They must receive appropriate training and continuing education as approved by the County EMS Medical Director.
  - The Naloxone must be administered as part of a protocol and procedure approved by the County EMS Medical Director, and the NC Office of EMS.
  - All administration of Naloxone must be reviewed by the EMS Peer Review/Quality Management Committee of the EMS System, which functions under the supervision of the local County EMS Medical Director.
- For an EMS System to use Tranexamic Acid (TXA), they must submit for approval by the OEMS State Medical Director a signed letter from any Trauma Centers that would be the recipient of the patient that the destination Trauma Center agrees with its use and will give the 2nd required dose of Tranexamic Acid (TXA).
- All Paramedic systems must carry some form of anti-arrhythmic agent. This must either be amiodarone, lidocaine, or procainamide.
- Paramedic systems must carry either a calcium channel blocker or beta-blocker.
- All Paramedic systems must carry some form of injectable benzodiazepine.
- EMT-Intermediate/AEMT systems must carry either acetaminophen or a non-steroidal anti-inflammatory.
- All Paramedic systems must carry an approved vasopressor. This must either be dobutamine, dopamine, epinephrine, norepinephrine, phenylephrine, or vasopressin.



**NCMB EMS Approved Skills****North Carolina Medical Board  
Approved Skills for Credentialed EMS Personnel**

EMS personnel performing these skills must do so within an EMS system. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies must be reviewed and approved by the Medical Director of the Office of EMS.

All items highlighted in “red” are required by NCCEP in all systems with EMS personnel credentialed at the specified level. Specialty Care (SCTP) required items are not listed here, as they can be found on the Specialized Ambulance Protocol Summary (SAPS) form.

| Skills                                       | EMR            | EMT            | AEMT           | MEDIC          |
|--|----------------|----------------|----------------|----------------|
| 12-Lead ECG Acquisition & Transmission       |                | X              | X              | X              |
| 12-Lead ECG Interpretation                   |                |                |                | X              |
| 15-Lead ECG Acquisition                      |                |                |                | X              |
| Arterial Access - Blood Draw                 |                |                |                | X              |
| Arterial Line maintenance                    |                |                |                | X              |
| Blind Insertion Airway Device (BIAD)         |                | X              | X              | X              |
| Capnography (Waveform)                       |                | X <sup>6</sup> | X <sup>6</sup> | X <sup>6</sup> |
| Carbon Monoxide Measurement (non-invasive)   | X              | X              | X              | X              |
| Cardiac Monitoring                           |                | X <sup>4</sup> | X <sup>4</sup> | X              |
| Cardiac Pacing                               |                |                |                | X              |
| Cardiopulmonary Resuscitation                | X              | X              | X              | X              |
| Cardioversion                                |                |                |                | X              |
| Carotid Massage                              |                |                |                | X              |
| Central Venous Pressure Line Maintenance     |                |                |                | X              |
| Chest Compression-External Device            |                | X              | X              | X              |
| Chest Decompression-Needle                   |                |                |                | X              |
| Chest Tube Maintenance                       |                |                |                | X              |
| Childbirth                                   | X              | X              | X              | X              |
| Cricothyrotomy-Needle                        |                |                |                | X              |
| Cricothyrotomy-Surgical                      |                |                |                | X <sup>5</sup> |
| Decontamination                              | X              | X              | X              | X              |
| Defibrillation-Automated                     | X              | X              | X              | X              |
| Defibrillation-Manual                        |                |                |                | X              |
| Direct Laryngoscopy                          |                |                | X              | X              |
| Endotracheal Tube Introducer                 |                |                | X              | X              |
| Epidural Catheter Maintenance                |                |                |                | X              |
| Foreign Body Airway Obstruction              | X              | X              | X              | X              |
| Gastric Intubation                           |                | X <sup>7</sup> | X <sup>7</sup> | X              |
| Glucose Measurement                          | X              | X              | X              | X              |
| Hemostatic Agent                             | X              | X              | X              | X              |
| Injections - Subcutaneous and Intramuscular  |                | X <sup>2</sup> | X              | X              |
| Intra-Ventricular Catheter Maintenance       |                |                |                | X              |
| Intubation - Nasotracheal                    |                |                | X              | X              |
| Intubation - Orotracheal                     |                |                | X <sup>6</sup> | X              |
| Intubation Confirmation - Capnometry (color) |                |                | X              | X              |
| Intubation Confirmation - Esophageal Bulb    |                |                | X              | X              |
| Medication Administration                    | X <sup>7</sup> | X <sup>7</sup> | X              | X              |
| Nebulizer Inhalation Therapy                 |                | X              | X              | X              |

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| Skills                                     | EMR | EMT            | AEMT           | MEDIC            |
|--|-----|----------------|----------------|------------------|
| Non-Invasive Positive Pressure Ventilation |     | X              | X              | X                |
| Orthostatic Blood Pressure                 | X   | X              | X              | X                |
| Oxygen Administration                      | X   | X              | X              | X                |
| Patient Assessment                         | X   | X              | X              | X                |
| Pulse Oximetry                             | X   | X              | X              | X                |
| Rapid Sequence Induction (RSI)             |     |                |                | X <sup>5,6</sup> |
| Reperfusion Checklist                      | X   | X              | X              | X                |
| Respirator Operation                       |     | X              | X              | X                |
| Restraints                                 |     | X              | X              | X                |
| Spinal Motion Restriction                  | X   | X              | X              | X                |
| Splinting                                  | X   | X              | X              | X                |
| Stroke Screen                              | X   | X              | X              | X                |
| Suction                                    | X   | X              | X              | X                |
| Swan-Ganz Catheter maintenance             |     |                |                | X                |
| Taser Probe Removal                        | X   | X              | X              | X                |
| Temperature Measurement                    | X   | X              | X              | X                |
| Tourniquet Application                     | X   | X              | X              | X                |
| Tracheostomy Tube Change                   |     |                | X              | X                |
| Urinary Catheterization                    |     |                |                | X                |
| Venous Access-Blood Draw                   |     |                | X              | X                |
| Venous Access-Existing catheters           |     |                |                | X                |
| Venous Access-Femoral Line                 |     |                |                | X                |
| Venous Access-Intraosseous                 |     |                | X              | X                |
| Venous Access-Peripheral                   |     |                | X              | X                |
| Ventilator Operation                       |     | X <sup>8</sup> | X <sup>8</sup> | X                |
| Wound Care                                 | X   | X              | X              | X                |

<sup>1</sup> EMTs using blind insertion airway devices must be functioning in EMS systems with medical direction and written treatment protocols.

<sup>2</sup> EMS personnel at any level who administer medications must do so within an EMS system that provides medical oversight. Personnel must follow written treatment protocols and must complete appropriate medical education. All EMS System protocols and policies must be reviewed and approved by the Medical Director of the Office of EMS. The approved medication list is found at the beginning of this document. The administration of oxygen does not require medical direction.

<sup>3</sup> Gastric tube insertion may be performed only when utilized in conjunction with a blind insertion airway device.

<sup>4</sup> EMT and AEMT may use the cardiac monitor for vital sign monitoring and EKG transmission.

<sup>5</sup> Systems performing rapid sequence induction must have the ability to perform surgical cricothyrotomy. Commercial cricothyrotomy or tracheostomy kits that create an airway comparable to a surgical cricothyrotomy are acceptable.

<sup>6</sup> Capnometry or capnography is mandatory with all methods of intubation. Continuous capnography (EtCO<sub>2</sub>) is strongly recommended for the monitoring of all patients with a BIAD and mandatory with monitoring of an endotracheal tube.

<sup>7</sup> Pediatric intubation is an optional skill/procedure.

<sup>8</sup> Ventilator patients may be transported by EMT/AEMT when all of the following conditions are met:

- Patient is receiving home (or skilled nursing) ventilator therapy.
- The ventilator is portable and can continue to ventilate the patient during transport.
- The patient is accompanied by a non-EMS adult (from either the home or facility) who is knowledgeable, capable, and willing to maintain the ventilator during the EMS transport.
- While in transit, the patient is monitored using pulse oximetry.

-As of 1 January 2017, NCOEMS will be transitioning all EMT-Intermediates to the Advanced EMT Level in order to align with the National Education Standards. The EMT-I and AEMT will have the same scope of practice. All EMR personnel performing skills beyond the National Education Standards, must do so under approved medical direction.

**10A NCAC 13P .0403 RESPONSIBILITIES OF THE MEDICAL DIRECTOR FOR EMS SYSTEMS**

(a) The Medical Director for an EMS System is responsible for the following:

- (1) ensuring that medical control as set forth in Rule .0401(5) of this Section is available 24 hours a day, seven days a week;
- (2) the establishment, approval, and annual updating of adult and pediatric treatment protocols;
- (3) EMD programs, the establishment, approval, and annual updating of the Emergency Medical Dispatch Priority Reference System;
- (4) medical supervision of the selection, system orientation, continuing education and performance of all EMS personnel;
- (5) medical supervision of a scope of practice performance evaluation for all EMS personnel in the system based on the treatment protocols for the system;
- (6) the medical review of the care provided to patients;
- (7) providing guidance regarding decisions about the equipment, medical supplies, and medications that will be carried on all ambulances and EMS nontransporting vehicles operating within the system;
- (8) determining the combination and number of EMS personnel sufficient to manage the anticipated number and severity of injury or illness of the patients transported in Medical Ambulance/Evacuation Bus Vehicles defined in Rule .0219 of this Subchapter;
- (9) keeping the care provided up-to-date with current medical practice; and
- (10) developing and implementing an orientation plan for all hospitals within the EMS system that use MICN, EMS-NP, or EMS-PA personnel to provide on-line medical direction to EMS personnel. This plan shall include:
  - (A) a discussion of all EMS System treatment protocols and procedures;
  - (B) an explanation of the specific scope of practice for credentialed EMS personnel, as authorized by the approved EMS System treatment protocols required by Rule .0405 of this Section;
  - (C) a discussion of all practice settings within the EMS System and how scope of practice may vary in each setting;
  - (D) a mechanism to assess the ability to use EMS System communications equipment, including hospital and prehospital devices, EMS communication protocols, and communications contingency plans as related to on-line medical direction; and
  - (E) the completion of a scope of practice performance evaluation that verifies competency in Parts (A) through (D) of this Subparagraph and that is administered under the direction of the Medical Director.

(b) Any tasks related to Paragraph (a) of this Rule may be completed, through the Medical Director's written delegation, by assisting physicians, physician assistants, nurse practitioners, registered nurses, EMDs, or paramedics.

(c) The Medical Director may suspend temporarily, pending review, any EMS personnel from further participation in the EMS System when he or she determines that the individual's actions are detrimental to the care of the patient, the individual committed unprofessional conduct, or the individual failed to comply with credentialing requirements.

During the review process, the Medical Director may:

- (1) restrict the EMS personnel's scope of practice pending completion of remediation on the identified deficiencies;
- (2) continue the suspension pending completion of remediation on the identified deficiencies; or
- (3) permanently revoke the EMS personnel's participation in the EMS System.

*History Note:* Authority G.S. 143-508(b); 143-508(d)(3); 143-508(d)(7);  
Temporary Adoption Eff. January 1, 2002;  
Eff. April 1, 2003;  
Amended Eff. January 1, 2009; January 1, 2004;  
Readopted Eff. January 1, 2017.



## Mecklenburg EMS Agency Scope of Practice

The following are based on skills and medications utilized within the Mecklenburg EMS Agency Patient Care Protocols

### EMT

#### \* Procedures and Skills

- 4-lead & 12-lead ECG acquisition
- Airway: Bag-Valve-Mask ventilation
- Airway: Blind Insertion Airway Device
- Airway: suctioning
- Capnography – waveform
- Cardiopulmonary Resuscitation (CPR)
- Childbirth
- Decontamination
- Defibrillation – Automated (AED)
- Foreign Body Airway Obstruction removal
- Gastric tube insertion via Blind Insertion Airway Device
- Glucose measurement
- Nebulizer administration (only patients with current prescription for beta agonist)
- Patient assessment
- PRN adapter monitoring
- Restraints application
- Spinal motion restriction
- Splinting of fractures
- Vital signs (including SpO<sub>2</sub>, CO, temperature & orthostatic vital signs)
- Wound care (tourniquet, chest seal, & Taser probe removal)

#### \* Medications

- Oral medications
  - Aspirin
  - Diphenhydramine (Benadryl®)
  - Glucose (InstaGlucose®)
  - Nitroglycerin SL (Nitrostat®) – only patients with current prescription
- Inhalational medications
  - Albuterol (Proventil®) – only patients with current prescription
  - Oxygen
- Intramuscular medications
  - Atropine via auto-injector in Mark-1® or DuoDote® antidote kits
  - Epinephrine 1:1,000 via draw and administer
  - Epinephrine 1:1,000 via auto-injector (EpiPen®)
  - Epinephrine 1:2,000 via auto-injector (EpiPen Jr®)
  - Pralidoxime via auto-injector in Mark-1® or DuoDote® antidote kits
- Intranasal medications
  - Naloxone (Narcan®)



**Advanced EMT****\* Procedures and Skills**

- 4-lead & 12-lead ECG acquisition
- Airway: Bag-Valve-Mask ventilation
- Airway: Blind Insertion Airway Device
- Airway: Suctioning
- Capnography – waveform
- Cardiopulmonary Resuscitation (CPR)
- Childbirth
- Decontamination
- Defibrillation – Automated (AED)
- Endotracheal intubation (orotracheal route only);
  - Under the direct supervision of the Medical Director or EMS Fellow
- Foreign Body Airway Obstruction removal
- Gastric tube insertion via Blind Insertion Airway Device
- Glucose measurement
- Nebulizer administration
- Patient assessment
- PRN adapter monitoring
- Restraints application
- Spinal motion restriction
- Splinting of fractures
- Vital signs (including SpO<sub>2</sub>, CO, temperature & orthostatic vital signs)
- Wound care (tourniquet, chest seal, & Taser probe removal)
- Venous access – Peripheral or Intraosseous

**\* Medications**

- Oral medications
  - Aspirin
  - Diphenhydramine (Benadryl®)
  - Glucose (InstaGlucose®)
  - Nitroglycerin sublingual (Nitrostat®)
- Topical medications
  - Nitroglycerin ointment (Nitro-BID® ointment)
- Inhalational medications
  - Albuterol (Proventil®)
  - Oxygen
- Intramuscular medications
  - Atropine via auto-injector in Mark-1® or DuoDote® antidote kits
  - Diphenhydramine (Benadryl®)
  - Epinephrine 1:1,000 via draw and administer
  - Epinephrine 1:1,000 via auto-injector (EpiPen®)
  - Epinephrine 1:2,000 via auto-injector (EpiPen Jr®)
  - Glucagon (GlucaGen®)
  - Naloxone (Narcan®)
  - Pralidoxime via auto-injector in Mark-1® or DuoDote® antidote kits

- Intranasal medications
  - Naloxone (Narcan®)
- Intravenous medications
  - Diphenhydramine (Benadryl®)
  - Epinephrine 1:10,000
  - Glucose solutions
  - Naloxone (Narcan®)
  - Normal saline

## Paramedic

### \* Procedures and Skills

- 4-lead & 12-lead ECG acquisition & interpretation
- Airway: Bag-Valve-Mask ventilation
- Airway: Blind Insertion Airway Device
- Airway: Endotracheal intubation (adult only)
- Capnography – waveform
- Cardiac Pacing – Transcutaneous
- Cardiopulmonary Resuscitation (CPR)
- Cardioversion
- Chest needle decompression
- Childbirth
- Decontamination
- Defibrillation – Manual & Automated (AED)
- Foreign Body Airway Obstruction removal
- Gastric tube insertion
- Glucose measurement
- Nebulizer administration
- Non-invasive positive airway pressure (CPAP)
- Patient assessment
- Restraints application
- Spinal motion restriction
- Splinting of fractures
- Suctioning
- Vital signs (including SpO<sub>2</sub>, CO, temperature & orthostatic vital signs)
- Venous access – Peripheral, Intraosseous, or External Jugular
- Wound care (tourniquet, chest seal, & Taser probe removal)

## \* Medications

- Oral medications
  - Aspirin
  - Diphenhydramine (Benadryl®)
  - Glucose (InstaGlucose®)
  - Nitroglycerin (Nitrostat®)
  - Ondansetron (Zofran®)
- Topical medications
  - Nitroglycerin ointment (Nitrol ointment®)
- Inhalational medications
  - Albuterol (Proventil®)
  - Epinephrine (racemic)
  - Nitrous oxide (N<sub>2</sub>O)
  - Oxygen
- Intramuscular medications
  - Atropine via auto-injector in Mark-1® or DuoDote® antidote kits
  - Diphenhydramine (Benadryl®)
  - Epinephrine 1:1,000
  - Epinephrine 1:1,000 via auto-injector (EpiPen®)
  - Epinephrine 1:2,000 via auto-injector (EpiPen Jr®)
  - Glucagon (GlucaGen®)
  - Midazolam (Versed®)
  - Naloxone (Narcan®)
  - Ondansetron (Zofran®)
  - Pralidoxime via auto-injector in Mark-1® or DuoDote® antidote kits
- Intranasal medications
  - Fentanyl (Sublimaze®)
  - Midazolam (Versed®)
  - Naloxone (Narcan®)

- Intravenous medications
  - Adenosine (Adenocard®)
  - Atropine
  - Calcium gluconate
  - Cefazolin (Ancef®)
  - Dextrose
  - Diltiazem (Cardizem®)
  - Diphenhydramine (Benadryl®)
  - Dopamine
  - Epinephrine 1:10,000
  - Fentanyl (Sublimaze®)
  - Glucagon (GlucaGen®)
  - Labetalol (Normodyne®)
  - Lidocaine
  - Magnesium sulfate
  - Methylprednisolone (Solu-Medrol®)
  - Naloxone (Narcan®)
  - Ondansetron (Zofran®)
  - Sodium bicarbonate
  - Sodium thiosulfate

## Paramedic Special Operations

### \* Medications

- Paramedic list with the following also included:
- Oral medications
  - Acetaminophen (Tylenol®)
  - Aluminum/magnesium hydroxide + simethicone (Maalox Plus®)
  - Bismuth subsalicylate (Pepto-Bismol®)
  - Ibuprofen (Motrin®)
  - Pseudoephedrine & Guaifenesin (Entex PSE®)
- Topical medications
  - Bacitracin ointment
  - Hemostatic agents
- Intraocular medications
  - Tetracaine 0.5% (Pontocaine®)
- Inhalational medications
  - Paramedic list
- Intramuscular medications
  - Paramedic list
- Intranasal medications
  - Paramedic list
- Intravenous medications
  - Paramedic list

## **Scene Response, Patient Categorization, and Hospital Transport**

### **Scene Response**

- \* Following the CMED call-taking processes, each request for service will be assigned a priority designation based on the Medical Priority Dispatch System sub-determinant
- \* Predetermined response configurations and vehicle response modes have been designated for each individual call determinant with appropriate upgrades for simultaneous incoming calls per local medical control
  - All vehicle response modes assigned by CMED will be strictly adhered to
- \* To upgrade the response to a higher priority, the Crew Chief must confer with CMED Control or the Operations Supervisor
- \* The call priority and vehicle response mode for responding to the scene of an incident will be defined as follows:

| <b><u>Category</u></b> | <b><u>Description</u></b>       | <b><u>Response Mode</u></b>          |
|------------------------|---------------------------------|--------------------------------------|
| Echo                   | Emergency, Life-threatening     | Warning lights & siren indicated     |
| Delta                  | Emergency, Life-threatening     | Warning lights & siren indicated     |
| Charlie                | Emergency, NON-life-threatening | Warning lights & siren indicated     |
| Bravo (hot)            | Emergency, NON-life-threatening | Warning lights & siren indicated     |
| Bravo (cold)           | NON-emergency                   | Warning lights & siren NOT indicated |
| Alpha                  | NON-emergency                   | Warning lights & siren NOT indicated |
| NET                    | scheduled                       | Warning lights & siren NOT indicated |

- \* In the event of a multiple casualty incident or disaster response, the above protocols may be changed to better insure adequate availability of resources

### **Patient Categorization**

- \* The Crew Chief will always be responsible for patient assessment, clinical decision-making, and treatment algorithms (per protocol) for all patients encountered
- \* Following the focused (primary), detailed (secondary) assessments, and critical intervention(s), patient categorization will be determined and assigned by the Crew Chief based on patient condition
- \* Patient categorization will be defined as follows:

| <b><u>Category</u></b> | <b><u>Description</u></b> | <b><u>Definition &amp; Transport Mode</u></b>   |
|------------------------|---------------------------|---|
| Priority-1             | Emergent                  | Immediately life-threatening / high potential for decompensation<br>Warning lights & siren indicated        |
| Priority-2             | Urgent                    | Not life-threatening / intermediate potential for decompensation<br>Warning lights & siren MAY be indicated |
| Priority-3             | Non-urgent                | Non-emergent / Minimal potential for decompensation<br>Warning lights & siren NOT indicated                 |
| Priority-4             | Scheduled                 | Non-emergent / Minimal potential for decompensation<br>Warning lights & siren NOT indicated                 |

**Priority-1 Medical Examples**

- \* Acute cerebrovascular accident categorized as CODE STROKE
- \* Acute myocardial infarction categorized as CODE STEMI
- \* Airway compromise or severe respiratory distress
  - Patient requiring CPAP
  - Patient requiring emergent intubation
  - Status asthmaticus
- \* Altered mental status with GCS  $\leq 8$
- \* Anaphylaxis
- \* Hemodynamically unstable
- \* Imminent delivery (term or pre-term)
- \* Rapidly deteriorating condition
- \* Severe abdominal or back pain with concern for abdominal aortic aneurysm
- \* Status epilepticus
- \* Unconscious and hemodynamically unstable

**Priority-2 Medical Examples**

- \* Acute coronary syndrome NOT categorized as CODE STEMI
- \* Altered mental status with GCS 9 – 13
- \* Cerebrovascular accident NOT categorized as CODE STROKE
- \* Moderate (NON-anaphylaxis) allergic reaction
- \* Respiratory distress NOT requiring emergent intubation or CPAP
- \* Severe abdominal pain NOT associated with a pulsatile intra-abdominal mass

**Priority-3 Medical Examples**

- \* Chest pain, unknown etiology
  - Not consistent with acute coronary syndrome or pulmonary embolus
- \* Chronic abdominal or back pain
- \* Constitutional symptoms (weak, dizzy, lightheaded, cold or flu-like symptoms)
- \* Headache
- \* Mild allergic reaction
- \* Respiratory distress relieved after appropriate treatment(s)
- \* Seizure history – postictal or fully awake

**Priority Trauma Examples**

- \* See specific guidelines listed with Trauma Triage Destination Protocol

## Transport

- \* Adult patients will always be transported on the ambulance stretcher using the 2 shoulder and 3 body straps
- \* If patient refuses to be transported on the stretcher, this will be documented on the PCR
- \* It is recommended that all patients be loaded into and moved out of the ambulance on the stretcher
- \* When it is determined that the patient can enter the ambulance on their own, assistance will always be provided
- \* **The squad bench and captain's chair will only be used when more than one patient is transported (or when a patient refuses to be transported on the stretcher)**
- \* All patients will be appropriately secured with seat belts
- \* Pediatric patients (birth to 40 pounds) will always be secured in a standard infant car seat
  - The car seat will only be secured to the stretcher or **the captain's chair, and will** never be secured to the squad bench
- \* If infant patients require spinal motion restriction, a standard infant car seat may be used
  - Additional padding will be used to reinforce motion restriction of the cervical spine
- \* Medical equipment in the patient compartment will be secured with straps or seat belts to reduce the potential for patient or provider injury should sudden deceleration occur

## Additional Considerations

- \* Scene Times
  - Trauma scene time goal is < 10 minutes
  - Code STEMI and Code Stroke scene time goal is < 15 minutes
  - Interfacility bedside time goal is < 15 minutes
  - Any requirement or unusual circumstances for longer scene / bedside times should be indicated on the PCR
- \* Interfacility transfers should be transported in timely efficient manor to the receiving hospital with mode (routine traffic or lights & siren) dependent on patient condition
  - Utilizing Priorities as outlined in medical priorities (listed above) or trauma priorities (listed in trauma triage categorization)
- \* Priority-1 or 2 Trauma Patients with need for emergent intervention (e.g. emergent need for airway intervention unable to be performed in the field) may be diverted to the closest appropriate facility for that intervention with subsequent continuance to the originally intended facility

## Receiving Hospitals and Patient Destination

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### **Receiving facility for patients being transported by the Mecklenburg EMS Agency will be any healthcare facility emergency department in Mecklenburg County**

- \* Atrium Health Huntersville (*free-standing Emergency Department*)
- \* Atrium Health Mercy – *no obstetric services (if patient > 20 weeks gestation)*
- \* Atrium Health Pineville
- \* Atrium Health South Park (*free-standing Emergency Department*)
- \* Atrium Health Steele Creek (*free-standing Emergency Department*)
- \* Atrium Health University City
- \* **Atrium Health's** Carolinas Medical Center
- \* Novant Health Huntersville Medical Center
- \* Novant Health Matthews Medical Center
- \* Novant Health Mint Hill Medical Center
- \* Novant Health Presbyterian Medical Center

### **Patients may request transport to hospitals (ED's) outside of Mecklenburg County**

- \* Atrium Health Cabarrus
- \* Atrium Health Harrisburg (*free-standing Emergency Department*)
- \* Atrium Health Lincoln
- \* Atrium Health Union
- \* Atrium Health Waxhaw (*free-standing Emergency Department*)
- \* CaroMont Regional Medical Center
- \* CaroMont Regional Medical Center Mount Holly (*free-standing Emergency Department*)
- \* Lake Norman Regional Medical Center
- \* Piedmont Medical Center
- \* Piedmont Medical Center Gold Hill (*free-standing Emergency Department*)
  
- \* These out-of-county requests may be honored only when system status will allow and is approved by CMED or the on-duty Operations Supervisor
- \* Secondary or NET transport to facilities outside of Mecklenburg County may be performed



## General Triage

1. ADULT patients categorized as **Priority-1 Medical** will be transported to the closest network system (Atrium Health or Novant Health) hospital emergency department requested by the patient/family
  - A. Patients not having a preference or unable to communicate their preference will be transported to the closest emergency department in MECKLENBURG COUNTY per mapping data
  - B. Exceptions: CODE STEMI, CODE STROKE, Cardiac arrest with ROSC in the field (refer to specific triage destination below for each of these patient types)
2. ADULT Patients categorized as **Priority-2 Medical, Priority-3 Medical** or **Priority-3 Trauma** may be transported to any hospital or free-standing emergency department
  - A. Choice of receiving hospital will be based on the following order:
    - i. Patient preference
    - ii. Patients not having a facility preference or unable to communicate their preference will be transported to the closest emergency department in MECKLENBURG COUNTY per mapping data
3. ***Prehospital personnel will refrain from persuading a patient's decision***
4. Free-standing emergency departments
  - A. Indications to transport to free-standing ED (FSED)
    - i. **Priority-2 Medical, Priority-3 Medical** or **Priority-3 Trauma**
    - ii. **Priority-1 Medical** or **Priority-1 Trauma** with emergent interventions required to sustain life (e.g. airway intervention, hemorrhage control)
    - iii. **Priority-1 Medical** or **Priority-1 Trauma** where death is imminent or obvious regardless of further resuscitative efforts (e.g. cardiac arrest with no ROSC)
  - B. Contraindications to transport to a free-standing ED
    - i. Pregnancy > 20 weeks gestation
      - Patients with imminent birth or birth complication should only be transported to FSED if facility is critically closer than a hospital ED
    - ii. CODE STEMI, cardiac arrest with ROSC in field, CODE Stroke
    - iii. Patient with a high likelihood of requiring hospital admission
    - iv. Patients requiring physical restraint for combativeness
  - C. If unclear about destination decisions regarding a hospital versus free-standing emergency department, contact medical control for consultation
5. For the initial evaluation, patients will only be transported to a hospital or free-standing emergency department
  - A. If it is subsequently determined that another facility such as a specialty care center or private office (e.g. eye injury requiring specialized diagnostic tools or equipment) is indicated, it is permissible to transport to that designated location
    - i. Such cases will be determined by the initial receiving emergency physician, and appropriate arrangements and communication between physicians and facilities will be established prior to transport
    - ii. Destination facility must be confirmed prior to departing referring facility
6. Prescheduled, nonemergency transports for medical or therapeutic appointments may be transported to that predesignated facility

## Emergency Departments on Diversion

1. There may be times when one or more hospitals or free-standing emergency departments are unable to receive patients; either in general or those with a specific clinical condition
2. When an emergency department(s) issues such requests and unless directed otherwise, the following protocol shall be followed:
  - A. The Trauma Triage Protocol will remain in place for **Priority-1** and **Priority-2 Trauma** patients
  - B. **Priority-1 Medical** patients will always be transported to the closest facility within with requested healthcare system if needed for emergent intervention (e.g. airway) regardless of the request issued by the Emergency Department
  - C. **Priority-1 Medical, Priority-2 Medical** and **all Priority-3** patients will be transported to an alternate destination
    - i. If an alternate receiving facility is recommended by the emergency department issuing the diversion request, that information will be provided to the patient
      - The patient will have the option to select the recommended facility or choose another facility based on their preference
    - ii. Patients not having a preference will be transported to the closest facility
      - Regardless of a possible change in healthcare system
    - iii. Patients adamantly insisting on transport to the facility that has issued a request not to receive patients will be transported to that facility
      - This must be clearly communicated with the facility
    - iv. Only Medical Control at the final receiving facility, not the original requested facility, should be contacted

## Interfacility Transports

1. **For patients with an established physician–patient relationship - includes: interfacility transfers, private physician office/clinic, urgent care center, etc.**
  - A. Crew will confer with patient and physician or staff together to confirm patient destination prior to departing hospital, ED, private office, urgent care, or clinic
  - B. If the patient changes their destination decision after departing the hospital/office/clinic/urgent care contact must be made with the facility immediately **to discuss the patient's** requested change of destination
  - C. If accepted by the referring staff, the original destination facility (if previously made aware of and expecting the patient), must also be notified of **the patient's** requested change
  - D. If patient condition changes while enroute such that it necessitates a change in destination, this also must be immediately communicated (e.g. patient develops ST-segment elevation in route necessitating diversion to a PCI capable hospital)
2. ***Prehospital personnel will refrain from persuading a patient's decision***

## Pediatric Triage

1. PEDIATRIC patients categorized as **Priority-1 or Priority-2 Medical** will be transported to either **Atrium Health's Levine Children's Hospital** or **Novant Health Presbyterian Medical Center Hemby Children's Hospital**
  - A. Choice of receiving hospital will be based on the following order:
    - i. Patient/family preference (healthcare system)
    - ii. Patients not having a preference or unable to communicate their preference will be transported to the closest **children's hospital** emergency department in MECKLENBURG COUNTY per mapping data
2. PEDIATRIC Patients categorized as **Priority-3 Medical or Priority-3 Trauma** or may be transported to any hospital or free-standing emergency department
  - A. Choice of receiving hospital will be based on the following order:
    - i. Patient/family preference
    - ii. Patients not having a facility preference or unable to communicate their preference will be transported to the closest emergency department in MECKLENBURG COUNTY per mapping data
3. Patients requiring emergent intervention (airway management, ongoing CPR, or other critical resuscitative need) should be transported to the closest emergency department
4. ***Prehospital personnel will refrain from persuading a patient's decision***

## Stroke Triage

1. Patients considered to be having an acute cerebrovascular accident (CVA) and categorized as **CODE STROKE** will be transported to a hospital emergency department only
  - A. Choice of receiving hospital will be based on the following order:
    - i. Patient/family preference
    - ii. Patients not having a facility preference or unable to communicate their preference will be transported to the closest hospital emergency department in MECKLENBURG COUNTY per mapping data
2. The Medical Control physician (or designee) at the destination hospital of a CODE STROKE patient will be notified **IMMEDIATELY** once the categorization and the destination hospital are determined
3. ***Prehospital personnel will refrain from persuading a patient's decision***

## Cardiac – Code STEMI Triage

1. Patients considered to be having an acute myocardial infarction will be categorized as **CODE STEMI** and shall only be transported to hospitals with interventional cardiac catheterization capabilities available 24 hours per day 7 days per week for primary coronary intervention (PCI)
2. Mecklenburg County PCI facilities:
  - \* Novant Health Presbyterian Medical Center
  - \* Novant Health Matthews Medical Center
  - \* Atrium Health Pineville
  - \* **Atrium Health's** Carolinas Medical Center
3. The choice of PCI center will be based on the following (in order):
  - A. Patient preference if one of the noted PCI facilities is requested
  - B. Physician preference if one of the groups is requested
 

| <u><b>Cardiology Group</b></u>   | <u><b>PCI Hospital</b></u>                                    |
|----------------------------------|---|
| Novant Health Heart and Vascular | Novant Health Presbyterian MC or<br>Novant Health Matthews MC |
| Sanger Heart and Vascular        | Atrium Health – Pineville or<br>AH's Carolinas Medical Center |
  - C. Patients requesting a facility other than a PCI facility will be referred to an alternate destination within the appropriate healthcare system
 

| <u><b>Facility</b></u>                    | <u><b>PCI Hospital</b></u>                                   |
|---|--|
| Novant Health Huntersville Medical Center | Novant Health Presbyterian MC                                |
| Novant Health Mint Hill Medical Center    | NH Presby MC or NH Matthews MC<br>(closest per mapping data) |
| Atrium Health Steele Creek                | Atrium Health Pineville                                      |
| Atrium Health Huntersville                | <b>AH's</b> Carolinas Medical Center                         |
| Atrium Health Mercy                       | <b>AH's</b> Carolinas Medical Center                         |
| Atrium Health South Park                  | <b>AH's</b> Carolinas Medical Center                         |
| Atrium Health University City             | <b>AH's</b> Carolinas Medical Center                         |
  - D. Patients not having a preference or unable to communicate their preference will be transported to the closest PCI hospital per mapping data
  - E. The Medical Control physician (or designee) at the destination PCI hospital of a **CODE STEMI** patient will be notified IMMEDIATELY once the categorization and the destination hospital are determined
4. **Prehospital personnel will refrain from persuading a patient's decision**

*Note: Referring a patient should be considered a possible substitute for the hospital initially requested. If a patient requests another hospital incorporating cardiac catheterization services other than the one referred, then that request will be honored. If the patient insists on the originally requested hospital despite efforts to refer them to a PCI capable hospital, then that request will be honored.*

## Cardiac – Post ROSC Triage

1. Patients with return of spontaneous circulation (ROSC) from a medical cardiac arrest will be transported to either:
  - \* Novant Health Presbyterian Medical Center
  - \* Novant Health Matthews Medical Center
  - \* Atrium Health Pineville
  - \* **Atrium Health's** Carolinas Medical Center
2. Choice of destination emergency department will be based on the following order:
  - A. Patient/family preference
  - B. Patients without preference or unable to communicate a preference will be transported to the closest of the *Induced Hypothermia* capable hospitals per mapping data
3. Medical Control physician (or designee) at the destination hospital emergency department of a patient with *Induced Hypothermia* shall be notified IMMEDIATELY once the categorization and the destination hospital are determined
4. Patients who do not achieve ROSC in the field, if transported, will be transported to the closest emergency department per mapping data

## Trauma Triage

- \* Level I Trauma Center
    - Atrium Health's Carolinas Medical Center
    - Atrium Health Levine Children's Hospital at CMC (*Pediatric*)
  - \* Level II Trauma Center
    - N/A
  - \* Level III Trauma Center
    - Novant Health Presbyterian Medical Center
1. **Patients categorized as Priority-1 Trauma will be transported to the HIGHEST-LEVEL designated trauma center in Mecklenburg County**
- \* Patients with the following injuries or mechanisms will be considered **Priority-1 Trauma**
    - Head injury with a Glasgow Coma Score  $\leq 13$ 
      - GCS  $\leq 8$  lights and siren transport indicated
      - GCS 9 – 13 clinical judgment must be used regarding use of lights and siren
    - Systolic BP < 90 mmHg
      - SBP < 110 mmHg for patients > 65-years of age
    - Respiratory Rate < 10 or > 29 or need for ventilatory support
    - Penetrating injury to the head, neck, torso or extremities proximal to the elbow or knee
    - Chest wall instability (e.g. flail chest)
    - Two or more proximal long bone fractures
    - Crushed, degloved, mangled or pulseless extremity
    - Amputation proximal to the wrist or ankle
    - Pelvic fracture(s)
    - Open or depressed skull fracture
    - Spinal injury associated with paralysis
    - Partial or full thickness (2<sup>nd</sup> or 3<sup>rd</sup> degree) burns associated with any of the following:
      - > 25% body surface area
      - Involvement of face, eyes, ears, hands, feet, or perineum
      - Burns crossing major joints
      - Circumferential involvement
      - High voltage electrical etiology
      - Associated inhalational injury or major trauma
    - Traumatic arrest with signs of life in the field
    - Maternal arrest with potential for emergent C-section of viable fetus

***\*pediatric patients ( $\leq 14$  years) P-1 or P-2 Trauma will be transported to the highest-level pediatric trauma center***

2. **Patients categorized as Priority-2 Trauma will only be transported to a designated trauma center (category: I, II, or III) in Mecklenburg County**
  - A. The decision between trauma centers will be based on patient preference
  - B. Patients not expressing a preference or unable to communicate their preference will be transported to the closest trauma center per mapping data
- \* Patients with the following injuries or mechanisms will be considered **Priority-2 Trauma**
  - NO Priority-1 criteria present
  - Femur fracture associated with high energy mechanism
    - MVC, MCC, pedestrian struck, fall > 10 feet
  - Falls
    - Adults  $\geq$  10 feet
    - Pediatrics\*  $\geq$  10 feet or 2-3X the height of the child
  - High-risk auto crash
    - Intrusion (including roof)
      - > 12 inches occupant site
      - > 18 inches any site
    - Ejection from automobile (partial or complete)
    - Death in same passenger compartment
    - Vehicle telemetry data consistent with high risk of injury
  - Automobile vs. pedestrian; bicyclist thrown or run over; OR impact > 20 MPH
  - Motorcycle crash > 20 MPH
  - **EMS Provider's judgement that patient's injury/condition requires a trauma center**
    - Examples:
      - Abdominal handlebar contusion
      - Abdominal seat belt contusion
      - Chest trauma with crepitus or subcutaneous air present
      - Rollover MVC
- \* The medical control physician (or designee) at the hospital receiving any patient(s) categorized as **Priority-1 or 2 Trauma** will be notified IMMEDIATELY following scene departure

***\*pediatric patients ( $\leq$  14 years) P-1 or P-2 Trauma will be transported to the highest-level pediatric trauma center***

3. **Patients categorized as Priority-3 Trauma may be transported to any emergency department**
  - A. The decision between hospitals will be based on patient preference
  - B. Patients not expressing a preference will be transported to the closest emergency department in MECKLENBURG COUNTY per mapping data
- \* Patients with the following injuries or mechanisms will be **Priority-3 Trauma**
  - NO Priority-1 criteria present
  - NO Priority-2 criteria present
  - Head injury associated with the following:
    - Brief loss of consciousness and now awake
    - $GCS \geq 14$
  - Fall < 10 feet
    - Including hip fracture resulting from ground level fall
  - Extremity injury
    - Distal extremity fractures with intact pulse
    - Penetrating injury distal to the elbow or knee
    - Minor isolated extremity injury



## Mass Casualty Incident Response

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### Introduction to the Incident Command System

- \* The Mecklenburg EMS Agency Mass Casualty Incident Response Protocol will serve as a guide for responding to any incident involving ten or more patients
- \* The purpose is to assist with efficient triage, treatment, and transportation of patients involved in a multiple casualty incident
- \* It is not limited to only large-scale incidents, but for a routine incident when the number of those ill or injured exceeds the capabilities of the first arriving resources
- \* The protocol aligns with the Charlotte-Mecklenburg All Hazards Plan, the North Carolina Office of EMS, the Region F Disaster Plan, and the Emergency Department Disaster Plans at Carolinas Medical Center and Novant Health Presbyterian Medical Center
- \* The incident command function must be clearly established at the beginning of operations
  - The agency with primary jurisdictional authority over the incident designates the individual on the scene responsible for establishing command
  - When command is transferred, a briefing is conducted between commanders that illustrates all essential information for continuing safe and effective operations
- \* For incidents involving multiple jurisdictions, a single jurisdiction with multiagency involvement, or multiple jurisdictions with multiagency involvement, a unified command system will be adopted to facilitate agencies with different legal, geographic, and functional authorities and responsibilities to work together without affecting individual agency authority, responsibility, or accountability

### Initial Response

- \* Successful medical management of a mass casualty response relies on the crew of the first arriving MEDIC unit
  - While the first unit on the scene will establish Incident Command, the crew of the first arriving MEDIC unit shall initiate medical operations to include triage, treatment, and staging operations
  - If MEDIC is first to arrive on the scene, the Crew Chief will establish Incident Command and identify the location of the Incident Command Post to CMED
  - Incident Command will be transferred only after the arrival of a more qualified person
  - Transfer of command shall be conducted face-to-face after a briefing of event details
- \* For a large-scale operation, Incident Command may establish a Medical Group or Medical Branch
  - As such, the paramedic Crew Chief shall serve as the Group Supervisor or Branch Director depending on the magnitude of the incident

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- \* For any incident involving 3 or more priority patients (1 and/or 2), the Incident Commander will assign the appropriate level of response:
  - Level 1
    - > 101 patients
    - Response:
      - 52 First Responder personnel
      - 20 ambulances
      - 5 EMS Supervisors
      - 1 mass casualty unit
      - 2 EMS buses
  - Level 2
    - 21-100 patients
    - Response:
      - 36 First Responder personnel
      - 15 ambulances
      - 3 EMS Supervisors
      - 1 mass casualty unit
      - 2 EMS buses
  - Level 3
    - 11-21 patients
    - Response:
      - 20 First Responder personnel
        - 10 ambulances
        - 2 EMS Supervisors
        - 1 mass casualty unit
        - 1 EMS buses
  - Level 4
    - 3-10 patients
    - Response:
      - 12 First Responder personnel
      - 5 ambulances
      - 1 EMS Supervisors
- \* The crew on the first arriving Medic unit shall perform scene size-up and notify CMED of a mass casualty incident in progress
- \* The appropriate level of response will be communicated to CMED
- \* CMED will simultaneously contact all Mecklenburg County hospitals, and upon verification that all hospitals are monitoring, will announce that a mass casualty incident has been declared
- \* The following information will be provided:
  - Brief description of what occurred
  - When the incident occurred
  - Where the incident occurred
  - Approximate number of patients involved and an estimate of the priorities
  - Approximate time when first patient will be transported from the scene

- \* CMED will advise the facilities to review their current status and be ready in 5 minutes to report the total number of patients, by priority, they are prepared to receive
- \* CMED will recontact each hospital to ascertain the number of patients they are capable of handling
  - This information will be reported to the personnel responsible for transportation

### **Personnel Responsibilities and Incident Scene Management**

- \* Positions are assigned during a mass casualty incident to provide better control and communications between field operations, Incident Command, and EMS Group Supervisor
- \* All Area positions may not need to be filled; the size and complexity of the incident will determine how large the management structure will be
- \* Incident Command or EMS Group Supervisor will assign the most qualified personnel to handle each area function
- \* The sector officers should be prepared to keep Incident Command and the EMS Group Supervisor informed on progress made and the need for any specialized equipment or personnel

### **Triage Group Supervisor**

- \* Responsible for supervising or conducting the systematic sorting and prioritization of patients in accordance with the START triage system
  - At an incident involving large numbers of patients, the Triage Supervisor should request additional personnel to assist with the movement of patients from the field/triage location to the appropriate treatment location
- \* Responsible for ensuring that the scene has been checked for potential victims that may have been overlooked during the initial triage phase

### **Treatment Group Supervisor**

- \* Responsible for establishing a treatment area that is large enough to handle the number of patients, emergency medical personnel providing treatment, and all required equipment
- \* Responsible for managing and overseeing the actions of the Treatment Areas to ensure that appropriate basic and advanced life support is provided until patients can be evacuated to appropriate medical facilities
- \* Responsible for coordinating the location of the treatment area with the Triage Supervisor
- \* Area location should be at a safe distance from a hazardous materials incident site, but should be proximal to the triage area, thereby preventing victims from being carried unusually long distances
  - The treatment area should be readily accessible and should have a clearly designated entrance point from triage and exit point to the transportation area

- For very large incidents, multiple patient triage collection points and treatment areas may be required
- Avoid placing patients too close to vehicle exhaust or any heavy equipment that may be operating in the area
- \* Treatment areas should be divided into four separate and well-identified sectors that correspond to the triage priority of the patients
- \* The following outlines the patient collection areas:
  - **Red (Priority-1)**
    - Patients that are the most seriously ill or injured with life-threatening conditions
    - These will be the first to be transported from the scene
  - **Yellow (Priority-2)**
    - Patients with illnesses or injuries that are potentially unstable / life-threatening
    - This group will be transported immediately following the Priority-1 victims
  - **Green (Priority-3)**
    - Patients with minor injuries, stable, and whose treatment or transport may be delayed (commonly referred to as "walking wounded")
    - This group will be transported following the Priority-2 victims or in mass on mass casualty transport vehicle when available
  - **Black (Deceased)**
    - Patients who are already dead or who have non-survivable fatal injuries
    - This area serves as the incident morgue
    - A law enforcement officer will be assigned to secure this area
- \* If there are significant numbers of patients, the Treatment Supervisor may designate one Treatment Team Leader to oversee each of the 3 treatment sectors (Red, Yellow, and Green)
- \* When arranging the layout of the Treatment Area
  - The Red (Priority-1) and Yellow (Priority-2) sectors should be proximate to each other
  - The Green (Priority-3) sector should be located to the side of the Yellow treatment sector, but of a sufficient distance to prevent those patients in the Green (Priority-3) sector from being exposed to the treatment activity
  - The Black (deceased) sector should be removed from the other treatment areas
- \* Treatment Supervisor should ensure that an appropriate stock of medical equipment and supplies are available to support patient care activities in the Treatment Areas
- \* Treatment Supervisor should coordinate with the Transportation Supervisor in moving patients between the Treatment Area and the Transportation Area
  - Transport Loaders will be designated to move patients from the Treatment Area to the Transport Area

**Transport Group Supervisor**

- \* Responsible for the routing of all patients from the incident scene to area hospitals by both ground and air transportation
- \* Serves as the single communications point between the scene and receiving facilities
- \* Determines and maintains the number of patients (by priority) that each hospital can receive
  - This task should be among the very first completed if not already accomplished by Incident Command or EMS Group Supervisor prior to designating a Transportation Supervisor
  - A hospital representative should be assigned to the radio channel to receive notifications of ambulance departures (including number of patients on board & priorities) to their facility
- \* Responsible for identifying an ambulance loading zone
  - This area should be large enough to accommodate multiple ambulances and should ideally provide for easy access into and out of the incident
  - Preferably, should have separate entrance and exit routes from the Transportation Area
  - Transportation Area should also be located proximal to the Treatment Areas as much as possible to prevent patients from having to be carried long distances
- \* Responsible for knowing the location of any helicopter landing zone that may be established to support the incident
  - If not already assigned by Incident Command or Operations, the Transportation Supervisor may designate a Landing Zone Coordinator to establish a safe and effective landing zone in conjunction with available fire personnel on the scene.
  - This function should be coordinated with Incident Command to ensure that the landing zone is in a safe area, close to the Transportation Area, and does not interfere with incident operations
  - The Landing Zone Coordinator should report back to the Transportation Supervisor and will assist in the movement of patients from the Treatment Area to awaiting helicopters
- \* Transportation Supervisor is responsible for assigning a patient to an ambulance and a corresponding destination to the ambulance crew
- \* Transportation Supervisor has ultimate responsibility of documenting which patients were transported to which facilities by specific EMS units (Mecklenburg County and mutual aid)
  - It is recommended that a Tracking Coordinator be designated to assist in coordination and documentation
- \* Transport Loaders will move patients from the Treatment Area to transporting vehicles
- \* When ambulances crews receive their patients and notified of the destination, they are to conduct the transport without radio contact with the receiving facility
  - All hospital notifications will be made by the Transportation Supervisor or designee (Tracking Coordinator)

- \* When units are prepared to transport, they will advise the receiving facility of the following:
  - The ambulance name or unit number (including helicopter EMS) transporting
  - The number of patients being transported
  - The priority of each patient
  - Any special needs (contamination, burn, OB, trauma, cardiac, pediatric)
- \* The Tracking Coordinator will coordinate with the Staging Supervisor to send the appropriate number and type of resources
  - If basic life support units are standing by in the Staging Area and are required, this should be specified by the Transportation Supervisor

### **Staging Supervisor**

- \* Responsible for establishing a staging location that is proximal to the incident site, easy to locate, easily accessible, and large enough to accommodate multiple ambulances
- \* It is preferable that the ambulance and fire vehicle Staging Area be either remote from each other or co-located in an area that allows ample parking for large numbers of both types of equipment
- \* A simple, easy to follow route should be identified to the Transportation Area
  - This route should be directly communicated to all ambulance personnel in the Staging Area location
- \* If the incident requires ambulances from out-of-county, volunteer rescue squads, or hospital ground transportation services, the Staging Manager must identify which vehicles are staffed and equipped at the basic and advanced life support level
- \* Tracks the arrival and departure of all ambulances to and from the Staging Area
- \* Provides Incident Command or EMS Group Supervisor and the Transportation Supervisor with the total number of ambulances in the Staging Area and is prepared to update this information
- \* Ensures that all personnel remain with their vehicles
- \* As ambulances arrive in the Staging Area, the Staging Supervisor will document the agency, unit number, and crew member in charge
  - All communications between the Staging Supervisor and units in the Staging Area will be through the documented crew member in charge of each unit
  - If personnel are needed to report to the scene from the Staging Area, the Staging Supervisor will ensure that the keys remain with each vehicle
- \* Will advise that radio communication is limited to EMS officers managing the various command functions and that scene to hospital radio communication will be handled by the Transportation Supervisor or designee
- \* Shall not send any units to the Transportation Area until requested to do so by the Transportation Supervisor

**Operations Chief**

- \* Assists Incident or Medical Command with overall EMS scene management
- \* The Operations Chief may be assigned overall scene management and supervision, and be expected to report operational status to Incident or Medical Command in the command post
- \* The Operations Chief may also be assigned a more specific oversight function and tasked with reporting progress on that specific activity or assignment

**Logistics Chief**

- \* Responsible for maintaining the inventory of equipment and supplies needed on the scene
- \* Directs requested equipment and supplies to those areas where requested
- \* Responsible for assisting with the setup of all treatment areas and will distribute equipment and supplies from the Mass Casualty Incident Response Unit
- \* Coordinates with the driver/operator of the Mass Casualty Incident Response Unit for the distribution of specialized equipment from this vehicle (electrical power, light tower, portable hydraulic lighting, and inflatable shelters)
- \* Coordinates with Incident or Medical Command to obtain any additional equipment and supplies that are not present on the scene

**Safety Officer**

- \* Responsible for the safety and well-being of medical personnel and patients
- \* Monitors and observes all aspects of EMS operations and advises Incident or Medical Command of procedures that reduce the risk of injury to responders

**Public Information Officer**

- \* Reports directly to Incident Command or EMS Group Supervisor and is responsible for expediting effective and accurate dissemination of media information related to the MEDIC response to the mass casualty incident

**Patient Identification**

- \* The START (Simple Triage and Rapid Treatment) / JumpSTART System of Triage has been adopted for use in Mecklenburg County and across the State of North Carolina
  - It is designed to rapidly and systematically assess large numbers of patients
  - See [START Triage](#) algorithm
- \* Primary identification of patients should be by the alpha-numeric listed on the patient triage and identification card
- \* The Triage Supervisor should place this card into the attached bag and attach the bag to the wrist of all victims who are assessed by EMS crews on the scene
  - If neither wrist is available due to injury, the card may be applied to an ankle

- Once applied on the scene, the triage and identification card should not be removed until after the patient has been positively identified at the hospital
- \* Patients should not pass beyond the Transportation Supervisor without having an identification card applied

### Initial Triage Designation

- \* The triage and identification card should be removed from the bag and folded such that the designated color/priority is showing

| Color  | Priority   | Description                              |
|--------|------------|--|
| Red    | Priority-1 | Immediately life-threatening             |
| Yellow | Priority-2 | Serious, potentially life-threatening    |
| Green  | Priority-3 | Stable, non-life-threatening, ambulatory |
| Black  | Deceased   | Dead, not salvageable                    |

### Secondary Triage Designation

- \* Patients will be moved to the prioritized Treatment Area based on the initial triage designation
- \* Upon arriving in the Treatment Area, the patient will be secondarily triaged to determine if the clinical status has changed
- \* For secondary triage, complete the patient assessment and treat injuries or illnesses accordingly
- \* Use the triage card to record clinical information.
- \* If priority changes, remove the triage card, change to the appropriate priority, then replace card
- \* The secondary triage priority determined in the treatment area should be the priority used for transport





## Patient Triage

## (NCCEP Protocol UP-2)

1. Locate and remove all the ambulatory patients into one location away from the incident
  - A. Assign an individual (law enforcement, fire, or well-appearing patient) to keep them together until additional emergency medical resources arrive
  - B. Notify Incident Command or EMS Group Supervisor of their location
2. Begin assessing all non-ambulatory victims at their location, if safe to do so
3. **Respirations**
  - A. If respiratory rate is 30 per minute or less, proceed to *Perfusion* assessment
  - B. If respiratory rate is greater than 30 per minute (>45 or < 15 pediatrics), tag the patient **Red**
  - C. If patient is not breathing, open the patient's airway, remove any obstructions and then reassess as outlined above – If patient is still not breathing, tag the patient **Black** – If patient has spontaneous respirations tag patient **Red**
4. **Perfusion**
  - A. Palpate a radial pulse and assess capillary refill time
  - B. If radial pulse is present or if capillary refill is < 2 seconds, proceed to *mental status*
  - C. If radial pulse is absent or if capillary refill is greater than 2 seconds, tag the patient **Red**
5. **Mental status**
  - A. Assess the patient's ability to follow simple commands and their orientation to person, place and time
  - B. If the patient follows commands and is oriented to person, place and time, tag the patient **Green**
  - C. Depending on injuries (burns, fractures, bleeding); may be necessary to tag the patient **Yellow**
  - D. If the victim is unconscious, does not follow commands or is disoriented, tag the patient **Red**
6. Special Considerations
  - A. The first assessment that produces a red tag stops further assessment
  - B. Only correction of life-threatening problems such as airway obstruction or severe hemorrhage should be managed during triage

## Patient Movement

1. Patients initially triaged will be move to the Treatment Area by Transport Loaders (non-ambulatory) or self (ambulatory)
  - A. Patients will be further placed into the appropriate treatment sector per triage category
2. Emergency medical care will be administered in each treatment sector
3. Limited documentation will be completed on the patient triage and identification card
4. The order of transportation will proceed from **Red**, then **Yellow**, and **Green**
5. Patients will be transported from the Treatment Area to the Transportation Area by Transport Loaders

6. The Transportation Supervisor will coordinate vehicle assets and the loading procedures
7. Upon departure from the scene, the Transportation Supervisor or designee will provide a brief report to the designated receiving facility
8. Transporting crews will provide the report to the hospital staff on arrival

## **Documentation**

- \* During a mass casualty incident, it is difficult to obtain much of the information that is typically included as part of a routine EMS response
  - Limited pertinent documentation will be performed on the patient triage and identification card
- \* The alpha-numeric identification on patient triage and identification card should be recorded on the patient registration form at the hospital

## **Termination / Recovery**

- \* The Transportation Supervisor is responsible for handing over the master transport list to Incident Command or the EMS Group Supervisor
  - Once the completed log is received, an accounting process of all casualties transported will be conducted
  - The Transportation Supervisor or Tracking Coordinator shall notify all facilities when the last patient has been transported from the scene and that the medical components of the incident are terminated
- \* Incident Command or EMS Group Supervisor, or the Safety Officer will ensure that EMS personnel have access to adequate rehabilitation as required (refer to Medical Monitoring protocol)
- \* Once all patients have been transported from the scene, the focus will be on returning the EMS system to standard operations
- \* The Logistics Officer will ensure that all equipment used on the scene is accounted for and returned to its appropriate vehicle
- \* Arrangements should be made to provide a dedicated paramedic unit for standby as the incident moves into the investigation and cleanup phase

## **Additional Considerations**

- \* During scene size-up providers must consider HazMat, WMD, or other potential poisonings
  - Every effort should be made to approach scene from upwind, uphill direction
- \* Triage emphasis is to ensure the best possible outcome for the greatest number of patients
- \* Only life-saving procedures should be performed during initial triage
  - e.g. Tourniquet for hemorrhage control
  - antidote administration of known exposure

## Medical Scene Control

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### First responders arrive prior to MEDIC:

1. First responders will assume the role of Medical Command and take control of all patient care activities
2. The first considerations are scene safety and scene evaluation
  - A. Safety issues should immediately be communicated to all responding agencies
  - B. Scene evaluation is necessary to request additional resources or personnel if needed
3. All patients will be initially assessed for priority as outlined in [Initial Approach to the Scene](#) and [Universal Patient Care Protocols](#)
4. Following all primary assessments and communication, treatment algorithms will be initiated
  - A. Airway management
  - B. Hemorrhage control by manual pressure (or tourniquet if indicated)
  - C. Bandages should not be applied until MEDIC personnel have had the opportunity to assess the injury
5. Manual cervical spine motion restriction as indicated based on mechanism of injury
  - A. A cervical collar may be applied prior to MEDIC personnel examining the spine
6. Expose the patient as indicated so that a complete assessment may be performed

### MEDIC arrives prior to first responders:

1. The paramedic will assume the role of Medical Command and take control of all patient care activities
2. All patients will be initially assessed for priority as outlined in [Initial Approach to the Scene](#) and [Universal Patient Care Protocols](#)
3. First responders will assume a complimentary role by assisting MEDIC personnel with equipment, supplies, medication preparation, and procedures as directed by the paramedic
  - A. Responsibilities may include the following performance measures:
    - i. Airway equipment and supplies
    - ii. Capnometry
    - iii. Cardiac monitor
    - iv. Connecting the electrodes to the patient (4-leads or 12-leads)
    - v. Glucometer
    - vi. Hemorrhage control by manual pressure (or tourniquet if indicated)
    - vii. Preparing all components for comprehensive monitoring
    - viii. Pulse oximetry
    - ix. Spinal motion restriction and fracture immobilization
    - x. Vital signs

## Transfer of Care

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- \* For Priority-1, 2, and 3 patients, patient care will only be transferred to a physician or nurse at all hospitals/emergency departments
  - Transfer of care to paramedic level personnel functioning in the emergency department of the receiving facility is permitted (as approved by that facility)
  - Transfer of care to medical personnel whose training or education level is below that of a paramedic is unacceptable
    - Emergency department technicians or other ancillary departmental staff may not accept formal transfer nor sign Patient Care Reports
- \* For Priority-1 or 2 trauma patients, the paramedic will provide a formal report to the physician and staff in the trauma room
  - If a physician is not immediately present, the paramedic will remain in the trauma room until a physician is in attendance
- \* Patients transported for any psychological or psychiatric condition regardless of severity or clinical nature will NOT be left unattended at the triage area
  - These patients will always be dispositioned to a treatment room or to triage nursing personnel
  - The patient is to be appropriately secured and the receiving staff must be comfortable with the transfer prior to departing the room
- \* When incidents involve an air medical response, the paramedic oversees patient care on the scene and will direct flight team personnel as appropriate
  - Patient care activities will then be a coordinated effort between both teams
  - Transfer of care shall occur once a formal report has been provided and all personnel agree that the transfer is appropriate
- \* For nonemergency, scheduled (Priority-4) transports:
  - When conducting transports from a facility or residence, transfer of care shall occur once the patient is transported off the facility property
  - When conducting transports to a facility or residence, transfer of care shall occur once the patient report has been provided
    - This report may be to facility staff, family members, or caregivers accepting the patient

## On-line Medical Control and Communications

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### Guidelines

- \* Except for prescheduled nonemergency (Priority-4) transports, hospital notification will be provided on all patients transported and medical control requests will be made as needed
  - This includes all interfacility transfers to an emergency department
  - Radio report must be given prior to arrival even if referring staff have provided report to receiving staff
- \* All hospital notification reports (regardless of priority) will be provided to a registered nurse *except for Priority-1 patients transported to Carolinas Medical Center*
- \* A physician may be contacted at any hospital and at any time for consultation or for orders when applicable
  - Medical Control should be contacted at any time there is any question regarding patient care
- \* When contacting Carolinas Medical Center for a **Pediatric patient** – request a nurse or physician (depending on priority) from the Levine Children's Hospital Emergency Department
- \* For incidents involving 3 or more priority patients (Priority-1 and/or 2) or 5 or more patients regardless of priority, the Crew Chief on the scene or preferably the Operations Supervisor after arrival and scene assessment, will contact the Major Treatment Attending at Carolinas Medical Center with:
  - Number of patients
  - Estimate of priority for each patient and any obvious significant injuries
  - The attending physician will assist in determining patient destinations to ensure that one facility is not replete at one time
  - If the Major Attending is unavailable, the third-year emergency medicine resident on duty may be contacted
- \* Past medical/surgical history and medications only pertinent to the patient's chief complaint should be reported
- \* Except under certain circumstances, reports should be as brief as possible and limited to **information related to the patient's acute illness or injury**
- \* The Medic unit number will be the only identifier used (no names or employee numbers)
- \* Slang terminology will NOT be tolerated, and statements should not be repeated unless requested
- \* The medical control physician or nurse should initially identify themselves
  - If any doubt exists as to whether a nurse or physician is taking the report and medical control orders are being requested or received it is imperative to verify that individual
- \* The medical control physician or designee at the hospital receiving any acute cardiac or cerebrovascular accident patient should be notified IMMEDIATELY once this determination is made
- \* Patients categorized as Priority-1 Medical or Trauma, the emergency department should be notified IMMEDIATELY following scene departure

**Priority-1 or Priority-2 Trauma Patient Report**

- \* "This is unit number, we have an ETA of # minutes with an age male/female following mechanism of injury
  - From scene/facility (if interfacility transfer)
- \* Airway status
- \* Highest heart rate, lowest blood pressure
- \* Current HR, BP, RR, SpO<sub>2</sub>, ETCO<sub>2</sub>
- \* Mental status with GCS
- \* Head / neck trauma
- \* Breath sounds (equal, diminished, clear, wheezes, rales)
- \* Abdomen (tenderness, soft / rigid)
- \* Pelvis (stability, tenderness)
- \* Extremities (deformities, neurovascular status)
- \* IV access and fluid administered
- \* Additional treatment administered
- \* Orders requested

**Priority-1 or Priority-2 Medical Patient Report**

- \* "This is unit number, we have an ETA of # minutes with an age male/female with working diagnosis
  - From scene/facility (if interfacility transfer)
- \* **Brief** HPI
  - For CODE STROKE: FAST-ED score & time of onset of symptoms (last time known to be normal)
  - For CODE STEMI: appropriate signs & symptoms; ECG interpretation
- \* Current HR, BP, RR, SpO<sub>2</sub>
- \* Mental status
- \* **Pertinent** physical exam
- \* Treatment administered
- \* Orders requested

**Priority-3 Trauma or Priority-3 Medical Patient Report**

- \* "This is unit number we have an ETA of # minutes with an age male/female a chief complaint of working diagnosis
- \* **Brief pertinent** history and / or physical exam findings
- \* Treatment administered
- \* Orders requested

**Additional Consideration**

- \* *During communication with receiving hospital, if deemed necessary to provide optimum patient care (either in the field or on arrival to the hospital) for critically ill patient, it IS acceptable to provide patient's name and DOB information to receiving physician during radio report*

## Priority Bedside Report Information

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### Code Stroke:

- \* Last time confirmed known to be normal
- \* GCS
- \* CPSS findings
- \* FAST-ED score
- \* Blood pressure
- \* Known past medical history
  - Known prior CVA history
- \* Known medications
  - Known anticoagulants

### Post Cardiac Arrest Resuscitation:

- \* Witnessed vs. unwitnessed
  - Amount of time from last seen till found in arrest if unwitnessed
- \* Bystander CPR
  - Yes or no
- \* Initial cardiac arrest rhythm
  - AED shockable vs. non-shockable
  - Initial MRx rhythm
- \* Any rhythm changes during resuscitation
- \* Time of return of spontaneous circulation
- \* Post-resuscitation vital signs
- \* Total downtime
- \* Number of defibrillations performed
- \* Medications administered
- \* Amount of IVF infused

## Nonemergency Transport

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**Medic may be called to transport nonemergency patients to include the following:**

- \* From extended care facility to physician's office
- \* From physician's office to residence
- \* From residence to treatment center
- \* From hospital to extended care center
- \* From hospital to residence

### Initial Evaluation

1. Upon arrival at the transferring facility, personnel will assess the patient per protocol
2. If a life-threatening (emergent) or urgent condition is apparent, the following will occur:
  - A. Discussion with referring providers of the patient's condition & any treatment or destination change if necessary
  - B. If a BLS Unit, a BLS to ALS upgrade response should be requested
3. If no emergency condition, the patient may be transported to the prearranged facility
4. Patients with decision making capacity **may refuse care or transport despite a physician's order**; this must immediately **be discussed with the patient's physician/care provider**

### Nonemergency Destination

- \* If emergency occurs enroute; the patient is to be transported to appropriate emergency department despite the original (non-hospital) request per destination protocols
- \* When transporting a patient to a prescheduled and/or prearranged location, either a healthcare facility or residence, the patient may be transferred to any level of caretaker or provider at that destination
  - This may be an individual certified or trained at a level lower than the paramedic, such as a certified nursing assistant or home health sitter
- \* If, upon arrival at the receiving destination it is noted that the facility is not equipped to care for the patient, or the staff is refusing to accept the patient, communication shall take place between that facility and the transferring institution prior to departure
  - If resolution is not accomplished, the patient is to be transported back to the original facility
  - If the transferring facility was a hospital, disposition may be to the emergency department
  - If the transferring facility was something other than a hospital, disposition may be **made back to the patient's original room**
- \* When transporting patients through counties other than Mecklenburg, or states other than North Carolina, the Mecklenburg EMS Agency protocols will be followed until such time that transfer of care has occurred
- \* If the patient becomes unstable during transport, diversion to the closest healthcare system hospital per patient request shall occur
  - If the patient has valid DNR orders and the receiving facility wishes to accept the patient in the current condition, this is acceptable



## Transfer of Care

- \* Upon departing the transferring facility, transfer of care shall occur once the patient is transported off the facility property
- \* Upon arrival at the receiving facility, transfer of care shall occur once the patient report has been provided to facility staff, family members, or caregivers accepting the patient

## Therapeutic Care during Transport

- \* Nutritional infusions, such as Hyperal, amino acids, intralipids may be continued
- \* Any chemotherapeutic agent currently being infused and monitored by persons other than the patient must be discontinued prior to transfer unless skilled personnel familiar with the agent and infusion accompanies the patient
  - When such personnel are not present, medications may be transported with the patient, but the infusion must be stopped
  - If it is noted by physician order or other documentation, that the chemotherapeutic infusion needs to be continued, there must be appropriately trained personnel attending the patient during the transport
  - If such personnel are not available, the transport must be referred to one of the hospital-based critical care transport services
  - Any violation of bag with chemotherapy agent must be considered a biohazard
    - Immediately report to the supervisor
    - Do not handle the exposed agent unless cleared to by the supervisor
- \* Any therapeutic agent currently being infused and monitored by the patient, such as a continuous infusion pump, may be continued during the transfer
- \* Chronic infusions or therapeutic procedures such as insulin pumps or peritoneal dialysis may be continued during transport
- \* If a problem arises with the pump and/or infusion, such as pump failure or intravenous infiltration, the infusion will be discontinued by turning off the infusion device
- \* For patients that are ventilator dependent, a transport ventilator may be used
  - Personnel familiar with these devices may continue the transport
  - **If unfamiliar with the operation of the patient's** ventilator, the transport must be referred to a crew that is familiar with the device or to one of the hospital-based critical care transport services

## Special Situations

- \* Medic may be asked to transport Hospice patients or patients with valid DNR orders to a residence or nursing facility
  - If patient loses vital signs while still on the property of the transferring facility:
    - Transport the patient back to their room and inform the care provider
  - If patient loses vital signs after leaving the property of the transferring facility:
    - Continue to transport the patient to their destination facility
    - Contact the Supervisor or CMED, and have them contact someone at that facility or residence to explain the circumstances

## Patient Initiated Refusal of Treatment or Transport

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### General

- \* Any patient requesting emergency medical treatment within the standard level of provision and scope of practice by the Mecklenburg EMS Agency, and/or requesting transportation to the hospital with or without treatment will be provided those services
- \* **Medic personnel WILL NEVER refuse treatment or transport nor suggest alternative transportation or follow-up** options to patients
- \* Presumptive diagnoses or expressed medical opinions that may suggest a minor clinical condition and/or influence a patient from not being treated/transported is forbidden
  - Only exception to this will be when the health and safety of personnel is of concern
  - When such circumstances arise, the Operations Supervisor and medical control will be consulted
- \* Patients may refuse the proposed treatment and/or transport provided by Medic
- \* While it is encouraged that all patients be transported, individuals may refuse services if the patient has the capacity to do so
- \* Capacity for medical decision-making may be defined as any patient with the following:
  - Able to make informed decisions regarding their health & healthcare
  - Able to understand the nature and severity of their presumptive process
  - Able to understand the risks of refusing care
    - Including permanent disability, debilitation, death
  - Able to understand the benefits of receiving care
  - Demonstrating no evidence of being under the influence of mind-altering substances including the following:
    - Clear sensorium without delusions
    - Oriented to person, place, and time
    - No new signs of incoordination
    - No new slurred speech patterns
  - NOT a threat to harm themselves or others
    - NOT suicidal
    - NOT homicidal
  - NOT medically unstable thereby impacting their ability to make informed decisions
    - Including but not limited to:
      - Hypoglycemia
      - Hypotension
      - Hypothermia
      - Hypoxia
      - Significant bradycardia or tachycardia
- \* It is imperative for the provider to act in the patient's best interest in determining the decision-making capacity

### **Patients Determined to have the Capacity to Refuse Treatment or Transportation**

1. When an adult patient (age  $\geq$  18-years) refuses care and other patient care or priority activities are not necessary (multiple casualty incident, system status demands), the following procedure will be followed:
  - A. An appropriate mental status examination shall be performed
  - B. The patient will be thoroughly evaluated if the patient gives permission & permits
  - C. Patient evaluation will follow the standard procedure outlined in the patient care **protocols for the patient's chief complaint and include any diagnostic test as indicated** (e.g. blood glucose, 12-lead ECG, pulse oximetry)
  - D. At a minimum, the following will be performed:
    - i. Blood glucose checked on all diabetic patients with a medical complaint, or any patient with a history of altered sensorium prompting the 911-call
    - ii. Pulse oximetry checked on any patient with a respiratory complaint
    - iii. A 12-lead ECG will be obtained on any patient complaining of chest discomfort, angina equivalent symptoms, syncope, or any patient with a history of chest pain or discomfort prompting the 911-call
  - E. Pertinent historical and/or physical findings will be obtained and discussed with the patient
  - F. Treatment interventions and transportation will always be offered/recommended
2. If the patient continues to refuse care or transportation, discuss the risks of refusing
  - A. Risks will include worsening condition with possible permanent disability or death
3. Communication should be such that the patient fully understands each of the risks outlined
  - A. If a language barrier exists, translators or language line resources must be used
  - B. If available, and permitted by patient, attempt to involve family members or friends to speak with the patient to be treated and/or transported
  - C. Patient should be able to reiterate the risks and benefits discussed with them
4. All patient questions should be answered
5. Reasonable scene treatment shall be offered and administered if accepted
6. At a minimum, documentation will consist of the Patient Refusal Form with supplemental information included on the Patient Care Report as needed
  - A. This information will be completed on all patients encountered and assessed
  - B. This includes patients where the paramedic has determined that the patient should be treated and transported
7. Patient refusal information will be completed for any patient considered to be at risk for refusing care
8. **The patient's signature will be obtained on the** Patient Care Report
  - A. If the patient refuses to sign, the Crew Chief will indicate this and sign the report
9. Patients who refuse treatment and/or transport will be given appropriate follow-up precautions/information

### **Patients Determined to NOT have the Capacity to Refuse Treatment/Transport**

1. Patients determined to NOT have adequate decision-making capacity, including suicidal threats or gestures, may refuse treatment in the field, but may not refuse transportation to the hospital
  - A. Patients determined to NOT have adequate decision-making capacity will be transported to the emergency department for further evaluation/treatment
  - B. Patients determined to NOT have adequate decision-making capacity will be transported to the emergency department regardless of consent to transport
2. If not on the scene, ensure that the police are requested or enroute to the scene as indicated by patient presentation
3. The patient will be thoroughly evaluated with pertinent historical and/or physical findings communicated to the patient
4. Treatment interventions will be performed if the patient permits and it is safe to do so
5. All patient questions should be answered
6. The following options are available for patients continuing to refuse care but lacking capacity to refuse care:
  - A. Contact medical control
  - B. **Engage first responder's assistance**
  - C. Discuss situation with police and request assistance
  - D. Request consultation with police supervisors (sergeant, captain)
  - E. Provide for consultation between medical control, police, and/or the patient
    - It may be appropriate for law enforcement to speak directly with medical control for a plan to be developed in the best interest of the patient
7. Transportation may only be provided by ambulance and not by a patrol car
  - A. Exception – patients with suicidal ideation, but no suicide attempt/ingestion may be transported to a behavioral health facility if no acute medical need is identified by EMS evaluation and patient/law enforcement consent to such transport
  - B. Exception – patients with known psychiatric diagnosis, requesting evaluation and/or treatment for same and if no acute medical need is identified by EMS evaluation and patient/law enforcement consent to such transport
8. It is permissible to have police accompany the patient in the back of the ambulance

### **Special Situations – patient < 18-years of age**

- \* Patients < 18-years of age may not consent to or refuse emergent medical care or transportation unless emancipated
- \* An emancipated minor is < 18-years of age and at least one of the following:
  - Married
  - Has become a member of the United States Armed Services
  - Has been declared emancipated by a court or other similar entity
- \* Emancipated minors have the legal rights of an adult and are free of parental or legal guardian authority
- \* Efforts should be made to obtain consent / refusal from the **minor's parent/legal guardian** on-scene or via phone consultation
  - Any conversation with parent/legal guardian with their consent/refusal must be documented in the PCR
  - If unable to contact parent/legal guardian, this must be documented, and patient shall be transported to the emergency department with treatment deferred (unless emergent medical care is required to prevent morbidity/mortality)
- \* Parent/legal guardian consent is NOT required if a minor patient is seeking care for:
  - Pregnancy/potential pregnancy
  - Psychiatric disturbance
  - Sexually transmitted disease
  - Substance abuse

### **Special Situations – patient with suicidal ideation**

- \* Any patient who has attempted or is contemplating suicide is to be considered a danger to themselves and will always be transported to the hospital (or behavioral health facility as outlined above)

### **Special Situations – patient with alcohol consumption**

- \* A patient who has recently consumed alcohol may be considered to have the capacity to make medical decisions if that patient does not appear to be intoxicated and appears to understand their condition and risks as defined above
- \* A patient who has recently consumed alcohol and is in his/her home, without any medical complaints, and is declining treatment and/or transport may remain at home provided:
  - Patient is deemed to NOT be at acute risk of injury (able to ambulate)
  - Patient is deemed to NOT be at acute risk of airway compromise
  - Responsible person is willing to remain on scene and monitor patient

### **Special Situations – Brief Resolved Unexplained Event (BRUE)**

- \* Parents describing a BRUE occurring with an infant up to 2-years of age should always be transported to the hospital for evaluation
  - An event lasting <1 minute in an infant that is associated with at least one of the following: cyanosis or pallor; absent, decreased, or irregular breathing; marked change in muscle tone (hypertonia or hypotonia); altered level of responsiveness
  - Infants will appear normal after the episode
  - These infants are at risk for sudden infant death syndrome

### **Additional Considerations**

- \* A Patient Care Report will be completed on all patients that are encountered
- \* A thorough history and physical examination will be performed as permitted by the patient and pertinent positive and negative findings will be documented including discussing of risks and benefits
- \* **Documentation must include statement noting the patient's decision-making capacity at the time of the encounter**

## Crime Scenes

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- \* When responders enter a questionable scene such that foul play is suspected, the following protocol should be strictly adhered to:
  - Ensure that the scene is safe to enter
  - Notify the police department if not already present or responding
  - Be careful not to touch any surroundings unless necessary
  - Do not leave any items (medical supplies/packages) at the scene
  - If anything at the scene (including the patient) is moved, advise the police
- \* Limit access to essential personnel only
  - Entry and exit routes should remain the same
- \* Report suspicious bystanders or occurrences to the police
- \* Any suicide note should not be handled
- \* If a viable patient is encountered, proceed with indicated protocol
- \* When treating patients who have sustained penetrating wounds and clothes need to be removed, do not cut through knife or bullet holes
- \* The following situations and responses may be indicated:
  - Hangings:
    - Noose must be loosened/removed as quickly as possible to promote patient resuscitation/care
    - Leave all knots intact, including the knot that the rope is suspended from and the knot making the "noose"
    - Cut the rope in an area halfway between the noose and the suspension point and in the middle of the noose
  - Weapons:
    - Extreme caution should be used when moving weapons, especially if the patient still has possession
    - Weapon(s) should be removed to a safe place, far away from the patient and bystanders – it is best to let the police handle this
    - Weapons should not be tampered with, opened, or unloaded
  - Sexual Assault:
    - It is important that victims of sexual assault be moved quickly to a safe environment if not already present
    - It is vital that the patient not shower or wash any part of their body or clothing, change clothing, douche, or use the bathroom if possible
- \* Crime scenes may be such that authorized police officers may prohibit prehospital personnel from entering the scene
  - According to North Carolina State Law this is permitted
  - When such circumstances arise and the responder suspects that medical assistance may be indicated, entrance to the scene should be discussed thoroughly with the officer and if necessary, their supervisor
  - If continued resistance is met, the responsible police officer's badge number shall be recorded on the Patient Care Report before departing the scene

## Medical Incident Review Process

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### Objectives

- ❖ The Medical Incident Review Process is designed to create a standard review algorithm that is consistent and appropriate for every incident in question
- ❖ The following are components of the process:
  - Standard algorithm for data retrieval, documentation, review, and outcome measures for each category of incident
  - Standard nomenclature that defines and characterizes the severity of an incident on initial presentation and final review
  - Incident Review Committee with defined roles and responsibilities for members
  - An outcome and remediation process
  - An appeal process for conflict resolution

### Methodology

- ❖ Incident processing
  - Inquiries may be received through a multitude of sources including the Operations Supervisor, CMED, or the receptionist
  - Regardless of person receiving the inquiry, all information will be immediately forwarded to the on-duty Operations Supervisor (for field issues) or the on-duty Communications Supervisor (for CMED issues)
- ❖ Initial Notification
  - Operations personnel receiving information from the recipient source shall review the call and notify the Deputy Director of Operations, Deputy Director of Medical Services, or Medical Director to discuss the case
  - The Supervisor may be asked to seek additional information from any source, or the decision may be made to proceed with formal processing
  - If the decision is made to proceed with an incident review, the Deputy Director of Medical Services or designee will notify the Medical Director, if not yet involved, to discuss the case
- ❖ Category Assignment
  - Consensus will be reached with the Medical Director to assign the presumptive category



**Presumptive Category 1**

- ❖ The **personnel's** action or failure to act was not consistent with standard prehospital medical practice
- ❖ Examples:
  - Failure to recognize an esophageal intubation
  - Failure to recognize and treat a lethal cardiac dysrhythmia
  - Failure to recognize a potential life-threatening condition that resulted in a non-transport
  - Performing medical acts or procedures not within the scope of practice of the provider or Mecklenburg EMS Agency, or administering medications not approved by the Medical Director

**Presumptive Category 2**

- ❖ The **personnel's** action or failure to act was not consistent with standard prehospital medical practice
- ❖ Examples:
  - Inappropriate medication administration (administering a medication to which the patient was allergic, inappropriate dose or inappropriate route of administration)
  - Failure to recognize appropriate diagnosis and following the wrong protocol
  - Failure to bring required equipment to the patient
  - Prolonged scene time in a high priority trauma patient who required immediate and definitive in-hospital care

**Presumptive Category 3**

- ❖ The **personnel's** action or failure to act was not consistent with standard prehospital medical practice
- ❖ Examples:
  - Walking a patient to the ambulance
  - Failure to transport a patient to their requested facility, or coercing a patient to be transported to an alternate facility
  - Allowing patient to refuse care who lacks the capacity to refuse treatment or transport

**Presumptive Category 4**

- ❖ The **personnel's** actions were consistent with standard prehospital medical practice
  - Documentation issues
  - Interpersonal action concern

**Review Processing**

- ❖ Operations personnel will initiate an Incident Review Worksheet to document that notifications and initial processing procedures are complete
- ❖ Operations may contact Education / Quality Improvement staff or appropriate first responder agency staff who will have the responsibility for obtaining all information pertinent to the case
- ❖ A Documentation Worksheet will be initiated to ensure that the review process is complete and appropriate

**Presumptive Category 1**

- ❖ Personnel involved are immediately placed on administrative leave with pay
- ❖ There will be no patient care activity at any level
- ❖ Barring unforeseen or unanticipated delays, the review process will take place within two (2) business days from the time the incident was reported
- ❖ The Medical Director or EMS Fellow will be present for the review

**Presumptive Category 2**

- ❖ Personnel involved may remain on duty and may continue all patient care activities
- ❖ Barring unforeseen or unanticipated delays, the review process will take place within three (3) business days from the time the incident was reported
- ❖ The Medical Director or EMS Fellow will be present for the review

**Presumptive Category 3 & 4**

- ❖ Personnel involved will remain on duty and may continue all patient care activities
- ❖ Barring unforeseen or unanticipated delays, the review process will take place within five (5) business days from the time the incident was reported
- ❖ At a minimum, the Clinical Education Manager will be present for the review

**All Presumptive Categories**

- ❖ Formal discussion of the incident with the personnel involved with the case, other than activities associated with obtaining facts, shall not occur prior to the Incident Review Committee meeting

**Incident Review Committee**

- ❖ Committee representatives will be predicated on the presumptive category assigned to the incident, and may include the Medical Director or EMS Fellow, Deputy Director of Medical Service, Deputy Director Operations of Operations or their designees
- ❖ Depending on the nature of the incident and initial findings, other members may include a representative from CMED or the first responder agency involved
- ❖ Incident Review involving clinical issues will be led by the Medical Director or designee
- ❖ Incident Review involving operational issues will be led by the Deputy Director of Operations or designee
- ❖ Medical Services will be responsible for setting up and coordinating the time and location for all committee meetings
- ❖ The Medical Director, with Operations, will determine committee representation
- ❖ All Presumptive Category 1 and 2 reviews will require a formal Incident Review Committee meeting
- ❖ Incidents categorized as Presumptive 3 or 4 may only require consultation between committee members without convening a formal committee meeting
- ❖ All personnel involved will have the opportunity to describe and discuss their recollections of the event and any rationale for their performance
- ❖ Review Committee members will have the opportunity to ask any relevant questions to assist them in determining the appropriateness of the providers actions
- ❖ Once all case information is presented, the committee will discuss the case privately
- ❖ A consensus decision will be made with reference to outcome and recommendations
- ❖ Each case will be assigned a Definitive Category
- ❖ Recommendations on disciplinary measures and/or remediation will be included in the summary, along with the timeframe for completion of remediation

**Definitive Category 1**

- ❖ The EMT's action or failure to act was not consistent with standard prehospital medical practice and directly contributed to an adverse patient outcome

**Definitive Category 2**

- ❖ The EMT's action or failure to act was not consistent with standard prehospital medical practice and did not clearly contribute to an adverse patient outcome

**Definitive Category 3**

- ❖ The EMT's action or failure to act was not consistent with standard prehospital medical practice, however there was no effect on patient outcome

**Definitive Category 4**

- ❖ The EMT's action was consistent with standard prehospital medical practice

## Definitive Category Subset

- ❖ A = system issue(s) identified
- ❖ B = no system issue(s) identified

## Remediation Process

- ❖ Depending on the Definitive Category assigned, remediation may be required
- ❖ Recommendations for remediation will be determined by the Incident Review Committee as part of the review process
- ❖ Recommendations may include any educational process, tutoring, committee or clinical activity participation, or other special project outlined
- ❖ Recommendations will also include other pertinent issues such as time frame for completion, penalties or consequences for noncompliance, any affects concerning salary, and documentation
- ❖ All final decisions for medical issues and operational issues will be made by the Medical Director and the Deputy Director of Operations, respectively

## Notification

- ❖ Operations personnel will be responsible for providing incident review results, decisions, and remediation requirements as applicable to the employee
- ❖ Notifications will be made at the conclusion of the incident review and discussed with the involved personnel

## Documentation

- ❖ All incident reviews will be thoroughly documented
- ❖ Medical Services personnel will be responsible for ensuring that all documents, including Patient Care Reports, CMED reports, supplemental reports, etc. are placed in a dedicated, secured file maintained by Quality Improvement staff
- ❖ **A specified marker will be placed in the employees' file maintained by Human Resources and in the Medical Services database to indicate that an incident review was conducted**

## Appeal Process

- ❖ If the provider disagrees with the findings and/or remediation recommendations from the Incident Review Committee following completion of the review process, the provider must submit their concerns in writing to the Deputy Director of Operations within 1 week of notification of the findings/remediation recommendations
- ❖ Case information, decisions, and recommendations will be forwarded to the Executive Director for further review and final decision
  - **This decision may include upholding the Incident Review Committee's original decision or forwarding the case to the Medical Control Board for further review**



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## **SECTION 2**

# **Patient Related Policies**

## **Criteria for Death/Withholding Resuscitation (NCCEP Disposition-1)**

### **Objective**

- \* To define instances when resuscitative efforts may be terminated or withheld

### **Medical Care**

1. ALS / CPR may be withheld for the following conditions:
  - A. The patient has a valid (original, signed by the patient or guardian, and dated) DO NOT RESUSCITATE order
  - B. The patient has a valid MOST Form noting DNR order
  - C. The patient has sustained injuries incompatible with life:
    - i. Burned beyond recognition
    - ii. Decapitation
    - iii. Blunt force trauma to chest &/or abdomen and absent vital signs
      - Pulseless, apneic, no signs of life
    - iv. Massive open or penetrating trauma to head or chest with obvious organ destruction
  - D. Obvious signs of death are present:
    - i. Body decomposition
    - ii. Dependent lividity
      - Onset occurs 1–2 hours after death
      - Peaks 6 hours after death
    - iii. Rigor mortis
      - Face and neck approximately 5 hours after death
      - Chest and arms approximately 7 – 9 hours after death
      - Entire body approximately 12 hours after death
2. If initiated by personnel on scene CPR / ALS may be terminated if:
  - A. One of the above criteria is present
  - B. Patient > 18 years of age
  - C. Asystole on ECG following extended downtime (> 20 minutes)
  - D. Adequate CPR and / or ACLS has been performed
  - E. Airway has been successfully managed
  - F. ETCO<sub>2</sub> < 20
3. If any doubt exists initiate / continue resuscitative efforts
4. Resuscitation should be continued on all pediatric patients unless patient has sustained injuries noted above which are incompatible with life
5. Crime scenes are such that authorized police officers may declare a patient dead and prohibit prehospital personnel from entering the scene
  - A. When such circumstances arise and the paramedic suspects that medical assistance may be indicated, entrance to the scene should be discussed thoroughly **with the officer and if necessary, their supervisor & record the officer's badge number on the PCR**

## Deceased Subjects

## (NCCEP Disposition-2)

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### Objective

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

### Indication

- \* Disposition of patients with failed prehospital resuscitation efforts and pronounced in the field
- \* Disposition of patients having injuries incompatible with life
- \* Disposition of patients with obvious evidence of expiration prior to MEDIC arrival
- \* Contact Medical Control for any concerns regarding pronouncing patient in the field

### Medical Care

1. Do not remove lines or tubes unless directed to do so by Incident Command
  - A. If destination is other than county morgue lines/tube may be removed prior to transport
2. Notify appropriate law enforcement agency
3. Ensure respect for the deceased and family is maintained
4. Scene should be maintained as a potential crime scene until directed otherwise by law enforcement
5. Record patient disposition on PCR

## **Discontinuation of Prehospital Resuscitation (NCCEP Disposition-3)**

### **Indication**

- \* Criteria for discontinuation of prehospital resuscitation after delivery of adequate CPR and ALS treatment

### **Medical Care**

1. For all cases where pronouncement of death may occur and regardless of medical or trauma etiology, the following will be performed:
    - A. Assess patient for vital signs
    - B. Apply cardiac monitor (4 leads)
    - C. Assess rhythm in leads I, II, and III
    - D. Obtain rhythm strip to be included as part of the Patient Care Report
  2. When pronouncing prior to contact with medical control **ALL** the following conditions must be met:
    - A. Age  $\geq$  18
    - B. Adequate CPR and appropriate airway management have been preformed
    - C. No evidence of:
      - i. Drug/toxin overdose
      - ii. Hypothermia
    - D. Rhythm appropriate medication have been administered without ROSC
    - E. Non-shockable rhythm on monitor
    - F. All EMS personnel agree that discontinuation of resuscitation is appropriate
  3. When resuscitation has been initiated; conditions / circumstances may result in terminating efforts and pronouncing an adult patient dead if the resuscitative efforts are unsuccessful
    - A. **Medical – asystole:**
      - i. Total resuscitation ALS > 20 minutes
      - ii. No return of spontaneous circulation
      - iii. Capnometry < 20 mmHg
    - B. **Medical – pulseless electrical activity:**
      - i. Total resuscitation ALS time > 20 minutes
      - ii. No return of spontaneous circulation
      - iii. Potential causes of PEA have been appropriately addressed
      - iv. Capnometry < 20 mmHg
    - C. **Medical – ventricular fibrillation and pulseless ventricular tachycardia**
      - i. Continue resuscitation efforts and initiate transport of patients with persistent/refractory or recurrent ventricular fibrillation or ventricular tachycardia
- \* Unless declared a crime scene by police; patients with a medical cause of cardiac arrest and in a public location should not be pronounced and left on scene but should have continued resuscitative efforts and be transported to the emergency department



**D. Blunt traumatic arrest:**

- i. If patient found to be pulseless, apneic, and without signs of life, may pronounce dead on scene
- ii. If patient becomes pulseless and apneic on scene:
  - Perform bilateral needle decompression – if blunt chest trauma
  - If asystole or wide complex PEA and transport to trauma center is > 5 minutes, may pronounce dead on the scene
  - If narrow complex PEA or shockable rhythm, initiate/continue resuscitative efforts and transport to the trauma center
- iii. If the patient becomes pulseless and apneic during transport:
  - Perform bilateral needle decompression – if blunt chest trauma
  - If asystole or wide complex PEA and transport to trauma center is > 5 minutes, may pronounce dead
  - If narrow complex PEA or shockable rhythm, initiate/continue resuscitative efforts and transport to the trauma center

**E. Penetrating traumatic arrest:**

- i. If patient found to be pulseless, apneic, and without signs of life, may pronounce dead on the scene
  - ii. If patient noted at any time to have palpable pulses or other signs of life continue resuscitation and transport
  - iii. If patient becomes pulseless and apneic and transport time to trauma center is < 15 minutes, continue resuscitation and transport
  - iv. If patient becomes pulseless and apneic and transport time to trauma center is > 15 minutes, contact medical control
4. Contact Medical Control as needed for assistance with decision making
  5. Police personnel should always be requested if not already present on the scene
  6. If a patient loses vital signs during transport and resuscitative efforts are considered futile (valid DNR order, blunt trauma arrest, etc.), it is appropriate to discontinue use of emergency lights and siren
  7. Any equipment placed during the resuscitation attempt (King LT airway, endotracheal tube, IO line, NG/OG tube) should remain in place after pronouncing the patient

**Additional Considerations**

- \* Resuscitation and transport should be performed on all pediatric cardiac arrest patients regardless of medical or trauma etiology
  - Unlike adult patients, all appropriate ALS medications should be administered as indicated for both medical and trauma pediatric patients
- \* Patients in cardiac arrest should not be transported by air medical transport as adequate CPR cannot be performed in the aircraft
- \* Refer to [\*\*Deceased Subjects Disposition Policy\*\*](#)
- \* **Document all patient care and interactions with patient's family, personal physician, law enforcement, medical control or medical examiner in the PCR**
- \* Patients not meeting above criteria should have resuscitative efforts continued until arrival at receiving facility or discontinuation order by Medical Control

## Disposition

## (NCCEP Disposition-4)

### General

- \* Any patient requesting emergency medical treatment within the standard level of provision and scope of practice by the Mecklenburg EMS Agency, and/or requesting transportation to the hospital with or without treatment will be provided those services
- \* **MEDIC personnel WILL NEVER refuse treatment or transport**
- \* **MEDIC personnel will not suggest alternative transportation or follow-up options to patients**
  - Presumptive diagnoses or other expressed medical opinions that might suggest a minor clinical condition and/or influence a patient from not being transported by EMS are strictly forbidden
  - The only exception to this policy will be when the health and safety of personnel is of concern
    - When such circumstances arise, the Operations Supervisor and Medical Control should be consulted
- \* Patients may refuse the proposed treatment and/or transport provided by MEDIC
  - While it is encouraged that all patients be transported, individuals with the capacity to make informed medical decisions may refuse services
- \* Capacity for medical decision-making may be defined as any patient with the following:
  - Able to make informed decisions regarding their health & healthcare
  - Able to understand the nature and severity of their presumptive process
  - Able to understand the risks of refusing care
    - Including permanent disability, debilitation, death
  - Able to understand the benefits of receiving care
  - Demonstrating no evidence of being under the influence of mind-altering substances including the following:
    - Clear sensorium without delusions
    - Oriented to person, place, and time
    - No new signs of incoordination
    - No new slurred speech patterns
  - NOT a threat to harm themselves or others
    - NOT suicidal
    - NOT homicidal
  - NOT medically unstable thereby impacting their ability to make informed decisions
    - Including but not limited to:
      - Hypoglycemia
      - Hypotension
      - Hypothermia
      - Hypoxia
      - Significant bradycardia or tachycardia

**Management**

1. All patient encounters resulting in any component of evaluation and/or treatment must have an PCR completed
2. Any patient who refuses evaluation or treatment must be explained the risks of any refusal of treatment or transport and the potential benefits of treatment and transport
3. Communication should be such that the patient fully understands each of the risks and/or benefits outlined
  - A. If a language barrier exists, translators or language line resources must be used
  - B. If available and capable, attempt to involve family members or friends to convince the patient to be treated and transported
    - i. As appropriate, consult with patient prior to involving persons not currently **involved in the patient's condition**
4. When an adult patient ( $\geq 18$  years of age) refuses care and other patient care or priority activities are not necessary (multiple casualty incident, system status demands); the following procedure will be followed:
  - A. Patient will be thoroughly evaluated if the patient gives permission & allows
  - B. Evaluation will follow the standard procedure outlined in the patient care protocols
  - C. Perform any diagnostic test as indicated
    - i. Including but not limited to: blood glucose, 12-lead ECG, pulse oximetry
  - D. At a minimum, the following will be performed:
    - i. Blood glucose will be checked on all diabetic patients with a medical complaint, or any patient with a history of altered sensorium
    - ii. Pulse oximetry will be checked on any patient with a respiratory complaint
    - iii. A 12-lead ECG will be obtained on any patient complaining of chest discomfort, angina equivalent symptoms, syncope, or any patient with a history of chest pain or discomfort prompting the 911-call
  - E. Pertinent historical and/or physical findings should be obtained
  - F. Treatment interventions and transportation will always be offered
    - i. Reasonable scene treatment shall be administered if accepted by patient
  - G. All patient questions should be answered
  - H. Appropriate mental status examination shall be performed to determine if the patient is considered to have the current capacity for medical decision-making
5. PCR must be completed
6. At a minimum, documentation will consist of the Patient Refusal Form with supplemental information included on the PCR as indicated
  - A. This information will be completed on all patients encountered and assessed
7. Patient refusal information must be completed for any patient considered to be at risk for refusing care
8. **The patient's signature will be obtained on the PCR**
  - A. If the patient refuses to sign, the Crew Chief will indicate this and sign the report
9. Patients who refuse treatment and/or transport will be given appropriate instructions

**Patients who do NOT have the capacity to refuse treatment and/or transport**

1. Patient determined to NOT have the capacity to refuse will be treated (if safe to do so) as indicated per protocol and transported to the hospital
  - A. Crew safety must be a priority
2. Patients determined to be potentially at risk for self-harm or harm to others (e.g. suicidal, homicidal) may refuse treatment in the field, but may not refuse transport
3. If not already present on the scene, ensure that the police are enroute to the scene
4. With the police present, the paramedic will attempt to develop a rapport with the patient and discuss plans for assessment, treatment, and transportation
5. Evaluate the patient with pertinent historical/physical findings discussed with the patient
6. Transportation may only be provided by ambulance and not by police in a patrol car
7. The following options are available for patients continuing to refuse care:
  - A. Contact medical control
  - B. **Engage first responder's assistance**
  - C. Discuss situation with police and request assistance
  - D. Request consultation with police supervisors (sergeant, captain)
  - E. Provide for consultation between medical control and police
  - F. It is permissible for police accompany the patient in the back of the ambulance

**Additional Considerations**

- \* Contact medical control for any question as to the patient's capacity to refuse care
- \* Patients less than 18-years of age may not refuse medical care or transportation
- \* An emancipated minor is less than 18-years of age and one of the following:
  - Married
  - Has become a member of the United States Armed Services
  - Has been declared as such by a court
  - The individual has the legal rights of an adult and is free of parental or legal guardian authority
- \* A patient who has recently consumed alcohol may be considered competent to make medical decisions if that patient does not appear to be clinically intoxicated and appears to understand their condition and risks as defined above
- \* Any patient who has attempted or is contemplating suicide is not considered to have decision-making capacity
  - These patients will always be transported to the hospital or behavioral health
- \* It is appropriate to have law enforcement personnel speak with a physician so that a plan that is in the best interest of the patient may be developed
- \* A PCR shall be completed on all patients that are encountered
  - Documentation must be completed **regardless of the patient's decision to be treated and/or transported**

## Do Not Resuscitate and MOST Form

(NCCEP Disposition-5)

### Introduction

- \* Any patient with a completed North Carolina *Do Not Resuscitate* (DNR) form shall have the form honored and CPR / ALS treatment withheld in the event of a cardiac arrest as **per the patient's wishes**
- \* Any patient with a completed Medical Orders for Scope of Treatment (MOST) form shall have the form honored treatment limited **as per the patient's wishes**

### Management

1. Valid DNR form:
  - A. **Original North Carolina DNR yellow form**
  - B. Effective & expiration dates completed (may utilize check-box for no expiration)
  - C. Physician or Advanced Care Practitioner (PA, NP) signature
2. Valid MOST form:
  - A. **Original North Carolina MOST bright pink form**
  - B. Effective date completed
  - C. Physician or Advanced Care Practitioner (PA, NP) signature
3. A valid DNR or MOST form may be overridden by:
  - A. The patient
  - B. Guardian or healthcare power of attorney for the patient
  - C. Physician on scene
4. If requested by the patient or family that the DNR or MOST Form NOT be honored, personnel should institute appropriate medical care and contact Medical Control for further decision-making assistance
5. If requested by a person on scene that the DNR or MOST Form NOT be honored, personnel should contact Medical Control for further decision-making assistance
6. Other documents requesting withholding of CPR / ALS such as a living will may be honored with the approval of Medical Control

### Additional Considerations


- \* **DNR orders may be written in a patient's chart or medical record**
  - Orders must be complete, current with date and time signed by attending physician
  - Telephone or verbal orders that are not signed are not acceptable without communication **directly with the patient's physician**
- \* **A living will or other legal document that identifies the patient's desire to withhold CPR or other medical care may be honored with the approval of Medical Control**

- \* For any doubt as to the validity of the DNR or living will resuscitative efforts should be continued as till such time as:
  - Validity is determined
  - Order to withhold efforts are given by Medical Control
  - Criteria have been met in [Criteria for Death/Withholding Resuscitation Policy](#) or [Discontinuation of Prehospital Resuscitation Policy](#)

## Special Situations

- \* When relatives or friends of the patient request, and agree, that resuscitative measures are to be withheld and a State DNR Form or similar document (Advanced Care Directive) is not present or acceptable orders do not exist, the paramedic should then attempt to establish telephone communication with the patient's personal physician or Medical Control to establish and/or confirm a DNR order
  - If this communication is established with the patient's physician and DNR orders are given, this information shall be recorded on the PCR
  - It would be desirable to have another individual (preferably your partner) witness this conversation
- \* In any case where doubt exists about a DNR order, the paramedic shall either contact Medical Control or commence appropriate resuscitative measures until such time that attending physician contact is made or the patient is delivered to a destination hospital
  - In the event of communication failure, resuscitative measures shall be instituted
- \* Any specified DNR or medical order, including the state DNR and MOST Forms, will not expire unless there is an expiration date on the document itself
  - If an expiration date exists and the patient lacks the capacity to make informed health care decisions on or after that date, the DNR or MOST order shall remain in effect
- \* If resuscitative measures have been initiated and a valid DNR order is presented, the resuscitation shall be terminated
  - Communication with Medical Control may be established if any questions arise
  - If the patient is successfully resuscitated before measures are ceased, the patient will be transported to the closest appropriate medical facility, withholding further resuscitative measures unless authorized to do so by appropriate sources (family members, attending physician, Medical Control)
- \* A DNR order may not be honored in a situation involving pregnancy where withholding resuscitative measures would jeopardize the fetus
  - This applies to cases where the fetus would ordinarily develop into a viable birth if treatment measures were instituted (typically  $\geq$  28 weeks of gestation)
- \* DNR orders for interfacility transfers shall be written and/or signed by the attending physician



**DNR Form**


Effective Date: \_\_\_\_\_  
 Expiration Date, if any \_\_\_\_\_

☐ Check box if no expiration

## DO NOT RESUSCITATE ORDER

Patient's full name \_\_\_\_\_

In the event of cardiac and/or pulmonary arrest of the patient, efforts at cardiopulmonary resuscitation of the patient **SHOULD NOT** be initiated. This order does not affect other medically indicated and comfort care.

I have documented the basis for this order and the consent required by the NC General Statute 90-21.16(b) in the patient's records.

\_\_\_\_\_  
 Signature of Attending Physician

\_\_\_\_\_  
 Printed Name of Attending Physician


\_\_\_\_\_  
 Address

\_\_\_\_\_  
 City, State, Zip

\_\_\_\_\_  
 Telephone Number (office)


\_\_\_\_\_  
 Telephone Number (emergency)

**Do Not Copy      Do Not Alter**





NC.DNR.HS.CS.DS.EMS    Rev. 1/02      100,000 copies of this document were printed at a cost of \$3,000.00 or \$0.03 per copy      NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

## MOST Form

| HIPAA PERMITS DISCLOSURE OF MOST TO OTHER HEALTH CARE PROFESSIONALS AS NECESSARY   |   |  |
|--|---|--|
|  <b>Medical Orders for Scope of Treatment (MOST)</b><br>This is a Physician Order Sheet based on the person's medical condition and wishes. Any section not completed indicates full treatment for that section. When the need occurs, <u>first</u> follow these orders, <u>then</u> contact physician.   |   | Patient's Last Name: _____<br><br>Patient's First Name, Middle Initial: _____                                      |
|  |   | Effective Date of Form: _____<br><i>Form must be reviewed at least annually.</i><br>Patient's Date of Birth: _____ |
| <b>Section A</b><br><i>Check One Box Only</i>  | <b>CARDIOPULMONARY RESUSCITATION (CPR): Person has no pulse and is not breathing.</b><br><input type="checkbox"/> Attempt Resuscitation (CPR) <input type="checkbox"/> Do Not Attempt Resuscitation (DNR/no CPR)<br>When not in cardiopulmonary arrest, follow orders in B, C, and D.   |  |
| <b>Section B</b><br><i>Check One Box Only</i>  | <b>MEDICAL INTERVENTIONS: Person has pulse and/or is breathing.</b><br><input type="checkbox"/> Full Scope of Treatment: Use intubation, advanced airway interventions, mechanical ventilation, cardioversion as indicated, medical treatment, IV fluids, etc.; also provide comfort measures. <b>Transfer to hospital if indicated.</b><br><input type="checkbox"/> Limited Additional Interventions: Use medical treatment, IV fluids and cardiac monitoring as indicated. Do not use intubation or mechanical ventilation; also provide comfort measures. <b>Transfer to hospital if indicated. Avoid intensive care.</b><br><input type="checkbox"/> Comfort Measures: Keep clean, warm and dry. Use medication by any route, positioning, wound care and other measures to relieve pain and suffering. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. <b>Do not transfer to hospital unless comfort needs cannot be met in current location.</b><br>Other Instructions: _____ |  |
| <b>Section C</b><br><i>Check One Box Only</i>  | <b>ANTIBIOTICS</b><br><input type="checkbox"/> Antibiotics if life can be prolonged.<br><input type="checkbox"/> Determine use or limitation of antibiotics when infection occurs.<br><input type="checkbox"/> No Antibiotics (use other measures to relieve symptoms).<br>Other Instructions: _____  |  |
| <b>Section D</b><br><i>Check One Box Only in Each Column</i>   | <b>MEDICALLY ADMINISTERED FLUIDS AND NUTRITION: Offer oral fluids and nutrition if physically feasible.</b><br><input type="checkbox"/> IV fluids long-term if indicated <input type="checkbox"/> Feeding tube long-term if indicated<br><input type="checkbox"/> IV fluids for a defined trial period <input type="checkbox"/> Feeding tube for a defined trial period<br><input type="checkbox"/> No IV fluids (provide other measures to ensure comfort) <input type="checkbox"/> No feeding tube<br>Other Instructions: _____   |  |
| <b>Section E</b><br><i>Check The Appropriate Box</i>   | <b>DISCUSSED WITH AND AGREED TO BY:</b><br><input type="checkbox"/> Patient<br><input type="checkbox"/> Parent or guardian if patient is a minor<br><input type="checkbox"/> Health care agent<br><input type="checkbox"/> Legal guardian of the person<br><input type="checkbox"/> Attorney-in-fact with power to make health care decisions<br><input type="checkbox"/> Spouse<br><input type="checkbox"/> Majority of patient's reasonably available parents and adult children<br><input type="checkbox"/> Majority of patient's reasonably available adult siblings<br><input type="checkbox"/> An individual with an established relationship with the patient who is acting in good faith and can reliably convey the wishes of the patient<br>Basis for order must be documented in medical record.   |  |
| MD/DO, PA, or NP Name (Print): _____   |   | MD/DO, PA, or NP Signature (Required): _____   |
|  |   | Phone #: _____   |
| Signature of Person, Parent of Minor, Guardian, Health Care Agent, Spouse, or Other Personal Representative (Signature is required and must either be on this form or on file)<br>I agree that adequate information has been provided and significant thought has been given to life-prolonging measures. Treatment preferences have been expressed to the physician (MD/DO), physician assistant, or nurse practitioner. This document reflects those treatment preferences and indicates informed consent.<br>If signed by a patient representative, preferences expressed must reflect patient's wishes as best understood by that representative. Contact information for personal representative should be provided on the back of this form.<br>You are not required to sign this form to receive treatment. |   |  |
| Patient or Representative Name (print)   | Patient or Representative Signature   | Relationship (write "self" if patient)   |
| <b>SEND FORM WITH PATIENT/RESIDENT WHEN TRANSFERRED OR DISCHARGED</b>  |   |  |



| HIPAA PERMITS DISCLOSURE OF MOST TO OTHER HEALTH CARE PROFESSIONALS AS NECESSARY  |                                 |  |   |
|---|---------------------------------|--|---|
| <b>Contact Information</b>  |                                 |  |   |
| Patient Representative:   | Relationship:                   | Phone #:   |   |
|   |                                 | Cell Phone #:  |   |
| Health Care Professional Preparing Form:  | Preparer Title:                 | Preferred Phone #:   | Date Prepared:  |
| <b>Directions for Completing Form</b>   |                                 |  |   |
| <b>Completing MOST</b> <ul style="list-style-type: none"> <li>MOST must be reviewed and prepared by a health care professional in consultation with the patient or patient representative.</li> <li>MOST is a medical order and must be reviewed and signed by a licensed physician (MD/DO), physician assistant, or nurse practitioner to be valid. <b><u>Be sure to document the basis for the order in the progress notes of the medical record.</u></b> Mode of communication (e.g., in person, by telephone, etc.) also should be documented.</li> <li>The signature of the patient or their representative is required; however, if the patient's representative is not reasonably available to sign the original form, a copy of the completed form with the signature of the patient's representative must be placed in the medical record and "on file" must be written in the appropriate signature field on the front of this form or in the review section below.</li> <li>Use of original form is required. <b><u>Be sure to send the original form with the patient.</u></b></li> <li>MOST is part of advance care planning, which also may include a living will and health care power of attorney (HCPOA). If there is a HCPOA, living will, or other advance directive, a copy should be attached if available. <b>MOST may suspend any conflicting directions in a patient's previously executed HCPOA, living will, or other advance directive.</b></li> <li><b>There is no requirement that a patient have a MOST.</b></li> <li>MOST is recognized under N.C. Gen. Stat. 90-21.17.</li> </ul> <b>Reviewing MOST</b><br>This MOST must be reviewed at least annually or earlier if: <ul style="list-style-type: none"> <li>The patient is admitted and/or discharged from a health care facility;</li> <li>There is a substantial change in the patient's health status; or</li> <li>The patient's treatment preferences change.</li> </ul> If MOST is revised or becomes invalid, draw a line through Sections A – E and write "VOID" in large letters. <b>Revocation of MOST</b><br>This MOST may be revoked by the patient or the patient's representative. |                                 |  |   |
| <b>Review of MOST</b>   |                                 |  |   |
| Review Date   | Reviewer and Location of Review | MD/DO, PA, or NP Signature (Required)  | Signature of Patient or Representative (Required) Outcome of Review   |
|   |                                 |  | <input type="checkbox"/> No Change<br><input type="checkbox"/> FORM VOIDED, new form completed<br><input type="checkbox"/> FORM VOIDED, no new form |
|   |                                 |  | <input type="checkbox"/> No Change<br><input type="checkbox"/> FORM VOIDED, new form completed<br><input type="checkbox"/> FORM VOIDED, no new form |
|   |                                 |  | <input type="checkbox"/> No Change<br><input type="checkbox"/> FORM VOIDED, new form completed<br><input type="checkbox"/> FORM VOIDED, no new form |
|   |                                 |  | <input type="checkbox"/> No Change<br><input type="checkbox"/> FORM VOIDED, new form completed<br><input type="checkbox"/> FORM VOIDED, no new form |
|   |                                 |  | <input type="checkbox"/> No Change<br><input type="checkbox"/> FORM VOIDED, new form completed<br><input type="checkbox"/> FORM VOIDED, no new form |
|   |                                 |  | <input type="checkbox"/> No Change<br><input type="checkbox"/> FORM VOIDED, new form completed<br><input type="checkbox"/> FORM VOIDED, no new form |
| <b>SEND FORM WITH PATIENT/RESIDENT WHEN TRANSFERRED OR DISCHARGED</b>   |                                 |  |   |
| <b>DO NOT ALTER THIS FORM!</b>  |                                 |  |   |
|  NCDHHS/DHSR/DHSR/EMS 1112 Rev. 10/07  |                                 | North Carolina Department of Health and Human Services  |   |

## Patient without a Protocol

(NCCEP Disposition-6)

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### Introduction

- \* Purpose
  - To ensure any person requesting EMS services will receive a professional evaluation, treatment, and transport regardless of complaint or condition
  - To ensure provision of medical care for every patient

### Indication

- \* Patient encounter does not fit into existing MEDIC patient care protocol

### Medical Care

1. [Universal Patient Care Protocol](#)
2. Contact Medical Control for further management direction

## Physician On-Scene

## (NCCEP Disposition-7)

### Introduction

- \* To establish guidelines for medical control when a physician is present on scene
  - To ensure the patient receives the maximum benefit from EMS
  - To minimize liability of the EMS system and the on-scene physician
- \* The Mecklenburg EMS Agency Medical Director is primarily responsible for overall patient care in the field
- \* For individual cases, the on-line medical control physician takes partial responsibility
- \* Occasionally, a physician will be present on the scene of a call
  - This circumstance may cause confusion, uneasiness, and medicolegal considerations
  - Two situations are potentially possible in this setting
    - The physician who knows the patient and has formally established a doctor-patient relationship
    - The physician who does not know the patient
    - Each case presents different physician responsibilities

### Management – Physician **WITH** established physician–patient relationship

1. Interfacility transfer, physician private office/clinic, urgent care center
2. MEDIC personnel will assess and manage the patient upon arrival to scene
3. **MEDIC personnel may follow physician's** orders as long as the crew is comfortable with treatment plan and the crew does not violate standing written protocols or violate the **crew members' scope of practice**
  - A. If crew is uncomfortable with any of the **on-scene physician's recommendations** the medical control physician should be contacted for verification of orders and/or direct physician to physician contact
  - B. If orders deviate from standard written protocols the on-scene physician must agree to accompany the patient in the ambulance to the destination facility
4. Crew will confer with patient and physician together to determine/confirm patient destination **prior** to departing the hospital, private office/clinic, or urgent care
  - A. Crew will confer with patient and physician together to determine/confirm patient destination prior to departing hospital, ED, private office, urgent care, or clinic
  - B. If the patient changes their destination decision after departing the hospital/office/clinic/urgent care contact must be made with the facility immediately to discuss the **patient's requested change of destination**
  - C. If accepted by the referring staff, the original destination facility (if previously made aware of and expecting the patient), must also be notified of **the patient's requested change**
  - D. If patient condition changes while enroute such that it necessitates a change in destination, this also must be immediately communicated (e.g. patient develops ST-segment elevation in route necessitating diversion to a PCI capable hospital)
5. **Medic personnel will refrain from persuading a patient's destination decision**
6. Physician giving orders must sign the PCR or appropriate Physician Order Sheet

**Management – Physician WITHOUT established physician–patient relationship**

1. Scene responses
2. Physician must be **given “On-Scene Physician” card**
3. Physician must show proof of North Carolina Medical License Identification Card
4. Physician must sign documentation of accepting medical control of the patient
5. Crew should record 5-digit medical license number or 5-digit registration number
6. The physician must be approved by on-line medical control physician
7. The physician must accompany the patient to the hospital
8. Orders given by the on-scene physician may be followed as long as they do not violate **the crew members’ scope of practice**
9. All orders must be signed by the physician
10. Destination decision will be based on patient preference following destination protocol

**Additional Considerations**

- \* All orders from Medical Control will supersede any on scene physician orders
- \* In the event of mass casualty events, an on-scene physician may be best utilized at the scene and does not need to accompany any individual patient(s) to the hospital
- \* Any on-scene physician who otherwise refuses to accompany the patient to the hospital will immediately relinquish any medical control
- \* CMC PGY-1 residents riding with MEDIC may NOT assume on-scene medical control
- \* CMC PGY-2, PGY-3, or higher residents riding with MEDIC, may assume on-scene medical control (5-digit license number does not need to be recorded but the physician should be listed on the PCR)
  - An on-scene resident will not decide patient destination – destination will follow standard destination decision protocol

Mecklenburg Emergency Medical Services Agency would like to thank you for your time and assistance. As a licensed Medical Doctor in the state of North Carolina, you may assume control of patient care activities. In order to do so, **ALL** the following must be satisfied:

You **MUST** show proof of current North Carolina licensure to the paramedics

You **MUST** accompany the patient to the hospital


You **MUST** carry out all orders that are not part of the paramedic's training

You **MUST** assume complete medico legal responsibility for all patient care activities until such time that care is formally transferred to another physician at the receiving hospital

During transport, the medical control physician must be notified about you assuming control. It is recommended that communication be established between the medical control physician and yourself directly. The medical control physician may supersede at any time in the prehospital setting.



## Physician On-Scene (NCCEP/NC OEMS Form)

|   |  |
|---|--|
|    | <h3>On-Scene Physician Form</h3>                           |
| <p>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:</p>   |  |
| <ol style="list-style-type: none"> <li>1. Receive approval to assume the patient's medical care from the EMS Agencies Online Medical Control physician.</li> <li>2. Show proper identification including current North Carolina Medical Board Registration/ Licensure.</li> <li>3. Accompany the patient to the hospital.</li> <li>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.</li> <li>5. Sign all orders on the EMS Patient Care Report.</li> <li>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.</li> <li>7. Complete the "Assumption of Medical Care" section of this form below.</li> </ol> |  |
| <h3>Assumption of Medical Care</h3>   |  |
| <p>I, _____, MD; License #: _____<br/> <b>(Please Print your Name Here)</b></p>   |  |
| <p>have assumed authority and responsibility for the medical care and patient management for</p>  |  |
| <p>_____<br/> <b>(Insert Patient's Name Here)</b></p>   |  |
| <p>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.</p>  |  |
| <p>_____, MD Date: ____/____/____ Time: ____AM/PM<br/> <b>(Physician Signature Here)</b></p>  |  |
| <p>_____, EMS<br/> <b>(EMS Lead Crew Member Signature Here)</b></p>   | <p>_____, Witness<br/> <b>(Witness Signature Here)</b></p> |
| <p><b>Appendix B</b></p>  |  |

## EMS Documentation and Data Quality

## (NCCEP Documentation-1)

### Introduction

- \* A Patient Care Report (PCR) will be completed for all patient encounters by MEDIC
- \* A PCR will be completed for any patient not transported by MEDIC but with whom MEDIC provided any evaluation or treatment
- \* The PCR shall be completed immediately following delivery of the patient to the destination facility
- \* A completed PCR shall always be left with the receiving nurse or physician (provided to nurse when they sign for receiving the patient and report)
  - Exception:
    - System resources in critical demand & need for unit to be returned to service prior to delivery of the patient care report
    - Requires approval of the on-duty Operations Supervisor
    - Must be communicated to the receiving nurse or physician
    - PCR must be submitted to destination hospital prior to the end of shift
  - If PCR cannot be left with receiving personnel due to extenuating circumstances, a full verbal report must be provided and PCR faxed as soon as possible

### Management

- \* The PCR will be completed utilizing ***SIREN PCR Suite***
- \* The PCR will include (at a minimum):
  - System data and crew information
  - Dispatch information
  - Patient demographic information
  - Care provided prior to MEDIC arrival
  - All times related to the call
  - Pertinent history of present illness/injury
  - Past medical history, medications, allergies
  - Vital signs
  - Patient assessment as per specific complaint-based protocol
  - Procedures performed (timed)
  - Treatment administered including **medications and patient's response (timed)**
  - Patient reassessment
  - Disposition facility
  - Receiving personnel
  - Any communication with medical control
  - MD signature for any orders received beyond standing protocols
  - Disposition of any patient belongings
  - Copy of **any rhythm strips, ECG's, invasive or non-invasive monitoring**
  - **Care providers' signatures**

**Documentation Pearls**

- \* Intubation
  - Indication
  - Number of attempts
  - Methods of confirmation
  - Vital signs pre-& post
- \* Defibrillation/Cardioversion
  - Pre-shock rhythm
  - Energy delivered
  - Post-shock rhythm
  - Patient response
- \* Pacing
  - Indication
  - Millivolts
  - Rate
  - Vital signs
- \* Medication administration
  - Indication
  - Dose
  - Route
  - Patient response
- \* Fracture immobilization
  - Injury
  - Method
  - PMS pre-immobilization
  - PMS post-immobilization
- \* Electrocardiograms (12-lead)
  - Rhythm
  - Rate
  - Nodal or bundle branch blocks
  - ST-segment or T-wave changes
- \* Cardiac arrest
  - Initial rhythm
  - Treatment
  - Any rhythm changes
  - Final rhythm
  - ETCO<sub>2</sub>
- \* Patient refusal of treatment/transport
  - **Confirmation of patient's** decision-making capacity
  - Explanation of risks and benefits
  - **Confirmation of patient's understanding** of risks and benefits
- \* Glucose, pulse oximetry, ECG as indicated

**Additional Considerations**

- \* Each medical crewmember involved in the patient's transport is responsible for content and completion of the PCR
- \* Personnel should only sign the PCR after having reviewed content for completeness
- \* An EMS Data Score will be calculated on each PCR as it is electronically processed into the North Carolina Pre-Hospital Medical Information System (PreMIS) with a best possible score of 0 (zero) and with each data quality error a point is added to the data quality score
- \* The PCR must be electronically submitted to the PreMIS System with 24 hours of the patient encounter
- \* All patients will have a dispatch signal assigned by CMED based on caller information
- \* Following patient disposition, one or more retrocodes will be assigned by provider
  - The primary retrocode will be the most significant clinical condition
  - Primary impressions specifics will be documented
  - Secondary presumptive diagnoses that may have contributed to the primary retrocode may be assigned as appropriate
- \* If patient experiences pulselessness at any time prior to transfer of care at the hospital, even if resuscitated, encounter should be retrocoded as: **Signal 9 Cardiac Arrest**
- \* If patient experiences a code STEMI, encounter should be retrocoded as: **Signal 19 Heart Problems (STEMI)**



## Documentation of Vital Signs

## (NCCEP Documentation-2)

### Introduction

- \* Every patient encounter by MEDIC will be documented
- \* Vital signs will be recorded for every patient encounter
- \* If patient refuses to allow vital sign measurement; this must be documented in the PCR along with **statement of the patient's capacity to refuse**

### Medical Care

1. Initial set of vital signs to include:
  - A. Heart rate
  - B. Blood pressure
  - C. Respiratory rate
  - D. Pulse oximetry
  - E. Glasgow coma score
2. Additional vital signs as indicated per patient complaint and/or condition
  - A. Temperature
  - B. Pain score
  - C. ETCO<sub>2</sub>
3. Reassess vital signs at **a frequency dictated by the patient's condition**
  - A. Minimum vital signs must be recorded every 5 minutes on all Priority-1 patients
  - B. Minimum, vital signs must be recorded every 10 minutes on all Priority-2 patients
  - C. Minimum vital signs must be documented every 15 minutes on Priority-3 patients
  - D. At a minimum, vital signs must be documented at the initiation and end of the transport for scheduled non-emergency transport patients
4. Times vital signs are obtained must be documented

### Additional Considerations

- \* Use of automated NIBP measurements is permitted provided:
  - The first set of vital signs will include a manual blood pressure
  - The manually BP obtained should be utilized to verify the automated BP reading
  - Any discrepancy between the manual and automated must be re-verified with repeat manual blood pressure measurement
  - For continued discrepancy between manual and automated measurements it is paramount the provider consider the clinical presentation
    - Providers must always avoid relying on potentially falsely elevated automated readings if readings do not correlate with manual measurement
- \* Patient care provider must use sound clinical judgment in patient assessment and need to verify NIBP blood pressure measurements and repeat manual blood pressure assessment as indicated

## EMS Dispatch Center Time

## (NCCEP EMS Dispatch 1)

### Introduction

- \* Definition
  - Time interval beginning with the time the initial 911 call is received by CMED and ending with the dispatch time of the responding MEDIC unit
- \* Purpose
  - To provide the safest and most appropriate level of response to all EMS events
  - To provide timely/reliable response for all EMS events
  - To provide quality EMS service
  - To provide for continuous quality assurance

### Procedure

- \* All 911-calls will be managed by certified EMD personnel
- \* All 911-calls will be managed according to Medical Priority Dispatch System guidelines
- \* The points of accreditation delineated by the International Academy of Emergency Dispatch will be utilized for ongoing quality assurance
- \* MEDIC and First Responder units will be dispatched according to sub-determinants per MPDS call taking
- \* MEDIC and First Responder units will respond as dispatched (lights & siren or NO lights & siren) immediately upon dispatch
- \* Dispatch priority may be changed once in route if:
  - CMED call taker determines patient condition has changed warranting an upgrade or downgrade in the response mode
  - Public safety personnel on-scene request an upgrade or downgrade based on patient condition
- \* Units responding to Echo or Delta level calls will NOT be diverted to alternate calls
- \* Units responding to Charlie, Bravo, or Alpha level calls may be diverted to higher priority calls if:
  - Instructed to do so by CMED personnel
  - An alternate unit is immediately dispatched to the original lower priority call
- \* Any time delays resulting in a prolonged EMS dispatch time will be documented in the PCR as an **"EMS Dispatch Delay"** as defined by the North Carolina College of Emergency Physicians EMS Dataset Standards Document

### Additional Considerations

- \* Once dispatched, MEDIC and First Responder units will respond as dispatched (Alpha, Bravo Cold, Bravo Hot, Charlie, Delta, or Echo) without question or hesitation

## Children with Special Healthcare Needs

(NCCEP Pediatric 1)

### Indication

- \* Care of children with special healthcare needs
- \* Unique medical condition(s)
- \* Specialized medical equipment

### Medical Care

1. When appropriate MEDIC personnel may contact a **child's physician for assistance with specific conditions or devices associated with the patient**
  - A. Care must remain within the providers scope of practice
2. **Patient's care providers may be used as an asset in assisting with specialty patient specific equipment**
3. Additional care as per the appropriate protocol

### Additional Considerations

- \* **Any interaction with the child's physician must be clearly documented on the PCR**
- \* Any request outside MEDIC protocols must remain within the providers scope of practice and be approved by Medical Control
- \* Contact Medical Control for any question as to the most appropriate course of care

## Infant Abandonment

(NCCEP Pediatric 2)

### Introduction

- \* 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
- \* Purpose
  - Protect infants that are placed into the custody of EMS under this law
  - Protect EMS systems and personnel when confronted with this issue

*"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 to 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."*

### Medical Care

1. Assure patient safety
2. [Pediatric Assessment Protocol](#)
  - A. [Newly Born Protocol](#) as applicable
3. Additional care per appropriate protocol
4. Notify CMPD
5. Contact the **Mecklenburg County Department of Social Services**
  - A. **(704) 336-2273**
6. Report any suspicious finding(s) to destination facility / receiving personnel
7. Transport infant to appropriate medical facility

## Child Abuse Recognition & Reporting

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### Indications

- \* Promote the recognition and reporting of child abuse to improve the safety of children
- \* Protect the child from harm
- \* Suspect the child may be a victim of abuse
- \* Collect as much information as possible

### Definition

- \* Child abuse is the physical, mental, sexual abuse or the negligent or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare

### Medical Care

1. Assess for characteristics of abuse
  - A. Fearful behavior
  - B. Excessive aggression
  - C. Excessive crying
  - D. Inappropriate interactions with person responsible for the child
2. Assess for physical signs of abuse
  - A. Injuries inconsistent with the history provided
    - i. Fractures in children < 2 years of age
  - B. Inconsistent history as to the mechanism of injury
    - i. **Mechanisms of injury inconsistent with the child's age / development**
  - C. Injuries in multiple stages of healing
  - D. Evidence of multiple prior injuries
3. Assess for signs of neglect
  - A. Absence of caregivers
  - B. Inadequate hygiene
  - C. Inappropriate clothing for current weather
  - D. Malnutrition
4. Move patient to safe location
5. Assessment and specific treatment per appropriate protocol
6. When abuse is suspected, ensure documentation of scene and clinical conditions
7. Insist on hospital transport & notify police as soon as possible
8. Report any suspicion of abuse to the receiving facility physician and nursing staff
9. Report any suspicion of abuse to Department of Social Services (DSS)

### Additional Considerations

- \* There is a legal requirement to report any suspicion of child abuse to **DSS**
  - **(704) 336-2273**
  - The prehospital provider is required to report suspicion of child abuse directly to DSS as well as inform the receiving provider and record report in the PCR
- \* Neglect is the most common form of abuse

## Domestic Violence Recognition and Reporting

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### Definitions

- \* Domestic (Spousal) abuse
  - Physical, sexual, or psychological abuse and/or intimidation which attempts to control another person in a current or former family, dating, or household relationship
- \* Elder abuse
  - Physical, sexual, psychological abuse or negligent treatment or maltreatment of a senior citizen by another person

### Medical Care

1. Ensure scene safety
2. Move patient to a safe location
3. Protect the patient from harm
4. Assess for psychological characteristics of abuse
  - A. Excessive passivity
  - B. Fearful behavior
  - C. Excessive aggression
  - D. Violent tendencies
  - E. Excessive crying
  - F. Behavioral disorders
  - G. Substance abuse
  - H. Repeated EMS requests
5. Assess for physical abuse
  - A. Defensive wounds
  - B. Injuries inconsistent with history / mechanism of injury
  - C. Multiple injuries in varying stages of recovery
  - D. Injuries during pregnancy
6. Assess for signs of neglect
  - A. Inadequate hygiene
  - B. Inappropriate clothing for weather conditions
  - C. Malnutrition
7. When abuse is suspected, ensure documentation of scene and clinical conditions
8. Insist on hospital transportation & notify police as needed
9. Report any suspicious finding(s) to destination facility / receiving personnel
10. Ensure contact with DSS for cases of suspected elder abuse or neglect
  - A. **Mecklenburg County Department of Social Services (704) 336-2273** to report the suspicion (there is a requirement to report elder abuse)

### Additional Considerations

- \* Suspect the patient may be victim of abuse if the injury / illness presentation is not consistent with the reported history
- \* Geriatric and child abuse have mandatory reporting laws for EMS personnel in North Carolina; however, it is not mandatory to report spousal abuse
- \* Questioning or screening patients of suspected spousal abuse is best performed in a safe environment away from any family members or other significant friends

## Non-Fatal Strangulation

---

### Introduction

- \* Strangulation definition: form of asphyxia caused by closing of the blood vessels and/or air passages of the neck as a result of external pressure applied
- \* Symptoms:
  - Anxiety
  - Depression
  - Difficulty breathing
  - Difficulty swallowing
  - Dizziness
  - GE reflux
  - Headache
  - Insomnia
  - Lightheadedness
  - Loss of consciousness
  - Loss of sensation
  - Memory problems
  - Miscarriage
  - Neck pain
  - Sore throat
  - Suicidal Ideation
  - Tinnitus
  - Urinary incontinence
  - Vision change
  - Voice change
- \* Physical exam findings:
  - Altered mental status
  - Aphonia
  - Crepitus
  - Dysphagia
  - Dysphonia
  - Epistaxis
  - Facial droop
  - Focal weakness
  - Ligature contusions/burns
  - Neck abrasions
  - Neck swelling
  - Neck tenderness
  - Odynophagia
  - Paralysis
  - Petechiae
  - Respiratory distress
  - Urinary incontinence
  - Voice changes

**Medical Care**

1. Ensure scene safety
  - A. It may be necessary to remove the patient from the surrounding area to a more protective and supportive environment
  - B. Ensure police are dispatched to the scene
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Maintain airway
  - A. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
4. [Spinal Motion Restriction Protocol](#) as per patient history and presentation
5. Assess vital signs
6. Supplemental oxygen as indicated per patient condition to maintain SpO<sub>2</sub> = 94 – 97%
7. Control any active bleeding sites with manual direct pressure and/or pressure dressing
8. Additional treatment as per appropriate protocol
9. If a sexual assault has occurred, do not allow patient to shower or change clothes
10. Encourage transport for Forensic Nurse Evaluation at the emergency department

**Additional Considerations**

- \* Victims of prior strangulation are 750% more likely of becoming a homicide victim
- \* #2 risk factor for domestic violence homicide from the *Danger Assessment*: has the abuser ever tried to strangle (choke) the victim
  - #1: has the abuser ever used or threatened to use a gun
- \* Pressure to occlude neck structures:
  - Jugular vein: 4 psi
  - Carotid artery: 11 psi
  - Trachea: 34 psi
- \* Comparison pressures requirements:
  - Handgun trigger pull: 6 psi
  - Opening a soda can: 20 psi
  - Adult male handshake: 80-100 psi
  - Adult male max handshake: 160-180 psi
- \* 50% of victims have no visible injury
  - Another 35% have injuries too minor to photograph
- \* Documentation should be limited to brief history of the event objective physical findings
- \* If patient refuses transport
  - Documentation will need to include more detailed account of events including
    - Type of strangulation - manual/ligature
      - Hands (one or both); Arm (choke hold)
      - Ligature device used
    - Patient's complaints
    - Detail of exam findings
  - Police should provide business card for follow-up (Care Ring – Children & Family Services Center) information



## Human Trafficking Victim Recognition and Reporting

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### Indications

- \* Promote the recognition and reporting of human trafficking to improve the safety of potential victims
- \* Maintain awareness that patient may be the victim of human trafficking
  - Includes: sexual exploitation, forced labor, slavery, removal of organs

### Definition

- \* The trade in humans, most commonly for the purpose of sexual slavery, forced labor or commercial sexual exploitation induced by force, fraud, or coercion

### Human trafficking considerations

- \* North Carolina is ranked as a top-10 state for human trafficking
  - Charlotte is considered the top destination as it is located at the junction of two major interstates with a direct route from shipping ports and is home to an international airport
- \* National Center for Missing & Exploited Children estimates 1 in 7 reports on endangered runaways probably involves victims of sex trafficking

### Potential indicators

- \* Someone else is speaking for the patient
  - Inconsistencies in story; story does not match injuries
- \* Patient is not aware of his/her location, the current date, or time
- \* Patient exhibits fear, anxiety, PTSD, submission, or tension
- \* Patient shows signs of physical/sexual abuse, medical neglect, or torture
  - Evidence of violence/physical abuse
- \* Patient is reluctant to explain his/her injury
- \* Hypervigilance, paranoia, fear, anxiety, depression, submission, nervousness
- \* Addiction/substance abuse; long-term antibiotic use
- \* Disorientation about time or location
- \* **Tattoos or branding (may indicate "ownership")**
- \* Environmental factors
  - Hotel with doors to the outside, multiple females in a room, security designed to keep people in (locks on outsides of interior doors)
- \* Pelvic, vaginal or rectal trauma
- \* STDs, urinary tract trauma/infections/mutilations from bad procedures
- \* Chronic untreated health problems

**Medical Care**

1. Ensure scene safety
2. [Medical Initial Assessment Protocol](#) or [Trauma Initial Assessment Protocol](#)
3. Assess vital signs
4. Move patient to a location to speak with them alone and not be overheard
5. Ask the following questions (when in private location; away from others on scene):
  - A. Have you been forced to engage in sexual acts for money or favors?
  - B. Is someone holding your passport or identification documents?
  - C. Has anyone threatened to hurt you or your family if you leave?
  - D. Has anyone physically or sexually abused you?
  - E. Do you have a debt to someone you cannot pay off?
  - F. Does anyone take all or part of the money you earn?
6. If answer is "yes" to any of the above questions, notify CMED
7. Consider location for PD response (hospital or incident location)
8. Additional treatment as per appropriate protocol
9. When human trafficking is suspected ensure documentation of scene and clinical conditions
10. Report any suspicion of human trafficking to the **National Human Trafficking Resource Center:**
  - A. Phone: **888-373-7888**
  - B. Text: **233733**
11. Report any suspicion of human trafficking to the receiving physician and nursing staff
  - A. If transporting to CMC:
    - Page the human trafficking counselor @ pager #5180 upon transfer of the patient

**Additional Considerations**

- \* Traffickers are master manipulators who convince their victims they cannot survive without them
  - Victims are sometimes allowed to roam freely without the traffickers worrying they will say anything to anyone
  - This is especially the case when traffickers have threatened to harm the victim or their family if they dare speak up
  - **Some traffickers carry out violence against victims' families to convince them of their control over their lives**
- \* Majority of victims tend not to self-identify as victims due to the trauma they've endured
- \* Additional resources
  - Department of Homeland Security: **866-347-2423**
  - National Center for Missing & Exploited Children: **800-843-5678**
  - Federal Bureau of Investigation: **800-225-5324**

## EMS Back in Service Time

## (NCCEP Service Metric-1)

### Introduction

- \* Definition
  - Time interval beginning with the time the transporting MEDIC unit arrives at the destination facility and ending with the time the unit checks back in service
  - Turn-around-time
- \* All MEDIC units transporting a patient to a medical facility shall transfer the care of the patient and complete the 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
- \* Purpose:
  - Assure that each transport occurs in a timely manner
  - Assure that each transport vehicle is available for the next mission in a timely manner
  - Assure that at a minimum an interim PCR is left at the receiving medical facility
  - To provide for continuous quality assurance

### Procedure

1. Upon arrival to the receiving facility, transfer of care will be performed as soon as possible
2. Personnel will provide a verbal report to receiving staff
3. An PCR will be completed at the receiving emergency department and a printed copy left with the receiving personnel
4. A PCR will be completed as soon as possible but that completion should not cause a delay in the EMS Back in Service Time
5. Any significant delay in EMS Back in Service Time will be documented in the PCR as per the North Carolina Performance Improvement request completed
6. Any 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 College of Emergency Physicians (NCCEP) EMS Dataset Standards Document**

### Additional Considerations

- \* EMS Unit should be cleaned, disinfected, and restocked during this time interval

## EMS Turn-out Time

## (NCCEP Service Metric-2)

### Introduction

- \* Definition
  - Time interval beginning with the time CMED dispatches the responding unit to a specific event and ending with the time the EMS unit is enroute to the scene
- \* Purpose
  - To ensure a timely/reliable response for all EMS events
  - To provide quality EMS service
  - To provide for continuous quality assurance

### Procedure

- \* MEDIC and First Responder units will initiate response to the scene within 60 seconds of dispatch 90% of the time
- \* The points of accreditation delineated by the International Academy of Emergency Dispatch will be utilized for ongoing quality assurance
- \* MEDIC and First Responder units will be dispatched according to sub-determinants per MPDS call taking
- \* If any unit fails to check enroute within 2:59; the next available EMS unit will be dispatched
- \* Any **"turn-out" time** delay will be documented in the PCR as an **"EMS Response Delay"** as defined by the North Carolina College of Emergency Physicians (NCCEP) EMS Dataset Standards

## Poison Control Center

## (NCCEP Toxic Environmental-1)

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### Indications

- \* Assistance via the poison center with patients who have potential or actual poisoning
- \* Purpose
  - Improve care of patients with poisonings, envenomations, or chemical/biological exposures
  - Integrate the state poison control center into response for hazardous materials

### Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Assess vital signs
3. [Overdose / Toxic Ingestion Protocol](#)
4. If no immediate live threat or transport need identified crew may contact the Carolinas Poison Control Center (State Poison Control Center)
  - A. **(704) 355-4000**
  - B. **(800) 222-1222**
5. Poison Specialist may be utilized as a resource for treatment and/or transport recommendations
6. Contact Medical Control for direction as necessary

### Additional Considerations

- \* Information for Poison Center Specialist
  - Name & age of patient
  - Ingestion or exposure agent
  - Time of ingestion or exposure
  - Amount of ingestion or exposure
  - Signs and symptoms present
  - Previous treatment provided
- \* Maintain high index of suspicion that more than one agent may be involved in intentional overdoses

## Air Transportation

## (NCCEP Transport-1)

### General

- \* Air transportation should be utilized whenever patient care can be improved by decreasing transport time or by providing advanced care not available from ground EMS
- \* The flight service at Carolinas Medical Center (MedCenter Air) has 4 rotor wing aircraft
  - American Eurocopter EC-135 type helicopters
  - Crew configuration consists of either RN/RN, RN/RRT, or RN/Paramedic
  - Helicopters are based in Rock Hill, SC, Concord, NC, Hickory, NC, and Wadesboro, NC
  - If closest MCA aircraft is not readily available to respond, MCA Dispatch will arrange for the next closest available aircraft to respond (may be a non-MCA aircraft)

### Considerations for Air Medical Transport

- \* Unstable Priority-1 patient with potential prolonged transport time (> 20 minutes)
- \* Potential prolonged extrication time (> 10 minutes) and potential for significant injuries
- \* Any patient whose mechanism of injury or primary assessment imparts the potential for sustaining multi-system organ damage such that early operative intervention may be life-saving, or whose condition has the potential for rapid deterioration as manifested by unsecured airway or unstable vital signs
- \* Multiple casualty incident, only if Priority-1 and/or 2 patients are triaged
- \* Time dependent medical conditions (e.g. STEMI) with prolonged/delayed ground transport
- \* Any patient where the location, time of day, traffic conditions, etc. may cause a delay in transport time from the scene to the hospital

### Personnel Requirements for Activation

- \* Any first responder physically present on the scene of an accident or injury, and after an initial patient assessment may request the helicopter if criteria are met as stated above
- \* Any member of the responding MEDIC crew, either enroute to the scene or after arrival
- \* The Medical Director, EMS Fellow, Operations Supervisor, or administrative staff

**Activation Procedure**

1. After determining that the helicopter is needed, notify CMED
  - A. The flight service will be notified, along with the appropriate fire department
  - B. No other information is necessary at that time
2. MEDIC crew will be notified as to the status of the helicopter
  - A. Available and responding, available in \_\_\_\_ time, or unavailable due to weather, mechanical conditions, or other reason
  - B. MedCenter Air will contact other agencies as indicated if no MCA asset available
3. Continue to provide patient care until such time that the helicopter arrives
4. Landing zone designation, preparation, and notification is the responsibility of the responding fire department
  - A. If patient care activities are stable and time permits, evaluating the landing zone yourself is advisable
  - B. If the designated landing zone appears to be a dangerous threat to anyone on the ground or the flight team, express those concerns to the fire incident commander

**Personnel Requirements for Deactivation**

1. Medic Crew Chief after patient evaluation
2. Operations Supervisor or administrative staff personnel at any time
3. The Medical Director or EMS Fellow at any time

**Landing Zone Requirement**

- \* All landing zones should be on a solid and flat surface, clear of potentially loose debris, and located approximately 200 yards from the scene of the accident
- \* There should be no obstacles or obstructions within the zone, such as trees, telephone/power poles, light poles, vehicles, landing zone personnel, etc.
- \* Dimensions daytime and nighttime: 100-feet x 100-feet area minimum

## Patient Preparation

- \* The patient should be prepared as usual
- \* The patient should have at least one intravenous line initiated prior to departure
- \* The flight team will need some patient information before arrival
  - Weight
  - Airway status
  - Obvious injuries
- \* Upon arrival, the flight team will approach the scene (if safe to do so) or ambulance and request a patient report or begin their assessment
- \* Prehospital personnel should never approach the helicopter without supervision or approval from the helicopter pilot
- \* Both crews (MEDIC and flight) should work as a team to maximize patient care
- \* If the patient has not been prepared for transport by the time the flight team arrives, the paramedic may wish to have the flight personnel assist with this activity
- \* If the patient is prepared for transport and the helicopter has not landed, the paramedic may choose to transport by ground and cancel the helicopter
- \* The flight team has the authority to use paralytics for intubation purposes
- \* When airway issues arise, and airway management is difficult, it may prove beneficial to wait a reasonably brief time until the flight team arrives to attempt intubation using drug assisted intubation medications
  - This may be especially important for patients with suspected head trauma
  - If such patients are already loaded into the ambulance and ready for departure, it is acceptable to have the flight team accompany MEDIC personnel and the patient in the ambulance for ground transport

## Additional Considerations

- \* Cardiac arrest, either from medical or traumatic conditions, is a contraindication for activation as effective CPR cannot be performed in the helicopter during transport



## **Safe Transport of Pediatric Patients**

**(NCCEP Transport-2)**

### **Indications**

- \* All occupants being transported must be properly restrained
- \* Children must be restrained in an appropriately sized infant or child restraint seat
- \* Ensure pediatric trauma patients in spinal protocol are properly secured to stretcher
- \* Child restraint seats for air medical transport must be FAA approved
- \* Ensure child restraint seat is properly secured to vehicle mounting site

### **Management**

1. NEVER allow parents / caregivers to attempt to hold the patient during transport
2. Patients < 40 pounds must be restrained with an approved child restraint device secured appropriately to the stretcher or captain's chair

### **Additional Considerations**

- \* Secure all monitoring devices and other equipment
- \* Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle, whenever possible

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## **SECTION 3**

# **Clinical Patient Care Protocols**

## GLAZE

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### ***This protocol is dedicated to Paramedic Nash Glaze (1962-1999)***

#### **Introduction**

- \* All protocols are based on standard medical care under emergent, field conditions
- \* This protocol is to remind each of us that the patients we respond to and care for are human beings, each having their own unique set of morals, values, and inspirations
- \* When faced with difficult patients or situations, it is imperative that the prehospital provider at all levels demonstrate professionalism, tolerance, and most of all, respect for others
- \* Patients come from all walks of life, each with their own set of circumstances and backgrounds
- \* There is no place for judgmental attitudes or beliefs

#### **When Entering a Home**

- \* Refrain from comments concerning lifestyle, surroundings, or domestic quality
- \* Concentrate on the patient and their clinical situation; that is why you are there
- \* While you are a public servant, you are also a guest

#### **When Confronting a Patient**

- \* There is always an emergent complaint until proven otherwise
- \* Remember compassion and do not to lose your perspective
- \* Your attitude and behavior reflect the profession, the Agency, and you as a person

#### **When Interacting with Colleagues**

- \* Be considerate and respect other professions and work together to provide the best possible care for the patient in need
- \* Each member plays a specific and significant role
- \* Strive to build a prehospital care system that you and your community are proud of

#### **When Providing Care**

- \* Not all patients require intensive therapeutic interventions, medication administration, or invasive procedures
- \* The vast majority only require your attention, consideration, and concern for their health
- \* The following protocols and standing orders coupled with the qualities of respect, honesty, compassion, and integrity will guide each prehospital provider to deliver quality medical care inherent to the Mecklenburg EMS Agency

*... Nash Glaze exemplified each of these qualities*

## Initial Approach to the Scene

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1. Following the dispatch to a call, prior to arrival, the MEDIC crew should organize their approach upon arrival
2. It should be predetermined which crew member will perform the primary assessment and which will perform other duties
3. En route to scene, crew should consider differential diagnosis based on dispatch chief complaint and pertinent CAD notes
4. Depending on the nature of the incident, equipment and supplies will be carried to the patient
  - A. Medical incidents:
    - i. Airway supplies and oxygen
    - ii. Cardiac monitor/defibrillator
    - iii. Medications
    - iv. Stretcher
  - B. Trauma incidents:
    - i. Airway supplies and oxygen
    - ii. Basic Life support supplies
    - iii. Cardiac monitor/defibrillator
    - iv. Stretcher
5. When approaching the scene, each crew member should ensure safety for themselves (following OSHA policies and procedures)
6. An initial scene evaluation is vital to request the necessary personnel or resources required to properly manage the incident
7. Once safety and resources are verified, the patient is evaluated
8. If more than one patient is involved, a rapid triage assessment must be performed
  - A. It is a judgment as to which patient to evaluate first; patients appearing critical, either by mechanism of injury or external appearance, should take precedence
  - B. Regardless of patient number, an organized approach for a primary assessment should be consistent
9. When initially confronting any patient, the provider should always introduce themselves and provide reassurance
  - A. This is important, for it lets the patient know that you are a trained individual (not a bystander) who is experienced at dealing with these types of incidents
10. Following the introduction, the patient's chief complaint should be elicited
11. Patient evaluation should always be performed in a controlled environment conducive to privacy and protection
  - A. When patients are found outside, particularly pediatrics, they should be relocated and evaluated inside the ambulance if possible

## Universal Patient Care Protocol

**(NCCEP UP-1)**

### Objective

- \* To establish the basic assessment for all patient contacts

### Management

1. Ensure scene safety
2. Ensure proper personal protection equipment (PPE) following universal precautions
3. Ensure all appropriate equipment is brought to the patient
4. Obtain SAMPLE information
  - A. Signs/Symptoms
  - B. Allergies
  - C. Medications
  - D. Past Medical History
  - E. Last oral intake
  - F. Events leading to illness/injury
5. Assess per appropriate protocol
  - A. [Medical Initial Assessment Protocol](#)
  - B. [Trauma Initial Assessment Protocol](#)
  - C. [Pediatric Initial Assessment Protocol](#)
  - D. [Pediatric Trauma Assessment Protocol](#)
6. Assess mental status
7. Assess vital signs (frequency will depend on patient condition)
  - A. Heart rate
  - B. Blood pressure
  - C. Respiratory rate
  - D. Pulse oximetry
  - E. Glasgow Coma Score
  - F. Trauma score as indicated
  - G. Assess ECG rhythm
    - i. 12-lead ECG as indicated based on patient's presentation
8. Further care as per appropriate protocol as per patient history / presentation
9. For any doubt as to appropriate protocol contact Medical Control
10. For any questions regarding patient care contact Medical Control

### Additional Considerations

- \* Any patient contact must have a completed patient care report (PCR)

## Medical Initial Assessment

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### Airway

1. Assess airway patency
  - A. **Ask all patients: "How is your breathing?"**
    - i. Answer to the question (regardless of answer) notes open, patent airway
2. Open airway using standard maneuvers (head tilt/chin lift or jaw thrust) as indicated
3. Insert oral-pharyngeal airway or nasal-pharyngeal airway as indicated
4. Suction as needed to maintain open airway
5. Assess **patient's ability to protect airway** per [Airway Protocols](#)

### Breathing

1. Assess respiratory effort and rate
2. Assess breath sounds
  - A. Auscultate left & right
  - B. Auscultate anterior & posterior
3. Assess pulse oximetry
4. Administer supplemental oxygen as indicated (nasal cannula, face-mask, BVM) based on respiratory assessment, SpO<sub>2</sub>, **and patient's clinical status**

### Circulation

1. Assess presence and quality of pulses
  - A. Palpate radial, femoral, or carotid pulse (in order)
2. Control any gross hemorrhage by direct pressure
3. Assess skin color and level of consciousness
4. Obtain baseline vital signs and initiate continuous ECG monitoring as indicated
5. Assess need for intravenous access and fluid resuscitation

### Disability

1. Assess neurological status
  - A. Assess whether alert; responds to voice; response to pain; unresponsive
  - B. Assess GCS & if any focal neurological deficits

### Additional Considerations

- \* Obtain appropriate history from patient (and/or referring facility if interfacility transfer)
- \* Perform focused physical exam based on **patient's** history and presentation
- \* Additional care per appropriate patient care protocol
- \* Reassess patient throughout transport and adjust care as **indicated by patient's response**
- \* At any point there is a change in the **patient's condition restart reassessment**

## Trauma Initial Assessment

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### Airway

1. Assess airway patency
  - A. **Ask all patients: "How is your breathing?"**
    - i. Answer to the question (regardless of answer) notes open, patent airway
2. Open airway using standard maneuvers (jaw thrust) maintaining c-spine stabilization
3. Insert oral-pharyngeal airway or nasal-pharyngeal airway as indicated
4. Suction as needed to maintain open airway
5. **Assess patient's ability to protect airway per [Airway Protocols](#)**

### Breathing

1. Assess respiratory effort and rate
2. Assess breath sounds
  - A. Auscultate left & right
  - B. Auscultate anterior & posterior
3. Assess pulse oximetry
4. Administer supplemental oxygen as indicated (nasal cannula, face-mask, BVM) based on respiratory assessment, SpO<sub>2</sub>, **and patient's clinical status**
5. Intubate as condition indicates per [Intubation Protocol](#)

### Circulation

1. Control obvious hemorrhage with direct pressure or MEDIC approved tourniquet
2. Obtain baseline vital signs and initiate continuous ECG monitoring
3. Assess presence and quality of pulses
  - A. Radial pulse = SBP  $\geq$  80 mmHg
  - B. Femoral pulse = SBP  $\geq$  70 mmHg
  - C. Carotid pulse = SBP  $\geq$  60 mmHg
4. Assess skin color, distal capillary refill
5. Place large bore peripheral IV(s) (16 – 18 gauge) and assess need for fluid resuscitation

### Disability

1. Assess neurological status
  - A. Assess whether alert; responds to voice; response to pain; unresponsive
  - B. Assess GCS & if any focal neurological deficits
2. Institute spinal stabilization as indicated by mechanism of injury and physical exam

### Exposure

1. Remove appropriate amount of clothing to allow adequate inspection of patient
2. Protect patient from hypothermia



**Secondary Survey**

1. General
  - A. Abrasions
  - B. Burns
  - C. Contusions
  - D. Lacerations
  - E. Penetrating injuries
2. Head and face
  - A. Fractures
  - B. Lacerations
  - C. Otorrhea/rhinorrhea
  - D. Pupillary exam
  - E. Penetrating injuries
  - F. Swelling
  - G. Tenderness
3. Neck
  - A. Bony tenderness
  - B. Crepitus
  - C. JVD
  - D. Tracheal deviation
4. Chest
  - A. Breath sounds
  - B. Crepitus/emphysema
  - C. Penetrating injuries
  - D. Tenderness
5. Back
  - A. Bony deformity
  - B. Bony tenderness
  - C. Penetrating injuries
  - D. Swelling
6. Abdomen
  - A. Distension
  - B. Penetrating injuries
  - C. Seat belt contusions
  - D. Tenderness
7. Pelvis
  - A. Blood at urethral meatus
  - B. Bony tenderness
  - C. Bony instability
  - D. Crepitus
  - E. Penetrating injuries
  - F. Vaginal bleeding

8. Extremities
  - A. Bony deformities
  - B. Bony tenderness
  - C. Distal pulses
  - D. Motor/sensory exam
  - E. Penetrating injuries
9. Neurological
  - A. Glasgow coma score
  - B. Focal deficits (motor & sensory)

**Additional Considerations**

- \* Mechanism of injury
- \* Time of injury
- \* MVC:
  - Ejection/roll-over
  - Impact location
  - Location in vehicle
  - Restraint device use
- \* Stabilizing treatment performed
- \* IVF administration
- \* Medications – dose & time administered

## Pediatric Initial Assessment

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### Airway

1. Assess airway patency
2. Open airway using standard maneuvers (head tilt/chin lift, jaw thrust)
3. Insert oral-pharyngeal airway or nasal-pharyngeal airway as indicated
4. Suction as needed to maintain open airway
5. **Assess patient's ability to protect airway per [Airway: Pediatric Protocol](#)**

### Breathing

1. Assess respiratory effort and rate
2. Assess breath sounds
3. Assess pulse oximetry
4. Administer supplemental oxygen as indicated (nasal cannula, face-mask, blow-by, BVM) based on respiratory assessment, SpO<sub>2</sub>, and clinical status
5. Intubate as condition indicates per [Intubation Protocol](#) (age > 14 years only)
  - A. BVM or King-LT as indicated

### Circulation

1. Assess presence, quality of pulses, and capillary refill
2. Assess skin color and level of consciousness
3. Obtain baseline vital signs and initiate continuous ECG monitoring
4. Assess need for intravenous access and fluid resuscitation
5. **Consider two peripheral IV's (per Broselow-Luten tape or similar system) and initiate NS IVF (bolus or drip) as indicated**
6. Consider IO access early if unable to establish IV access

### Disability

1. Assess neurological status
  - A. Assess GCS (record lowest and current) or AVPU level of alertness
  - B. Assess for focal neurological deficits

### Additional Considerations

- \* Utilize Broselow-Luten tape or similar system to assist with equipment sizes and medication dosages
- \* Perform a focused physical exam based on patient's history
- \* **At any point there is a change in the patient's condition start reassessment at ABC's**
- \* Obtain blood glucose level if any altered mental status, suspected hypoglycemia, sepsis, seizure, or toxic appearing child

## Pediatric Trauma Assessment

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### Airway

1. Assess airway patency
2. Open airway using standard maneuvers (jaw thrust) maintaining c-spine stabilization
3. Insert oral-pharyngeal airway or nasal-pharyngeal airway as indicated
4. Suction as needed to maintain open airway
5. Assess patient's ability to protect airway per [Airway: Pediatric Protocol](#)

### Breathing

1. Assess respiratory effort and rate
2. Assess breath sounds
3. Assess pulse oximetry
4. Administer supplemental oxygen as indicated (nasal cannula, face-mask, BVM) based on respiratory assessment, SpO<sub>2</sub> as available
5. Intubate as condition indicates per [Intubation Protocol](#) (age > 14 years only)
  - A. BVM or King-LT as indicated

### Circulation

1. Assess presence and quality of pulses
2. Assess skin color
3. Obtain baseline vital signs and initiate continuous ECG monitoring
  - A. Systolic blood pressure should be  $70 + (2 \times \text{age in years})$
4. Assess need for intravenous access and fluid resuscitation
5. Consider largest appropriate sized peripheral IV(s) (per Broselow-Luten tape) and initiate NS as indicated
6. Control obvious hemorrhage with direct pressure

### Disability

1. Assess neurological status
  - A. Assess GCS (record lowest and current)
  - B. Assess for focal neurological deficits
2. Institute spinal stabilization as indicated by mechanism of injury and physical exam

### Exposure

1. Secondary survey as outlined previously in [Trauma Initial Assessment Protocol](#)
2. Remove appropriate amount of clothing to allow adequate inspection of potential injuries
3. Protect patient from hypothermia

## Airway: Adult

(NCCEP AR-1)

### Assessment

1. [Medical Initial Assessment Protocol](#) or [Trauma Initial Assessment Protocol](#)
2. Assess for ability to perform BVM ventilations (see addendum)
3. Assess for ability to perform endotracheal intubation (see addendum)
4. Assess for ability to utilize BIAD airway (see addendum)

### Basic Medical Care

1. Assess airway status and adequacy of respiratory effort
2. Relieve airway foreign body obstruction per [Airway: Foreign Body Obstruction Procedure](#)
3. Provide supplemental oxygen as required by patient condition
  - A. Goal is  $SpO_2 = 94 - 97\%$
4. Perform basic airway maneuvers as required by patient condition
  - A. Head tilt / chin lift
    - i. Must maintain c-spine motion restriction in trauma patients
  - B. Jaw thrust
  - C. Utilize nasal or oral pharyngeal airway as indicated per patient condition
5. Assistance with Bag Valve Mask as indicated per patient condition
6. Insert King LT per [Airway: BIAD-Protocol](#) as indicated

### Advanced Medical Care

1. Consider CPAP as indicated per patient condition
2. Perform intubation as required by patient condition per [Airway: Intubation Protocols](#)
  - A. Orotracheal intubation
  - B. Nasotracheal intubation
3. [Airway: Adult – Failed Protocol](#) as indicated
4. Utilize  $ETCO_2$  monitoring in any patient with a BIAD or ETT placed
5. Place orogastric tube in any patient with a BIAD or ETT placed
6. The receiving/destination facility must be notified of the status of any difficult airway or use of any advanced airway device

**Additional Considerations**

- \* Endotracheal intubation can be performed using a variety of techniques
  - Orotracheal
  - Blind nasotracheal
    - Reserved for patients with clear need of ETI and oropharyngeal access is not possible (e.g. massive angioedema of tongue/lips)
- \* Nasotracheal intubation is contraindicated in cases of:
  - Apnea
  - Cardiac arrest
  - Coagulopathy
  - Combative patient
  - Facial trauma
  - Severe head injury
  - Suspected foreign body in upper airway
  - Upper airway trauma
- \* Proper airway device positioning must be verified after each patient movement
  - To/from EMS stretcher
  - Loading/unloading from ambulance
- \* Maintain ETCO<sub>2</sub> 35 – 45 mmHg
  - Exception: clinical condition with significant metabolic acidosis (e.g. aspirin overdoses) in which a lower level is compensatory and required
  - Exception: clinical condition in which a permissive hypercapnia is beneficial to permit adequate exhalation time (e.g. asthma exacerbation)

## Airway Management: Adult (Addendum\*\*)

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### Indicators of difficulty to perform mask ventilation

- \* **R**adiation / **R**estriction (poor lung compliance)
  - Asthma, COPD
  - ARDS
  - Term pregnancy
- \* **O**besity / **O**bstruction / **O**bstructive sleep apnea
- \* **M**ask seal / **M**allampati
- \* **A** > 55 years
- \* **N**o teeth

### Indicators of difficult intubation

- \* **L**ook at head & neck for anatomical difficulties or injuries
- \* **E**valuate for 3-3-2
  - 3 fingers in oral opening
  - 3 fingers between hyoid and midline of jaw
  - 2 fingers from hyoid to thyroid cartilage
- \* **M**allampati
- \* **O**bstruction
- \* **N**eck immobility

### Indicators of difficult use of King LT device

- \* **R**estricted oral opening
- \* **O**bstruction or obesity
- \* **D**istorted airway anatomy
- \* **S**tiff lungs

\*\*adapted from *Manual of Emergency Airway Management 5<sup>th</sup> Edition* and *The Airway Course*

## Airway: Adult – Failed

**(NCCEP AR-2)**

### Definition

- \* Failed intubation = failed attempt(s) at intubation by ALS provider
- \* Failed airway = failure to intubate + failure to oxygenate / ventilate by any means

### Caveats

- \* A single failed attempt does not equate to a failed airway
  - BVM or supra-glottic device can be utilized to maintain  $\text{SpO}_2 > 90\%$
  - Any intubation attempt must cease when  $\text{SpO}_2$  falls to  $\leq 90\%$
- \* No one crew member shall make more than two (2) attempts at intubation
- \* No more than a total of three (3) attempts at intubation, shall be made by all paramedics on scene
- \* Consider cause(s) of failed attempt and make appropriate adjustments prior to next attempt at intubation
- \* Use of a rescue device may be performed at any time crew feels that further attempts would not result in endotracheal intubation and therefore this would be in the best interest of the patient
- \* Oxygenation / ventilation via BVM may be needed to maintain  $\text{SpO}_2 > 90\%$  between attempts at intubation

### Assessment

1. Can the patient effectively be oxygenated and ventilated with a BVM
2. Can BIAD be placed safely
3. Can intubation adjunct be utilized to assist in securing correct ETT placement

### Management

1. Following failed attempt at intubation, oxygenation / ventilation must be ensured
2. Place BIAD as per [Airway: BIAD-Protocol](#)
3. Airway may be managed with BVM alone if adequate oxygenation / ventilation ensured
4. Utilize  $\text{ETCO}_2$  continuous waveform monitoring in all patients with BIAD or ETT in place
5. Medical Control must be notified prior to arrival of any failed airway or failure to perform endotracheal intubation even if patient able to be well managed with BVM or King LT

### Additional Considerations

- \* Maintain  $\text{SpO}_2 \geq 90\%$
- \* Maintain  $\text{ETCO}_2$  35 – 45 mmHg
  - Exception: clinical condition with significant metabolic acidosis (e.g. aspirin overdoses) in which a lower level is compensatory and required
  - Exception: clinical condition in which a permissive hypercapnia is beneficial to permit adequate exhalation time (e.g. asthma exacerbation)



## Airway: Pediatric

**(NCCEP AR-5)**

### Assessment

1. [Pediatric Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
2. Assess for ability to perform BVM ventilations
3. Assess for ability to utilize supra-glottic device

### Basic Medical Care

1. Assess airway status and adequacy of respiratory effort
2. Provide supplemental oxygen as required by patient condition
3. Perform basic airway maneuvers as required by patient condition
  - A. Head tilt / chin lift
    - i. Must maintain c-spine motion restriction in trauma patients
  - B. Jaw thrust
  - C. Assistance with Bag Valve Mask

### Advanced Medical Care

1. Perform Intubation as required by patient condition per [Airway: Intubation Orotracheal Protocol](#)
  - Only for patients > 14 years of age
2. Place BIAD as per [Airway: BIAD Protocol](#)
3. Follow [Airway: Pediatric Failed Intubation Protocol](#) as indicated
4. Bag-valve-mask ventilation
5. Utilize ETCO<sub>2</sub> monitoring in any patient with a BIAD or ETT placed

### Additional Considerations

- \* Utilize Broselow-Luten tape for assistance with equipment size selection
- \* Basic airway maneuvers with proper technique BVM may be the preferred method of airway maintenance in many patients
- \* Blind nasotracheal is contraindicated in pediatric patients (< 16 years old)
- \* Maintain SpO<sub>2</sub> = 94 – 97%
- \* Maintain ETCO<sub>2</sub> 35 – 45 mmHg
  - Exception: clinical condition with significant metabolic acidosis (e.g. aspirin overdoses) in which a lower level is compensatory and required
  - Exception: clinical condition in which a permissive hypercapnia is beneficial to permit adequate exhalation time (e.g. asthma exacerbation)
- \* Ventilatory rates
  - Neonate = 30 per minute
  - Toddler = 25 per minute
  - Children = 20 per minute

## Airway: Pediatric – Failed

(NCCEP Protocol AR-6)

### Definition

- \* Failed intubation = failed attempt(s) at intubation by both crew members on scene
- \* Failed airway = failure to intubate + failure to ventilate (can't intubate/can't ventilate)

### Caveats

- \* A single failed attempt does not equate to a failed airway
- \* No one paramedic shall make more than two (2) attempts at intubation
  - Only patients > 14 years of age
  - No more than a total of four (4) attempts at intubation, shall be made by all paramedics on scene
  - Consider cause(s) of failed attempt and make appropriate adjustments prior to next attempt at intubation
- \* Use of a rescue device may be performed at any time crew feels that further attempts would not result in endotracheal intubation and therefore this would be in the best interest of the patient
- \* Oxygenation / ventilation via BVM may be needed to maintain  $SpO_2 > 90\%$  between attempts at intubation

### Assessment

1. Can the patient effectively be oxygenated and ventilated with a BVM

### Basic Medical Care

1. Following failed attempt at intubation, oxygenation / ventilation must be ensured, use of a BVM may be necessary
  - A. Maintain  $SpO_2 = 94 - 97\%$
  - B. Utilized nasopharyngeal or oropharyngeal airway as indicated
2. Place BIAD as per [Airway: BIAD Protocol](#)
3. Crew may elect to manage airway with BVM alone if adequate oxygenation / ventilation is ensured

### Additional Considerations

- \* Maintain  $SpO_2 = 94 - 97\%$
- \* Maintain  $ETCO_2 35 - 45$  mmHg
  - Exception: clinical condition with significant metabolic acidosis (e.g. aspirin overdoses) in which a lower level is compensatory and required
  - Exception: clinical condition in which a permissive hypercapnia is beneficial to permit adequate exhalation time (e.g. asthma exacerbation)

## Pain Control

(NCCEP UP-11)

### Objective

- \* To provide pain relief and reduce anxiety during transport

### Clinical Presentation

- \* Assess location of pain and pain severity
- \* Trauma vs. non-trauma related pain
- \* Acute vs. chronic
- \* Aggravating vs. alleviating factors

### Management

1. [Medical Initial Assessment Protocol](#) or [Trauma Initial Assessment Protocol](#)
2. [Pediatric Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Treat patient condition as per appropriate protocol
4. Assess patient's pain severity as per [Assessment: Pain Procedure](#)
5. Refer to specific medication on the following pages for dosing guidelines
6. It may be appropriate to contact Medical Control prior to narcotic administration in patients with acute multi-system trauma
  - A. Situations may arise at trauma scenes that narcotic administration may be warranted prior to full evaluation to successfully extricate patient from vehicle or other entrapment type position
7. Narcotic medication administration should be avoided in the following patients:
  - A. Acute brain injury
  - B. Altered mental status
  - C. Acute intoxication / drug overdose
  - D. CNS disease
8. Narcotic medication should be administered at lower doses and with caution in hypotensive (SBP < 90 mmHg) / hemodynamically unstable
9. IV medications should be given by slow push over 1 – 2 minutes
10. **Reassess patient's response to treatment**
11. **Reassess patient's pain severity** and vital signs prior to subsequent doses
12. Following two (2) doses given by protocol, contact Medical Control for further orders
13. Refer to case specific protocols for further pain management

**Fentanyl (Sublimaze®)**

1. Dose
  - A. Adult
    - i. 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
    - ii. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - iii. ***It is acceptable to give a lower dose, as indicated, based upon the patient's clinical condition***
  - B. Pediatric
    - i. 0.5 – 1 mcg/kg IV, IM, IO, IN (maximum 100 mcg)
    - ii. ***It is acceptable to give a lower dose, as indicated, based upon the patient's clinical condition***
  - C. Must be given slowly
  - D. **Titrate second dose in 15 minutes based on patient's response / condition**
    - i. Adults: maximum dose 100 mcg any route
    - ii. Pediatrics Medical Control order is required for repeat dosing
2. Contraindications – absolute
  - A. Known hypersensitivity reaction
3. Contraindications – relative
  - A. Altered mental status
  - B. Hypotension [SBP < 90 mmHg adult; < 70+(2\*age in years) mmHg pediatric]
4. Adverse effects
  - A. Chest wall rigidity can occur with too rapid infusion
  - B. Respiratory depression
  - C. Depressed level of consciousness
  - D. Hypotension
  - E. Nausea / vomiting
5. Reversal
  - A. Adult = naloxone (Narcan®) 2 mg IV, IM
  - B. Naloxone does not reverse chest wall rigidity

**Nitrous Oxide**

1. Dose adult & pediatric patients
  - A. 50:50 mixture via self-administered device
2. Contraindications
  - A. Bowel obstruction
  - B. Hypotension
  - C. Pneumothorax
  - D. Pregnancy (patient or provider)
  - E. Significant respiratory compromise

**Ibuprofen (Motrin®)**

1. Dose
  - A. Adult: 400 – 800 mg PO
  - B. Pediatric: 10 mg/kg PO (maximum 400 mg)
2. Contraindications
  - A. Known hypersensitivity
  - B. Age < 6 months
  - C. Gastrointestinal ulcer disease / bleeding
  - D. NPO status
  - E. Renal disease
3. Adverse effects
  - A. Gastrointestinal distress

**Additional Considerations**

- \* Narcotic analgesics should be avoided in the treatment of chronic pain or chronic pain syndromes

## Medical Monitoring

(NCCEP SO-1/SO-2)

### Objective

- \* The purpose of this protocol is to provide guidelines for MEDIC personnel at incidents where the primary role is to monitor the health and wellbeing of other allied agency personnel

### Introduction

- \* MEDIC may be called to the scene of an extended public service function or public safety operation
- \* In addition to providing medical care for ill or injured civilians at the scene; MEDIC will be responsible for the medical monitoring of allied agency personnel participating in the event
  - Event may involve working fires, evacuations, police actions, or recovery operations
- \* Depending on resources, it is recommended that a dedicated rehabilitation team be assigned to the incident, while additional resources are called in for civilian incident casualties
- \* These incidents may constitute a dangerous or potentially hazardous working environment for all those involved
- \* Important considerations include public safety personnel rehabilitation (ensuring rest and hydration), monitoring of physical and mental status, and relief from extreme environmental conditions

### Considerations

- \* Upon scene arrival, MEDIC personnel will identify and report to the scene Incident Command to receive instructions on roles and responsibilities
- \* Ensure appropriate measures for active cooling or warming as per environmental conditions
- \* A medical monitoring location should be identified which is both safe and proximate to identify individuals at risk
  - The ambulance should be positioned such that exit routes are easily attainable
  - The site should be protective from extreme environmental conditions and those resulting from the incident scene
  - The site should be large enough to accommodate multiple personnel
  - There should be clear entrance and egress routes
- \* Regardless of the incident, the following equipment and supplies must be readily available:
  - Airway supplies and oxygen
  - Cardiac monitor/defibrillator
  - Medications

- \* Rehydration is the most important function in medical rehabilitation
  - Protocols for hydration include the following:
    - During heat stress activity, consumption should reach a goal of 1 quart of fluid intake per hour
    - Fluids should include water or a 50:50 mixture of water and activity beverage (Gatorade®, PowerAde®)
    - This should be accomplished regardless of hot or cold ambient temperatures
    - Caffeine and carbonated drinks are contraindicated
- \* Food should be considered for incidents extending beyond 3 hours
  - The following are considerations:
    - Soups, broths, stew
    - Fruits
    - Fatty and salty foods (constitutes most fast food) are contraindicated
    - Caffeinated or carbonated beverages are contraindicated
- \* Rest protocols should include the following:
  - For every 45 minutes of work time (equivalent to 2 SCBA air bottles), no less than 10 minutes of rest and monitoring should be required
  - **Extended periods may be warranted depending on the individual's health status**
  - During extremely hot periods of work, avoid air-conditioned environments initially
    - A cool down period in the ambient environment is mandatory initially
    - Active cooling (e.g. forearm immersion in an ice bath, is encouraged)
- \* Vital signs should be checked immediately and every 20 minutes while in the rehabilitation area
- \* Vital sign protocols are as follows:
  - Pulse rate > 150 beats per minute, or rate reaches 90% of predicted maximum rate (determined by:  $220 - \text{age}$ ), and/or systolic blood pressure > 180 or < 100 mmHg:
    - Remove from work environment
    - Remove personal protective equipment and as much protective clothing as able
    - Use external cooling sources (fans/misters/ice bath) as available
    - Encourage oral hydration
  - Pulse rate < 100 beats per minute and systolic blood pressure >100 and <180 mmHg:
    - May return to work

- \* If available, a carboxyhemoglobin level should be obtained with the Rad 57 pulse oximeter

\* **Initial SpCO level**

**Protocol**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>➤ &lt; 3%</li> <li>➤ 3% to 12% and no symptoms</li> <li>➤ &gt; 3% and symptoms; or &gt; 12%</li> </ul> | <ul style="list-style-type: none"> <li>Return to work</li> <li>Return to work</li> <li>Oxygen via NRB mask &amp; transport</li> </ul> |
|---|---|
- \* Symptoms of CO toxicity:
    - Headache, shortness of breath, nausea, vertigo, confusion, loss of consciousness
  - \* Any personnel with chest pain, shortness of breath, or nausea should be transported to a medical facility for treatment
  - \* Various minor traumatic injuries may also be seen in the rehabilitation area
  - \* If there is a potential for worsening of the injury or impaired performance by returning to active on-scene duty, the involved personnel may not return to duty
  - \* Both psychological and physiological stress should be evaluated
    - Psychological stress may include the following:
      - inappropriate emotional outbursts
      - aggressive behavior
      - uncontrolled emotions
      - depressed attitude or blunt affect
    - Physiologic stress may include the following:
      - chest discomfort
      - trouble breathing
      - unstable vital signs
      - heat-related illness
      - altered mental status



## Working Fires

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- \* MEDIC personnel will ordinarily be dispatched to the scene when the Charlotte Fire Department or a Mecklenburg County Volunteer Fire Department is engaged in fire suppression activities
- \* At the scene of a working fire, firefighters will be in standard turnout gear
  - Although protective, this gear greatly increases the risk for heat-related illness
  - In addition, firefighters will be undergoing profound physical stress due to mobilization of equipment and firefighting functions
- \* Firefighters will rotate out of active duty for rehabilitation after expending two SCBA air bottles or canisters
  - Each bottle lasts approximately fifteen minutes; therefore, firefighters should rotate out every thirty minutes.
- \* Complaints related to heat illness may include the following:
 

|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>➤ Chest pain</li> <li>➤ Shortness of breath</li> <li>➤ Headache</li> <li>➤ Altered mental status</li> </ul> | <ul style="list-style-type: none"> <li>➤ Fatigue</li> <li>➤ Muscle cramps</li> <li>➤ Nausea and vomiting</li> <li>➤ Malaise</li> </ul> |
|--|--|

## Basic Medical Care

1. Remove patient from any warm/hot, smoke-filled environment
2. Use external cooling sources (fans or misters) as available
  - A. Moving to a cool, air-conditioned environment (fixed facility, transit bus, ambulance) as available is indicated after a cool-down period
3. Remove any protective clothing to facilitate cooling
4. If any medical illnesses or traumatic injuries are noted, refer to appropriate protocol
5. For potential for inhalational injury, oxygen via non-rebreathing mask at 15 L/min
6. Obtain vital signs
7. If available, a carboxyhemoglobin level should be obtained with the Rad 57 oximeter
8. 

|                                  |                                 |
|----------------------------------|---------------------------------|
| <b><u>Initial SpCO level</u></b> | <b><u>Protocol</u></b>          |
| A. < 3%                          | Return to work                  |
| B. 3% to 12% and no symptoms     | Return to work                  |
| C. >3% & symptoms; or > 12%      | Oxygen via NRB mask & transport |
9. Symptoms of CO toxicity:
  - A. Headache, shortness of breath, nausea, vertigo, confusion, loss of consciousness
10. If nausea & vomiting is absent, encourage oral hydration
11. For patient considered having heat stroke, cool central body regions with ice packs (scalp, axilla, groin, chest, and abdomen)
  - A. Keep skin cool and moist by applying cool compresses
12. For patient considered hypothermic, immediately remove from the environment into a warm setting and protect from further heat loss
  - A. Remove cold, wet clothing and apply warm blankets
  - B. Massaging extremities is contraindicated

13. Continue to monitor vital signs
  - A. HR > 110 or RR < 8 or > 40 → continue rehabilitation and reassess in 10 minutes
  - B. SBP  $\geq$  160 or DBP  $\geq$  100 → if firefighter is symptomatic; continue rehabilitation and reassess in 10 minutes
  - C. Temp  $\geq$  100.6 → if firefighter is symptomatic; continue rehabilitation and reassess in 10 minutes

### Advanced Medical Care

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. For firefighter or patient burned:
  - A. IV Access Protocol
  - B. NS IVF
    - i. Adult
      - Hemodynamically unstable or large TBSA burn (> 10%): wide open
      - Hemodynamically stable and small TBSA burn (< 10%): TKO
    - ii. Pediatric
      - Hemodynamically unstable or large TBSA burn (>10%): 20ml/kg
      - Hemodynamically stable and small TBSA burn (<10%): TKO
  - C. Fentanyl (Sublimaze®) for pain control
    - i. Adult
      - 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
      - 1 – 2 mcg/kg IN (maximum 200 mcg)
      - May repeat x1 in 15 minutes as indicated (maximum 100 mcg)
    - ii. Pediatric
      - 0.5 – 1 mcg/kg IV, IO, IN (maximum 100 mcg)
      - Contact Medical Control for repeat dosing
3. HR > 85% NFPA age predicted maximum (per years of age)
 

|                     |                     |
|---------------------|---------------------|
| ➤ 20 – 25 = 170 BPM | ➤ 41 – 45 = 152 BPM |
| ➤ 26 – 30 = 165 BPM | ➤ 46 – 50 = 148 BPM |
| ➤ 31 – 35 = 160 BPM | ➤ 51 – 55 = 140 BPM |
| ➤ 36 – 40 = 155 BPM | ➤ 56 – 60 = 136 BPM |

  - A. Normal saline 1 – 2 liters as per patient condition
  - B. No improvement → initiate transport to emergency department
4. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
5. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
6. Additional care as per appropriate protocol per presentation of illness/injury

**Additional Considerations**

- \* Stopping the burning process by soaking or irrigating the burned area with water or saline should only be performed within minutes after the patient is removed from the exposure
  - Only saline or a clean water source should be used
  - Ice, other water sources (lake water), or ointments should never be used.
  - Cooling should only be performed for 1 to 2 minutes
  - The end-point is not palpable cool skin, but a 1 to 2-minute time frame
  - Cooling with water is considered useless and potentiates hypothermia if performed outside of this 1 to 2-minute time frame from exposure
- \* Heat related illness
  - Heat exhaustion may be distinguished from heat stroke in that diaphoresis will be present with exhaustion, whereas this finding may be absent with stroke
  - Heat stroke is defined by altered mental status in the setting of heat related illness
- \* The average adult male requires approximately 500-600 mL/hour of fluid while performing moderate activity to maintain body homeostasis

## Hazardous Materials

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- \* MEDIC personnel may be dispatched when the Charlotte Fire Department Hazardous Materials Team is involved in the management and containment of a radiation, biological, or chemical incident
- \* For incidents involving such hazardous materials, strict communication and coordination with the fire department Hazardous Materials Team must be established
- \* At the scene of a hazardous materials incident, firefighters will be in one of three levels of turnout gear for a nuclear, biological, or chemical release or spill:
  - Level A
    - Provides the maximal amount of vapor and splash protection
    - Fully encapsulating and used with a supplied air source (SCBA)
    - Maximum work time is 15 to 20 minutes
  - Level B
    - Resistant against vapor and splash exposure
    - Partially encapsulating and used with a supplied air source (SCBA)
    - Maximum work time is 1 to 2 hours
  - Level C:
    - Resistant against vapor and splash exposure
    - Partially encapsulating and used with a charcoal-filtered respirator; either a charcoal-filtered mask or a powered air purifying respirator
    - Maximum work time is 4 to 6 hours
  - Level D
    - Regular turnout work garment
    - Respiratory protection not required
- \* For radiation accidents, levels of protective clothing vary depending upon the rescuer's level of exposure to the site
  - Those working in the inner perimeter (hot zone) will be in complete protective suits
- \* All levels and types of protective gear greatly increase an individual's risk for heat illness
- \* In addition, rescue personnel will be undergoing profound physical stress due to mobilization of equipment and resources, containment of the incident, and civilian rescue
- \* MEDIC personnel should anticipate & ensure that operations personnel rotate from active duty for rehabilitation
- \* No attempt should be made to access patients or other personnel who have not been properly decontaminated
- \* Complaints related to heat illness may include the following:
 

|                         |                       |
|-------------------------|-----------------------|
| ➤ Chest pain            | ➤ Fatigue             |
| ➤ Shortness of breath   | ➤ Muscle cramps       |
| ➤ Headache              | ➤ Nausea and vomiting |
| ➤ Altered mental status | ➤ Malaise             |
- \* Patients with profound vomiting, diarrhea, and mental status changes should be considered to have suffered an acute exposure and should be rapidly transported to the nearest medical facility after proper decontamination procedures

**Basic Medical Care**

1. Ensure scene safety and a protective environment for all personnel and patients
2. Additional precautions (distance and shielding) should be considered when radiological agents are involved
3. Ensure that fire department resources (Hazardous Materials Team) has been notified and have been dispatched
4. Attempt to identify exposure (bystander or worker information, incident location, environmental indicators, container description, placards or labels, shipping papers or Material Safety Data Sheets, patient symptoms)
5. Apply appropriate personal protective equipment
  - A. The decision for type and level will be made by the scene Incident Command
6. Immediately remove all patients from the exposure and determine the level of contamination present
7. Determine the need for decontamination prior to full assessment and treatment
  - A. Vapor material source
    - i. Remove from source of contamination
  - B. Liquid material source
    - i. Remove contaminated equipment and clothing and perform gross and technical showering decontamination procedures
  - C. Solid material source
    - i. Remove material by physical measures of brushing away source, then gross and technical showering decontamination procedures if indicated
8. If any medical illnesses or traumatic injuries are noted, refer to appropriate protocol
9. Maintain airway; suction as needed
10. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
  - A. Consider use of a nasopharyngeal or oropharyngeal airway as an adjunct
11. If potential for inhalational injury, provide supplemental oxygen as indicated
12. Obtain vital signs
13. If nausea or vomiting is absent, encourage oral hydration
14. For patient considered being heat stroke
  - A. Cool central body regions with ice packs (scalp, axilla, groin, chest, and abdomen)
  - B. Keep skin cool and moist by applying cool compresses
15. For patient considered hypothermic
  - A. Immediately remove from the environment into a warm setting and protect from further heat loss
  - B. Remove cold, wet clothing and apply warm blankets
  - C. Massaging extremities is contraindicated
16. For eye exposure, irrigate copiously with sterile saline
17. Continue to monitor vital signs

**Advanced Medical Care**

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. Assess hydration status, need for intravenous fluid resuscitation
3. Normal saline IVF
  - A. Adult
    - i. Hemodynamically unstable: wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatric
    - i. Hemodynamically unstable: 20ml/kg bolus
    - ii. Hemodynamically stable: TKO
4. For bronchospasm or reactive airways disease, albuterol via hand held or mask nebulizer
  - A. Adult = 5 mg
    - i. Repeat 5 mg for persistent wheezing
  - B. Pediatric = 2.5 – 5 mg
    - i. Repeat 2.5 - 5 mg for persistent wheezing
5. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
6. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
7. Additional care as per appropriate protocol per presentation of illness/injury

**Additional Considerations**

- \* Ensure that the scene is safe and appropriate resources are available before approaching the scene or patient
  - Wind direction and fluid run-off should be primary considerations
- \* Toxicity from hazardous materials may be the result of inhalation, ingestion, absorption, or injection
  - Clinical signs and symptoms may be internal or external depending on route of exposure
- \* In any setting involving noxious gas inhalation, high flow oxygenation is paramount for these patients
  - High levels of SpO<sub>2</sub> (including 100%) do not reflect the degree of oxygenation
  - All patients with potential exposures should be administered 100% oxygen by non-rebreathing mask
- \* The Carolinas Poison Center may provide assistance and is available 24-hours a day
  - **704-355-4000**
  - **800-222-1222**

## Police Operations

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### Introduction

- \* MEDIC personnel may be dispatched to the scene of any incident in which the Charlotte-Mecklenburg Police Department or Federal Bureau of Investigation Special Weapons and Tactics (S.W.A.T.) team is deployed
- \* At the scene of a police or S.W.A.T. call-out, team members will be in tactical gear, which may include Kevlar body armor and helmets
  - While protective against penetrating injury, this clothing may increase the risk for heat-related illness
  - Further, team members may be engaged in profound physical exertion involving equipment transport and resource deployment
- \* Depending upon the tactical situation, team members may be exposed to environmental extremes for prolonged periods of time
- \* Additional environmental hazards may include insect bites/stings or mammalian/reptilian bites
- \* Penetrating, blast, or other traumatic injuries should be treated per protocol

### Basic Medical Care

1. Confirm scene safety and ensure a protective environment for yourself and the patient
2. Place patient in most comfortable position
3. For any medical illnesses or traumatic injuries noted, refer to appropriate protocol
4. Wound care as indicated per patient presentation
5. For uncontrolled hemorrhage noted to an extremity that cannot be controlled with direct pressure, consider any or all the following:
  - A. MEDIC Tourniquet application per [Wound Care – Tourniquet Protocol](#)
  - B. Hemostatic dressing
6. Provide supplemental oxygen as indicated per patient condition
7. Assess vital signs

### Advanced Medical Care

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. Consider normal saline IVF
  - A. Hemodynamically unstable
    - i. Adults: wide open
    - ii. Pediatrics: 20 ml/kg IV and reassess
  - B. Hemodynamically stable: TKO
3. For penetrating traumatic injury results in an open chest wound, consider the following:
  - A. Hydrogel occlusive dressing (chest seal)
  - B. For hemodynamically unstable: chest needle decompression

## Police Custody

## (NCCEP Protocol UP-12)

### Basic medical Care

1. Confirm scene safety and ensure a protective environment for yourself and the
2. Place patient in most comfortable position
3. For any medical illnesses or traumatic injuries are noted, refer to appropriate protocol
4. Wound care as indicated per patient presentation
5. For uncontrolled hemorrhage noted to an extremity that cannot be controlled with direct pressure, consider any or all the following:
  - A. MEDIC Tourniquet application per [Wound Care – Tourniquet Protocol](#)
  - B. Hemostatic dressing
6. Provide supplemental oxygen as indicated per patient condition
7. Assess vital signs
8. Pepper spray
  - A. Remove contaminated clothing
  - B. Irrigate with copious amounts of normal saline or water
  - C. Administer albuterol via nebulizer for exacerbation of reactive airway disease
    - i. EMT may administer only to patients with a current prescription
9. Taser deployment
  - A. [Wound Care – Conducted Electrical Weapon Protocol](#)

### Advanced Medical Care

1. Refer to appropriate medical or trauma protocol as per patient presentation
2. Obtain rhythm strip and refer to appropriate protocol as indicated
3. Consider normal saline IVF
  - A. Hemodynamically unstable: wide open
  - B. Hemodynamically stable: TKO
4. For signs of excited delirium
  - A. IVF wide open
  - B. Midazolam (Versed®) 5 mg IM or 5 – 10 mg IN

### Additional Considerations

- \* All patients in police custody retain the right to participate in decision making regarding their care and may request care of EMS
  - Patients in police custody retain the right to refuse medical care as long as the patient has the capacity to make an informed decision and understands the risks of refusing treatment and the benefits of accepting medical treatment
- \* Deaths associated with TASER® devices have been associated with “excited delirium”
  - A hyperdopaminergic state characterized by extreme aggression, shouting, delusions, paranoia, strength, and hyperthermia
  - Associated with physical control measures (Taser or physical restraint)
  - Most commonly seen in males with history of serious mental illness or drug use
  - It is more common with cocaine, methamphetamine, or similar drug use



## Diving Operations

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### Introduction

- \* First responder and Medic personnel may be dispatched to the scene of a possible drowning or missing person in which case rescue personnel are involved in a water rescue or recovery operation
- \* This may involve diving-related illness, drowning, or environmental-related illness
- \* Body cooling occurs rapidly in water
  - Hypothermia can ensue in water temperatures of 70-80° F
- \* Medic personnel should expect operations personnel to systematically rotate out of active duty for rehabilitation
- \* No attempt should be made to access patients who have not been removed from the water
- \* Complaints related to hypothermia may include the following:
  - Malaise
  - Altered mental status
  - Fatigue
  - Nausea
- \* Complaints related to diving injuries may include the following:
  - Arthralgias
  - Altered mental status
  - Myalgias
  - Shortness of breath
  - Headache
- \* Divers with specific complaints, such as respiratory distress, chest pain, burns, or falls should be treated per protocol

### Basic Medical Care

1. Confirm scene safety and ensure a protective environment for yourself and the patient
2. For patient still in water, prepare for resuscitation once rescue is affected
3. For patient found in cool, adverse environment, remove to appropriate warmer setting
4. When trauma to head or spine is suspected (history of fall from height, boating or other watercraft accident, diving accident), protect and maintain control of the cervical and thoracolumbar spine
  - A. Attempt to remove patient from water in a horizontal position
5. Check for breathing and pulses
  - A. If apneic and pulseless, initiate CPR for the following conditions:
    - i. Submersion time is less than 30 minutes in all patients
    - ii. Submersion time is less than 45 minutes and water temperature < 50°F
6. Maintain airway; suction as needed
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. Apply pulse oximeter and cardiac monitor
9. Provide supplemental oxygen
10. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries

11. For any medical illnesses or traumatic injuries are noted, refer to appropriate protocol
12. For suspected spinal trauma, maintain cervical spine motion restriction at all times
  - A. Place patient on a long backboard as necessary/indicated for patient movement
  - B. While log rolling patient, inspect the back and axilla for any additional injuries
13. For patient determined to be hypothermic, consider the following:
  - A. Place patient in most comfortable position and remove any wet or damp clothes
  - B. Insulate patient as much as possible with blankets
  - C. Gently move patient to warm ambulance as soon as possible
14. For patient noted to have isolated areas of frostbite, remove any obstructive clothes or coverings and protect from further injury
  - A. Blisters should remain intact
15. Obtain vital signs
16. Prohibit ambulation and use of tobacco products
17. Assess blood glucose
  - A. Treatment as per protocol

### Advanced Medical Care

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. For bronchospasm or reactive airways disease, consider the following:
  - A. Adult: albuterol 5 mg via hand held or mask nebulizer
    - i. Repeat 5 mg for continued wheezing
  - B. Pediatric: albuterol 2.5 - 5.0 mg via hand held or mask nebulizer
    - i. Repeat 2.5 - 5 mg for continued wheezing
3. For persistent respiratory distress in alert patient:
  - A. Adult: CPAP per protocol
4. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
5. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
6. Additional care as per appropriate protocol per presentation of illness/injury

### Additional Considerations

- \* Always ensure that the scene is safe before approaching the patient
- \* Some patients, particularly children, can survive extended periods of submersion in very cold water
  - Even in situations where the patient's pupils were fixed and dilated, and the resuscitation was prolonged, patients have had good clinical outcomes
  - Rewarming techniques must be initiated to achieve core body temperature greater than 86° F before resuscitation can be terminated
- \* Dysrhythmias, primarily ventricular fibrillation, are common at core temps < 86° F
  - Hypothermic patients presenting in cardiac arrest should have no cardiac medications, cardioversion, pacing, or defibrillation until rewarmed
  - The primary treatment is active core rewarming

- \* If PEA suspected, auscultate for heart sounds over the precordium prior to initiating treatment per protocol (hypothermia may result in decreased peripheral pulses)
- \* All non-fatal drowning patients, with or without aspiration, must be transported to the hospital for observation and to evaluate for laryngospasm, pulmonary edema, and Adult Respiratory Distress Syndrome (ARDS)
  - Any nonfatal drowning patient should not refuse care or transport
- \* Diving related injuries
  - Barotrauma
    - Middle ear squeeze is the most common complaint of SCUBA divers
    - Inner ear barotrauma – vertigo, unilateral tinnitus, hearing loss
    - Other: sinus barotrauma, mask squeeze, barodontalgia
  - Nitrogen narcosis
    - Occurs at depths > 100 feet
    - Impaired judgment
  - Alternobaric vertigo
    - Unequal middle ear pressures; occurs with ascent
    - Vertigo typically self-limited (descending few feet may resolve)
  - Decompression injury
    - Occurs with ascending too rapidly
    - Symptoms within 12 hours of ascent
      - Fatigue, joint pain, CNS disturbances
    - Type I – joint pain, skin rash
    - Type II – paresthesia, dizziness/vertigo, nausea, headache, paralysis, dyspnea, chest pain, loss of consciousness
    - Type III – pulmonary complications: pneumothorax, pneumomediastinum
  - Air embolism
    - Rapid onset of symptoms (within 10 minutes of ascent)
    - Loss of consciousness, confusion, stupor, apnea, cardiac arrest
  - Management
    - **Assess ABC's and vital signs**
    - Provide supplemental oxygen
    - Left lateral decubitus positioning
- \* Available decompression chambers
  - Healogics – Charlotte, NC\*\*
    - **704-807-1513**
    - May not be available 24 hours/day
  - Duke University – Durham, NC
    - **919-680-8111** – contact the HBO Attending or Fellow on-call
  - Richland Palmetto Hospital – Columbia, SC
    - **803-434-7000** – contact the HBO physician on-call
- \* Additional resources
  - **Diver's Alert Network**
    - **919-684-9111**
    - **800-446-2671**

## Abdominal Pain Vomiting & Diarrhea

(NCCEP Protocol UP-3)

### Differential Diagnosis

- \* Abdominal aortic aneurysm
- \* Appendicitis
- \* Bowel obstruction
- \* Cholelithiasis / cholecystitis
- \* Constipation
- \* Diverticulitis
- \* DKA
- \* Dysmenorrhea
- \* Gastritis
- \* Gastroenteritis
- \* Hepatitis
- \* Hernia
- \* Ischemic bowel
- \* Kidney stone
- \* Myocardial infarction / ischemia
- \* Pancreatitis
- \* Pelvic (ovarian cyst, PID)
- \* Peptic ulcer disease
- \* Pneumonia
- \* Pregnancy
- \* Pyloric stenosis
- \* Substance abuse
- \* Trauma
- \* Urinary tract infection

### Clinical Presentation

- \* History considerations
  - Age
  - Past medical / surgical history
  - Medications
  - OB/Gynecological history
    - Gravida, Parity
    - LMP
  - Travel outside of U.S.
- \* Duration, location, character of pain
- \* Associated symptoms
  - Fever
  - Nausea, vomiting
  - Hematemesis, hematochezia/melena
- \* Aggravation or alleviating factors
- \* Physical exam
  - Focused abdominal exam
    - Inspect for prior incision scars
    - Auscultate bowel sounds (increase with obstruction), bruit (AAA)
    - Palpation for area of tenderness and possible related peritoneal signs
  - Further exam as indicated by history

**Basic Medical Care**

1. **Medical Initial Assessment Protocol**
2. Assess vital signs
3. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
4. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
5. Assess blood glucose level
  - A. Oral glucose if patient hypoglycemic and alert with intact gag reflex

**Advanced Medical Care**

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. 12-lead ECG if patient history consistent with potential cardiac etiology
3. IVF bolus for signs of hypotension/dehydration
  - A. Adult: 500 – 1000 ml as per patient condition
  - B. Pediatric: 10 – 20 ml/kg
4. Ondansetron (Zofran®) for nausea/vomiting
  - A. Adult: 4 – 8 mg PO, IV, IM
  - B. Pediatric dose = 0.15 mg/kg PO, IV, IM (maximum 4 mg)
5. Fentanyl (Sublimaze®) for pain control
  - A. Adult:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatric:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
6. Alternate analgesic: nitrous oxide via patient-controlled inhalation

**Additional Considerations**

- \* All women of child-bearing age should be pregnant until proven otherwise
  - Abdominal pain with syncope in female of child-bearing age should be considered an ectopic pregnancy until proven otherwise
- \* Patients with undiagnosed cause of pain or possible need for surgery should be NPO
- \* Consider cardiac etiology of symptoms especially in patients > 50 years of age, diabetics, and/or women with upper abdominal complaints
  - **"Indigestion" may be the angina equivalent for myocardial ischemia**
- \* Older patients with abdominal pain, especially those that are hemodynamically unstable, should be considered critical until proven otherwise
  - Consider abdominal aortic aneurysm (AAA)
    - Age > 50-years
    - Bruit on auscultation
    - Diminished femoral pulses
    - Lower extremity pain
    - Pulsatile intraabdominal mass
- \* Vomiting may be the presenting symptom of serious non-GI tract pathologies, consider:
  - CNS process
  - DKA
  - Myocardial ischemia/infarction
  - Poisoning
    - Carbon monoxide
    - Organophosphate
    - Others
- \* Differential diagnosis per pain location (presentations may vary)

| <b>Right Upper Quadrant</b>  | <b>Epigastric</b>  | <b>Left Upper Quadrant</b>   |
|--|--|--|
| Cholelithiasis/cholecystitis<br>Hepatitis<br>Lower lobe pneumonia  | Gastritis / Ulcer disease<br>Pancreatitis<br>Myocardial infarction   | Pancreatitis<br>Splenic infarct<br>Lower lobe pneumonia  |
| <b>Right Side/Flank</b>  | <b>Mid Abdomen</b>   | <b>Left Side/Flank</b>   |
| Pyelonephritis<br>Ureteral calculi   | Pancreatitis<br>Small bowel obstruction<br>Abdominal aortic aneurysm | Pyelonephritis<br>Ureteral calculi   |
| <b>Right Lower Quadrant</b>  | <b>Suprapubic</b>  | <b>Left Lower Quadrant</b>   |
| Appendicitis<br>Ectopic pregnancy<br>Ovarian Cyst/torsion<br>Ureteral calculi<br>PID<br>Testicular torsion     | Cystitis<br>Urinary retention<br>Uterine fibroids                    | Diverticulitis<br>Ectopic pregnancy<br>Ovarian cyst/torsion<br>Ureteral calculi<br>PID<br>Testicular torsion |
| <b>Diffuse</b>   |  |  |
| Bowel perforation<br><b>Crohn's disease</b><br>DKA<br>Mesenteric ischemia<br>Spontaneous bacterial peritonitis |  |  |

## Allergic Reaction

(NCCEP Protocol AM-1/PM-1)

### Objective

- \* Restore and maintain optimal respiratory and cardiovascular status
- \* Limit further exposure to the allergen
- \* Limit recurrent symptoms

### Introduction

- \* True anaphylaxis is a severe systemic reaction to an allergen causing a massive release of histamine and other chemical mediators
- \* Although anything can cause anaphylaxis, the most common offenders include:
  - Antibiotics (penicillins, sulfa, vancomycin)
  - Aspirin
  - Bee stings
  - Certain foods (i.e. peanuts, shellfish)
  - Contrast dye
  - **NSAID's**
- \* Anaphylaxis may cause:
  - Generalized urticaria and pruritus
  - Hypotension due to vasodilatation
  - Respiratory distress due to Bronchospasm
  - Upper airway obstruction due to edema

### Clinical Presentation

- \* Difficulty breathing, swallowing
- \* Exposure to allergen (may not be realized)
- \* Hypotension
- \* Nausea and vomiting
- \* Possible anxiety or agitation
- \* Rapidly progressive upper airway edema with stridor, increased secretions, dysphagia
- \* Urticaria with or without pruritus
- \* Wheezing

### Differential Diagnosis

- \* Angioedema
- \* Aspiration / airway obstruction
- \* Asthma / COPD
- \* Cardiac dysrhythmia
- \* Congestive heart failure
- \* Pulmonary embolus
- \* Shock

**Basic Medical Care**

1. **Medical Initial Assessment Protocol or Pediatric Initial Assessment Protocol**
2. Assess vital signs
3. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
4. Attempt to remove source of exposure (e.g. stinger) as possible
5. Uncomplicated allergic reaction (urticaria, flushing, itching only)
  - A. Diphenhydramine (Benadryl®):
    - i. Adult: 25 – 50 mg PO
    - ii. Pediatric > 9 months of age: 1 mg/kg PO (maximum 50 mg)
6. For associated bronchospasm:
  - A. Albuterol via hand-held or mask nebulizer
    - i. Adult: 5 mg
      - EMT may administer to patients currently prescribed beta agonist
      - **Repeat 5 mg as indicated by patient's condition**
    - ii. Pediatric: 2.5 – 5 mg
      - EMT may administer to patients currently prescribed beta agonist
      - **Repeat 2.5 – 5 mg as indicated by patient's condition**
7. For any evidence of anaphylaxis
  - A. Epinephrine (1:1000) IM
    - i. Adult: 0.3 ml
      - Consider decreasing dose to 0.15 mg IM in patients with coronary artery disease or patients > 55 years and coronary disease risk factors
    - ii. Pediatric: 0.15 ml

**Advanced Medical Care**

1. Uncomplicated allergic reaction (urticaria, flushing, itching only)
  - A. Diphenhydramine (Benadryl®); if not already administered po
    - i. Adult: 25 – 50 mg PO, IV or IM
    - ii. Pediatric > 9 months of age: 1 mg/kg PO, IV, IM (maximum 50 mg)
  - B. Methylprednisolone (Solu-Medrol®)
    - i. Adult: 125 mg IV
    - ii. Pediatric: 2 mg/kg IV (maximum 125 mg)
2. For associated bronchospasm
  - A. Albuterol via hand-held or mask nebulizer
    - i. Adult: 5 mg
    - ii. Pediatric: 2.5 mg
3. **Airway: Adult; Airway: Pediatric Protocol**



4. For evidence of anaphylaxis
  - A. Epinephrine (1:1,000)
    - i. Adult: 0.3 mg IM
      - Consider decreasing dose to 0.15 mg IM in patients with coronary artery disease or patients > 55 years and coronary disease risk factors
    - ii. Pediatric: 0.01 mg/kg IM (0.01 ml/kg); maximum 0.3 mg (0.3 ml)
    - iii. May repeat every 5 – 10 minutes depending on patient response
  - B. IVF
    - i. Adult: wide open
    - ii. Pediatric: 20 ml/kg and reassess, re-bolus as clinically indicated
  - C. Diphenhydramine & methylprednisolone as above (if not yet administered)
5. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
6. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen

### Additional Considerations

- \* Epinephrine is the drug of choice and the first drug that should be administered in acute anaphylaxis (Moderate / Severe Symptoms)
  - Epinephrine should be administered in priority before attempts at IV or IO access
- \* Anaphylaxis is a clinical diagnosis based on typical systemic manifestations
- \* Cardiovascular effects result from decreased vascular tone and capillary leakage
  - Hypotension, cardiac arrhythmias, syncope, and shock can result from intravascular volume loss, vasodilation, and myocardial dysfunction
- \* Anaphylaxis symptoms may include
  - Altered mental status
  - Altered voice
  - Difficulty swallowing
  - Hypotension
  - Respiratory distress
  - Sensation of throat swelling
- \* 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 involves swelling of the face, lips or airway structures
  - May be seen in patients taking Angiotensin Converting Enzyme Inhibitors (ACE-I)
    - lisinopril (Prinivil®, Zestril®) benazepril (Lotensin®), captopril (Capoten®)
- \* 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
    - Ecallantide (Kalbitor®)
  - Paramedic may assist or administer this medication per patient / package instructions

## Bites & Envenomations

(NCCEP Protocol TE-1)

### Snake Bite

#### Introduction

- \* Consider bite is poisonous until proven otherwise
- \* Typically present with pain, swelling, edema, paresthesia, numbness
- \* May present with nausea, vomiting, hypotension, coagulopathy, seizure
- \* 25% of bites may be “dry bites” – no envenomation

#### Basic Medical Care

1. Ensure scene safety
2. Assess vital signs
3. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
4. Obtain any available information on the snake
5. Immobilize extremity in neutral position
  - A. Measure extremity circumference at and above the bite site
  - B. Place appropriate marking on the extremity to ensure subsequent measurements are taken at the same location for direct comparison
6. Remove any constricting clothing or jewelry/watches
7. Provide basic wound care for the bite site
8. Do **NOT** apply ice
9. Do **NOT** apply any constrictive dressings (including any form of tourniquet)

#### Advanced Medical Care

1. IVF resuscitation as per patient condition
  - A. Adult: TKO to wide open
  - B. Pediatric: TKO to 10 – 20 ml/kg bolus and reassess
2. Fentanyl (Sublimaze®) for pain control
  - A. Adult
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatric
    - i. 0.5 – 1 mcg/kg IN, IV, IM (maximum 100 mcg)
    - ii. Contact medical control for repeat dosing

#### Additional Considerations

- \* Contact Poison Control as needed:
  - **704-355-4000**
  - **800-222-1222**

## Marine Envenomation/Injury

**(NCCEP Protocol TE-6)**

### Sources

- \* Cone shell sting
- \* Coral sting
- \* Jellyfish sting
- \* Lion fish sting
- \* Man-o-war
- \* Sea anemone
- \* Sea urchin sting
- \* Sting ray barb

### Clinical Presentation

- \* Allergic reaction
- \* Hypotension
- \* Increased oral secretions
- \* Localized pain, swelling, edema
- \* Nausea / vomiting
- \* Parasthesias, numbness

### Introduction

- \* Allergic reactions/anaphylaxis may occur from marine envenomations
- \* Coral contact often presents with delayed onset of symptoms
- \* Many marine envenomations occur in the home as above sources are kept as pets in saltwater aquariums

### Basic Medical Care

1. Ensure scene safety
2. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
3. Assess bite site / extremity
  - A. Measure extremity circumference at and above bite site
  - B. Place appropriate marking on the extremity to ensure subsequent measurements taken at the same location for direct comparison
  - C. Repeat measurement every 15 minutes until stable
4. [Allergic Reaction Protocol](#) as indicated
5. Remove any obvious barbs/spines/stingers
  - A. Lift do NOT brush away any tentacles or barbs
6. Rinse site / area with seawater (do **NOT** use fresh water)
  - A. May rinse with vinegar as available (jellyfish, anemone, man-o-war stings)
  - B. Immerse with hot water as available (sting ray, lion fish, sea urchin stings)
7. Splint the affected extremity in neutral position
8. Do **NOT** apply ice
9. Do **NOT** apply constrictive dressings (including tourniquet)

**Advanced Medical Care**

1. IVF resuscitation as per patient condition
  - A. Adult: TKO to wide open
  - B. Pediatric: TKO to 10 – 20 ml/kg bolus and reassess
2. Fentanyl (Sublimaze®) for pain control
  - A. Adult
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact medical control for repeat dosing
3. Calcium gluconate for severe muscle spasms
  - A. Adult: 1 gram (10 ml of 10% solution) IV, IO
  - B. Pediatric: 20 mg/kg IV, IO (0.2 ml/kg of 10% solution); maximum 2 grams (20ml)

**Other Envenomations**

- \* Fire ants
  - Approximately 10% of patients with fire ant bites will suffer anaphylactic reactions
  - Treat as per [Allergic Reaction Protocol](#)
- \* Black widow spider bites
  - Can cause significant muscle spasms and pain and therefore may require benzodiazepine administration as well as analgesic care
  - Contact Medical Control for possible midazolam (Versed®) administration
- \* Brown recluse spider bites
  - Initially present with minimal symptoms
  - May progress to necrotic bite sites over the next few days

## Animal Bites

(NCCEP Protocol TE-1)

### Types

- \* Cat bite
- \* Dog bite
- \* Human bite
- \* Other animal bites

### Basic Medical Care

1. Ensure scene safety
2. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
3. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
4. Control bleeding
5. Assess vital signs
6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Provide local wound care and dress wound as appropriate
8. Remove any constricting clothing or jewelry/watches
9. Splint affected extremity as needed for patient comfort
10. [Allergic Reaction Protocol](#) as indicated

### Advanced Medical Care

1. IV Access as indicated by mechanism of injury
  - A. Preferably establish IV access in unaffected extremity
  - B. IVF resuscitation as indicated by patient condition
    - i. Adults: TKO to wide open
    - ii. Pediatrics: TKO to 10 – 20 ml/kg bolus and reassess
2. Fentanyl (Sublimaze®) for pain control
  - A. Adult:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - A. Pediatric:
    - i. 0.5 – 1 mcg/kg IN, IV, IM, IO (maximum 100 mcg)
    - ii. Contact medical control for repeat dosing
3. Alternative analgesic: nitrous oxide via patient-controlled inhalation
4. [Allergic Reaction Protocol](#)
5. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
6. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen

**Additional Considerations**

- \* Human bites
  - Control hemorrhage and apply appropriate wound dressing
  - Apply appropriate wound dressing
  - Potential for high infection rates
    - Eikenella
    - Streptococcus
    - Staphylococcus
  - **"Fight bites"** involve wounds to hands from thrown punches contacting teeth of 2<sup>nd</sup> party
    - These wounds are particularly at high risk for infection
- \* Dog & Cat bites
  - Dog bites often have associated crush type injury
  - Cat bites often have deep puncture wounds with minimal surface injury and therefore increased risk of infection
  - Potential for high infection rates
    - Dogs: Pasteurella, staphylococcus, streptococcus
    - Cats: Pasteurella, staphylococcus, streptococcus
  - Control hemorrhage and apply appropriate wound dressing
  - Any unknown animal bite must be considered at risk for rabies transmission
  - Consider contact with Animal Control

## Assault

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### Basic Medical Care

1. Ensure scene safety
  - A. It may be necessary to remove the patient from the surrounding area to a more protective and supportive environment
  - B. After discussing your course of action and within a confidential setting, remove appropriate clothing to fully inspect the chest, abdomen, and extremities for any signs of physical abuse or assault
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Maintain airway
  - A. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
4. [Spinal Motion Restriction Protocol](#) as per patient history and presentation
5. Assess vital signs
6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Control any active bleeding sites with manual direct pressure and/or pressure dressing
8. If a sexual assault has occurred, do not allow patient to shower or change clothes

### Advanced Medical Care

1. IV access as indicated by mechanism of injury
2. IVF bolus for signs of hypotension
  - A. Adult: 500 – 1000 ml as per patient condition
  - B. Pediatric: 10 – 20 ml/kg
3. Fentanyl (Sublimaze®) for pain control
  - A. Adult:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatric:
    - i. 0.5 – 1 mcg/kg IV, IM, IN, IO (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
4. Alternate analgesic: nitrous oxide via patient-controlled inhalation
5. For adult with suspected open fracture: cefazolin (Ancef®)
  - A.  **$\geq 70$  kg: 2 grams IV over 10 minutes**
  - B.  **$< 70$  kg: 1 gram IV over 10 minutes**
6. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
7. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen

**Additional Considerations**

- \* Adult assault patients should only refuse care in the presence of law enforcement officers
  - If this is not available, the case should be discussed with Medical Control
  - A Patient Refusal Form will be completed on all cases of refusal
  - Pediatric patients may not refuse transport, nor may their guardians refuse transport if you suspect child abuse
- \* Refer to Non-fatal strangulation and/or human trafficking protocols as indicated
- \* Ensure that patient has a safe place to go if refusing transport (family members, friends) and document this information in the PCR
- \* It may be acceptable for patients to agree to go to the hospital but refuse all assessment and care
- \* Fentanyl or other mind-altering medications for pain control should be avoided in patients with a closed head injury unless ordered by medical control
- \* Ensure contact with DSS & other appropriate agency for cases of suspected elder or child abuse or neglect
  - **Mecklenburg County Department of Social Services** to report the suspicion
    - **(704) 336-2273**



## Back Pain

(NCCEP Protocol UP-5)

### Differential diagnosis

- \* Abdominal aortic aneurysm
- \* Acute coronary syndrome
- \* Aortic dissection
- \* Epidural abscess
- \* Herniated disc
- \* Kidney stone
- \* Metastatic cancer
- \* Musculoskeletal strain / muscle spasm
- \* Pneumonia
- \* Pulmonary embolus
- \* Pyelonephritis
- \* Vertebral fracture

### Clinical Presentation

- \* History considerations
  - Age
  - Onset of pain
  - Trauma
  - Lower extremity symptoms
  - Bowel, bladder, urinary dysfunction symptoms
- \* Physical exam
  - Vital signs including temperature
  - Abdominal mass, bruit
  - Costovertebral angle tenderness, muscular tenderness
  - Midline/vertebral tenderness
  - Extremity motor, sensory, vascular status

**Basic Medical Care**

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Medical
  - A. Allow patient to sit/lay in position of comfort
  - B. Additional care as per appropriate medical protocol
6. Trauma
  - A. [Spinal Motion Restriction Protocol](#) as per patient history and presentation
    - i. Long spine boards are to be utilized as a patient extrication/movement device and are not intended for the patient to be transported on the LSB
  - B. Additional care as per appropriate trauma protocol

**Advanced Medical Care**

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. Consider 12-lead ECG as per patient's presentation
3. IV Access as indicated by mechanism of injury, patient condition
4. IVF resuscitation as indicated for signs of hypotension, volume depletion
  - A. Adult: 500 – 1000 ml as per patient condition
  - B. Pediatric: 10 – 20 ml/kg as per patient condition
  - C. Repeat IVF bolus as indicated per patient condition
5. Fentanyl (Sublimaze®) for pain control
  - A. Adult:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatric:
    - i. 0.5 – 1 mcg/kg IV, IM, IN, IO (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
  - C. NOT indicated for patients with chronic pain
6. Alternate analgesic: nitrous oxide via patient-controlled inhalation
7. Ondansetron (Zofran®) for nausea/vomiting
  - A. Adult: 4 – 8 mg IV, IM, PO
  - B. Pediatric: 0.15 mg/kg IV, IM, PO (maximum 4 mg)
8. Additional treatment as per appropriate protocol or contact medical control for management assistance

**Additional Considerations**

- \* Analgesia may be required prior to patient movement
- \* Elderly patients with back pain, especially those that are hemodynamically unstable, should be considered critical until proven otherwise
- \* Back pain in diabetic patients may be cardiac in etiology
- \* Women of child-bearing age should be considered pregnant until proven otherwise
  - Pregnancy/ectopic must be considered
- \* Potential Etiologies
  - Abdominal aortic aneurysms
    - May present as isolated back pain or abdominal pain radiating to the back
    - May present with pulsatile abdominal mass, bruit and /or diminished lower extremity pulses
  - Aortic dissection
    - Hypertension and thoracic back pain
    - Blood pressure and pulses should be checked in both extremities
  - Cauda equine (spinal cord terminal nerves compression)
    - May present with saddle anesthesia, bowel/bladder dysfunction, lower extremity motor weakness and decreased reflexes
  - Cholecystitis
    - May present as RUQ pain with radiation to back and/or the scapula
  - Epidural abscess
    - Fever, chills
    - History of IV drug abuse
    - Immunocompromised (HIV, chronic steroids, other)
  - Kidney stones
    - May present as intractable unilateral flank pain that radiates to the groin
  - Sciatica
    - May present as low back pain radiating down posterior aspect of one leg
- \* Concerning signs & symptoms
  - Age > 50 or < 18-years
  - Fever
  - History of IV drug abuse
  - History of cancer
  - Neurological deficit
    - Bowel incontinence
    - Urinary retention
    - Weakness
  - Pain worse at rest

## Breathing Problems

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### Differential Diagnosis

#### Adult

- \* Anaphylaxis
- \* Asthma
- \* Cardiac dysrhythmia
- \* Congestive heart failure
- \* COPD
- \* Epiglottitis
- \* Myocardial infarction
- \* Peritonsillar abscess
- \* Pneumonia
- \* Pneumothorax
- \* Pulmonary embolus
- \* Upper respiratory infection

#### Pediatric

- \* Asthma
- \* Epiglottitis
- \* Cardiac dysrhythmia
- \* Croup
- \* Foreign body aspiration
- \* Peritonsillar abscess
- \* Pneumonia
- \* Pneumothorax
- \* Retropharyngeal abscess
- \* Tonsillitis
- \* Upper respiratory infection

### Evaluation

- \* History
  - Pre-existing cardiac or pulmonary disease
  - Acute vs. gradual onset & duration of symptoms
  - Presence of chest pain, fever, and/or cough
- \* Physical exam
  - Assess mental status
  - Auscultate heart sounds
  - Auscultate breath sounds
    - Absent breath sounds consider pneumothorax
    - Diffuse rales consider pulmonary edema
    - Focal rales / rhonchi consider pneumonia
    - Diffuse wheezing consider reactive airway disease
    - Focal diminished sounds consider pleural effusion, pneumonia
    - Normal sounds with pleuritic chest pain consider pulmonary embolus
  - Assess for unilateral or bilateral lower extremity edema
  - Assess for urticaria

**Basic Medical Care**

1. [\*\*Medical Initial Assessment Protocol\*\*](#) or [\*\*Pediatric Initial Assessment Protocol\*\*](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$ 
  - A. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
5. Allow all conscious patients to sit in a position of comfort
6. Additional care as per presumed etiology of breathing problem

**Advanced Medical Care**

1. Apply monitor & obtain rhythm strip and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG for patient history consistent with cardiac ischemia
3. [\*\*Airway: Adult; Airway: Pediatric Protocol\*\*](#)
4. Additional care as per presumed etiology of breathing problem
5. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
6. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen
7. Additional care as per presumed etiology of breathing problem

**Asthma, COPD, Reactive Airway Disease****(NCCEP AR-4, AR-7)**

1. Albuterol
  - A. Adult: 5 mg via hand-held or mask nebulizer
    - i. EMT may administer to patients currently prescribed beta agonist
    - ii. **Repeat 5 mg as indicated by patient's condition**
  - B. Pediatric: 2.5 – 5 mg via hand-held or mask nebulizer
    - i. EMT may administer to patients currently prescribed beta agonist
    - ii. **Repeat 2.5 – 5 mg as indicated by patient's condition**
2. Methylprednisolone (Solumedrol®)
  - A. Adult: 125 mg IV
  - B. Pediatric: 2 mg/kg IV (maximum 125 mg)
    - i. May refrain from administering if placing IV access strictly for the purpose of administering methylprednisolone, as this may further distress the pediatric patient worsening any respiratory distress
3. For persistent respiratory distress:
  - A. Continuous positive airway pressure (CPAP)
  - B. Continue albuterol in-line via CPAP as indicated by patient condition
  - C. Magnesium sulfate
    - i. Adult: 1 – 2 grams IV over 5 – 10 minutes
    - ii. Pediatric: 25 – 50 mg/kg IV over 5 – 10 minutes
4. For severe respiratory distress:
  - A. Epinephrine (1:1,000)
    - i. Adult: 0.3 – 0.5 mg IM
      - Consider decreasing dose to 0.15 mg IM in patients with coronary artery disease or patients > 55 years and coronary disease risk factors
    - ii. Pediatric: 0.01 mg/kg IM; maximum 0.3 mg IM (0.3 ml)
5. Advanced Airway management as indicated
  - A. **Airway: Intubation Protocol**
  - B. **Airway: BIAD Protocol**
6. Ensure proper tube placement with capnometry, SpO<sub>2</sub>, ventilate with 100% oxygen
7. Continue albuterol in-line via CPAP, ETT, or King LT as indicated by patient condition

## Pulmonary Edema

(NCCEP Protocol AC-5)

### Advanced Medical Care

1. Assess 4-lead ECG
2. Obtain 12-lead ECG as indicated by patient presentation
3. For persistent respiratory distress: Continuous positive airway pressure (CPAP)
  - A. Titrate pressure per patient response to therapy
4. Maintain patient in position of respiratory comfort
5. Nitroglycerin (adult patients only)
  - A. 0.4 mg SL
  - B. For patient unable to tolerate SL nitroglycerin, apply nitro paste to upper chest
    - i. SBP > 200 mm Hg: apply 2 inches
    - ii. SBP 150 – 200 mm Hg: apply 1.5 inches
    - iii. SBP 100 – 150 mm Hg: apply 1 inch
  - C. Hold/remove for SBP < 100 mm Hg
  - D. Hold for Viagra®, Cialis®, Levitra®, or similar drug use in the past 24 hours
  - E. EMT may administer to patients with a current prescription for nitroglycerin
6. For hypotension:
  - A. Dopamine @ 10 – 20 mcg/kg/min
7. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
8. Ensure proper tube placement using capnometry and SpO<sub>2</sub>, ventilate with 100% oxygen

## Croup

**(NCCEP Protocol AR-7)**

### Description

- \* Acute obstructive swelling and inflammation in the subglottic area and tracheobronchial tree caused by viral infection
- \* Occurs most often in children three (3) months to three (3) years of age
- \* Often preceded by upper respiratory infection
- \* Clinical Presentation: dyspnea, stridor, barking type cough, tachycardia

### Basic Medical Care

1. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
2. Maintain child in position of respiratory comfort

### Advanced Medical Care

1. For any signs of respiratory distress (retractions, flaring, stridor, hypoxia, dyspnea etc.): racemic epinephrine nebulizer
  - A.  $<5$  kg: 0.25 ml ( $\frac{1}{2}$  ampule) of 2.25% solution (diluted to 3 mL with NS)
  - B.  $\geq 5$  kg: 0.5 ml (1 ampule) of 2.25% solution (diluted to 3 mL with NS)
2. Methylprednisolone (Solu-Medrol®) 2 mg/kg IV (maximum 125 mg)
  - A. Do not start IV access simply for methylprednisolone administration – this may further upset the child worsening respiratory distress
3. Reassess patient frequently
4. Advanced airway management as indicated

## Bronchiolitis

### Description

- \* Viral infection typically affecting young infants resulting in fever, congestion, wheezing
- \* May cause episodes of apnea

### Basic Medical Care

1. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
2. Maintain child in position of respiratory comfort

### Advanced Medical Care

1. Albuterol 2.5 – 5 mg via hand-held or mask nebulizer
  - A. Repeat 2.5 – 5 mg as indicated by patient's condition



## Tracheostomy Tube Emergencies

(NCCEP Protocol AR-10)

### Differential Diagnosis

- \* Allergic reaction
- \* Aspiration
- \* Asthma
- \* Foreign body obstruction
- \* Infection / Sepsis
- \* Trauma

### Basic Medical Care

1. Assess vital signs
2. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
3. Provide suctioning as indicated per patient condition
4. Maintain patient in position of respiratory comfort

### Advanced Medical Care

1. Assess tracheostomy tube
2. For tube not in place; place tube via standard technique
  - A. Prepare and check necessary equipment including device of the same size and 0.5 size smaller than patients existing device
  - B. Have standard airway management equipment available
  - C. Appropriately lubricate the replacement tube
3. Ensure obturator removed
4. Ensure inner cannula properly placed
5. Provide suctioning as indicated per patient condition
  - A. Limit suctioning attempt to  $< 10$  seconds
  - B. May instill 2 – 3 ml of saline as needed before suctioning
6. Assist ventilations with BVM as indicated per patient condition
7. Replace tube if indicated per [Airway: Tracheostomy Tube Change Protocol](#)
8. If unable to place new smaller device, use standard airway procedures to assist patient
  - A. [Airway: Adult Protocol](#); [Airway: Pediatric Protocol](#)

### Additional Considerations

- \* Utilize family members as appropriate for assistance in the care of the tracheostomy
- \* More difficulty with tube changing should be anticipated with tracheostomy sites that are  $< 2$  weeks old
- \* Potential complications
  - Airway obstruction
  - Airway device misplacement
  - Bleeding

## Ventilator Emergencies

(NCCEP Protocol AR-9)

### Differential Diagnosis

- \* Disruption from oxygen source
- \* Dislodgement or obstruction of tracheostomy (endotracheal) tube
- \* Disruption of ventilator circuit
- \* Patient with increase oxygen requirement
- \* Ventilator failure

### Basic Medical Care

1. Assess vital signs including pulse oximetry
2. Confirm baseline SpO<sub>2</sub> saturation

### Advanced Medical Care

1. Assess ventilator, oxygen source, and circuit
2. Attempt to maintain patient on **patient's typical ventilator settings**
3. Contact Medical Control to attempt corrective actions to improve cause of respiratory distress/increased work of breathing
4. Ventilate with bag-valve-device if unable to oxygenate/ventilate with ventilator despite appropriate adjustment to settings
5. Utilize continuous waveform ETCO<sub>2</sub> during transport

### Additional Considerations

- \* Troubleshooting **DOPE** mnemonic
  - **D**isplaced ETT, tracheostomy
  - **O**bstuction
  - **P**neumothorax
  - **E**quipment failure
- \* Typical alarms
  - Low pressure/apnea
    - Loose or disconnected circuit
    - Leak in circuit or at tracheostomy site
  - Low power
    - Internal battery depletion
  - High pressure
    - Plugged/obstructed airway or circuit
- \* When in doubt: ventilate with bag-valve-device if unable to oxygenate/ventilate with ventilator

**Additional Considerations**

- \* CPAP
  - For COPD, asthma, bronchospasm, or reactive airways disease, apply positive end-expiratory pressure by starting at 3 – 5 cm H<sub>2</sub>O of pressure and slowly titrating to achieve a desirable and tolerated positive pressure reading
  - Maximum 10 cm H<sub>2</sub>O
- \* The benefits of administering supplemental oxygen to patients with exacerbated COPD outweigh the risks of suppressing the hypoxic respiratory drive
  - This phenomenon does not occur in the acute care or prehospital setting
- \* Bronchospasm may be severe enough – especially in pediatric patients – that no wheezing is heard on auscultation as air flow is minimal
  - This represents significant exacerbation and warrants aggressive therapy
- \* When patients present with severe respiratory distress, impending respiratory failure or are deteriorating, treatment should be initiated before transport
- \* **Consider the patient's history of or risk for coronary artery disease prior to the administration of epinephrine**
  - Consider decreasing dose or contact medical control prior to IM epinephrine administration to patients with a known cardiac history or patients > 55-years of age with known coronary artery disease risk factors
  - However, there is no contraindication to the administration of epinephrine in a life-threatening respiratory situation
- \* For intubated patients:
  - Allow for adequate time for exhalation with increased I:E ratios
  - Plan for lower respiratory rates and lower tidal volumes than typical normal levels in patients with asthma/COPD exacerbations
  - The goal of treatment should be to maximize medical therapy early to avoid intubation
- \* Consider acute myocardial ischemic event, especially in patients with any chest pain or cardiac disease risk factors
- \* Epiglottitis
  - Bacterial infection involving the epiglottitis causing it to swell and partially or totally obstruct the upper airway
  - Typically presents with sudden onset of sore throat, drooling, stridor, and fever
  - Total airway occlusion is a catastrophic possibility that can be precipitated by invasive oral exams (using tongue blades or laryngoscopes), finger sweeps, and/or supine positioning
  - Prehospital treatment includes quiet transportation with the patient in position of comfort and parent or guardian accompanying the child
  - Oxygen should be utilized as tolerated

## Burns

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### Clinical Presentation

- \* Superficial burns
  - Erythematous patches
  - Minimal tissue injury of the outermost layers of epidermis
- \* Partial thickness burns
  - Vesicle formation
  - Tissue damage extends into dermis
- \* Full thickness burns
  - Charred, leathery or pearly white surface
  - Destruction of all layers of skin including nerve endings
- \* Rule of nines for estimation of % total body surface area – **Adult**
  - Head = 9% (face 4.5%, scalp 4.5%)
  - Anterior torso = 18%
  - Posterior torso = 18%
  - R Arm = 9% (anterior 4.5%, posterior 4.5%)
  - L Arm = 9% (anterior 4.5%, posterior 4.5%)
  - R Leg = 18% (anterior 9%, posterior 9%)
  - L Leg = 18% (anterior 9%, posterior 9%)
  - Genitalia = 1%
- \* Rule of nines for estimations of % total body surface area – **Pediatric**
  - Head = 18% (face 9%, scalp 9%)
  - Chest = 13%
  - Back = 13%
  - R Arm = 9%
  - L Arm = 9%
  - R Leg = 18%
  - L Leg = 18%
  - Genitalia = 1%
- \* ***Only partial-thickness (2<sup>nd</sup> degree) and full-thickness (3<sup>rd</sup> degree) burns should be considered when calculating the Total Body Surface Area (TBSA) extent of burns***
  - As an estimate, the size of the patient's palm can be considered 1% TBSA in calculating scattered areas of burn
  - Refer to attached figures for further assistance in calculating TBSA extent of burn
- \* TBSA estimation of burn size can only be utilized for thermal burns
- \* For electrical burns: exterior burns can NOT be utilized to determine extent of injury or needed fluid resuscitation

## Burns – Thermal

(NCCEP Protocol TB-9)

### Basic Medical Care

1. Ensure scene safety
2. Remove patient from source of injury
3. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
4. [Airway: Adult Protocol](#); [Airway: Pediatric Protocol](#)
5. Assess vital signs
6. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
7. Assess extent and depth of burns
8. Assess for signs of airway burns / inhalational injury
  - A. Stridor, dyspnea
  - B. Intra-oral burns
  - C. Carbonaceous sputum
  - D. Singed nasal hair
9. For multi-trauma [Spinal Motion Restriction Protocol](#) as per patient history
10. Remove any constricting clothing, jewelry, watches, etc. on any affected extremity
11. Attempt to cool burn with saline or clean water
  - A. Only if within the first 1 – 2 minutes from time of injury
12. Dress burns with clean, DRY dressings

### Advanced Medical Care

1. Apply cardiac monitor
2. Obtain rhythm strip and refer to appropriate protocol as indicated
3. [Airway: Adult Protocol](#); [Airway: Pediatric Protocol](#)
4. Normal saline IVF
  - A. Adult
    - i. Hemodynamically unstable or  $\geq 25\%$  TBSA: IVF wide open
    - ii. Hemodynamically stable &  $< 25\%$  TBSA: IVF @ maintenance rate
  - B. Pediatrics
    - i. Hemodynamically unstable or  $\geq 25\%$  TBSA: IVF @ 20 mg/kg bolus
    - ii. Hemodynamically stable and  $< 25\%$  TBSA: IVF @ maintenance rate
5. Fentanyl (Sublimaze®)
  - A. Adult
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatric
    - i. 0.5 – 1 mcg/kg IN, IV, IM (maximum 100 mcg)
    - ii. Contact medical control for repeat dosing
6. Alternative analgesic: Nitrous oxide via patient-controlled inhalation
7. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
8. Ensure proper tube placement using capnometry,  $\text{SpO}_2$  and ventilate with 100% oxygen

**Additional Considerations**

- \* Always ensure that the scene is safe before approaching the patient
- \* Cooling with water is considered useless and potentiates hypothermia if performed outside of the first 1 – 2 minutes from time of exposure
- \* Do **NOT** apply ice
- \* Carbon monoxide, cyanide, or other toxic gases may exacerbate the patient's clinical condition
  - Consider associated carbon monoxide toxicity
    - High flow oxygen via face mask
  - Consider associated cyanide toxicity
    - Symptoms
      - Altered mental status
      - Chest pain
      - Dizziness
      - Headache
      - Nausea, vomiting
      - Syncope
    - High flow oxygenation is paramount for these patients
      - Pulse oximetry measurements may be falsely elevated
    - Treatment: sodium thiosulfate
      - Adults: 12.5 grams IV over 10 minutes
      - Pediatrics: 250 mg/kg IV (maximum 12.5 grams) over 10 minutes
- \* Always consider the possibility of abuse, particularly in pediatric patients
- \* It is acceptable to initiate an IV or IO over a superficial or partial thickness burn area
- \* Avoid IM medications in patients with significant thermal burns

## Burns – Chemical and Electrical

(NCCEP Protocol TB-2)

### Current

- \* Alternating Current (AC)
  - Lower voltage, household current
  - Flow of electrons switches from positive to negative
  - Tends to cause continuous muscle contraction (tetany), therefore longer exposure time
  - Classically cardiac arrest due to ventricular fibrillation
- \* Direct Current (DC)
  - Higher voltage, power lines, lightning
  - Flow of electrons in one direction
  - Tends to cause single muscle spasm, therefore short exposure time and throw victim from the source
  - Classically cardiac arrest due to asystole

### Clinical Presentation

- \* Variable entrance and exit wounds
- \* Cardiac dysrhythmia
- \* Muscle pain

### Basic Medical Care

1. Ensure scene safety
  - A. Ensure patient no longer in contact with power source
  - B. Ensure power source turned off
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. [Airway: Adult Protocol](#); [Airway: Pediatric Protocol](#)
4. Assess vital signs
5. Initiate spinal motion restriction as indicated
6. Provide copious water / saline irrigation to the site of any chemical burn / exposure after brushing away any dry compounds that may be present
7. Apply sterile dressing to involved site(s)
8. Remove any constricting clothing, jewelry, watches, etc. on any affected extremity
9. Provide supplemental oxygen per patient condition to maintain SpO<sub>2</sub> = 94 – 97%
10. Assess extent and depth of burns
  - A. Rule of nines **CANNOT** be utilized to assess extent of injury with electrical burns
11. Consider blunt trauma as suggested by mechanism of injury
12. Note neurovascular status of distal extremities
13. If chemicals are involved, attempt to identify source
  - A. Any chemical information or copy of the data sheet (MSDS) should be brought to the hospital with the patient
  - B. Decontaminate as indicated based on exposure history
  - C. Copiously irrigate any eye exposure with sterile saline

**Advanced Medical Care**

1. Apply monitor and obtain 12-lead ECG as per patient history
  - A. Obtain 4-lead ECG and refer to appropriate protocol as indicated
  - B. 12-lead ECG should be obtained on all patients with electrical injury
2. **Airway: Adult Protocol; Airway: Pediatric Protocol**
3. Normal saline IVF
  - A. Adult
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: maintenance rate
  - B. Pediatrics
    - i. Hemodynamically unstable: IVF @ 20 mg/kg bolus
    - ii. Hemodynamically stable: maintenance rate
4. Fentanyl (Sublimaze®)
  - A. Adult
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatric
    - i. 0.5 – 1 mcg/kg IN, IV, IM (maximum 100 mcg)
    - ii. Contact medical control for repeat dosing
  - A. Alternative analgesic: nitrous oxide via patient-controlled inhalation
5. Advanced Airway management as indicated
  - A. **Airway: Intubation Protocol**
  - B. **Airway: BIAD Protocol**
1. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen

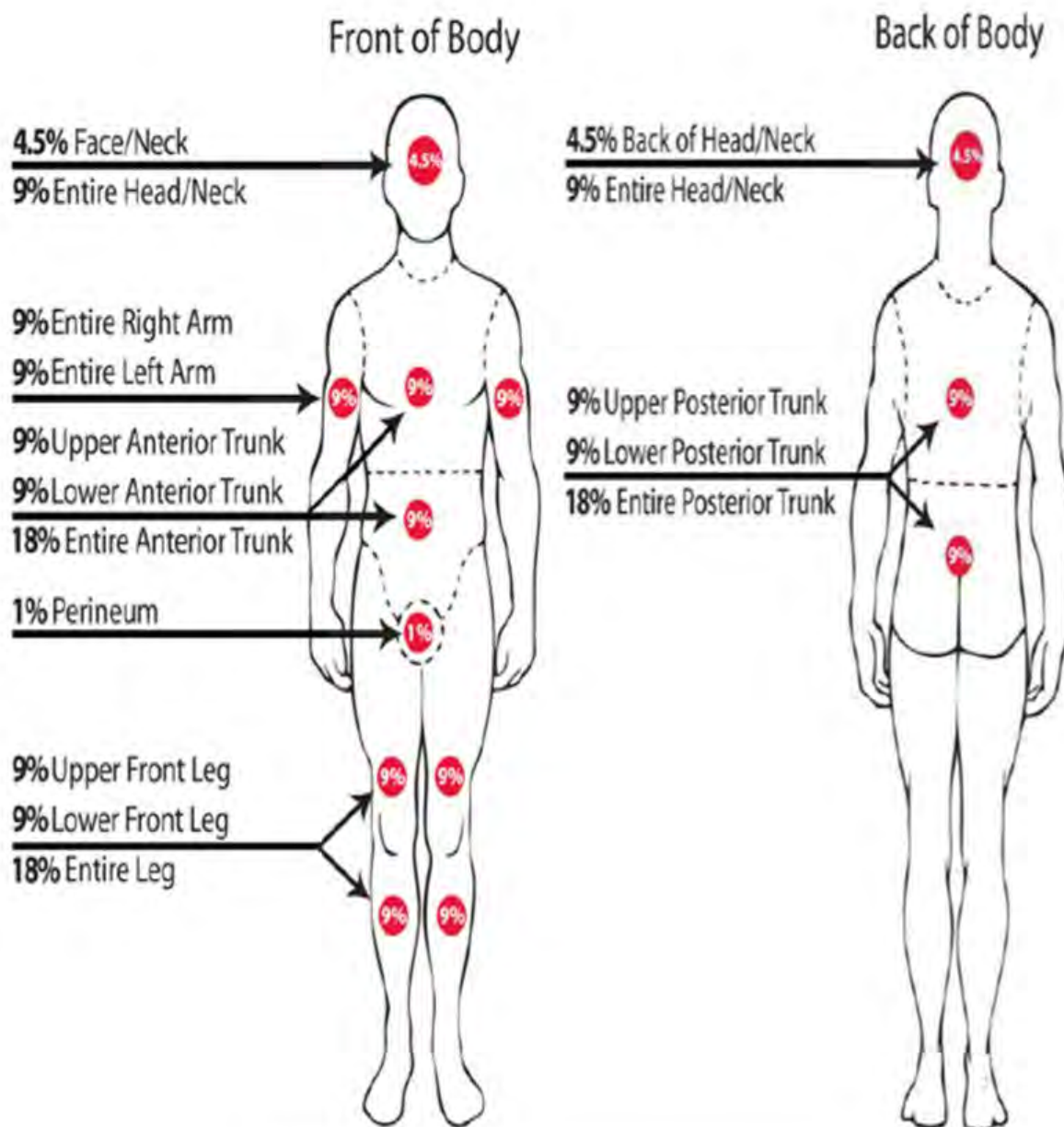
**Additional Considerations**

- \* Always ensure that the scene is safe before approaching the patient
- \* Cooling with water is considered useless and potentiates hypothermia if performed outside of the first 1 – 2 minutes from time of exposure
- \* Carbon monoxide, cyanide, or other toxic gases may exacerbate the patient's condition
  - Consider associated carbon monoxide toxicity
    - High flow oxygen via face mask
  - Consider associated cyanide toxicity
    - Patient may complain of headache, nausea, vomiting, chest pain, dizziness, altered mental status, or a syncopal event
    - High flow oxygenation is paramount for these patients
    - Pulse oximetry measurements may be falsely elevated
    - Treatment: sodium thiosulfate
      - Adults: 12.5 grams IV over 10 minutes
      - Pediatrics: 250 mg/kg IV (maximum 12.5 grams) over 10 minutes
- \* Always consider the possibility of abuse, particularly in pediatric patients
- \* It is acceptable to initiate an IV or IO over a superficial or partial thickness burn area

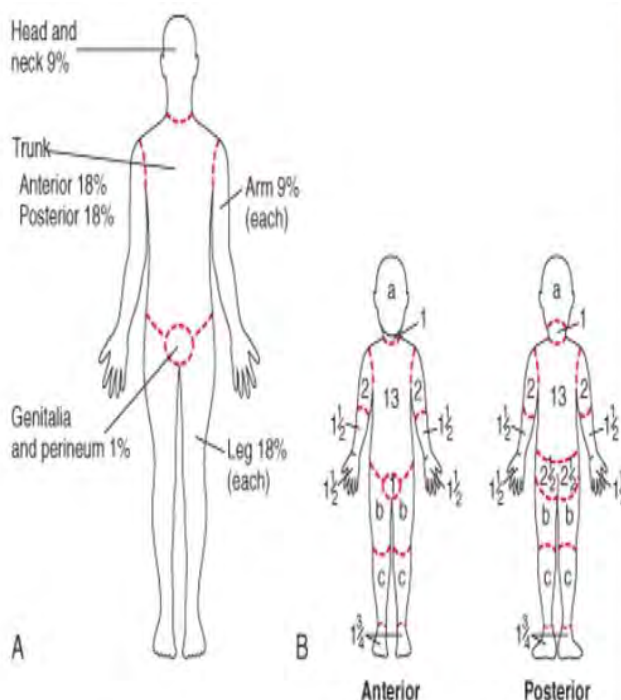


## Burn Charts for Estimating Burn Size (Rule of Nines Charts)

### Estimation of burn size (Adult)



Estimate spotty areas of burn by using the size of the patient's palm as 1 %

**Estimation of burn size (pediatric)**

Relative percentage of body surface area (% BSA) affected by growth

| Body Part              | Age   |       |       |       |       |
|------------------------|-------|-------|-------|-------|-------|
|                        | 0 yr  | 1 yr  | 5 yr  | 10 yr | 15 yr |
| a = 1/2 of head        | 9 1/2 | 8 1/2 | 6 1/2 | 5 1/2 | 4 1/2 |
| b = 1/2 of 1 thigh     | 2 3/4 | 3 1/4 | 4     | 4 1/4 | 4 1/2 |
| c = 1/2 of 1 lower leg | 2 1/2 | 2 1/2 | 2 3/4 | 3     | 3 1/4 |

**Rule of Nines**

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1<sup>st</sup> degree burn from those of partial (2<sup>nd</sup>) or full (3<sup>rd</sup>) 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 (1<sup>st</sup> degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> 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:
  - 4<sup>th</sup> referring to a burn that destroys the dermis and involves muscle tissue.
  - 5<sup>th</sup> referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6<sup>th</sup> referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

Estimate spotty areas of burn by using the size of the patient's palm as 1 %

## Carbon Monoxide / Cyanide / HazMat Exposure

(NCCEP TE-2)

### Basic Medical Care

1. Ensure scene safety and a protective environment for all personnel and patients
  - A. Additional precautions (distance and shielding) should be considered when radiological agents are involved.
2. Ensure fire department resources (Hazardous Materials Team) has been notified
3. Attempt to identify exposure (bystander or worker information, incident location, environmental indicators, container description, placards or labels, shipping papers or Material Safety Data Sheets, patient symptoms)
4. Don appropriate personal protective equipment
  - A. Decision for type and level will be made by the scene Incident Command
5. Immediately remove all patients from the exposure and determine the level of contamination present
  - A. Determine the need for decontamination prior to full assessment and treatment
  - B. Vapor material source: remove from source of contamination
  - C. Liquid material source: remove contaminated equipment and clothing and perform gross and technical decontamination procedures
  - D. Solid material source: remove material by physical measures of brushing away source, then gross and technical decontamination procedures as indicated
6. **Medical Initial Assessment Protocol or Pediatric Initial Assessment Protocol**
7. **Airway: Adult Protocol; Airway: Pediatric Protocol**
8. Assess vital signs
9. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
10. Remove appropriate clothing to fully inspect the chest, abdomen, and extremities for any significant thermal injuries
11. Remove constricting jewelry, watches, etc.
12. Assess vital signs with pulse oximetry
13. If available, a carboxyhemoglobin level should be obtained with the Rad 57 oximeter
  - A. **Initial SpCO level**

|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>➤ &lt; 3%</li> <li>➤ 3% to 12% and no symptoms</li> <li>➤ &gt; 3% and symptoms; or &gt; 12%</li> </ul> | <b><u>Protocol</u></b><br>Continue to monitor<br>Oxygen via NRB mask<br>Oxygen via NRB & transport |
|---|--|
  - B. Symptoms of CO toxicity:
    - i. Headache, vertigo, confusion, loss of consciousness
    - ii. Shortness of breath
    - iii. Nausea
14. For eye exposure, copiously irrigate with sterile saline
15. Provide copious water / saline irrigation to the any site of chemical exposure burn
16. Apply sterile dressing to involved site(s)
17. Any chemical information or copy of the data sheet (MSDS) should be brought to the hospital with the patient

**Advanced Medical Care**

1. Apply monitor and obtain 4-lead ECG
2. Obtain 12-lead ECG as per patient history
3. Obtain rhythm strip and refer to appropriate protocol as indicated
4. **Airway: Adult Protocol; Airway: Pediatric Protocol**
5. Normal saline IVF
  - A. Adult
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: IVF @ TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: IVF @ 20 mg/kg bolus
    - ii. Hemodynamically stable: IVF @ TKO
1. Albuterol via hand-held or mask nebulizer
  - A. Adults: 5 mg
  - B. Pediatrics: 2.5 – 5 mg
  - C. EMT-B may administer to patients currently prescribed beta agonist
6. CPAP as indicated by patient condition
7. Ondansetron (Zofran) for nausea/vomiting
  - A. Adults: 4 – 8 mg IV, IM, PO
  - B. Pediatrics: 0.15 mg/kg IV, IM, PO (maximum 4 mg)
8. Advanced Airway management as indicated
  - A. **Airway: Intubation Protocol**
  - B. **Airway: BIAD Protocol**
9. Ensure proper tube placement using capnometry, SpO2 and ventilate with 100% oxygen

## Cyanide

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### Toxicity

- \* Mild – no symptoms
- \* Moderate – anxiety, nausea/vomiting, weakness, dizziness
- \* Severe – syncope, loss of consciousness, seizures, apnea

### Basic Medical Care

1. Assess vital signs
2. Provide supplemental oxygen
  - A. High flow oxygenation is paramount for these patients
  - B. Pulse oximetry measurements may be falsely elevated
3. Assist ventilations as indicated by patient presentation
4. Assess blood glucose level for any altered mental status

### Advanced Medical Care

1. **[Airway: Adult Protocol](#); [Airway: Pediatric Protocol](#)**
2. IVF resuscitation as indicated by patient condition
  - A. Adult
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: maintenance rate
  - B. Pediatrics
    - i. Hemodynamically unstable: IVF @ 20 mg/kg bolus
    - ii. Hemodynamically stable: maintenance rate
3. Sodium thiosulfate:
  - A. Adults 12.5 grams IV over 10 minutes
  - B. Pediatrics: 250 mg/kg IV (maximum 12.5 grams) over 10 minutes

### Additional Considerations

- \* Always ensure scene safety
- \* Always ensure appropriate personal protection
- \* Copiously irrigate exposed patient to prevent cross contamination of providers or other patients
  - Protect patient from hypothermia as a result of irrigation

## Vesicants

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### Agents

- \* Mustard gas

### Symptoms

- \* Skin - erythema, burning, itching, vesicles, blisters, bulla
- \* Eyes - conjunctivitis, lid inflammation and edema, blepharospasm, corneal effects
- \* Respiratory - epistaxis, sinus pain, pharyngitis, cough, dyspnea, pulmonary edema
- \* Other system effects - gastrointestinal tract (nausea, vomiting)

### Basic Medical Care

1. Skin exposure
  - A. Standard burn therapy
2. Eye exposure
  - A. Copious irrigation
3. Respiratory tract exposure
  - A. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
  - B. Albuterol via hand held or mask nebulizer as indicated
    - i. Adults: 5 mg
    - ii. Pediatric 2.5 – 5 mg

### Advanced Medical Care

1. Additional care as per appropriate medical or trauma condition protocol

### Additional Considerations

- \* Always ensure scene safety
- \* Always ensure appropriate personal protection
- \* Copiously irrigate exposed patient to prevent cross contamination of providers or other patients
  - Protect patient from hypothermia as a result of irrigation

## Pulmonary agents

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### Agents

- \* Hydrogen sulfide
- \* Ammonia
- \* Chlorine

### Symptoms

- \* Eyes - irritation and burning
- \* Respiratory - cough, shortness of breath, dyspnea, chest pain

### Basic Medical Care

1. Skin exposure
  - A. Irrigation and standard burn therapy
2. Eye exposure
  - A. Copious irrigation
3. Respiratory tract exposure
  - A. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
  - B. Suction as indicated
  - C. Albuterol via hand held or mask nebulizer as indicated
    - i. Adults: 5 mg
    - ii. Pediatric 2.5 – 5 mg

### Advanced Medical Care

1. Additional care as per appropriate medical or trauma condition protocol

### Additional Considerations

- \* Always ensure scene safety
- \* Always ensure appropriate personal protection
- \* Copiously irrigate exposed patient to prevent cross contamination of providers or other patients
  - Protect patient from hypothermia as a result of irrigation

## Riot Control Agents

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### Agents

- \* Pepper spray – OC (Oleoresin Capsicum)
- \* Mace – CN (chloroacetophenone)
- \* Tear gas – CS (chlorobenzylidenemalononitrile)

### Symptoms

- \* Skin - burning, redness, blisters
- \* Eyes - blepharospasm (eyelid closure), transient blindness, tearing, conjunctival injection
- \* Respiratory - nasal discharge, sneezing, burning, cough, shortness of breath, chest tightness, bronchospasm and wheezing

### Basic Medical Care

1. Skin exposure
  - A. Irrigation and standard burn therapy
2. Eye exposure
  - A. Copious irrigation with normal saline or water
3. Respiratory tract exposure
  - A. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
  - B. Suction as indicated

### Advanced Medical Care

1. Additional care as per appropriate medical or trauma condition protocol

### Additional Considerations

- \* Always ensure scene safety
- \* Always ensure appropriate personal protection
- \* Copiously irrigate exposed patient to prevent cross contamination of providers or other patients
  - Protect patient from hypothermia as a result of irrigation



**WMD - Nerve Agent Exposure****(NCCEP Protocol TE-8)****Chemical Nerve Agents, Organophosphates, Carbamates****Symptoms**

- \* SLUDGE syndrome: salivation, lacrimation, urination, defecations, gastric hypermobility (diarrhea), vomiting
- \* Muscle fasciculations, muscle twitching, weakness, flaccid paralysis
- \* Loss of consciousness, seizures
- \* Hypertension, bradycardia or tachycardia, ventricular dysrhythmias, apnea
- \* Vapor exposure: miosis, blurred vision, eye pain

**Basic Medical Care**

1. Initiate decontamination procedures
2. Airway protection; may need frequent suctioning
3. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
4. Treatment Adult:
  - A. Mild effects (miosis, rhinorrhea, nausea, vomiting)
    - i. 1 – atropine/2-Pralidoxime IM via auto-injector
  - B. Moderate effects (shortness of breath)
    - i. 2 – atropine/2-Pralidoxime IM via auto-injector
  - C. Severe effects (seizures, vomiting, apnea)
    - i. 3 – atropine/2-Pralidoxime IM via auto-injector
5. Treatment Pediatric:
  - A. < 7 years of age: 1 – atropine/2-Pralidoxime IM via auto-injector
  - B. 7 – 14 years of age: 2 – atropine/2-Pralidoxime IM via auto-injector
  - C. > 14 years of age: 3 – atropine/2-Pralidoxime IM via auto-injector

**Advanced Medical Care**

1. Treatment Adult
  - A. Mild effects: Atropine 2 mg IV, IM, IO
  - B. Moderate effects: Atropine 4 mg IV, IM, IO
  - C. Severe effects: Atropine 6 mg IV, IM, IO
  - D. Seizures: Midazolam 5 – 10 mg IN or 5 mg IM
2. Treatment Pediatric
  - A. Mild – moderate symptoms
    - i. Atropine 0.02 – 0.05 mg/kg IV, IM, IO (maximum 4 mg)
    - ii. Repeat 0.02 mg/kg IV, IM, IO in 5 minutes as indicated (maximum 2 mg)
  - B. Severe symptoms
    - i. Atropine 0.02 – 0.05 mg/kg IV, IM, IO (maximum 6 mg)
  - C. Seizures: Midazolam 0.2 mg/kg IN or 0.15 mg/kg IM (max 10 mg IN, 5 mg IM)
3. Repeat atropine every 3-5 minutes as indicated

**Radiation Incident****(NCCEP Protocol TB-7)****Basic Medical Care**

1. Ensure scene safety
2. [\*\*START Triage Protocol\*\*](#)
3. [\*\*Medical Initial Assessment\*\*](#) or [\*\*Trauma Initial Assessment Protocol\*\*](#) as indicated
4. [\*\*Pediatric Initial Assessment\*\*](#) or [\*\*Pediatric Trauma Assessment Protocol\*\*](#) as indicated
5. Attempt to assess the type and duration of exposure
6. Decontaminate with copious amounts of normal saline irrigation
7. Additional care as per appropriate associated protocol

**Additional Considerations**

| Time Phases of Radiation Injury<br>(Exposure Dose vs Clinical Outcome)   |                   |                                     |                  |            |                              |
|--|-------------------|-------------------------------------|------------------|------------|------------------------------|
| Exposure Dose (Gy)   | Prodrome Severity | Manifest Illness - Symptom Severity |                  |            | Prognosis                    |
|  |                   | Hematologic                         | Gastrointestinal | Neurologic |                              |
| 0.5 to 1.0   | +                 | +                                   | 0                | 0          | Survival almost certain      |
| 1.0 to 2.0   | +/**              | +                                   | 0                | 0          | Survival >90 percent         |
| 2.0 to 3.5   | ++                | ++                                  | 0                | 0          | Probable survival            |
| 3.5 to 5.5   | +++               | +++                                 | +                | 0          | Death in 50% at 3.5 to 6 wks |
| 5.5 to 7.5   | +++               | +++                                 | ++               | 0          | Death probable in 2-3 wks    |
| 7.5 to 10  | +++               | +++                                 | +++              | 0*         | Death probable in 1-2.5 wks  |
| 10 to 20   | +++               | +++                                 | +++              | +++        | Death certain in 5-12 days   |
| > 20   | +++               | +++                                 | +++              | +++**      | Death certain in 2-5 days    |
| <b>Abbreviations:</b> Gy: dose in Grey;<br>0: no effects; +: mild; ++: moderate; +++: severe or marked<br>* Hypotension<br>** Also cardiovascular collapse, fever, shock   |                   |                                     |                  |            |                              |
| Modified from : Waselenko, JK, MacVittie, TJ, Blakely, WF, et al. Medical management of the acute radiation syndrome: Recommendations of the strategic national stockpile radiation working group. Ann Int Med 2004; 140:1039. |                   |                                     |                  |            |                              |

**\* Classes of radiation**

- Ionizing
  - Greater energy, most dangerous
  - Alpha particles, beta particles, gamma rays
- Non-ionizing
  - Lower energy
  - Microwaves, radios, lasers, visible light

## Cardiac Arrest

## (NCCEP Protocol AC-3)

### Differential Diagnosis

- \* Asystole
- \* Pulseless Electrical Activity
- \* Ventricular fibrillation
- \* Ventricular tachycardia without a pulse

### Considerations

- \* Medical vs. trauma
- \* Past medical history
- \* Current medications
- \* DNR order
- \* Events preceding cardiac arrest
- \* Estimated downtime
- \* Pre-arrival treatment

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Immediately following arrival on the scene, the attending paramedic (or EMTCC) will proceed directly to the patient
  - A. **Once at the patient's side, check for pulses and breathing**
    - i. If absent, will begin chest compressions
    - ii. Compressions:  $\geq$  2-inch depth & permit full chest recoil
    - iii. Compression rate = 110/minute
  - B. If bystander chest compressions are being administered, proceed to perform airway interventions (ensure chest compressions are being performed appropriately)
3. The EMT or non-attending paramedic will bring in equipment, proceed directly to the **patient's airway and check for breathing** & if absent:
  - A. Adult
    - i. Insert BIAD airway device and begin ventilations or
    - ii. Utilize BVM and 100% oxygen for ventilations
    - iii. Insert orogastric tube and connect to suction
  - B. Pediatric
    - i. Insert BIAD airway device and begin ventilations or
    - ii. Provide ventilations with OPA/NPA and bag-valve-mask & 100% oxygen
  - C. Provide one ventilation every 20<sup>th</sup> compression
  - D. Apply cardiac monitor or quick look paddles and obtain rhythm strip
    - i. If only BLS providers on scene apply AED
    - ii. Follow AED prompts for potential defibrillation in coordination with compression cycles
  - E. After 200 compressions, relieve paramedic with chest compressions
    - i. The paramedic will continue with Advanced Medical Care

**Advanced Medical Care**

1. Upon Paramedic crew arrival
  - A. Paramedic will proceed to the **patient's side and initiate** intraosseous (IO) line as indicated per [Parenteral Access: IO Protocol](#) and ACLS interventions
  - B. EMT-Basic or Non-Crew Chief Paramedic will deploy the MRx monitor including defibrillation pads, QCPR meter, SpO<sub>2</sub> monitor and ETCO<sub>2</sub> adaptor
2. If BIAD placement unsuccessful or is ineffective – perform endotracheal intubation
  - A. Compressions must NOT be interrupted for any attempt at intubation
  - B. Confirm placement via standard technique
3. EMT-Basic or Non-Crew Chief will prepare chilled saline IVF for infusion then assume ready position to assume ventilations at the next position change following 200 compressions cycle and enter same rotation through positions with first responders
4. While rapid defibrillation is the treatment of choice for ventricular fibrillation, CPR should be performed on all adult unwitnessed cardiac arrests regardless of initial rhythm for at least 200 compressions prior to defibrillation attempt
5. For pediatric ventricular fibrillation arrest, early defibrillation is more important
  - A. Ventricular fibrillation is seen in cardiomyopathies, myocarditis, hypoxia, or intoxication
  - B. Airway control and oxygenation are of paramount importance
  - C. Pediatric patients in cardiac arrest from a medical etiology should not be expeditiously carried to the ambulance when it arrives
    - i. For maximum survival benefit, resuscitative efforts should be conducted on the scene with two or more rescuers performing CPR
  - D. Resuscitation and transport should be performed on all pediatric cardiac arrest patients regardless of etiology – medical or trauma
  - E. Indicated ALS medications should be administered for both pediatric medical and trauma arrest
6. After each defibrillator shock, chest compressions should commence immediately
7. Additional care as per specific dysrhythmia protocol

**Additional Considerations**

- \* Ensure hyperventilation does NOT occur
  - Feedback in the form of end-tidal CO<sub>2</sub> and verbal queues are important to the provider administering the ventilations to avoid hyperventilation
- \* With ETCO<sub>2</sub> spike consider return of spontaneous circulation
- \* Epinephrine (1:10,000) during cardiac arrest care:
  - Maximum total amount for adult cardiac arrest = 5 mg
- \* Opioid associated cardiac arrest:
  - Naloxone (Narcan®) is not associated with improved outcome once cardiac arrest has occurred and its administration is not recommended without ROSC
  - Attention must be on airway, oxygenation, ventilation, and cardiac arrest care
- \* Maternal arrest: follow appropriate protocol
  - **Manually displace uterus to the patient's left**

**Ventricular Fibrillation, Pulseless Ventricular Tachycardia (NCCEP AC-8/PC-6)****Witnessed by EMS provider:**

1. Immediately initiate CPR as defibrillation pads are applied and defibrillator charged
  - A. Adults: defibrillate @ 150 Joules as soon as pads are applied & charged
  - B. Pediatrics: defibrillate @ 2 Joules/kg as soon as pads are applied & charged
2. If defibrillation pads are already in place → immediately defibrillate
3. Immediately resume CPR post-shock delivery
4. Perform ventilations at rate of 6 ventilations per minute

**Unwitnessed by EMS provider**

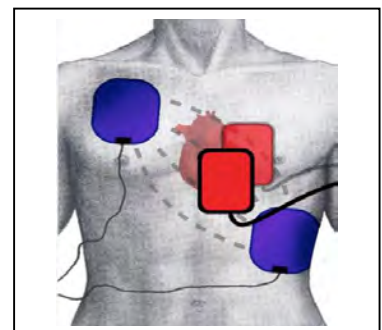
1. Perform CPR for 200 compressions
  - A. Rate: 110 compressions per minute
2. Pre-charge defibrillator at compression #180
  - A. Adults: 150 Joules
  - B. Pediatrics: 2 Joules/kg (maximum 150 Joules)
3. Perform defibrillation
4. Immediately resume CPR post-shock delivery
5. Perform ventilations at rate of 6 ventilations per minute
  - A. One ventilation should occur each 20<sup>th</sup> compression

**VFib, Pulseless VTach Present/Persisting after Initial Intervention**

1. Continue CPR for 200 compressions
2. Pre-charge defibrillator at compression #180
3. Check rhythm
  - A. Organized → check pulses
    - i. No pulse present → continue CPR for cycle of 200 compressions
    - ii. Pulse present → referred to **Post-Resuscitation Protocol**
  - B. Persistent VF/VT without pulse → Perform defibrillation
    - i. Adults: 200 Joules
    - ii. Pediatrics: 4 Joules/kg (maximum 150 Joules)
4. Immediately resume CPR post-shock delivery
5. Continue with cycles of 200 compressions between rhythm/pulse checks
6. Epinephrine (1:10,000) every 5 minutes
  - i. Adults: 1 mg IO, IV
  - ii. Pediatrics: 0.01 mg/kg; (0.1 ml/kg) IO, IV (maximum: 1 mg; 1 ml)
7. For persistent VF/VT
  - A. Lidocaine 1.5 mg/kg IO, IV
  - B. Repeat x1 additional dose at 0.5 mg/kg in 5 – 10 minutes as indicated
  - C. Magnesium sulfate
    - i. Adults: 2 grams IO, IV over 2 minutes
    - ii. Pediatrics: 50 mg/kg IO, IV over 2 minutes (maximum 2 grams)
8. Total arrest time > 15 minutes
  - A. Sodium bicarbonate
    - i. Adults: 50 mEq (50 ml) IO, IV
    - ii. Pediatrics: 1 mEq/kg (1 ml/kg); max 50 mEq (50 ml) IO, IV
    - iii. Repeat every 10 minutes
9. If rhythm converts to organized rhythm with palpable pulses and lidocaine has not previously been administered: lidocaine at dose outlined above
10. Total ACLS resuscitation time > 20 minutes, no ROSC, and ETCO<sub>2</sub> < 20 mmHg
  - A. Patients with refractory/recurrent ventricular fibrillation/tachycardia should be transported to the emergency department with continued resuscitative efforts
11. Any time rhythm changes to alternate rhythm refer to the appropriate protocol

**Additional Considerations**

- \* Following three (3) unsuccessful defibrillation attempts, change location of defibrillation pads (from right upper-apex to anterior-posterior)



## Torsades de Points

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1. Pulseless and witnessed by EMS provider:
  - A. Initiate CPR as defibrillation pads are applied and defibrillator charged
    - i. Adults: defibrillate @ 150 Joules as soon as pads are applied & charged
    - ii. Pediatrics: defibrillate @ 2 Joules/kg as soon as pads are on & charged
  - B. If defibrillation pads are already in place → immediately defibrillate
  - C. Immediately resume CPR post-shock delivery
  - D. Perform ventilations at rate of 6 ventilations per minute
2. Pulseless and unwitnessed by EMS provider
  - A. Perform CPR for 200 compressions
  - B. Perform defibrillation
    - i. Adults: 150 Joules
    - ii. Pediatrics: 2 Joules/kg (maximum 150 Joules)
  - C. Immediately resume CPR post-shock delivery
  - D. Perform ventilations at rate of 6 ventilations per minute
3. Magnesium sulfate
  - A. Adults: 2 grams IO, IV
  - B. Pediatrics: 50 mg/kg IO, IV (maximum 2 grams)
  - C. Repeat in 5 – 10 minutes if Torsades persists
4. Epinephrine (1:10,000) every 5 minutes
  - A. Adults: 1 mg IO, IV
  - B. Pediatrics: 0.01 mg/kg; (0.1 ml/kg) IO, IV (maximum 1 mg; 1 ml)
5. Continue CPR for 200 compressions
6. Pre-charge defibrillator at compression #180
7. Check rhythm
  - A. Organized → check pulses
    - i. No pulse present → continue CPR for cycle of 200 compressions
    - ii. Pulse present → referred to **Post-Resuscitation Protocol**
  - B. Persistent VF/VT without pulse → Perform defibrillation
    - i. Adults: 200 Joules
    - ii. Pediatrics: 4 Joules/kg (maximum 150 Joules)
8. Immediately resume CPR post-shock delivery
9. Continue with cycles of 200 compressions between rhythm/pulse checks
10. Total arrest time > 15 minutes
  - A. Sodium bicarbonate (repeat every 10 minutes)
    - i. Adults: 50 mEq (50 ml) IO, IV
    - ii. Pediatrics: 1 mEq/kg (1 ml/kg); max 50 mEq (50 ml) IO, IV
2. If rhythm converts to organized rhythm with palpable pulses and lidocaine has not previously been administered: lidocaine at dose outlined above
11. Total ACLS resuscitation time > 20 minutes, no ROSC, and ETCO<sub>2</sub> < 20 mmHg
  - A. Patients with refractory/recurrent torsades should be transported to the emergency department with continued resuscitative efforts
12. ALL pediatric patients should be transported to the closest emergency department



**Pulseless Electrical Activity****(NCCEP Protocol AC-1/PC-1)**

1. Perform CPR for 200 compressions
2. Epinephrine (1:10,000)
  - A. Adults: 1 mg IO, IV
  - B. Pediatrics: 0.01 mg/kg; (0.1 ml/kg) IO, IV
    - i. Administration early as possible in resuscitation of non-shockable rhythms
3. Check rhythm
  - A. Organized → check pulses
  - B. No pulse present → continue CPR for next cycle of 200 compressions
  - C. Pulse present → referred to **Post-Resuscitation Protocol**
4. Continue with cycles of 200 compressions between rhythm/pulse checks
  - A. Pre-charge defibrillator at compression #180
5. Epinephrine (1:10,000) every 5 minutes
  - A. Adults: 1 mg IO, IV
  - B. Pediatrics: 0.01 mg/kg; (0.1 ml/kg) IO, IV (maximum 1 mg; 1 ml)
6. Consider administration of dopamine @ 10 – 20 mcg/kg/min
  - A. **ONLY** if concern for pseudo-PEA (extreme hypotension)
7. Total arrest time > 15 minutes
  - A. Sodium bicarbonate
    - i. Adults: 50 mEq (50 ml) IO, IV
    - ii. Pediatrics: 1 mEq/kg (1 ml/kg) maximum 50 mEq (50 ml) IO, IV
    - iii. Repeat every 10 minutes
8. Consider causes of PEA and their associated treatment:
  - A. Hypoxia: oxygenation
  - B. Hypovolemia: IVF bolus
  - C. Hyperkalemia: Calcium gluconate
    - i. Adult: 2 grams of 10% solution IV (20 ml)
    - ii. Pediatric: 20 mg/kg IO, IV (0.2 ml/kg); maximum 2 grams (20 ml)
  - D. Hypothermia: active rewarming
  - E. Acidosis: sodium bicarbonate 1 mEq/kg (maximum 50 mEq) IV, IO
  - F. Overdose: drug specific therapies
    - i. Tricyclic Antidepressant (TCA): sodium bicarbonate
    - ii. Naloxone (Narcan®) is NOT indicated once cardiac arrest has occurred
      - Consider post-resuscitation if patient hypoventilating
  - G. Acute Myocardial infarction: **Chest Pain: Cardiac & STEMI Protocol**
  - H. Cardiac tamponade: IVF bolus
  - I. Tension pneumothorax: chest needle decompression
  - J. Pulmonary embolus: maximize oxygenation
9. Total ACLS resuscitation time > 20 minutes, no ROSC, and ETCO<sub>2</sub> < 20 mmHg
  - A. May pronounce dead on scene (adults only)
  - B. Notify police if not already on scene
10. Total ACLS resuscitation time > 20 minutes: ALL pediatric patients and adults not pronounced on scene should be transported to the closest emergency department
11. Any time rhythm changes to alternate rhythm refer to the appropriate protocol



**Asystole****(NCCEP Protocol AC-1/PC-2)**

1. Initiate CPR for 200 compressions
2. Epinephrine (1:10,000)
  - A. Adults: 1 mg IV, IO
  - B. Pediatrics: 0.01 mg/kg; (0.1 ml/kg) IV, IO
    - i. Administration early as possible in resuscitation of non-shockable rhythms
3. Check rhythm
  - A. Organized → check pulses
  - B. No pulse present → continue CPR for next cycle of 200 compressions
  - C. Pulse present → referred to Post-Resuscitation Protocol
4. Continue with cycles of 200 compressions between rhythm/pulse checks
  - A. Compressions must NOT be interrupted for airway management
  - B. Limit time off the chest to < 10 seconds during rhythm checks
5. Epinephrine (1:10,000) every 5 minutes
  - A. Adults: 1 mg IO, IV
  - B. Pediatrics: 0.01 mg/kg; (0.1 ml/kg) IO, IV (maximum 1 mg; 1 ml)
6. Total arrest time > 15 minutes
  - A. Sodium bicarbonate
    - i. Adults: 50 mEq (50 ml) IV, IO
    - ii. Pediatrics: 1 mEq/kg (1 ml/kg); maximum 50 mEq (50 ml) IV, IO
    - iii. Repeat every 10 minutes
7. Dextrose (D10) IV for hypoglycemia
8. Total ACLS resuscitation time > 20 minutes, no ROSC, and ETCO<sub>2</sub> < 20 mmHg
  - A. May pronounce dead on scene (adults only)
  - B. Notify police if not already on scene
9. Consider naloxone (Narcan®) post ROSC
  - A. Naloxone (Narcan®) is not associated with improved outcome once cardiac arrest has occurred and its administration is not recommended without ROSC
10. Total ACLS resuscitation time > 20 minutes: ALL pediatric patients and adults not pronounced on scene should be transported to the closest emergency department
11. Any time rhythm changes to alternate rhythm refer to the appropriate protocol

## **Pulseless Wide-complex bradycardia, prolonged QT-interval, or sine wave possibly resulting from hyperkalemia**

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1. Initiate CPR
2. Calcium gluconate (10%)
  - A. Adult: 2 grams (20 ml) IO, IV over 2 minutes
  - B. Pediatric: 20 mg/kg IO, IV (0.2 ml/kg) maximum 2 grams (20ml) over 2 minutes
  - C. Repeat in 10 minutes as indicated by patient condition and rhythm
3. Sodium bicarbonate
  - A. Adult: 50 mEq (50 ml) IO, IV
  - B. Pediatric: 1 mEq/kg (1 ml/kg) maximum 50 mEq (50 ml) IO, IV
4. Epinephrine (1:10,000) every 5 minutes
  - A. Adults: 1 mg IO, IV
  - B. Pediatrics: 0.01 mg/kg; (0.1 ml/kg) IO, IV (maximum 1 mg; 1 ml)
5. Total ACLS resuscitation time > 20 minutes, no ROSC, and ETCO<sub>2</sub> < 20 mmHg
  - A. May pronounce dead on scene (adults only)
  - B. Notify police if not already on scene
6. Total ACLS resuscitation time > 20 minutes: ALL pediatric patients and adults not pronounced on scene should be transported to the closest emergency department
7. Any time rhythm changes to alternate rhythm refer to the appropriate protocol

### **Additional Considerations**

- \* Patients at risk for hyperkalemia
  - Renal failure
    - Especially if patient has missed scheduled dialysis
  - DKA
  - Crush syndrome/rhabdomyolysis
  - Severe burns
- \* Rate of rhythm associated with hyperkalemia may be slow, normal, or fast

## Adult Blunt Trauma Arrest

**(NCCEP TB-10)**

1. For patient found to be pulseless, apneic, and without signs of life, may pronounce dead on scene
2. If patient noted at any time to have palpable pulse attempt resuscitation
3. If patient becomes pulseless and apneic on scene:
  - A. For blunt trauma to the torso with suspicion for tension pneumothorax perform chest needle thoracostomy bilaterally
  - B. For asystole or wide complex PEA, no signs of life, and transport to trauma center is > 5 minutes, may pronounce dead on the scene
  - C. For narrow complex PEA or shockable rhythm, initiate/continue resuscitative efforts and transport to the trauma center
4. If the patient becomes pulseless and apneic during transport:
  - A. Perform bilateral needle decompression – for blunt chest trauma
  - B. For asystole or wide complex PEA, no signs of life, and transport to trauma center is > 5 minutes, may pronounce dead
  - C. For narrow complex PEA or shockable rhythm, initiate/continue resuscitative efforts and transport to the trauma center
  - D. Notify receiving facility and continue transport
5. Advanced Airway management as indicated
  - A. [Airway: BIAD Protocol](#)
  - B. [Airway: Intubation Protocol](#)
6. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen

## Adult Penetrating Trauma Arrest

1. For patient found to be pulseless, apneic, and without signs of life, may pronounce dead on the scene
2. If patient noted at any time to have palpable pulses, continue resuscitation and transport
3. If patient becomes pulseless and apneic and transport time to trauma center is < 15 minutes, continue resuscitation and transport
4. For penetrating trauma to the upper torso with suspicion for tension pneumothorax perform chest needle thoracostomy
  - A. Notify receiving facility and continue transport
  - B. If patient becomes pulseless and apneic and transport time to trauma center is > 15 minutes, contact medical control
5. Advanced airway management as indicated
  - A. [Airway: BIAD Protocol](#)
  - B. [Airway: Intubation Protocol](#)
6. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen

## **Pediatric Blunt or Penetrating Trauma Arrest**

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1. Initiate resuscitation and transport
2. Evaluate rhythm and treat per appropriate protocol
3. Advanced Airway management as indicated
  - A. **Airway: BIAD King LT Protocol**
4. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
5. For blunt or penetrating trauma to the torso with suspicion for tension pneumothorax perform chest needle thoracostomy
6. Epinephrine (1:10,000) 0.01 mg/kg IV, IO (max. 1 mg) every 5 minutes
7. Total arrest time > 15 minutes
  - A. Sodium bicarbonate 1 mEq/kg (1 ml/kg) maximum 50 mEq (50 ml) IO, IV

### **Additional considerations**

- \* Epinephrine and/or atropine are NOT indicated in the resuscitation of **ADULT** cardiac arrest as the result of blunt or penetrating trauma
  - Exception: For the traumatic event believed to be the result of a cardiac event – treat dysrhythmia as per medical cardiac arrest guidelines
- \* Unlike adult traumatic cardiac arrest, ACLS medications may be indicated in pediatric traumatic cardiac arrest

## Post-Resuscitation Care

(NCCEP Protocol AC-9/PC-7/AC-10)

### Traumatic Cardiac Arrest

1. Post resuscitation from traumatic cardiac arrest continue with destination as per [Trauma Triage Destination](#) and with trauma care as per appropriate protocol

### Medical Cardiac Arrest – PRIOR to Patient Movement from Point of Resuscitation

1. If patient remains unconscious initiate/continue induced hypothermia with chilled saline
2. If patient becomes alert with GCS >8, discontinue induced hypothermia
3. Obtain 12-lead ECG
4. Assess cardiac rhythm and vital signs (ensure manual BP measurement)
5. Provide supplemental oxygen to maintain SpO<sub>2</sub> = 94 – 97%
6. Ensure adequate IV access (2 sites)
7. Assess blood glucose level: D10 as indicated
8. Hypotension
  - A. Ensure adequate volume resuscitation
  - B. Adult: IVF at wide open rate (2 liters chilled normal saline initial choice)
  - C. Pediatric: 20 ml/kg IVF bolus
  - D. Dopamine @ 10 – 20 mcg/kg/min IV, IO
9. Adult Bradycardia (symptomatic)
  - A. Atropine 0.5 mg IV, IO
10. Pediatric Bradycardia
  - A. Epinephrine (1:10,000) 0.01 mg/kg IV, IO (maximum 1 mg)
  - B. For continued bradycardia: atropine 0.02 mg/kg IV, IO (min 0.1 mg, max 1 mg)
  - C. HR < 80 infant or < 60 child: initiate chest compressions
11. Adult 2<sup>nd</sup> degree type II or 3<sup>rd</sup> degree heart block
  - A. [Transcutaneous Pacing Protocol](#)
12. Continue to treat dysrhythmias as per appropriate protocol
13. Do NOT hyperventilate
  - A. Ensure ventilation rate maintained @ 6 – 10 per minute
  - B. Goal is normalization of ETCO<sub>2</sub> 35 – 45 mmHg
14. Plan/arrange for most appropriate method for transition from scene to ambulance
15. Do not attempt scene transition until full patient assessment and resuscitation has been completed (ECG, BP, IVF, vasopressor, anti-dysrhythmic, transcutaneous pacing)
16. Ensure consistent palpation of pulse during patient transition from scene to ambulance
  - A. Reassess at multiple points during egress from scene
17. Ensure consistent evaluation of rhythm during patient transition from scene to ambulance
  - A. Reassess at multiple points during egress from scene
18. Continue to treat any presumptive diagnosis being treated prior to cardiac arrest
19. Reassess frequently during transport
20. Plan/arrange for most appropriate method for transition from ambulance to hospital
21. Ensure consistent evaluation of pulse and rhythm during transition from ambulance

**Exclusion Criteria for Post-Resuscitation Induced Hypothermia**

1. Any evidence of significant trauma
2. Any clinical suspicion of intracranial hemorrhage
3. Any underlying terminal disease process
4. Acute sepsis
5. Any encephalopathy unrelated to cerebral anoxia from cardiac arrest
  - A. Post-Resuscitation Induced Hypothermia Protocol is for patients suffering cerebral anoxia from cardiac arrest and therefore other causes of coma (overdose, intoxication, stroke/CVA, trauma) must be excluded

**Additional Considerations**

- \* For cardiac arrest from a medical etiology, it is better to attempt resuscitation and stabilization on the scene rather than in a moving ambulance
- \* While rapid defibrillation is the treatment of choice for ventricular fibrillation, CPR should be performed on all adult unwitnessed cardiac arrests prior to administering shock
- \* Chest compressions should be hard and fast, bringing the hand on the upstroke off the chest for maximum recoil
  - Chest compressions should be started immediately after each shock
- \* Chest compressions should NEVER be interrupted except when performing rhythm analysis or delivering defibrillation shock
  - When compressions are interrupted for rhythm analysis or defibrillation shock this time should be limited to < 6 seconds
  - Provider performing compressions must count aloud every 20<sup>th</sup> compression
  - Defibrillator should be pre-charged at compression #180
  - Providers must change positions every 200 compressions
- \* Feedback in the form of end-tidal CO<sub>2</sub> and verbal queues are important to the provider administering the ventilations to avoid hyperventilation
- \* In any patient in cardiac arrest, consider hypoglycemia
  - Assess glucose level or consider administration of D10 IV
- \* Use of magnesium sulfate is contraindicated in patients with renal insufficiency or on dialysis except in cases of Torsades de Points
- \* If peripheral access is unobtainable and the patient has access via a central intravenous line or dialysis catheter, this may be used for fluid and medication administration
- \* If the patient < 70-years of age, the cardiac arrest was witnessed, and the suspected etiology of cardiac arrest is a pulmonary embolism (based on risk factors, sudden onset of symptoms, young age, absent premorbid conditions), MEDIC should consider continued resuscitation, transport, and not pronounce dead
  - The patient should be prepared for transport as expeditiously as possible for possible thrombolytic administration immediately following hospital arrival
- \* Naloxone (Narcan®) is not indicated once cardiac arrest has occurred
  - Consider post-resuscitation if patient hypoventilating and narcotic overdose is suspected

## Focused Cardiac Arrest

(NCCEP Protocol AC-11)

### First Responder Arrives Prior to Medic

1. **Medical Initial Assessment Protocol or Pediatric Initial Assessment Protocol**
2. Firefighter-1 or designee will check for pulses
  - A. If absent, will begin chest compressions.
3. Firefighter-2 or designee will check for responsiveness and breathing
  - A. If absent will perform the following:
    - i. Adult: Insert the blind insertion airway device and begin ventilations
      - Insert orogastric tube and connect to suction
    - ii. Pediatric: Provide assisted ventilations with BVM and 100% oxygen
4. The Captain or designee will attach the automatic external defibrillator, deploy the QCPR meter, and activate immediately for first responder witnessed arrests or after 200 chest compressions have been performed for arrests not witnessed by First Responder
5. Ensure CPR is being performed for 200 compressions while applying defibrillator (AED)
6. Follow AED prompts for potential defibrillation in coordination with compression cycles
7. **Provider performing compressions will count aloud the first compression "1" and subsequently count aloud every 20<sup>th</sup> compression (i.e. "20", "40", "60"...)**
8. Provider performing ventilations will provide one ventilation with every 20<sup>th</sup> chest compression
9. Captain: **check for femoral pulse during compressions "180" through "200" and perform defibrillation as indicated by the AED rhythm analyzation after compression "200"**
  - A. Ensure timely defibrillation after analyzation and immediately resume compressions post-shock
10. The engineer will take a ready position to assume compressions following the initial set of 200 chest compressions
11. After each defibrillator shock, chest compressions should commence immediately
12. Following 200 compressions each provider will move to the next role
  - A. **As provider performing compressions announces "180", providers will prepare to move to the next role**
  - B. Immediately after compression 200, provider performing compressions will move to the head of the patient to assume ventilations
  - C. Immediately after compression 200, provider performing ventilations will move the patient's side ("on deck") and prepare for assuming compressions at the next position change
  - D. Captain will perform defibrillation as indicated by the AED
  - E. **The provider who was "on deck" and is now prepared to provide compressions will perform compressions after AED analyzation and shock (if shock indicated)**
  - F. **Provider now performing compressions will count aloud the first compression "1" and subsequently count aloud every 20<sup>th</sup> compression**
13. Perform ventilations at a rate of 6 ventilations per minute (every 20<sup>th</sup> compression)
14. Analyze rhythm after every 200 compressions cycle of CPR
15. Repeat defibrillation as indicated
16. Each provider will change rotated position after every 200-compression cycle of CPR with no exceptions

## Advanced Medical Care

1. Upon Paramedic crew arrival
  - A. **Attending paramedic will proceed to the patient's side and initiate intraosseous (IO) line per [Venous Access: IO Protocol](#) and ACLS interventions as indicated**
  - B. EMT-Basic or Non-Crew Chief Paramedic will deploy the cardiac monitor including defibrillation pads, QCPR meter, SpO<sub>2</sub> monitor and ETCO<sub>2</sub> adaptor
2. EMT-Basic or Non-Crew Chief will prepare chilled saline IVF for infusion then assume ready position to assume ventilations at the next position change following 200 compressions cycle of CPR and enter same rotation through positions with first responders
3. While rapid defibrillation is the treatment of choice for ventricular fibrillation, CPR should be performed on all adult unwitnessed cardiac arrests regardless of initial rhythm for at least 200 compressions prior to defibrillation attempt
4. For pediatric ventricular fibrillation arrest, early defibrillation is more important
  - A. Ventricular fibrillation is seen in cardiomyopathies, myocarditis, hypoxia, or intoxication
  - B. Airway control and oxygenation are of paramount importance
  - C. Pediatric patients in cardiac arrest from a medical etiology should not be expeditiously carried to the ambulance when it arrives
    - i. For maximum survival benefit, resuscitative efforts should be conducted on the scene with two or more rescuers performing CPR
  - D. Resuscitation and transport should be performed on all pediatric cardiac arrest patients regardless of etiology – medical or trauma
  - E. Indicated ALS medications should be administered for both pediatric medical and trauma arrest
5. Ensure every 20<sup>th</sup> **compression is being counted aloud ("20", "40", "60", ...)**
6. **"Pre-charge defibrillator" with compression #180**
7. Palpate femoral pulse compressions #180 – 200
8. Analyze rhythm immediately following compression #200:
  - A. For ventricular fibrillation or ventricular tachycardia without a pulse immediately defibrillate @ 150 J
  - B. For asystole or PEA immediately resume compressions and disarm defibrillator
    - i. Ensure providers have rotated positions
  - A. For perfusing rhythm, immediately initiate post-resuscitation care
9. Repeat 5 through 8 as indicated by rhythm every 200 compressions
10. Perform ventilations at a rate of 6 ventilations per minute
11. The Captain or designee will initiate documentation and continue throughout the resuscitation period on the scene



## Medic Arrives Prior to First Responder

1. **Medical Initial Assessment Protocol or Pediatric Initial Assessment Protocol**
2. Immediately following arrival on the scene, the attending Paramedic or EMTCC will proceed directly to the patient
  - A. Once at the patient's side, check for pulses and breathing
    - i. If absent, will begin chest compressions
3. The non-attending EMT or Paramedic will bring in equipment, proceed directly to the patient's airway and check for breathing
  - A. If absent, perform the following:
    - i. Adult
      - Insert BIAD airway device and begin ventilations
      - Utilize BVM and 100% oxygen for ventilations
      - Insert orogastric tube and connect to suction
    - ii. Pediatric
      - Provide ventilations with OPA/NPA and bag-valve-mask & 100% oxygen
  - B. Do NOT interrupt compression for airway management
4. For BLS crew: apply AED
  - A. Follow AED prompts for potential defibrillation in coordination with compression cycles
5. For ALS crew: deploy the cardiac monitor including defibrillation pads, QCPR meter, SpO<sub>2</sub> monitor and ETCO<sub>2</sub> adaptor
6. Ensure every 20<sup>th</sup> compression is being counted aloud ("20", "40", "60", ...)
7. **"Pre-charge defibrillator" with compression #180**
8. Palpate femoral pulse compressions #180 – 200
9. Analyze rhythm immediately following compression #200:
  - A. For ventricular fibrillation or ventricular tachycardia without a pulse immediately defibrillate @ 150 J
  - B. For asystole or PEA immediately resume compressions and disarm defibrillator
    - i. Ensure providers have rotated positions
  - C. For perfusing rhythm, immediately initiate post-resuscitation care
10. Repeat 5 through 8 as indicated by rhythm every 200 compressions
11. Perform ventilations at a rate of 6 ventilations per minute
12. Upon arrival of first responder have personnel proceed immediately to their pre-designated positions as in **First Responder Arrives Prior to Medic** (see above)

**Additional Considerations**

- \* For cardiac arrest witnessed by EMS provider immediately initiate chest compressions while AED/cardiac monitor and pads are deployed
  - i. For initial rhythm that is shockable (ventricular fibrillation, pulseless ventricular tachycardia), defibrillate immediately then resume chest compressions for 200 compression cycle
  - ii. For rhythm that is NON-shockable perform 200 compression cycle and continue as outlined above
- \* Chest compressions goals:
  - i. Limit time to defibrillation to < 6 seconds
    - There is an 18% increase in survival to hospital discharge for every 5 second decrease in time to defibrillation following chest compressions
  - ii. Compressions should be performed  $\geq$  90% of the time during the resuscitation efforts
  - iii. **Limit time "off the chest" to < 6 seconds** for position rotations
  - iv. Utilize QCPR feedback to ensure adequate rate, depth, and release of chest
- \* Ventilation goals:
  - i. Hyperventilation must be avoided
    - Must avoid any increase in intrathoracic pressure which will in turn decrease coronary perfusion
  - ii. Maintain ET $\text{CO}_2$  35 – 45 mmHg
  - iii. For First Responder or BLS only crews on scene, ventilate at rate of 6 breaths per minute (every 20<sup>th</sup> compression)
- \* Epinephrine during cardiac arrest care:
  - i. Maximum total amount for adult cardiac arrest = 5 mg
- \* Documentation
  - i. Witnessed or unwitnessed
  - ii. Record initial rhythm
  - iii. Record any change in rhythm during the resuscitation
  - iv. Medication(s) administered
  - v. Defibrillation(s) performed
  - vi. Record the final rhythm

## Chest Pain (non-cardiac etiology)

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### Differential Diagnosis

- \* Angina
- \* Aortic dissection
- \* Asthma
- \* Bronchitis
- \* Bronchospasm
- \* Cocaine abuse
- \* COPD
- \* Dysrhythmia
- \* Esophageal spasm
- \* Esophagitis
- \* Marijuana abuse
- \* Musculoskeletal pain
- \* Myocardial infarction
- \* Pericarditis
- \* Pneumonia
- \* Pneumothorax
- \* Pulmonary embolus
- \* Rib contusion/fracture
- \* Sickle cell anemia crisis

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Maintain airway; suction as needed
4. Assess vital signs
5. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
6. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
7. Allow all conscious patients to sit in a position of comfort
8. For chest pain considered to be of cardiac etiology refer to [Heart Problems Protocol](#)

**Advanced Medical Care**

1. Apply cardiac monitor and obtain 12-lead ECG as per patient history
2. Obtain rhythm strip and refer to appropriate protocol as indicated
3. IVF bolus for signs of hypotension/dehydration
  - A. Adult: 500 – 1000 ml as per patient condition
  - B. Pediatric: 10 – 20 ml/kg
4. Dopamine @ 10 – 20 mcg/kg/min for persistent hypotension
5. Ondansetron (Zofran®) for nausea/vomiting
  - A. Adult: 4 – 8 mg IV, PO
  - B. Pediatric dose = 0.15 mg/kg IV, PO (maximum 4 mg)
6. Fentanyl (Sublimaze®) for pain control
  - A. Indicated for significant non-cardiac chest pain or pain of presumed cardiac etiology pain persistent following 2 doses nitroglycerin administration
  - B. Adult
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - C. Pediatric
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
7. For chest pain considered to be of cardiac etiology refer to [Heart Problems Protocol](#)

**Additional Considerations**

- \* Patients with suspected cardiac chest pain should have the 12-lead ECG performed immediately while on the scene
- \* Patients above the age of 30-years with chest pain or any patient with a recent history of cocaine or crack use with chest pain should be considered at risk for cardiac disease
  - These patients should have a 12-lead ECG performed
  - ECG interpretation should be noted during radio report to medical control
  - Paramedic interpretation that is different than the computer interpretation should also be verbalized
- \* An on-scene 12-lead ECG that appears normal or interpreted as unremarkable should never be used to convince a patient that their condition is stable
  - > 50% of acute myocardial infarctions will present with an unremarkable ECG
- \* Pain from an aortic dissection may be described as ripping or tearing in nature
  - In this context, the examination should include bilateral blood pressures along with upper and lower extremity pulse assessments
- \* Patients at risk for pulmonary embolism (patients on oral contraceptives, prolonged immobilization, recent surgery, prior history of clotting disorders) may show signs of tachycardia and tachypnea
  - The ECG may reflect the S1, Q3, T3 pattern
    - Although pattern is classical it may not be present in patients with a PE
  - Patients with PE may also have an ECG reflecting incomplete RBBB or right heart strain

## Choking

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### Differential Diagnosis

- \* Anaphylaxis
- \* Angioedema
- \* Asthma
- \* Cerebrovascular accident
- \* Croup
- \* Epiglottitis
- \* Foreign body aspiration
- \* Upper respiratory infection

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Partial or complete airway obstruction due to foreign body
  - A. Patient conscious
    - i. Encourage coughing
    - ii. Coughing ineffective → deliver 5 sub diaphragmatic abdominal thrusts
    - iii. Sub diaphragmatic thrusts ineffective (or pregnant patient) → deliver chest thrusts
    - iv. Continue thrusts until obstruction is relieved or unconsciousness occurs
  - B. Infant < 1 year of age conscious
    - i. If child coughing or making sounds, observe for further obstruction
    - ii. If choking progresses and cough is ineffective → deliver 5 back blows then 5 less forceful chest thrusts
    - iii. Continue cycle of back blows and chest thrusts until obstruction relieved
  - C. Patient unconscious
    - i. Open airway using head tilt-chin lift and check oral cavity for foreign body
    - ii. Use finger sweep as indicated if material is visualized
      - Do not perform blind finger sweeps
    - iii. Attempt ventilations
    - iv. Reposition airway as indicated to optimized ventilations
    - v. Repeat above until obstruction relieved or intubation equipment prepped
    - vi. Initiate CPR as indicated by patient condition

**Advanced Medical Care**

1. For unconscious patients with airway obstruction unrelieved by methods outlined above, use laryngoscope to visualize posterior pharynx and larynx
  - A. Remove any observed foreign material with suction or Magill forceps
2. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
3. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
4. Obtain rhythm strip and refer to appropriate protocol as indicated

**Additional Considerations**

- \* Many choking episodes will be resolved prior to EMS arrival on the scene
  - A thorough assessment should be performed on all patients regardless of symptoms
- \* Blind finger sweeps without direct visualization of foreign material is contraindicated in all patients
- \* Any infant choking episode associated with a period of apnea or cyanosis should be transported regardless of appearance on arrival
- \* Choking may be an early sign for stroke onset
- \* Aspiration is often associated with a choking episode
- \* In situations where a complete obstruction is below the level of the vocal cords, the only option may be to perform intubation via standard technique and advance the endotracheal tube into a mainstem bronchus in effort to advance the foreign body into that bronchus
  - Then withdrawal the endotracheal tube so the distal end is at typical depth within the trachea and ventilate as usual
  - Provider will only be ventilating one lung in this instance, but effective oxygenation and ventilation can still occur utilizing a single lung

## Convulsions-Seizures

(NCCEP Protocol UP-13)

### Introduction

- \* General categories of causes
  - CNS mass lesions
  - CNS trauma
  - CVA
  - Drug intoxication/overdose
  - Drug withdrawal
  - Eclampsia
  - Epilepsy
  - Fever (age: 6 mos. – 6 years)
  - Hyperthermia
  - Hypoglycemia
  - Hyponatremia
  - Hypotension/Hypertension
  - Hypoxia
  - Infection (meningitis/encephalitis)
  - Metabolic
- \* Status epilepticus = continuous seizure activity lasting > 5 minutes or recurrent seizure activity without clearing to normal mental status between episodes

### Clinical Presentation

- \* Involuntary, non-purposeful, tonic-clonic muscle activity (Grand Mal Seizure)
- \* Unconsciousness or inability to respond (Absence or Petit Mal seizure)
- \* Breath-holding spells
- \* Bowel / Bladder incontinence
- \* Focal or generalized
- \* Tongue biting
- \* Post-ictal confusion

### Basic Medical Care

1. [\*\*Medical Initial Assessment Protocol\*\*](#) or [\*\*Pediatric Initial Assessment Protocol\*\*](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Assess blood glucose level
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
7. For **patient actively seizing, ensure patient's safety**
  - A. Do not attempt to restrain seizure activity
  - B. Protect patient from potential injury by surroundings
8. Allow conscious patients to maintain position of comfort

**Advanced Medical Care**

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Midazolam (Versed®) for actively seizing or status epilepticus
  - A. Adults: 5 mg IM or 10 mg IN
  - B. Pediatrics: 0.15 mg/kg IM (maximum 5 mg) or 0.2 mg/kg IN (maximum 10 mg)
  - C. Repeat dose in 5 minutes for continued seizure activity
3. For hypoglycemia: D10
  - A. Adults: D10 @ 100 ml IV, IO
    - i. Reassess mental status/recheck glucose
    - ii. As indicated repeat D10 @ 100 ml IV, IO
    - iii. If unable to establish IV access: glucagon 1 mg IM
  - B. Pediatrics  $\geq$  8 years: D10 @ 5 ml/kg IV, IO (maximum 100 ml)
    - i. Reassess mental status/recheck glucose
    - ii. As indicated repeat D10 @ 5 ml/kg IV, IO (maximum 100 ml)
    - iii. If unable to establish IV access: glucagon 1 mg IM
  - C. Pediatrics: 31 days – 8 years: D10 @ 2 ml/kg IV, IO (maximum 100 ml)
    - i. Reassess mental status/recheck glucose
    - ii. As indicated repeat D10 @ 2 ml/kg IV, IO (maximum 100 ml)
    - iii. If unable to establish IV access: glucagon
      - $\leq$  20 kg: 0.5 mg IM
      - $>$  20 kg: 1 mg IM
  - D. Neonates (0 – 30 days of age): D10 @ 2 ml/kg IV, IO
    - i. Reassess/recheck glucose
    - ii. Repeat D10 @ 2 ml/kg IV, IO as indicated per mental status and blood glucose level
4. For suspected eclampsia (patient 20 weeks pregnant or  $\leq$  1-month post-partum):
  - A. Magnesium sulfate 4 grams IV over 15 minutes
  - B. Midazolam (Versed®) 5 mg IM, 10 mg IN
5. For suspected narcotic overdose: naloxone (Narcan®)
  - A. Adults: 2 mg IV, IO, IN
  - B. Pediatrics: 0.1 mg/kg IV, IO, IN (maximum 2 mg)
6. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
7. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
8. If patient has a vagus nerve stimulator (VNS) implanted for refractory seizures
  - A. Place magnet over the VNS for recurrent/continued seizures



**Additional Considerations**

- \* Administration of midazolam is only indicated for patients actively seizing or in status epilepticus
  - Status = continuous seizure activity for greater than 5 minutes or 2 or more sequential seizures without full recovery of consciousness between episodes
- \* Treatment for status seizures should be initiated on scene with transport initiated as soon as possible
- \* Do not force objects into the oral cavity during a seizure or during the post-ictal period
- \* Suspect cardiac etiology or stroke in patient > 50-years of age with seizure activity
- \* Partial seizures may involve muscle twitching in an isolated digit or extremity, various neurological complaints (auditory or visual hallucinations), or repetitive movements (chewing, repetitive hand movements or speech patterns)
- \* Complex or generalized seizures are more common and involve full-body movements
- \* If intravascular access is required for resuscitative purposes and peripheral intravenous lines are unobtainable after two attempts an intraosseous line may be initiated

## Diabetic Problems

(NCCEP Protocol AM-2/PM-2)

### Diabetic Ketoacidosis (DKA)

- \* Results from inadequate supply of insulin
- \* Results in hyperglycemia, osmotic diuresis, dehydration, electrolyte abnormalities, ketone production, and metabolic acidosis
- \* Causes:
  - Burns
  - Infection
  - Myocardial infarction
  - Non-compliance
  - Pregnancy
  - Stroke
  - Surgery
  - Trauma
- \* Clinical Presentation (DKA)
  - Acidosis
  - Hyperglycemia
  - Hyperkalemia
  - Hypotension
  - Ketonuria
  - Kussmaul respirations
  - Polydipsia
  - Polyuria
  - Tachycardia
  - Tachypnea

### Hyperglycemic Nonketotic Hyperosmolar Coma (HDKH)

- \* Results from inadequate supply of insulin
- \* Results in severe hyperglycemia, hyperosmolality, osmotic diuresis, dehydration without ketone production or acidosis
- \* Causes:
  - Same as DKA
- \* Clinical Presentation (HDKH)
  - Altered mental status
  - Dehydration
  - Hyperglycemia
  - Hyperosmolality
  - Hypotension
  - Nausea/vomiting
  - Tachycardia

### Hypoglycemia

- \* Definition: serum glucose < 60 mg/dl
- \* Causes:
  - Adrenal insufficiency
  - Hypothermia
  - Inadequate intake
  - Infection (sepsis)
  - Insulinoma
  - Medication overdose
- \* Clinical Presentation
  - Altered mental status
  - Coma
  - Diaphoresis
  - Disorientation
  - History of diabetes
  - Hypothermia
  - Lethargy
  - Seizure
  - Tachycardia
  - Tremors

## Hypoglycemia

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Assess blood glucose level
  - A. Oral glucose for hypoglycemic and patient alert with intact gag reflex

### Advanced Medical Care

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. D10
  - A. Adults: D10 @ 100 ml IV, IO
    - i. Reassess mental status/recheck glucose
    - ii. As indicated repeat D10 @ 100 ml IV, IO
    - iii. If unable to establish IV access: glucagon 1 mg IM
  - B. Pediatrics  $\geq 8$  years: D10 @ 5 ml/kg IV, IO (maximum 100 ml)
    - i. Reassess mental status/recheck glucose
    - ii. As indicated repeat D10 @ 5 ml/kg IV, IO (maximum 100 ml)
    - iii. If unable to establish IV access: glucagon 1 mg IM
  - C. Pediatrics: 31 days – 8 years: D10 @ 2 ml/kg IV, IO (maximum 100 ml)
    - i. Reassess mental status/recheck glucose
    - ii. As indicated repeat D10 @ 2 ml/kg IV, IO (maximum 100 ml)
    - iii. If unable to establish IV access: glucagon
      - $\leq 20$  kg: 0.5 mg IM
      - $> 20$  kg: 1 mg IM
  - D. Neonates (0 – 30 days of age): D10 @ 2 ml/kg IV, IO
    - i. Reassess/recheck glucose
    - ii. Repeat D10 @ 2 ml/kg IV, IO as indicated per mental status and blood glucose level

- \* If D10 unavailable:
- Dilute D50 to D25
    - Adults = D25 @ 50 ml, IV, IO
    - $> 8$  years = D25 @ 50ml IV, IO
    - 31 days – 8 years = D25 @ 2 ml/kg IV, IO (maximum 50ml)
    - $< 30$  days old = D12.5 @ 2 ml/kg IV, IO
  - Reassess and repeat as indicated based on patient condition and blood glucose level

## Hyperglycemia

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### Basic Medical Care

1. Medical Initial Assessment Protocol or Pediatric Initial Assessment Protocol
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Assess blood glucose level

### Advanced Medical Care

1. Adults: normal saline IVF 500 – 1000 ml bolus and reassess
2. Pediatrics: normal saline IVF 10 – 20 ml/kg bolus and reassess
3. Ondansetron (Zofran®) for nausea and/or vomiting
  - A. Adults: 4 – 8 mg IV, IM, PO
  - B. Pediatrics: 0.15 mg/kg IV, IM, PO (maximum 4 mg)
4. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
5. Ensure proper tube placement using capnometry,  $\text{SpO}_2$ , and ventilate with 100% oxygen
6. Considers causes of hypoglycemia/hyperglycemia and treat per appropriate protocol

### Additional Considerations

- \* Blood glucose should be assessed on all patients with an altered level of consciousness
- \* For hypoglycemic patients post treatment and refusing transport ensure the following:
  - Glucose level > 80
  - History of diabetes on insulin therapy
    - Not on oral agents
  - Patient access to food and ability to eat
  - Capacity to make an informed healthcare decision
  - If all the above are not met, contact medical control
- \* Patients on oral hypoglycemic agents are at increased risk for recurrent hypoglycemia and therefore should be transported for further evaluation and/or treatment
- \* Hyperglycemia resulting in diabetic ketoacidosis may be associated with hyperkalemia
  - This may result in cardiac dysrhythmias, therefore cardiac monitoring is essential in these patients
- \* If intravascular access is required for resuscitative purposes and peripheral intravenous lines are unobtainable after two attempts, and glucagon is ineffective, an intraosseous line should be initiated

## Submersion-Drowning / Diving Accident

(NCCEP Protocol TE-3)

### Definitions

- \* Fatal drowning = death by suffocation from submersion event
- \* Non-fatal drowning = survival, at least temporarily, following suffocation by submersion

### Basic Medical Care

1. Confirm scene safety and ensure a protective environment for yourself and the patient
2. For patient still in water, prepare for resuscitation once rescue is affected
  - A. Always ensure that the scene is safe before approaching the patient
  - B. For patient in cool, adverse environment, move to appropriate warmer setting
3. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
4. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
5. Maintain airway; suction as needed
6. Assess vital signs
7. If apneic and pulseless, initiate CPR for the following conditions:
  - A. Submersion time < 30 minutes in all patients
  - B. Submersion time < 45 minutes and water temperature is less than 50° F
8. Provide supplemental oxygen per patient condition to maintain SpO<sub>2</sub> = 94 – 97%
9. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
10. Albuterol: 2.5 – 5 mg via nebulizer for respiratory distress related to reactive airway disease
  - A. EMT-B may administer to patients with current prescription for beta-agonist
11. Assess blood glucose level
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
12. For suspected trauma to head or spine (history of fall from height, boating or other watercraft accident, diving accident), protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Attempt to remove patient from water in a horizontal position
13. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries
  - A. For any illnesses or trauma is noted, refer to appropriate protocol
14. For patient determined to be hypothermic, consider the following:
  - A. Place patient in most comfortable position and remove any wet or damp clothes
  - B. Insulate patient as much as possible with blanket
  - C. Move patient to warm ambulance as soon as possible
15. For patient noted to have isolated areas of frostbite, remove any obstructive clothes or coverings and protect from further injury; leave blisters intact

**Advanced Medical Care**

1. Obtain rhythm strip and refer to appropriate protocol as indicated
3. Albuterol via hand held or mask nebulizer for bronchospasm
  - A. Adults: 5 mg
  - B. Pediatrics: 2.5 – 5
  - C. Repeat as indicated per patient condition
4. For persistent respiratory distress:
  - A. CPAP if patient is awake and not responding to above treatment
  - B. Continue albuterol in-line via CPAP as indicated by patient condition
5. For hypoglycemia treat as per [Diabetic Problems Hypoglycemia Protocol](#)
6. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
7. Ensure proper tube placement using capnometry and SpO<sub>2</sub>, and ventilate with 100% oxygen
8. Additional care per appropriate protocol based on **patient's presentation**

**Additional Considerations**

- \* Consider pre-existing medical condition as precipitant to near submersion episode
  - Drug intoxication / overdose
  - Hypoglycemia
  - Seizure
  - Syncope
  - Trauma
- \* Intubated patients may likely require elevated levels of PEEP
- \* Document length of time under water and temperature of water (if known)
- \* Some patients, particularly children, can survive extended periods of submersion in very cold water
  - **Even in situations where the patient's pupils were fixed and** dilated, and the resuscitation was prolonged, patients have had good clinical outcomes
  - Rewarming techniques must be initiated to achieve core body temperature greater than 86° degrees F before resuscitation can be stopped
- \* All non-fatal patients, with or without aspiration, must be transported to the hospital for observation and to evaluate for laryngospasm, pulmonary edema, and Adult Respiratory Distress Syndrome (ARDS)
  - Any submersion event patient should not refuse care or transport
- \* When using CPAP for non-fatal drowning with possible aspiration, apply positive end-expiratory pressure by starting at 0 cm H<sub>2</sub>O of pressure and slowly titrating to achieve a desirable and tolerated positive pressure reading (usually 5-10 cmH<sub>2</sub>O; maximum 10 cmH<sub>2</sub>O)
- \* Foam often is 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)

## Electrocution

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### Current

- \* Alternating Current (AC)
  - Lower voltage, household current
  - Flow of electrons switches from positive to negative
  - Tends to cause continuous muscle contraction (tetany), therefore longer exposure
  - Cardiac arrest due to ventricular fibrillation
- \* Direct Current (DC)
  - Higher voltage, power lines, lightning
  - Flow of electrons in one direction
  - Tends to cause single muscle spasm, therefore short exposure time and throw victim from the source
  - Cardiac arrest due to asystole

### Clinical Presentation

- \* Cardiac dysrhythmia
- \* Muscle pain
- \* Variable wounds (external wounds can NOT be used to estimate extent of injury)

### Basic Medical Care

1. Confirm scene safety
2. Ensure a protective environment for yourself and the patient
  - A. For patient still near or in contact with electrical source, prepare for resuscitation once rescue is affected
  - B. Ensure power source is off prior to contact with the patient
3. **[Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)**
4. Maintain airway; suction as needed
5. Assess vital signs
  6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization), and the thoracolumbar spine until cervical collar placed and patient secured to the transport stretcher
9. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries
10. Cover burned skin with a clean, dry sheet
11. Keep patient as warm as possible
12. Splint any long bone deformities or areas where crush injury has occurred
13. Consider additional blunt trauma as suggested by mechanism of injury

**Advanced Medical Care**

1. Apply cardiac monitor and obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG as indicated
3. For ECG changes consistent with hyperkalemia
  - A. Calcium gluconate (10% solution)
    - i. Adult: 2 gram (20ml) IO, IV over 2 minutes
    - iii. Pediatric: 20 mg/kg IO, IV (0.2 ml/kg); maximum 2 grams (20 ml)
    - ii. Repeat in 10 minutes as indicated by patient condition and rhythm
  - B. Sodium bicarbonate
    - i. Adult: 50 mEq (50 ml) IO, IV
    - ii. Pediatric: 1 mEq/kg (1 ml/kg) maximum 50 mEq (50 ml) IO, IV
4. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
5. Fentanyl (Sublimaze®) for pain management
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
6. Alternative analgesic: nitrous oxide via patient-controlled inhalation
7. Advanced Airway management as indicated
  - A. **[Airway: Intubation Protocol](#)**
  - B. **[Airway: BIAD Protocol](#)**
8. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen



**Additional Considerations - Lightning**

- \* Some victims who have been struck by lightning and have prolonged cardiac or respiratory arrest have been resuscitated with good clinical outcomes
- \* It is imperative to continue ALS care until patient arrives at the hospital
- \* Lightning strike should be suspected in all patients found to be confused, unconscious, in respiratory or cardiac arrest, or injured in the appropriate setting and conditions
- \* Additional signs & symptoms:
  - Cool pulseless extremities secondary to vasospasm
  - Extremity paralysis/paresthesia
  - Lichtenberg figures (ferning)
  - Tympanic membrane rupture
- \* Lightning strike involving multiple patients requires a reverse triaging technique
  - Patients awake, and breathing will not likely experience an acute dysrhythmia event
  - Patients who are unresponsive should be evaluated initially and resuscitative measures instituted
- \* Typical series of events is cardiac arrest with apnea, patient's heart automaticity often restarts a perfusing rhythm, however neurologic control of breathing centers is delayed, and apnea continues resulting in a secondary cardiac arrest from hypoxia

**Additional Considerations – Electrical shocks**

- \* Attempt to ascertain the voltage delivered, current type, duration of exposure, and the suspected pathway of the current through the body (based on entry and exit burns that may or may not be present)
- \* Entrance wounds from electrical shocks appear as painless, sharp, well-demarcated, inflammatory lesion
- \* Exit wounds are often described as having an “exploded” and more ragged appearance
- \* Electrical burns that do not appear to be severe externally may have caused severe damage internally

## Eye Problems

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### Differential Diagnosis

- \* Allergies
- \* CVA
- \* Foreign body
- \* Glaucoma
- \* Infection
- \* Trauma
- \* Vision blurred/loss

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization), and the thoracolumbar spine until cervical collar placed and patient secured to the transport stretcher
7. For chemical burn, riot control agent exposure, or foreign body in eye, irrigate gently with normal saline
8. For globe protruding or not appropriately in the socket, cover the affected eye with a sterile, moist dressing
  - A. Be sure to NOT apply direct pressure to the globe
  - B. Then cover uninjured eye
9. For foreign body protruding from the eye, stabilize the object as best possible and cover both eyes
  - A. Attempts to remove any large foreign body from the eye should not be performed

### Advanced Medical Care

1. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 -1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
2. Alternative analgesic: nitrous oxide via patient-controlled inhalation
3. Ondansetron (Zofran®) for nausea and/or vomiting
  - A. Adults: 4 – 8 mg IV, IM, PO
  - B. Pediatrics: 0.15 mg/kg IV, IM, PO (maximum 4 mg)

**Additional Considerations**

- \* When injuries are noted to one eye, both eyes should be covered
  - This limits bilateral or consensual eye movements
- \* Chemical injuries
  - Bases (lye) cause more severe injuries than acids
  - In both circumstances, the eyes should be flushed gently with copious amounts of normal saline
- \* **A retinal detachment is a serious threat to the patient's vision, and may or may not result from a traumatic insult**
  - The patient may describe seeing flashes of light, floating strands or particles, or a visual field defect described as a shadow or a curtain
  - Detachment is typically not painful
- \* Unilateral, transient, painless blurred vision may be the warning sign for impending cerebrovascular accident (amaurosis fugax)
  - Unilateral, painless blindness may be the result of an embolic event to the retinal artery
  - This must be evaluated immediately
- \* Acute glaucoma is an emergency
  - Patient will complain of severe pain, headache, blurred vision, halos around lights, and nausea and vomiting
  - Blindness may result

## Falls / Back Injury

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### Introduction

- \* Consider history of events precedent to fall / back injury
  - Assault/trauma
  - Heavy lifting
  - Hypoglycemia
  - Near syncope/syncope
  - Seizure
  - Slip/trip
  - Vertigo

### Basic Medical Care

1. Ensure scene safety
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Maintain airway; suction as needed
4. Control any active bleeding sites with manual direct pressure and/or pressure dressing
5. Assess vital signs
6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization), and the thoracolumbar spine until cervical collar placed and patient secured to the transport stretcher
  - A. Assess neurological status before and after motion restriction
9. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries
10. Splint any long bone deformities or areas where crush injury has occurred
  - A. Dislocated joints should be splinted in position of deformity
  - B. Fractures should be realigned and splinted from joint above through joint below
  - C. Distal pulses should be assessed before and after realignment and splinting
11. Apply appropriate dressing to any open wounds
12. Assess blood glucose level as indicated per patient presentation
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
13. Follow the appropriate protocol for any medical cause of fall as identified

**Advanced Medical Care**

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
3. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
  - C. Avoid in cases involving exacerbation of chronic back pain
4. Alternative analgesic: nitrous oxide via patient-controlled inhalation
5. For adult with suspected open fracture: cefazolin (Ancef®)
  - A. **≥ 70 kg: 2 grams IV over 10 minutes**
  - B. **< 70 kg: 1 gram IV over 10 minutes**
6. Advanced Airway management as indicated
  - A. **[Airway: Intubation Protocol](#)**
  - B. **[Airway: BIAD Protocol](#)**
7. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
8. Follow the appropriate protocol for any medical cause of fall as identified

**Additional Considerations**

- \* Determine if any clinical condition is present that may have led to the fall
  - Dizziness
  - Hypoglycemia
  - Syncope
  - Trauma
  - Vertigo
- \* Anticipate potential injuries based on the body area sustaining impact
  - Supine impact: central and peripheral skeletal, blunt chest or abdominal injuries
  - Prone impact: central and peripheral skeletal, blunt chest or abdominal injuries
  - Head impact: traumatic brain injury, cervical spine fractures
  - Upright impact: leg, foot, ankle fractures, lumbar and thoracic spine fractures
- \* Estimate distance of the fall
- \* Some patient populations may sustain significant injury with relatively minor falls
  - Anticoagulation
  - Chronic alcohol abuse
  - Elderly
  - Post-menopausal women
- \* Neurogenic shock
  - Signs: Hypotension with bradycardia
  - IVF resuscitation
  - Dopamine @ 10 – 20 mg/kg/min and titrate to systolic BP > 90 mmHg
- \* Patients should have cervical collar placed and transported in supine position firmly secured to the transport stretcher if any of the following are present:
  - Abnormal mental status
  - Intoxicated or under the influence of mind-altering substance
  - Age < 5 years or > 65 years (with any evidence of trauma above the clavicles)
  - Any posterior midline tenderness
  - Presence of distracting injury
  - Cervical pain with cervical range of motion
    - Patient unable to rotate neck 45 degrees to the left and to the right
    - Do NOT assess range of motion if the patient has any midline cervical spine tenderness to palpation
  - Any focal neurological deficit
  - High risk mechanism of injury
    - Fall > 3 feet (5 stairs)
    - Diving injury
- \* Long spine boards are intended to be utilized as a patient extrication/movement device and it is not intended for the patient to be transported on a long spine board
- \* LSB should be removed once the patient is placed on the transport stretcher

## Headache

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### Differential Diagnosis

- \* Brain abscess
- \* Brain tumor
- \* Cerebrovascular accident
- \* Cluster headache
- \* Encephalitis
- \* Epidural hemorrhage
- \* Hypertensive crisis
- \* Intracerebral hemorrhage
- \* Meningitis
- \* Migraine
- \* Sinus infection
- \* Subarachnoid hemorrhage
- \* Subdural hemorrhage
- \* Tension headache

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent

### Advanced Medical Care

1. Apply monitor and obtain rhythm strip and refer to appropriate protocol as indicated
2. CAUTIOUSLY consider fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IN, IM, IO (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
  - C. Avoid in patients with exacerbation of chronic headaches
3. Ondansetron (Zofran®) for nausea and/or vomiting
  - A. Adults: 4 – 8 mg IV, IM, PO
  - B. Pediatrics: 0.15 mg/kg IV, IM, PO (maximum 4 mg)
4. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
5. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen

**Additional Considerations**

- \* Migraine headache
  - Typically unilateral and described as pounding or throbbing pain
  - Often associated with photophobia or sensitivity to noise or odors
  - Often associated with blurred vision, nausea or vomiting
  - Sometimes preceded by an aura
- \* Tension headache
  - Typically constant band-like pain or pressure
  - Affects the front, top or sides of the head
  - Usually begins gradually, and often occurs in the middle of the day
- \* Cluster headache
  - Recurs over a period of time
  - Typically intense one-sided pain described as having a burning or piercing
  - Usually located behind one eye or in the eye region, without changing sides
  - Persons experience an episode one to three times per day during a period of time (the cluster period), which may last from two weeks to three months
  - Headaches may disappear completely for months or years, only to recur
  - Often respond to high flow oxygen via non-rebreather
- \* Sinus infection headache
  - Typically associated with a deep and constant pain in the cheekbones, forehead, or bridge of the nose
  - Pain usually intensifies with sudden head movement or leaning forward
  - Usually accompanied by nasal discharge, fever, and/or facial swelling
- \* Subarachnoid hemorrhage
  - **Classically presents as a sudden onset of “the worst headache of my life”**
  - Usually caused by ruptured aneurysm
  - May occur as the result of head trauma
  - Often associated with nausea or vomiting
  - May present with photophobia, altered mental status, or focal neurologic deficit
- \* Meningitis, encephalitis, brain abscess
  - Associated symptoms of include sudden fever, headache, vomiting, photophobia, stiff neck, confusion, impaired judgment, and/or altered mental status
  - Necessary precautions should be considered
- \* Epidural, subdural hemorrhage
  - Result of head trauma (subdural may occur with minor head trauma in patients on anticoagulation)
  - Epidural: classically loss of consciousness, a lucid interval, then decline in mental status as hemorrhage enlarges
  - Subdural: may be slowly progressive or associated with rapid symptoms; typically older patients; may present with frequent falls



## Heart Problems

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### Differential Diagnosis

- \* Angina
- \* Aortic dissection
- \* Asthma
- \* Cardiac arrest
- \* Chest wall injury
- \* Cocaine abuse
- \* Congenital heart abnormality
- \* COPD
- \* Esophageal spasm
- \* Electrolyte abnormality
- \* GI pathology
- \* Marijuana abuse
- \* Methamphetamine abuse
- \* Musculoskeletal pain
- \* Myocardial infarction
- \* Pericarditis
- \* Pneumothorax
- \* Pulmonary embolus

### Considerations

- \* History
  - Age
  - Cardiac risk factors
  - Medications
  - Provocation/relief
- \* Signs/symptoms
  - Pain, pressure, tightness, palpitations
  - Shortness of breath, dyspnea
  - Nausea/vomiting
  - Diaphoresis

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Additional care as per specific presumptive diagnosis, patient condition, cardiac disorder

### Advanced Medical Care

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG
  - A. Scene to ECG time should be < 8 minutes
3. Additional care per specific entity
4. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
5. Additional Care as per specific presumptive diagnosis, patient condition, cardiac disorder

## **Chest Pain Considered due to Myocardial Ischemia (NCCEP AC-4)**

### **Advanced Medical Care**

1. ECG: normal or non-specific ST-segment/T-wave changes, or ST-segment depression of > 1 mm in two or more contiguous leads (inferior, septal, anterior, or lateral)
2. Aspirin 324 mg PO
3. Nitroglycerin 0.4 mg SL
  - A. Repeat 0.4 mg SL every 5 minutes until pain resolves
  - B. Hold for SBP < 100 mm Hg
  - C. EMT may administer to patients with a current prescription for nitroglycerin
4. For patient unable to tolerate SL nitroglycerin, apply nitro paste to upper chest
  - A. SBP > 200 mm Hg: apply 2 inches
  - B. SBP 150 – 200 mm Hg: apply 1.5 inches
  - C. SBP 100 – 150 mm Hg: apply 1 inch
  - D. Hold/remove for SBP < 100 mm Hg
5. Fentanyl (Sublimaze®) for pain control if pain persists following 2 doses of nitroglycerin
  - A. 1 – 2 mcg/kg IN (maximum 200 mcg)
  - B. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
  - C. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
6. IVF resuscitation
  - A. Hemodynamically unstable: IVF wide open
  - B. Hemodynamically stable: TKO
7. Ondansetron (Zofran®) for nausea and/or vomiting
  - A. Adults: 4 – 8 mg IV, IM, PO
8. Advanced Airway management as indicated
  - B. [\*\*Airway: Intubation Protocol\*\*](#)
  - C. [\*\*Airway: BIAD Protocol\*\*](#)
9. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen

### **Additional Considerations**

- \* Patients with suspected cardiac chest pain should have the 12-lead ECG performed immediately while on the scene
- \* Any patient > of 30-years of age with chest pain or any patient with a recent history of cocaine or crack use with chest pain should be considered at risk for cardiac disease
  - These patients should have a 12-lead ECG performed
- \* Female, geriatric, and patients with diabetes with myocardial ischemia (or infarction) often present with atypical symptoms and not frank chest pain
  - Dyspnea, weakness/fatigue, jaw pain
- \* Patients considered to have an Acute Coronary Syndrome should have aspirin and nitroglycerin administered immediately and transport performed expeditiously
- \* Nitroglycerin is contraindicated for any patient who has taken sildenafil (Viagra®), tadalafil (Cialis®), or vardenafil (Levitra®) within the past 24 hours

## **Chest Pain Considered due to Myocardial Infarction (NCCEP AC-4)**

### **Advanced Medical Care**

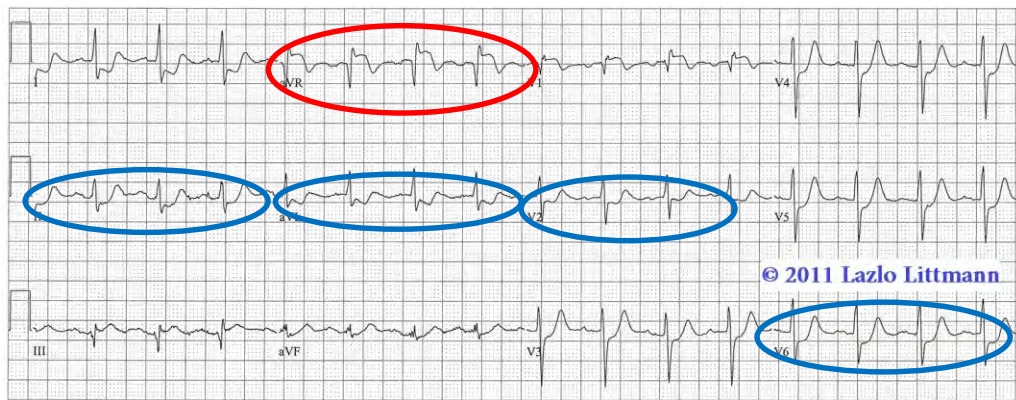
1. ECG
  - A. ST-segment elevation > 1 mm in two or more continuous leads (inferior, septal, anterior, or lateral)
  - B. R-wave and ST-segment depression in anterior leads suggesting posterior MI
  - C. Computer interpretation on ECG reports **"ACUTE MI"**
2. Repeat ECG as indicated per patient presentation / change in presentation
3. Aspirin 324 mg PO
4. Nitroglycerin 0.4 mg SL
  - A. Repeat 0.4 mg SL every 5 minutes until pain resolves
  - B. Hold for SBP < 100 mm Hg
  - C. EMT may administer to patients with a current prescription for nitroglycerin
5. For patient unable to tolerate SL nitroglycerin, apply nitro paste to upper chest
  - A. SBP > 200 mm Hg: apply 2 inches
  - B. SBP 150 – 200 mm Hg: apply 1.5 inches
  - C. SBP 100 – 150 mm Hg: apply 1 inch
  - D. Hold/remove for SBP < 100 mm Hg
6. Fentanyl (Sublimaze®) for pain control if pain persists following 2 doses of nitroglycerin
  - A. 1 – 2 mcg/kg IN (maximum 200 mcg)
  - B. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
  - C. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
7. IVF resuscitation
  - A. Hemodynamically unstable: IVF wide open
  - B. Hemodynamically stable: TKO
8. Consider placing defibrillation/pacing pads on patient
  - A. Should be placed on all patients with an anterior or septal STEMI
    - These patients are at increased risk of heart blocks necessitating TCP
9. For significant ventricular ectopy:
  - A. Lidocaine 1.5 mg/kg IV
  - B. Repeat lidocaine 0.5 mg /kg IV every 5 minutes for dysrhythmia that continues until dysrhythmia resolves or a total of 3 mg/kg has been administered
10. Contact Medical Control at destination PCI hospital for notification of **CODE STEMI** as soon as STEMI is identified (prior to scene departure)

**Additional Considerations**

- \* During the radio report to medical control, the ECG interpretation should be verbalized
  - The paramedic interpretation should be reported & emphasized if STEMI
- \* ECG findings which warrant discussion with medical control at a PCI facility (see below)
  - ST-segment elevation in aVR with widespread ST depression
    - Suggestive of multi-vessel or left main coronary artery disease
    - Patient should be transport to a PCI facility
    - Even though **NOT** a code STEMI, should be transported to a PCI center
  - Verified new left bundle branch block (LBBB)
    - New LBBB does **NOT** equal STEMI
    - Consider Sgarbossa criteria with medical control physician
      - Concordant ST elevation > 1mm in leads with positive QRS
      - Concordant ST depression in lead V1 – V3
      - Discordant ST elevation > 5 mm in leads with a negative QRS
    - ECG should be faxed to and discussed with medical control physician
    - With LBBB that is not verified as new, patient may be transport per general triage guidelines (provided above Sgarbossa criteria are not present)
  - **Wellens' syndrome**
    - Biphasic or deep inverted T-wave V<sub>2</sub> – V<sub>3</sub>; potential proximal LAD disease
- \* Chest pain is the most common manifestation of acute MI
  - May be described as burning, heavy, pain, pressure, squeezing, or tightness
- \* Angina equivalent may include:
  - Fatigue
  - Neck, jaw, epigastric pain
  - Nausea
  - Shortness of breath, dyspnea on exertion
- \* 12-lead ECG assessment
  - Inferior – leads II, III, aVF
  - Septal – leads V1, V2
  - Anterior – leads V3, V4
  - Lateral – leads V5, V6, I, aVL
  - Posterior – leads V1, V2, V3
- \* Patients with myocardial chest pain & 12-lead ECG that reflects  $\geq 1$  mm of ST-segment elevation in  $\geq 2$  contiguous precordial leads, should be transported immediately
  - Scene to ECG time should be < 8 minutes
  - Total scene time should be < 15 minutes
- \* An on-scene 12-lead ECG that is interpreted as normal or unremarkable should never be used to convince a patient that their condition is stable
  - 50% of acute myocardial infarctions will initially present with an unremarkable ECG (non-ST elevation MI)
- \* Patients with an inferior MI are at risk for right ventricle infarct and nitroglycerin should be used with caution as patients are prone to develop hypotension
  - Nitroglycerin is NOT contraindicated, but increased caution must be used
  - Inferior infarctions typically require normal saline IVF boluses

**ECG Considerations**

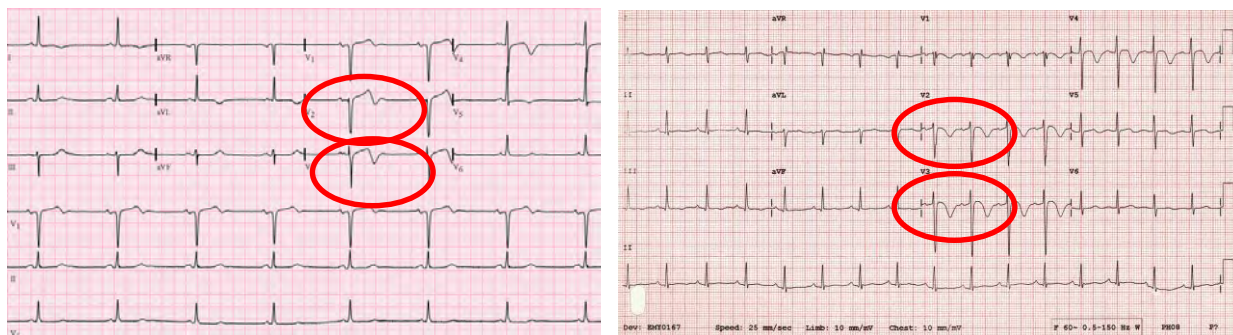
aVR Sign



Sgarbossa criteria



Wellens' criteria



## Chest Pain Associated with Cocaine Use

---

### Advance Medical Care

1. Obtain 12-lead ECG with further management as per interpretation
2. IVF: 500 – 1000 ml bolus
3. Midazolam (Versed®) 5 mg IM or 5 – 10 mg IN
4. Reassess with repeat treatment as indicated

### Additional Considerations

- \* Patients must also be evaluated for risk factors for coronary artery disease
  - Age
  - Diabetes
  - Family history
  - Hypercholesterolemia
  - Hypertension
  - Known coronary artery disease
  - Smoking
- 1. Patients at risk for coronary artery disease should also be treated as any patient with suspected myocardial ischemia
  - A. Aspirin 324 mg PO
  - B. Nitroglycerin 0.4 mg SL
    - i. Repeat 0.4 mg SL every 5 minutes until pain resolves
    - ii. Hold for SBP < 100 mm Hg
    - iii. EMT may administer to patients with a current prescription for nitroglycerin
  - C. For patient unable to tolerate SL nitroglycerin, apply nitro paste to upper chest
    - i. SBP > 200 mm Hg: apply 2 inches
    - ii. SBP 150 – 200 mm Hg: apply 1.5 inches
    - iii. SBP 100 – 150 mm Hg: apply 1 inch
    - iv. Hold/remove for SBP < 100 mm Hg

## **Supraventricular Tachycardia – Stable (NCCEP Protocol AC-6/PC-5)** **[Including undifferentiated REGULAR wide complex]**

---

### **SVT Differential Diagnosis**

- |   |                                 |
|---|---------------------------------|
| * Sinus tachycardia                       | * Atrial fibrillation           |
| * AV-Nodal reentrant tachycardia ("PSVT") | * Atrial flutter                |
|   | * Multifocal atrial tachycardia |

### **Advanced Medical Care**

1. Obtain 4-lead ECG (12-lead as indicated)
2. Adult: perform vagal maneuvers
  - A. Valsalva maneuvers
    - i. Breath holding and bearing down
    - ii. Blowing into a straw
3. Adenosine (Adenocard®) – ensure monitor recording strip is printing
  - A. Adults:
    - i. 6 mg IV rapid push followed by saline flush
      - Transport and monitor if rhythm converts
    - ii. 12 mg IV rapid push followed by saline flush if SVT continues and no AV-block was achieved with previous dose
      - Transport and monitor if rhythm converts
    - iii. 12 mg IV rapid push followed by saline flush if SVT continues and no AV-block was achieved with previous dose
      - Transport and monitor if rhythm converts
    - iv. If no conversion and AV block was achieved, assess underlying rhythm evident during AV block and treat per appropriate protocol
  - B. Pediatrics:
    - i. 0.1 mg/kg IV (maximum 6 mg) rapid push followed by saline flush
      - Transport and monitor if rhythm converts
    - ii. 0.2 mg/kg IV (maximum 12 mg) rapid push followed by saline flush if SVT continues and no AV-block was achieved with previous dose
      - Transport and monitor if rhythm converts
    - iii. 0.2 mg/kg IV (maximum 12 mg) rapid push followed by saline flush if SVT continues and no AV-block was achieved with previous dose
      - Transport and monitor if rhythm converts
    - iv. If no conversion and AV block was achieved, assess underlying rhythm evident during AV block and treat per appropriate protocol
4. Additional care as per specific rhythm protocol
5. If any rhythm change occurs refer to appropriate protocol
6. Contact Medical Control if rhythm fails to convert following 3<sup>rd</sup> dose of adenosine



**Supraventricular Tachycardia – Unstable (NCCEP Protocol AC-6/PC-5)**

1. Midazolam (Versed®)
  - A. Adult:
    - i. 5 mg IM or 5 – 10 mg IN
  - B. Pediatrics:
    - i. 0.15 mg IM or 0.2 mg IN (maximum 5 mg IM, 10 mg IN)
2. Fentanyl (Sublimaze®) as patient status permits
  - A. Adult: 0.5 – 1 mcg/kg IV, IO, IN (maximum 100 mcg)
  - B. Pediatric: 0.5 – 1 mcg/kg IV, IO, IN (maximum 100 mcg)
3. Synchronized cardioversion
  - A. Adults:
    - i. 50 Joules
    - ii. 100 Joules if dysrhythmia continues
    - iii. 150 Joules if dysrhythmia continues
      - Initial setting for unstable atrial fibrillation
  - B. Pediatrics:
    - i. 0.5 J/kg
    - ii. 1 J/kg if dysrhythmia continues
    - iii. 2 J/kg if dysrhythmia continues
4. Contact Medical Control if dysrhythmia persists following above treatment

**Additional Considerations**

- \* Do NOT administer adenosine to any heart transplant patient
- \* Diltiazem may be harmful in patients with a history of pre-excitation syndromes (WPW)
- \* Judicious use of cardioversion should be used in patients currently on digitalis or digoxin
- \* Restoration of normal sinus rhythm in a patient who has been in chronic atrial fibrillation without therapeutic anticoagulation increases the risk for embolization
- \* Sedation with midazolam (Versed®) should be attempted before cardioversion unless the patient is extremely unstable or unconscious
- \* If cardioversion performed, ensure equipment for airway management readily available
- \* Rapid ventricular response with possible accessory pathway conduction that is irregular & wide complex or polymorphic (WPW with atrial fib) should **NOT** be treated with adenosine, beta blockers, or calcium channel blockers which may increase conduction through the accessory pathway
  - If unstable – synchronized cardioversion @ 150 Joules
  - If unable to synchronize – defibrillate @ 150 Joules
- \* Supraventricular tachycardia is the most common dysrhythmia causing cardiovascular instability during infancy
  - Supraventricular tachycardia with aberrant conduction that produces a wide complex tachycardia is rare in infants and children
  - Wide complex tachycardia should be treated as ventricular in origin
- \* In older children, may consider Valsalva while setting up for more aggressive therapy



## **Atrial Fibrillation or Atrial Flutter with Rapid Ventricular Response (NCCEP Protocol AC-6)**

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### **Advanced Medical Care**

#### **Stable**

1. Obtain 4-lead ECG
2. Obtain 12-lead ECG as indicated
3. Adults:
  - A. Diltiazem (Cardizem®) 15 mg IV over 2 minutes
  - B. For no response within 15 minutes: diltiazem (Cardizem®) 20 mg IV over 2 minutes
2. For no response: contact Medical Control
3. IVF resuscitation: TKO

#### **Unstable**

1. Obtain 4-lead ECG
2. Obtain 12-lead ECG as indicated
3. Adults:
  - A. Midazolam (Versed®) 5 mg IM or 5 – 10 mg IN
  - B. Fentanyl (Sublimaze®) as patient status permits
    - i. 0.5 – 1 mcg/kg IV, IO, IN (maximum 100 mcg)
  - C. Synchronized cardioversion
    - i. Atrial fibrillation: @ 150 Joules
    - ii. Atrial flutter: @ 50 Joules
4. IVF resuscitation: IVF wide open
5. For unstable dysrhythmia that continues perform synchronized cardioversion @ 150 Joules
6. If any rhythm change occurs refer to appropriate protocol
7. Contact Medical Control for rhythm fails to convert

### **Additional Considerations**

- \* Signs of instability
  - Acute congestive heart failure
  - Altered mental status
  - Hypotension
  - Ischemic chest pain
  - Seizure
  - Syncope

**Bradycardia****(NCCEP Protocol AC-2/PC-2)****Advanced Medical Care****Symptomatic sinus bradycardia or Type-I 2<sup>nd</sup> heart block**

1. Obtain 4-lead ECG
2. Obtain 12-lead ECG as indicated
3. Ensure adequate oxygenation
4. Adults:
  - A. Atropine 0.5 mg IV, IO
  - B. Repeat atropine 0.5 mg IV every 5 minutes until dysrhythmia resolves or total dose of 3 mg (or 0.04 mg/kg) has been administered
    - i. Hold if occurs in the setting of acute MI and wide-complex rhythm
5. Pediatrics:
  - A. Epinephrine (1:10,000) 0.01 mg/kg (0.1 ml/kg) IV, IO
  - B. Atropine 0.02 mg/kg IV, IO (minimum 0.1 mg, max 0.5 mg)
  - C. Repeat atropine 0.02 mg/kg IV, IO (minimum 0.1 mg, max 0.5 mg) in 5 minutes x1 additional dose
  - D. Initiate CPR for continued bradycardia and heart rate < 80 (infant) or < 60 (child)
6. IVF resuscitation as indicated by hemodynamics
  - A. Adults: IVF wide open
  - B. Pediatrics: 10-20 ml/kg bolus
7. Consider dopamine 10 – 20 mcg/kg/min IV, IO

**Type-II 2<sup>nd</sup> degree or 3<sup>rd</sup> degree heart block**

1. Ensure adequate oxygenation
2. Obtain 4-lead ECG
3. Obtain 12-lead ECG as indicated
4. Adults:
  - A. Midazolam (Versed®) 5 mg IM or 5 – 10 mg IN
  - B. Transcutaneous pacing per [Cardiac: External Pacing Protocol](#)
  - C. Dopamine @ 10 – 20 mcg/kg/min IV, IO for continued hypotension
  - D. Calcium gluconate 2 grams (20 ml of 10% solution) for continued hemodynamically unstable and patient on calcium channel blocker medication
5. Pediatrics:
  - A. Midazolam (Versed®) 0.15 mg/kg IM or 0.2 mg/kg IN
    - i. Maximum 5 mg IM or 10 mg IN
  - B. Transcutaneous pacing per [Cardiac: External Pacing Protocol](#)
  - C. Initiate CPR for continued bradycardia & heart rate < 80 (infant) or < 60 (child)
  - D. Dopamine @ 10 – 20 mcg/kg/min IV, IO for continued hypotension

**Additional Considerations**

- \* Asymptomatic sinus bradycardia and/or first-degree heart block does not require any treatment
- \* Symptoms necessitating treatment
  - Altered mental status
  - Hypotension
  - Ischemic chest pain
  - Syncope
- \* Always consider early application of pacing pads in elderly patients having bradycardic rhythms
- \* Any patient noted to be hemodynamically unstable and in Type II second degree or third-degree heart block should be paced immediately
  - Provide sedation and analgesia in patients undergoing transcutaneous pacing
- \* 2° AVB type II and 3° AVB may deteriorate to asystole
  - Lidocaine and amiodarone (Cordarone®) are contraindicated with these blocks
- \* Patients at risk for brady-dysrhythmias
  - Anterior or Inferior wall MI
  - Patients taking: beta-blockers, calcium channel blockers, or digoxin
- \* Consider treatable causes for bradycardia
  - Beta Blocker OD
  - Calcium Channel Blocker OD
- \* Hypoxia is a common etiology for symptomatic bradycardia in children, therefore, attention to airway and oxygenation is of paramount importance
- \* Sinus bradycardia is a common pre-terminal event in children, therefore attention to airway and oxygenation is of paramount importance
- \* 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

**Wide Complex Tachycardia (VT)****(NCCEP Protocol AC-7)****Advanced Medical Care**

1. Obtain 4-lead ECG
2. Obtain 12-lead ECG as indicated

**Stable**

1. Adults:
  - A. Lidocaine 1.5 mg/kg IV, IO
  - B. Repeat lidocaine 0.5 mg/kg IV, IO every 5 minutes for ventricular tachycardia that continues until tachycardia resolves or total of 3 mg/kg has been given
  - C. Magnesium sulfate 2 grams IV, IO over 2 minutes for ventricular tachycardia that continues or is polymorphic
2. Pediatrics:
  - A. Lidocaine 1 mg/kg IV, IO
  - B. Repeat lidocaine 0.5 mg/kg IV, IO every 5 minutes for ventricular tachycardia that continues until tachycardia resolves or total of 3 mg/kg has been given
3. If any rhythm change occurs refer to appropriate protocol

**Unstable (with a pulse)**

1. Adults:
  - A. Midazolam (Versed®) 5 mg IM or 5 – 10 mg IN
  - B. Fentanyl 1 mcg/kg IV, IO, IN (max 100 mcg) as patient condition permits
  - C. Synchronized cardioversion @ 100 Joules
  - D. For ventricular tachycardia that resolves: lidocaine 1.5 mg/kg IV, IO
  - E. Repeat cardioversion @150 Joules for VTach that continues
  - F. Repeat cardioversion @150 Joules for VTach that continues
  - G. Magnesium sulfate 2 grams IV, IO over 2 minutes for ventricular tachycardia that continues or is polymorphic
  - H. For ventricular tachycardia that is polymorphic (Torsades) or monitor cannot synchronize, perform defibrillation @ 150 Joules
    - i. Magnesium sulfate 2 grams IV
  - I. Contact Medical Control
2. Pediatric
  - A. Midazolam (Versed®) 0.15 mg/kg IM or 0.2 mg/kg IN (max 5 mg IM, 10 mg IN)
  - B. Fentanyl 1 mcg/kg IV, IO, IN (max 100 mcg) as patient condition permits
  - C. Synchronized cardioversion @ 0.5 J/kg
  - D. For ventricular tachycardia resolves: lidocaine 1 mg/kg IV, IO
  - E. Repeat cardioversion @ 1 Joules/kg for VT that continues
  - F. Repeat cardioversion @ 2 Joules/kg for VT that continues
  - G. For ventricular tachycardia that is polymorphic (Torsades) or monitor cannot synchronize, perform defibrillation @ 4 Joules/kg (maximum 150 Joules)
    - i. Magnesium sulfate 50 mg/kg IV (maximum 2 grams)
  - H. Contact Medical Control
3. If any rhythm change occurs refer to appropriate protocol

## Wide-complex, prolonged QT-interval, or sine-wave consistent with hyperkalemia

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1. Adults:
  - A. Calcium gluconate 2 grams (20 ml of 10% solution) IV over 2 minutes
  - B. Repeat calcium gluconate 2 grams for dysrhythmia that continues
  - C. Sodium bicarbonate 50 mEq (50 ml) IV, IO
  - D. Albuterol 5 mg via nebulizer
2. Pediatrics:
  - A. Calcium gluconate 20 mg/kg IO, IV (0.2 ml/kg of 10% solution); maximum 2 grams (20 ml) over 2 minutes
  - B. Albuterol 2.5 mg via nebulizer
3. If any rhythm change occurs refer to appropriate protocol

### Additional Considerations

- \* When ventricular escape beats are observed in the presence of bradycardia, do not treat with lidocaine
  - Escape beats are attempting to sustain the patient
  - Treat the bradycardia with atropine
- \* If unable to differentiate the rhythm between supraventricular and ventricular, treat as ventricular
- \* Bolus of lidocaine is more efficacious and safer than lidocaine drips in suppressing ventricular ectopy
- \* Prophylactic lidocaine therapy is NOT indicated for routine use when PVC's are associated with acute MI
- \* Any dysrhythmia can provoke a pulmonary edema/CHF exacerbation in a patient with a compromised heart
  - Treat the dysrhythmia first
  - For patient that demonstrates signs of respiratory distress and is determined to be in congestive heart failure or pulmonary edema, obtain 12-lead ECG on-scene
    - For acute injury or infarction noted, immediately transport
- \* Patients with a history of congestive heart failure, liver disease, shock, or advanced age (>70 years old) should receive half (0.75 mg/kg) the normal bolus of lidocaine
  - Repeat doses should be reduced to 0.5 mg/kg
- \* Consider hypoglycemia in any patient progressing into cardiac arrest
  - Consider D10 @ 25 grams (100 ml) IV, IO
- \* Magnesium sulfate is contraindicated in patients with renal insufficiency or on dialysis except in cases of Torsades
- \* Hyperkalemia is a dangerous electrolyte abnormality and can lead to peaked T-waves, PR segment prolongation, absent p-waves, widening QRS interval, and heart blocks
  - Causes include renal failure, noncompliance with dialysis, acidosis, medications, and significant crush or burn injuries
  - Calcium gluconate and sodium bicarbonate are emergently required as treatment

## Congestive Heart Failure

**(NCCEP Protocol AC-5/PC-3)**

### Differential Diagnosis

- \* Anaphylaxis
- \* Aspiration
- \* Asthma
- \* Congestive Heart Failure
- \* Myocardial Infarction
- \* Pericardial effusion/tamponade
- \* Pleural effusion
- \* Pneumonia
- \* Pulmonary embolus
- \* Toxic exposure

### Advanced Medical Care

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG
3. Adults:
  - A. Nitroglycerin 0.4 mg SL
    - i. Hold for SBP < 100 mm Hg
  - B. For patient unable to tolerate SL nitroglycerin, apply nitro paste to upper chest
    - i. SBP > 200 mm Hg: apply 2 inches
    - ii. SBP 150 – 200 mm Hg: apply 1.5 inches
    - iii. SBP 100 – 150 mm Hg: apply 1 inch
    - iv. Hold/remove for SBP < 100 mmHg
  - C. CPAP per [Respiratory: NIPPV Protocol](#), for patient is awake and has not responded to above measures
4. Pediatrics:
  - A. Position patient with head of be elevated 30-45°
  - B. Consider placing patient with hips and knees flexed
5. For cardiogenic shock:
  - A. Adults: Dopamine @ 10 – 20 mcg/kg/min IV
  - B. Pediatrics: Dopamine @ 10 – 20 mcg/kg/min IV
  - C. Discontinue CPAP if already instituted

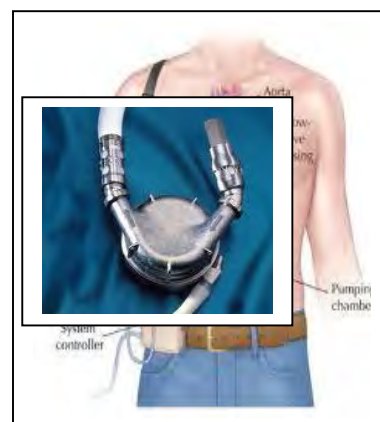
### Additional Considerations

- \* Any patient noted to be in congestive heart failure should be considered at risk for coronary artery disease
  - Consideration should be given as to the etiology (ischemia/infarction, dysrhythmia)
- \* When hypotension is present in patients suspected of being in congestive heart failure, judicious use of IV fluid is important
  - Dopamine may be considered as initial intervention in these instances
- \* Pediatric patient considerations
  - Tetralogy of Fallot, transposition of the great arteries, coarctation of the aorta, ventricular septal defects, atrial septal defects, myocarditis, pericarditis, SVT

## Left Ventricular Assist Device (LVAD)

## Introduction

- \* Left Ventricular Assist Device (LVADs) are placed in patients with severe heart failure
  - Most are awaiting heart transplantation
- \* There are internal components (connected to the heart) and external components (batteries, drive-line, controller device)
- \* Several types exist
  - Patients should have documentation of the type of their LVAD
  - Contact numbers for coordinator for assistance with management
  - Both patient and at least one family member is extensively educated on LVAD system and alarms before discharge from the hospital
- \* Patients may or may not have a palpable pulse
  - Non-pulsatile device (MAJORITY) = may NOT have a pulse and BP may only be measurable via Doppler
  - Pulsatile device (Total Artificial Heart) = will have a pulse and measurable BP
- \* All LVADs are preload dependent, give fluids as needed for hypotension
- \* Potential complications include:
  - Bleeding
  - Dysrhythmia
  - Hemolysis
  - Infection
  - Pump failure
  - Thrombosis
- \* LVAD patients are anti-coagulated
  - May present with GI bleeding or other significant hemorrhage
- \* Ensure both batteries are NEVER disconnected at the same time
- \* HeartMate II (non-pulsatile)
- \* HeartMate XVE (pulsatile)



## Basic Medical Care

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess level of consciousness
  - A. Patient may be awake and alert despite no palpable pulse
    - i. May or may not have a palpable pulse at baseline
    - ii. Do not rely on pulses to determine if patient has had a cardiac arrest
    - iii. Check to see if patient is breathing, if breathing NO CPR
  - B. If unconscious, pulseless, and apneic
    - i. Initiate focused cardiac arrest protocol and apply AED
    - ii. Do NOT place pads directly over LVAD
4. Assess vital signs
5. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
6. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
7. Additional care as per specific presumptive diagnosis, patient condition, cardiac disorder











## Advanced Medical Care

1. Obtain 4-lead ECG as indicated and refer to appropriate protocol
2. Obtain 12-lead ECG as indicated
3. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
4. IVF Resuscitation – LVADs are preload dependent and IVF resuscitation is indicated for signs of hypotension and/or volume depletion
  - A. Adult: 500-1000 ml IV, IO as per patient condition
  - B. Pediatric: 10 – 20 ml/kg IV, IO as per patient condition
  - C. Repeat IVF bolus as indicated per patient condition
5. For persistent hypotension following IVF resuscitation
  - A. Dopamine @ 10 – 20 mcg/kg/min IV
6. Dysrhythmias: Treat the patient NOT the monitor
  - A. Defibrillation/cardioversion only if patient compromised
    - i. Do NOT place pads directly over LVAD
  - B. Patient may be awake and alert despite ventricular arrhythmia (VF or VT)
  - C. Ventricular Tachycardia: treat with IV medication per protocol
  - D. Ventricular Fibrillation: treat the patient
    - i. Check to see if patient is breathing, if breathing NO CPR
    - ii. If patient is unresponsive, apneic, and failure of defibrillation attempt (as indicated) initiate CPR
7. Additional Care as per specific presumptive diagnosis, patient condition, cardiac disorder








**Additional Considerations**

- \* Patients are anti-coagulated and prone to bleeding
- \* GI bleeding being a common complication
- \* Persistent bleeding following minor trauma may occur
- \* An LVAD is an invasive device and is prone to infection
  - Source of **infection to consider is the "Drive Line"** (connects the internal device to the external controller)
    - DO NOT TOUCH the drive line but look for signs of infection at site
- \* Bring all LVAD equipment during transport
- \* **Allow patient's family member who is educated** on LVAD use and alarms to accompany patient during ambulance transport
- \* Consult LVAD documentation regarding any alarms on controller device
  - HeartMate II alarms

| Priority                             | System Controller Screen  | Active Symbols  | Alarm Means  |
|--------------------------------------|---|---|--|
| A<br>D<br>V<br>I<br>S<br>O<br>R<br>Y | Connect Power<br>Ⓢ - 04   |   | One of the two power cables is disconnected                      |
|                                      | Replace Power<br>Ⓢ - 02   |  | Low Battery, Power Input is low with less than 15 min. remaining |
|                                      | Low Battery<br>Ⓢ - 06   |   |  |
|                                      | Replace Controller<br>Controller fault  |  | System Controller hardware fault                                 |
|                                      | Call Hospital Contact<br>Controller fault   |   |  |
|                                      | Call Hospital Contact<br>System battery fault                                       |  | System Controller Backup Battery fault                           |
|                                      | Low Speed<br>Ⓢ - 03   |  | Low speed advisory warning                                       |
|                                      | Call Hospital Contact<br>Ⓢ - 07   |   |  |
|                                      | Call Hospital Contact<br>Drive line fault   |  | Drive line fault   |
|                                      |  |  | System Controller Backup Battery not installed                   |
|                                      |  |  | Controller Clock not set   |

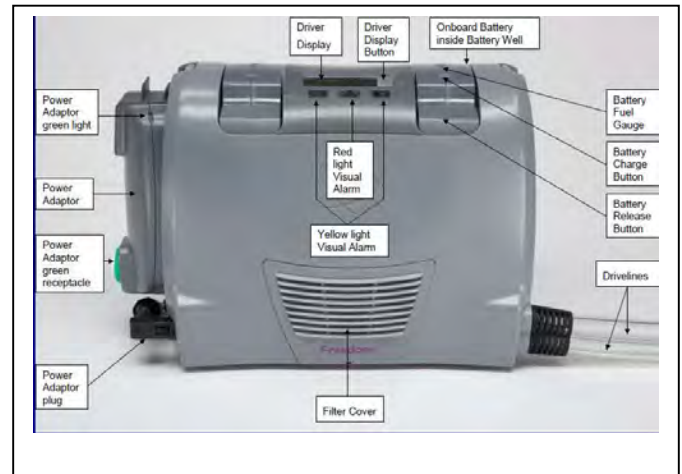
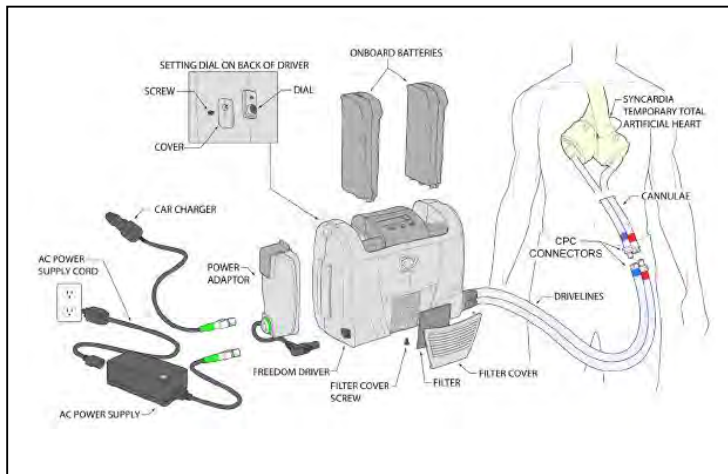
**Important!** The pump running (Ⓢ) symbol is always lit green when the pump is run

| Priority                   | System Controller Screen            | Active Symbols  | Alarm Means   |
|----------------------------|-------------------------------------|---|---|
| H<br>A<br>Z<br>A<br>R<br>D | Low Flow<br>Ⓢ - 01                  |   | Pump is off. The pump running symbol (Ⓢ) is black.                        |
|                            | Call Hospital Contact<br>Ⓢ - 07     |   |   |
|                            | Connect Drive line<br>Ⓢ - 02        |  | Drive line is disconnected. The pump running symbol (Ⓢ) is black.         |
|                            | Replace battery<br>Ⓢ - 01           |  | Both power cables are disconnected  |
|                            | Connect Power Immediately<br>Ⓢ - 05 |   |   |
|                            | Low Flow<br>Ⓢ - 03                  |  | Low flow, flow is less than 2.5 lpm                                       |
|                            | Call Hospital Contact<br>Ⓢ - 07     |   |   |
|                            | Replace Power Immediately<br>Ⓢ - 02 |  | Low Battery, Power Input is extremely low with less than 5 min. remaining |
|                            | Low Battery<br>Ⓢ - 06               |   |   |

# Total Artificial Heart

## Introduction

- \* Serves as a bridge to heart transplantation for patients at risk of death from biventricular failure
- \* Device features:
  - Both right and left ventricles + all heart valves removed (atria remain)
  - Same blood flow pathway as native heart
  - Patients WILL have a pulse
  - Patients WILL NOT have a cardiac rhythm
- \* BP cuff should be utilized for monitoring
- \* CPR is NOT effective and should not be performed
- \* NO vasopressors should be utilized in the field
- \* Patients are anticoagulated



## Troubleshooting

- \* Alarms
  - Battery: beeping audible alarm and blinking yellow light
    - One or more batteries with < 30% charge or incorrectly installed
    - Replace battery(ies) ONE AT A TIME or connect to external power
  - Temperature: beeping audible alarm and blinking red light
    - Remove any debris blocker filter cover and/or fan
    - Move device to a cooler (or warmer) area
  - Fault: constant audible alarm and solid red light
    - If secondary to Valsalva/straining – have patient relax, interrupt Valsalva
    - If secondary to kinked drivelines – straighten drivelines
    - If disconnected from external power without battery – insert battery or connect to external power
    - If 1 or more batteries < 30% charge – replace battery
    - Driver malfunction – transport to hospital

## Heat Exposure – Hyperthermia

(NCCEP Protocol TE-4)

### Introduction

- \* Heat illnesses encompass a spectrum of disorders from simple muscle cramps and heat exhaustion to life-threatening heat stroke
- \* Temperatures more than 107°F do not occur from infectious sources and require aggressive treatment to cool the patient
- \* Differential Diagnosis
  - CNS lesion
  - Dehydration
  - Delirium tremens
  - Environmental exposure
  - Fever
  - Hyperthyroidism
  - Medication intoxication
- \* Risk Factors
  - Drugs
    - Amphetamines
    - Anticholinergics
    - Aspirin
    - Cocaine
    - Neuroleptics
  - Endocrine disorders
    - Exertion
    - Heat exposure
    - Hyperthyroidism
    - Status epilepticus
- \* Clinical Presentation
  - Heat cramps
    - Benign muscle cramping
    - Body temperature normal, no dehydration
    - Secondary to hyponatremia
  - Heat exhaustion
    - Dehydration
    - Headache
    - Malaise, irritability
    - Nausea, vomiting
    - Profuse sweating
  - Heat stroke
    - Altered mental status
    - Elevated temperature
    - Often dry skin
    - Tachycardia, tachypnea

**Basic Medical Care**

1. Confirm scene safety
2. Ensure a cool protective environment for yourself and the patient & initiate cooling
3. **Medical Initial Assessment Protocol** or **Pediatric Initial Assessment Protocol**
4. Maintain airway; suction as needed
5. Assess vital signs including temperature
6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. Immediately initiate cooling central body regions with ice packs
  - A. Axilla, groin, scalp, chest, abdomen
9. Assess blood glucose
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
10. Expose patient and mist skin wet with room temperature saline
  - A. Apply fan / cool air blow-by
  - B. Stop if patient begins to shiver

**Advanced Medical Care**

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG as indicated by patient presentation
3. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
4. Ondansetron (Zofran®) for nausea/vomiting
  - A. Adult: 4 – 8 mg IV, PO
  - B. Pediatric dose = 0.15 mg/kg IV, PO (maximum 4 mg)
5. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
6. Alternative analgesic: nitrous oxide via patient-controlled inhalation
7. Advanced Airway management as indicated
  - A. **Airway: Intubation Protocol**
  - B. **Airway: BIAD Protocol**
8. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen
9. Additional care as per appropriate protocol

## Cold Exposure – Hypothermia

(NCCEP Protocol TE-5)

### Introduction

- \* Definitions
  - Body core temperature < 95°F (35°C)
  - Primary hypothermia = due to cold environment exposure
  - Secondary hypothermia = illness that impairs thermoregulation
  - Mild hypothermia: temperature 90°-95°F (32°-35°C)
  - Moderate hypothermia: temperature 82°-90°F (28°-32°C)
  - Severe hypothermia: temperature < 82°F (28°C)
- \* Differential Diagnosis
  - CNS dysfunction
  - Environment exposure
  - Hypoglycemia
  - Hypothyroidism
  - Hypoadrenalism
  - Sepsis
- \* Clinical Presentation
  - Cold exposure
  - Shivering (may be absent in severe hypothermia)
  - Altered consciousness
  - Dehydration
  - Tachypnea then bradypnea
  - Bradycardia to cardiac arrest

**Basic Medical Care**

1. Confirm scene safety
2. Ensure a protective environment for yourself and the patient
3. **Medical Initial Assessment Protocol** or **Pediatric Initial Assessment Protocol**
4. Maintain airway; suction as needed
5. Assess vital signs including temperature
  6. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. Assess blood glucose
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
9. Remove all wet clothing
10. Initiate re-warming
  - A. Passive external:
    - i. Provide warm environment, insulate from further heat loss
  - B. Active external:
    - i. Heater, warm blankets
11. Assess for associated trauma
12. Remove rings, bracelets, or constricting items on any extremity with potential frostbite

**Advanced Medical Care**

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG
3. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
1. For hypoglycemia treat per **Diabetic Problems Hypoglycemia Protocol**
4. For suspected narcotic use:
  - A. Adults: naloxone (Narcan®) 2 mg IV, IO, IN
  - B. Pediatrics: naloxone (Narcan®) 0.01 – 0.1 mg/kg IV, IO, IN
5. Advanced Airway management as indicated
  - A. **Airway: Intubation Protocol**
  - B. **Airway: BIAD Protocol**
6. Ensure proper tube placement using capnometry,  $\text{SpO}_2$  and ventilate with 100% oxygen
7. Assess for associated trauma
8. Additional care as per appropriate protocol

9. For suspected frostbite
  - A. Do not rub affected part
  - B. Do not break or open blisters
  - C. Apply sterile dressing
  - D. Do not attempt to thaw frozen area unless ensured area will not refreeze prior to arrival to definitive care
  - E. Fentanyl (Sublimaze®) for pain control
    - i. Adults:
      - 1 – 2 mcg/kg IN (maximum 200 mcg)
      - 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
      - May repeat x1 in 15 minutes as indicated (max 100 mcg any route)
    - ii. Pediatrics:
      - 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
      - Contact Medical Control for repeat dosing
10. For patient in cardiac arrest
  - A. Continue CPR until core temperature > 90°F
  - B. Defibrillation typically unsuccessful at temperature < 90°F
  - C. Hold ACLS medications until core temperature > 86°F
  - D. Consider withholding CPR if patient has organized rhythm or has other signs of life
    - i. Contact medical control
  - E. Consider: no patient is dead until warm and dead (temp ≥ 93.2°F; 32°C)

**Additional Considerations – Heat Exposure**

- \* Initiate cooling activities immediately
- \* Extremes of age are more prone to heat related emergencies
- \* Assess for predisposing factors
  - Cocaine, amphetamines, salicylates, tricyclic antidepressants, phenothiazines, anticholinergic medications
- \* A thermometer should be used for patients where clinical signs and symptoms of hyperthermia are not apparent, and a body temperature reading would alter clinical decision-making in the prehospital environment
- \* There is no role for antipyretics such as acetaminophen or ibuprofen in patients with non-infectious causes of hyperthermia
- \* Heat cramps = benign muscle cramping due to dehydration & typically not associated with elevated temperature
- \* Heat exhaustion = dehydration, salt depletion, dizziness, fever, cramping, N/V
- \* Heat stroke = altered mental status, dehydration, elevated temperature

**Additional Considerations – Cold Exposure**

- \* Extremes of age are more susceptible to cold emergencies
- \* Osborn (J) waves = ECG: slow positive deflection at the end of QRS complex, occur at temperature < 90°F (32°C)
- \* Dysrhythmias classically progress:
  - NSR → SB → AFIB with slow ventricular response → VFIB → asystole
- \* Obtain as much information from bystanders as possible
  - Duration of exposure
  - If immersion was present
  - Drug or alcohol history
- \* Hypothermic patients should be handled with caution
  - Dysrhythmias, primarily ventricular fibrillation, are commonplace at core temperatures < 86°F, and may be precipitated easily with careless handling of the patient
- \* A thermometer should be used for patients where clinical signs and symptoms of hypothermia are not apparent, and a body temperature reading would alter clinical decision-making in the prehospital environment
- \* In cardiac arrest the primary treatment is active core rewarming
  - The hypothermic heart is usually unresponsive to most cardiac medications, defibrillation, and pacing
  - If the patient is below 86°F or 30°C only defibrillate one time if defibrillation is required
  - Normal defibrillation procedure may resume once patient reaches 86°F (30°C)
  - Below 86°F (30°C) anti-dysrhythmics may not work and, if given, should be given at reduced intervals contact medical control before they are administered
  - Below 86°F (30°C) or pacing should not be performed



## Hemorrhage – Medical Etiology

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### Etiologies

- \* Dental hemorrhage
- \* Dialysis access hemorrhage
- \* Epistaxis
- \* Hematemesis
- \* Hematochezia / melena
- \* Hematuria
- \* Hemoptysis
- \* Intracranial hemorrhage

### Differential Diagnosis

- \* Medical Shock
  - Anaphylaxis
  - Drug induced
  - Cardiogenic
  - Neurogenic
  - Sepsis
- \* Traumatic Shock
  - External hemorrhage
  - Internal hemorrhage
  - Cardiac tamponade
  - Neurogenic

### Basic Medical Care

1. Confirm scene safety
2. **[Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)**
3. Maintain airway; suction as needed
4. Assess vital signs
5. Provide supplemental oxygen per patient condition to maintain SpO<sub>2</sub> = 94 – 97%
6. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
7. Additional care as per following section per etiology of hemorrhage

## Dental Hemorrhage

(NCCEP Protocol UP-7)

1. Have patient bite down on gauze packing
2. Assess for trauma and treat as per appropriate protocol
3. For avulsed tooth
  - A. Gently irrigate and attempt to replace into socket
    - i. Do NOT rub or scrub tooth
  - B. If unable to replace into socket have patient hold tooth in cheek
    - i. Patient must have normal mental status
    - ii. Otherwise place tooth in milk or normal saline

## Dialysis Access Hemorrhage

1. Apply direct pressure to site
2. Apply MEDIC tourniquet for presumed life-threatening hemorrhage not controlled with direct pressure
  - A. Be sure to apply proximal to the shunt (**NOT** directly on the shunt)

## Epistaxis

(NCCEP Protocol UP-9)

1. Have patient forcibly blow nose
  - A. Immediately apply direct pressure by pinching nostrils & tilting head forward
2. Suction as necessary
3. Assess for trauma and treat as per appropriate protocol

## Gastrointestinal Hemorrhage

1. Maintain patient in position to maximum airway protection and patient comfort
2. Provide suctioning as indicated

**Advanced Medical Care**

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
3. For persistent hypotension following IVF resuscitation
  - A. Dopamine @ 10 – 20 mcg/kg/min IV
4. Ondansetron (Zofran®) for nausea or vomiting
  - A. Adults: 4 – 8 mg IV, PO
  - B. Pediatrics: 0.15 mg/kg IV, PO (maximum 4 mg)
5. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
6. Advanced Airway management as indicated
  - A. **[Airway: Intubation Protocol](#)**
  - B. **[Airway: BIAD Protocol](#)**
7. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen

**Additional Considerations**

- \* Hypertension typically does not cause epistaxis; however, it may worsen the condition
  - Contact Medical Control for labetalol for patient that is significantly hypertensive
- \* Primary avulsed teeth (< 5 years of age) are not replaced
- \* Secondary (permanent) avulsed teeth may be replanted after irrigating with tap water or saline
  - Irrigation should be done gently without debriding or scrubbing the tooth

## Industrial Accident

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### Basic Medical Care

1. Confirm scene safety
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Maintain airway; suction as needed
4. Assess vital signs
5. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$ 
  - A. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Control any active external bleeding with direct pressure
  - A. Apply MEDIC tourniquet for presumed life-threatening extremity hemorrhage not controlled with direct pressure
7. Splint any long bone deformity or area where crush injury has occurred
  - A. Dislocated joints should be splinted in position of deformity
  - B. Fractures should be realigned and splinted from joint above through joint below
  - C. Distal pulses should be assessed before and after realignment and splinting
8. Ensure spinal motion restriction as indicated by mechanism of injury and presentation
9. Attempt to locate any amputated appendage or part
  - A. Gently irrigate with normal saline and wrap in normal saline moistened gauze
  - B. Place in plastic bag and put bag on ice (as available) and transport to hospital with patient
  - C. Amputated parts should never be in direct contact with ice

### Advanced Medical Care

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
3. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
4. Alternative analgesic: nitrous oxide via patient-controlled inhalation
5. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
6. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen

## Overdose / Toxic Ingestion

(NCCEP Protocol TE-7)

### Differential Diagnosis

- \* Acetaminophen
- \* Alcohols
- \* Anticholinergics
- \* Cardiac medications
- \* Caustics
- \* Illicit drugs
- \* Opioids
- \* Organophosphates
- \* Solvents
- \* Stimulants
- \* Tricyclic Antidepressants
- \* Other medications

### Clinical Presentations

- \* Ingestions
  - Abdominal pain
  - Altered mental status
  - Miosis / mydriasis
  - Nausea, vomiting, diarrhea
  - Oral burns
  - Respiratory depression
  - Salivation
  - Seizures
- \* Inhalation
  - Cyanosis
  - Dizziness
  - Headache
  - Lethargy
  - Nausea / vomiting
- \* Injection
  - Edema
  - Euphoria / drowsiness
  - Hypotension
  - Nausea / vomiting
  - Puncture

**Basic Medical Care**

1. Confirm scene safety
2. [\*\*Medical Initial Assessment Protocol\*\*](#) or [\*\*Pediatric Initial Assessment Protocol\*\*](#)
3. Maintain airway; suction as needed
4. Assess vital signs
5. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
6. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
7. Assess blood glucose level
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
8. For presumed narcotic – opioid overdose:
  - A. Naloxone (Narcan®)
    - Adults: 1 – 2 mg IN
    - Pediatrics: 0.01 – 0.1 mg/kg IN
    - May repeat as indicated to maximum of 10 mg
9. Determine nature of ingestion
  - A. Bring any pill bottles found to the emergency department with the patient
10. For evidence of contamination, immediately decontaminate
  - A. Ensure personal protection during decontamination
  - B. Remove patient from source
  - C. Remove clothing
  - D. Wash skin and hair
  - E. Flush eyes and mucous membranes
11. Additional care as per substance ingestion/exposure

**Advanced Medical Care**

1. Obtain 4-lead and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG as indicated per patient's ingestion/exposure
3. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
2. For hypoglycemia treatment as per [\*\*Diabetic Problems Hypoglycemia Protocol\*\*](#)
4. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
5. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen
6. Additional care as per substance ingestion/exposure

**Additional Considerations**

- \* Consider contacting Carolinas Poison Control Center
  - **704-355-4000**
  - **800-222-1222**
- \* Do NOT induce vomiting
  - Ipecac is not to be utilized unless directed by Poison Center or Medical Control
- \* Secure remaining medications away from patient
- \* For incidents involving industrial or chemical spills, radiation accidents, or other incidents where hazardous materials are involved, strict communication with the fire department/hazardous materials team should be established
- \* Sedation for patients noted to be extremely agitated should be emergently considered because rapid decompensation is possible
- \* Intentional overdoses often involve multiple agents taken simultaneously and providers must keep a degree of suspicion for poly-pharmacy overdose and treat accordingly
- \* Consider restraints as per Patient Restraints Protocol
- \* Effort should be made to obtain any possible medications on scene of intentional ingestions
- \* Airway management and ventilatory assistance remains paramount and must be performed while preparing naloxone for administration
- \* Naloxone administration may precipitate narcotic withdrawal in patients who chronically abuse narcotics
  - Providers must be prepared to manage acute agitation and/or nausea/vomiting that may result from narcotic withdrawal following naloxone administration
- \* Many overdoses may involve multiple agents and therefore naloxone administration may not fully restore adequate respiratory effort
  - Provider must be prepared to continue to manage the airway and assist ventilations as indicated
- \* Signs/symptoms:
  - **Anticholinergics**: AMS, dilated pupils, hyperthermia, dry skin
  - **Aspirin**: tachypnea, altered mental status
  - **Cardiac medications**: dysrhythmias, bradycardia/tachycardia, hypotension
  - **Cyanide**: altered mental status, hypotension, severe acidemia
  - **Depressants**: hypotension, respiratory depression
  - **Organophosphates**: salivation, lacrimation, urination, defecation, GI distress, emesis (SLUDGE)
  - **Stimulants**: tachycardia, tachypnea, hypertension, hyperthermia, AMS
  - **TCA's**: dysrhythmia, hypotension, altered mental status, seizure

## Poison Specific Therapies

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1. Opioids (narcotics)
  - A. Naloxone (Narcan®)
    - i. Adults: 1 – 2 mg IV, IN, IM
      - IM administration should be used only as the last option
    - ii. Pediatrics: 0.01 – 0.1 mg/kg IV, IN, IM (maximum 2 mg)
      - IM administration should be used only as the last option
  - B. May repeat every 5 minutes to maximum of 10 mg
2. Tricyclic antidepressants
  - A. Sodium bicarbonate
    - i. Adults: 50 – 100 mEq (50 – 100 ml) IV, IO
    - ii. Pediatrics: 1 mEq/kg (1 ml/kg) maximum 50 mEq (50 ml) IV, IO
  - B. Give based on presence of tachycardia, hypotension with QRS widening
3. Stimulants/sympathomimetics (cocaine associated agitation)
  - A. Midazolam (Versed®)
    - i. Adults: 5 mg IM or 5 – 10 mg IN
    - ii. Pediatrics: 0.15 mg/kg IM or 0.2 mg/kg IN (max 5 mg IM, 10 mg IN)
  - B. May repeat in 10 – 15 minutes for continued or worsening symptoms
4. Organophosphates
  - i. Duo-dote kit (atropine/Pralidoxime) IM
  - ii. Atropine
    - Adult: 2 mg IV, IM
    - Pediatric: 0.02 mg/kg IV (minimum 0.1 mg; maximum 1 mg)
  - iii. May repeat every 5 minutes until drying of secretions occurs
5. Calcium Channel Blockers / Beta Blockers
  - A. Calcium gluconate (10% solution) over 2 min
    - i. Adults: 2 grams (20 ml) IV
    - ii. Pediatrics: 20 mg/kg IO, IV (0.2 ml/kg); maximum 2 grams (20 ml) IV
  - B. Glucagon
    - i. Adults: 2 mg IV
    - ii. Pediatrics: 0.05 mg/kg IV (maximum 2 mg)
  - C. Dopamine @ 10 – 20 mcg/kg/min IV
6. Cyanide
  - A. Sodium thiosulfate 12.5 grams IV over 10 minutes
  - B. Pediatrics: 250 mg/kg IV (maximum 12.5 grams) over 10 minutes

### Additional Considerations

- \* Naloxone IM is to be reserved as a last option as its absorption and its anti-opioid effects are inconsistent when given IM and therefore creates difficulty in ascertaining which effect will clear first (opioid vs. naloxone) which then leads to difficulty in determining appropriateness for release



## Pregnancy & Childbirth

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### Differential Diagnosis

- \* Vaginal bleeding
  - Labor
  - Placenta previa
  - Placental abruption
  - Trauma
- \* Abdominal pain
  - Labor
  - Trauma
  - Differential as per [Abdominal Pain Protocol](#)
- \* Hypertension
  - Pregnancy induced hypertension
  - Pre-eclampsia/Eclampsia

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Maintaining appropriate privacy, remove clothes below waist to visualize delivery progression or any bleeding present as indicated by patient presentation

### Advanced Medical Care

1. Apply cardiac monitor & obtain rhythm strip and refer to appropriate protocol as indicated
2. IVF resuscitation
  - A. Hemodynamically unstable: IVF wide open
  - B. Hemodynamically stable: TKO
3. For hypotension, transport in left lateral decubitus position in Trendelenburg orientation
4. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
5. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen
6. Ondansetron (Zofran®) 4 – 8 mg IV, PO for nausea and/or vomiting
7. Additional care per appropriate protocol
8. Fentanyl (Sublimaze®) for pain control as patient condition permits
  - A. 1 – 2 mcg/kg IN (maximum 200 mcg)
  - B. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
  - C. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)

**CHILDBIRTH****(NCCEP Protocol AO-1)****Basic Medical Care – No Crowning**

1. Monitor and reassess

**Basic Medical Care – Crowning**

1. Gently control the progress of the head
2. Support the head with one hand as it is delivered
3. Clear **the infant's airway by suctioning with bulb syringe**
  - A. Suction mouth then nose
4. Check to ensure that the umbilical cord is not wrapped around the head / neck (nuchal)
  - A. Gently slip the cord over the head
  - B. If unable to slip cord: either deliver through it and unwrap after delivery or reduce the cord before the shoulders deliver
5. Help direct the anterior shoulder under the symphysis pubis with downward pressure on **the side of the neonate's head**
6. Apply gentle upward pressure to deliver the posterior shoulder
7. Support the infant through the remainder of the delivery
8. **Clamp the cord approximately two (2) inches from the infant's abdomen and cut**
9. Stimulate the infant and clear the airway
10. Dry and wrap the infant for warmth
11. Assess infants APGAR score at one and five minutes:
12. Deliver the placenta
  - A. Never pull on umbilical cord to deliver the placenta
13. Massage the fundus of the uterus
14. Monitor for post-partum hemorrhage

**Childbirth Complications**

1. For prolapsed cord
  - A. Encourage mother to refrain from pushing
  - B. Place in Trendelenburg position
  - C. Insert fingers into vagina to relieve pressure on cord by displacing fetal head up
  - D. Keep cord moist with saline soaked gauze
2. For breech presentation
  - A. Encourage mother to refrain from pushing
  - B. Place in Trendelenburg position
  - C. Support presenting part(s); do NOT pull
3. For Shoulder Dystocia
  - A. **Hyperflex the mother's hips and thighs towards her chest and apply anterior to posterior pressure with lateral to medial pressure supra-pubic in attempt to rotate the baby's shoulders off the pelvic rim**

**NEWLY BORN****(NCCEP Protocol AO-2)****Basic Medical Care**

1. [Pediatric Initial Assessment Protocol](#)
2. Assess estimated gestational age
3. Suction oropharynx as required for meconium present
  - A. May require positive pressure ventilation with BVM based on patient's condition
4. Dry infant and keep warm
5. Position & clear airway as indicated
6. Assess APGAR score
  - A. Heart rate > 100 BPM
    - i. For color normal = monitor and reassess
    - ii. For color cyanotic = provide supplemental oxygen
  - B. Heart rate < 100
    - i. Provide positive pressure ventilation
    - ii. [Airway: Pediatric Protocol](#)
    - iii. Reassess HR after 30 seconds of BVM ventilation
  - C. Heart rate < 60 BPM
    - i. Initiate CPR (compressions @ 100 – 120 min)
    - ii. Provide positive pressure ventilation
    - iii. Compression to ventilation ratio = 3:1
    - iv. [Airway: Pediatric Protocol](#)
  - D. Respirations
    - i. Present = monitor and reassess
    - ii. Respirations absent = stimulate, suction
    - iii. Respirations remain absent = initiate BVM ventilations (ventilations @ 40/min)
  - E. Color
    - i. Pink – monitor and reassess
    - ii. Cyanotic – provide supplemental oxygen
    - iii. Airway: Pediatric Protocol
7. Consider maternal hypoglycemia & maternal medication effects
8. Reassess APGAR score

**Advanced Medical Care**

1. Heart rate < 60 BPM
  - A. Epinephrine (1:10,000) 0.01 mg/kg; (0.1 ml/kg) IO, IV (maximum 1 mg; 1 ml)
2. Consider hypoglycemia
  - A. D10 @ 2 ml/kg as indicated
    - i. Repeat based on clinical condition and blood glucose level
3. IVF bolus: 10 ml/kg IV, IO for continued lethargy
4. Consider maternal medication effects
  - A. Naloxone (Narcan®) 0.01 – 0.1 mg/kg IN, IV as indicated

## Obstetrical Emergencies

(NCCEP Protocol AO-3)

### Pre-Eclampsia / Eclampsia

#### Clinical Presentation

- \* Edema
- \* Headache
- \* Hyper-reflexia
- \* Hypertension > 160/110
- \* Proteinuria
- \* Visual changes

#### Risk Factors

- \* Maternal age < 20 years
- \* Primagravida
- \* Multiple gestation
- \* Molar pregnancy

#### Basic Medical Care

1. [Medical Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen as indicated per patient condition to maintain SpO<sub>2</sub> > 94%
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. For hypertension, position patient in left lateral decubitus position (left side down)
7. Seizure precautions

#### Advanced Medical Care

1. For pre-eclampsia
  - A. Labetalol (Normodyne®) 20 mg IV
  - B. Repeat labetalol 20 mg IV for persistent symptoms or hypertension
2. Transport patient in the left lateral decubitus position (left side down)
3. For Eclampsia
  - A. Magnesium sulfate 4 grams IV over 15 minutes (4 grams in 150 ml NS)
  - B. Monitor for signs for magnesium toxicity:
    - i. hyporeflexia, respiratory depression, hypotension
    - ii. Stop infusion if present
  - C. Midazolam (Versed®) 5 mg IM or 5 – 10 mg IN for persistent seizure activity

## Placental Abruption

### Introduction

- \* Partial or complete detachment of the placenta from its normal implantation site
- \* Occurs in 1 in 200 deliveries
- \* Accounts for 30% of cases of antepartum hemorrhage
- \* Risk factors = trauma, hypertension, acute decompression of distended uterus

### Clinical Presentation

- \* Painful dark vaginal bleeding (classic presentation)
- \* Uterine irritability
- \* Uterine tenderness

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Do not attempt to localize the of vaginal bleeding beyond visual inspection of perineum

### Advanced Medical Care

1. IVF resuscitation as indicated
  - A. Hemodynamically unstable: IVF wide open
  - B. Hemodynamically stable: TKO
2. Fentanyl (Sublimaze®) for pain control
  - A. 1 – 2 mcg/kg IN (maximum 200 mcg)
  - B. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
  - C. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
3. Ensure necessary equipment for emergent delivery is immediately available

## Placenta previa

### Introduction

- \* Implantation of the placenta in the lower uterine segment in advance of the fetal presenting part after 24 weeks gestation
- \* Occurs in 1 in 250 deliveries
- \* Accounts for 20% of cases of antepartum hemorrhage

### Clinical Presentation

- \* Painless bright red vaginal bleeding (classic presentation)
- \* Contraction may or may not be present
- \* Potential for hypotension

### Basic Medical Care

1. [Medical Initial Assessment Protocol](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Do not attempt to localize the of vaginal bleeding beyond visual inspection of perineum

### Advanced Medical Care

1. IVF resuscitation as indicated
  - A. Hemodynamically unstable: IVF wide open
  - B. Hemodynamically stable: TKO
2. Ensure necessary equipment for emergent delivery is immediately available

**Additional Considerations – Breech Presentation**

- \* Allow the buttocks and trunk to deliver spontaneously
- \* As the baby is delivered, continue to support with both hands
- \* Attempt to deliver the anterior shoulder and arm and then deliver the posterior shoulder and arm
- \* The arms need to be delivered to enable the head to be delivered
- \* Assist with the delivery of the head by exerting pressure above the pubic symphysis
- \* The face should be kept in a downward position
- \* Do not allow hyperextension of the neck as the head is delivered

**Additional Considerations – Newborn Resuscitation**

- \* All newborn infants must be kept warm
- \* For thick meconium found in the amniotic fluid at the time of delivery or is present in the oropharynx, suction oropharynx and prepare for need for positive pressure ventilation via bag-valve-mask device
- \* Meconium Aspiration Syndrome is a severe complication for the neonate
- \* For meconium present at the time of delivery and the neonate has normal vital signs and demonstrates vigorous muscle activity
  - Use the bulb suction or appropriately sized suction catheter to suction oropharynx
- \* For neonate that is depressed (apnea, heart rate < 100, and decreased muscle tone)
  - Provide positive pressure ventilation with bag-valve-mask device
  - Re-suction oropharynx as required
    - Suction should not last more than 3 to 5 seconds

**Additional Considerations – Miscellaneous**

- \* Transport to patient's hospital of choice
  - For complications (hemorrhage, neonatal distress, abnormal delivery complication) divert to the closest hospital with OB/labor and delivery services within the requested healthcare system
  - Avoid free-standing emergency departments except in extreme circumstances and the free-standing ED is critically closer than closest hospital ED
    - A. These facilities do not have OB/labor and delivery services

## APGAR Score

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| Sign         | 0      | 1                      | 2                  |
|--------------|--------|------------------------|--------------------|
| Heart Rate   | Absent | < 100 BPM              | > 100 BPM          |
| Respirations | Absent | Slow, irregular        | Good, crying       |
| Muscle Tone  | Limp   | Some flexion           | Active motion      |
| Reflexes     | None   | Grimace                | Cough, sneeze, cry |
| Color        | Blue   | Pink, blue extremities | Pink               |

## Physiologic Changes of Pregnancy

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| Parameter             | Non-pregnant  | Change    | Pregnant       |
|-----------------------|---------------|-----------|----------------|
| <b>Cardiovascular</b> |               |           |                |
| Heart Rate            | 70-80 BPM     | Increases | 80-95 BPM      |
| Cardiac Output        | 4.5 L/min     | Increases | 6 L/min        |
| Blood Pressure        | 110/70        | Decreases | 100/55         |
| <b>Hematological</b>  |               |           |                |
| Blood volume          | 4000 ml       | Increases | 5500 – 6000 ml |
| Plasma volume         | 2400 ml       | Increases | 3700 ml        |
| Hemoglobin            | 12-14 gram/dL | Decreases | 10-12 gram/dL  |
| <b>Respiratory</b>    |               |           |                |
| Tidal volume          | 500 - 700 ml  | Increases | 700 - 900 ml   |
| Respiratory rate      | 12 – 16 BPM   | Increases | 18-24 BPM      |
| Residual volume       | 1200 ml       | Increases | 1800 ml        |
| pO <sub>2</sub>       | 95 – 100 mmHg | Increases | 100 – 108 mmHg |
| pCO <sub>2</sub>      | 40 mmHg       | Decreases | 30 mmHg        |



1. When transporting to **Atrium Health's** Carolinas Medical Center; the patient may be transported directly to Labor and Delivery (bypassing Triage and the ED) for patient  $\geq 20$  weeks in gestation (manifested by dates, ultrasound, or the uterus palpated above the navel) and any the following are present:
  - A. Indications
    - Abdomen, pelvic, or back pain
    - Signs and symptoms of labor or imminent delivery without crowning
    - Vaginal bleeding
    - Water has broken
  - B. Contraindications for transporting directly to L&D
    - Active seizures
    - Crowning or imminent delivery
    - Respiratory or cardiac arrest
    - Shock
    - Trauma
  - C. Contact CMC Labor and Delivery to provide report
    - Contact CMED at **704-598-2436** and request patch to CMC Labor and Delivery
    - If this fails, Radio - Provide report to ED and request information be communicated to Labor and Delivery
    - If this fails, Cellular - Dial direct at **704-355-2053**
  - D. The following minimum information should be communicated along with routine clinical findings:
    - Name
    - Date of birth
    - Name of Obstetric Clinic or Obstetrician
    - Last menstrual period
    - Delivery date
  - E. On arrival, proceed directly to the 8th floor
    - Labor and Delivery staff will be present on arrival to direct appropriate patient destination
  - F. Contact Medical Control for any of the following:
    - Unsure whether the patient meets appropriate criteria
    - Unable to contact Labor and Delivery
    - Clinical condition changes and destination directly to Labor and Delivery is contraindicated

## Psychiatric / Behavioral

(NCCEP Protocol UP-6)

### Differential Diagnosis

- |                               |                                      |
|-------------------------------|--------------------------------------|
| * Adverse medication reaction | * Hypoxia                            |
| * Anxiety disorder            | * Infection                          |
| * Bipolar disorder            | * Medication effect                  |
| * Depression disorder         | * Medication overdose                |
| * Drug / Alcohol intoxication | * Post-ictal seizure                 |
| * Drug withdrawal             | * Psychosis disorder (schizophrenia) |
| * Hemodynamic instability     | * Trauma                             |
| * Hypoglycemia                |                                      |

### Clinical Presentation

- |  |                      |
|--|----------------------|
| * Agitation                            | * Delusions          |
| * Anxiety                              | * Hallucinations     |
| * Bizarre behavior or thought patterns | * Homicidal thoughts |
| * Combative or violent                 | * Suicidal thoughts  |
| * Confusion                            |                      |

### Basic Medical Care

1. Ensure scene safety
2. **Medical Initial Assessment Protocol or Pediatric Initial Assessment Protocol**
3. Remove patient from stressful environment & attempt to calm by reassurance
4. Treat suspected trauma or medical illness per appropriate protocol
5. Assess vital signs
6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. For hanging or suspected trauma to head or spine
  - A. Protect and maintain control of the cervical spine with manual stabilization until cervical collar is placed and patient secured to transport stretcher
9. Assess blood glucose level
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
10. If restraints are required to control aggressive behavior, only use authorized restraints
  - A. Modification of these devices or attempting to restrain patients using devices or techniques that have been **used during prior experiences (so called "homemade")** is strictly prohibited
  - B. Tape will not be used unless required to secure an authorized restraint
  - C. Patients will NEVER be restrained prone (face down) on the stretcher
11. Personal protective masks may be applied to patients threatening to spit

**Advanced Medical Care**

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG as indicated per patient's presentation
3. IVF resuscitation as indicated
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - iii. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - iv. Hemodynamically stable: TKO
3. For hypoglycemia, treat as per [\*\*Diabetic Problems Hypoglycemia Protocol\*\*](#)
4. For significant agitation associated with substance abuse/withdrawal or excited delirium
  - A. Midazolam (Versed®)
    - i. Adults: 5 mg IM or 5 – 10 mg IN
    - ii. Pediatrics: 0.15 mg/kg IM (max. 5 mg) or 0.2 mg/kg IN (max. 10 mg)
    - iii. Repeat x1 as indicated per patient response
    - iv. Contact Medical Control for further sedation following 2<sup>nd</sup> dose
5. For dystonic reaction following use of antipsychotic medication
  - A. Diphenhydramine (Benadryl®)
    - i. Adults: 25 – 50 mg IV, IM
    - ii. Pediatrics > 9 months: 1 mg/kg IV, IM (maximum 25 mg)
6. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD King LT Protocol\*\*](#)
7. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
8. Additional care as indicated by patient presentation

## Additional Considerations

- \* Excited delirium is a syndrome with paranoia, disorientation, hyper-aggression, hallucinations, tachycardia, hyperthermia, and possibly increased strength
  - Most commonly seen in males with history of mental illness and/or drug use
    - Especially with cocaine, crack, methamphetamine, or amphetamine use
  - Requires aggressive sedation with benzodiazepines and IVF
- \* Sedation for patients noted to be extremely agitated should be emergently considered because rapid decompensation is possible
- \* Dystonic reactions are characterized as an altered mental status displaying features of anxiety, facial grimacing, and torticollis (rigidity) of the neck
- \* Patient must have the mental capacity to refuse medical care
  - Contact Medical Control for **any concerns as to the patient's level of capacity to** comprehend risks of refusing care and benefits accepting care
- \* Consider medical or trauma causes for altered mental status prior to defining psychiatric condition
- \* Combative patients resulting from acute psychosis or intoxication who are restrained in the prone position are at increased risk for lactic acidosis, positional asphyxiation, and subsequent cardiac arrest
  - If physical restraints are necessary, such patients will always be placed and transported in the lateral or supine position
  - Only authorized soft restraints issued by Medic are to be used to restrain patients
  - Extreme precautions must be used, and close monitoring performed when restraining a patient who has been subjected to a riot control agent
  - Restrained patients will never be left unattended
- \* Always be aware of the possibility of domestic violence and/or abuse
- \* Patients at the Behavioral Health Center (CMC-Randolph) may require additional medical screening or treatment for possible organic conditions
  - When MEDIC is requested to conduct these transports:
    - Prior to transfer, BHC staff will discuss medical clearance plans with the patient, collectively deciding on hospital destination
    - Upon Medic arrival, the physician or nurse will discuss the destination facility with the crew with the patient in attendance so that all agree
    - Ensure appropriate portions of the medical record accompany the patient to the destination hospital
    - If, while enroute, the patient changes their mind and requests an alternative destination; that request will **NOT** be honored – transport will continue to the previously noted destination
  - MEDIC personnel will not alter the destination decision
- \* If patient becomes aggressive or combative, contact local law enforcement for assistance

## Community Policing Crisis Response Team

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### Purpose

- \* Provide an alternate destination for patients with isolated psychiatric complaints who meet certain criteria
- \* Permit EMS providers to safely leave a patient meeting criteria in the care of CMPD or the jurisdictional police department while awaiting CPCRT or CMCT evaluation, with the understanding that at any time, EMS may be called to return to the scene

### Introduction

- \* The Community Policing Crisis Response Team (CPCRT) is an initiative by the Charlotte Mecklenburg Police Department (CMPD) to provide an alternative to EMS transport to the emergency department for patients requiring mental health evaluation or treatment
- \* CPCRT is typically available 0700 – 0200 within the jurisdiction of the CMPD
- \* CPCRT is composed of licensed mental health workers that can arrange either outpatient treatment and resources or inpatient evaluation at a mental health facility, including involuntary commitment
- \* For those patients deemed by CPCRT to require inpatient treatment, CPCRT also arranges transport to inpatient psychiatric facilities without utilizing EMS
- \* CPCRT may be requested to respond to the scene by either CMPD or EMS providers on the scene of a mentally ill patient once police are also on scene
  - CPCRT may be requested either by speaking directly with the on-scene police officer or by contacting CMPD dispatch through CMED or the shift supervisor
- \* In jurisdictions outside of CMPD, the Community Mobile Crisis Team (CMCT), which serves an identical role to the CPCRT outside of CMPD jurisdictions, may be requested to the scene by the jurisdictional police department
  - Police should be on scene before contact CPCRT and CMCT

### Medical Care

1. Ensure scene safety
  - If determined it is unsafe to leave the patient in the care of police or CPCRT/CMCT without medical personnel, transport per appropriate protocol
2. **Medical Initial Assessment Protocol or Pediatric Initial Assessment Protocol**
3. Assess vital signs
4. Assess blood glucose level

5. The following criteria must be met for the patient to be left in the care of CMPD/jurisdictional police while awaiting CPCRT/CMCT:
  - GCS = 15
  - Temperature < 101.0° F
  - HR = 60 – 120
  - SBP = 100 – 180
  - RR = 12 – 24
  - SpO2 = 94 – 100%
  - No non-psychiatric complaints (e.g. chest pain, abdominal pain, etc.)
  - No external signs of trauma and no history of trauma reported by the patient, police or bystanders
    - Includes, but not limited to: evidence of recent self-injury or strangulation
  - No evidence of ingestion, intoxication, or exposure and no history of ingestion, intoxication or exposure reported
    - Includes, but not limited to: ingestion of medication beyond what is instructed/prescribed
    - Includes, but not limited to: exposures to carbon monoxide or other toxic substances
    - Includes no medication administration by EMS
  - No acute agitation and no requirement for physical or chemical restraints
  - CPCRT or CMCT have been contacted and are available at the time
  - Police on scene and willing to assume responsibility for patient while awaiting CPCRT or CMCT
- AND**
- Police ensure that the patient will not be left unattended unless deemed safe following CPCRT or CMCT evaluation
6. **Unit may clear the call and become available under the premises of “cancellation”**
  - With appropriate PCR documentation
7. If system status permits, EMS unit may remain on scene with the patient until evaluation has been completed by CPCRT or CMCT
  - Unit may then clear the call and become available under the premises of “cancellation”
    - With appropriate PCR documentation

### **Additional Considerations**

- \* CPCRT or CMCT may already be contacted by CMPD or jurisdictional police prior to EMS arrival
  - Do not cancel CPCRT/CMCT unless the patient requires immediate transport to the hospital or does not meet all of the above criteria (#5)
- \* CPCRT or CMCT may arrange transport to a psychiatric facility through CMPD or jurisdictional police or another resource
- \* CPCRT or CMCT may deem the patient safe to stay on scene and not requiring additional evaluation/treatment and appropriate for outpatient resources and treatment

## Sick Person

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### Differential Diagnosis

- |                                    |                           |
|------------------------------------|---------------------------|
| * Behavioral disorder              | * Infection               |
| * Blood pressure abnormality       | * Inflammatory illness    |
| * Brief Resolved Unexplained Event | * Medication reaction     |
| * Cancer                           | * Pancreatitis            |
| * Cerebrovascular accident         | * Pneumonia               |
| * Cholecystitis                    | * Renal Failure           |
| * Diabetic condition               | * Sepsis                  |
| * Electrolyte abnormality          | * Sickle Cell Pain Crisis |
| * Gastroenteritis                  | * Substance abuse         |
| * Hepatitis                        | * Ulcer disease           |
| * HIV or AIDS                      | * Viral syndrome          |
| * Hypertension                     |                           |

### Basic Medical Care

1. [\*\*Medical Initial Assessment Protocol\*\*](#) or [\*\*Pediatric Initial Assessment Protocol\*\*](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Assess blood glucose level
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex

### Advanced Medical Care

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG for **patient's presentation** consistent with cardiac ischemia
3. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - iii. Hemodynamically unstable: 10 - 20 ml/kg bolus and reassess
    - iv. Hemodynamically stable: TKO
4. For persistent hypotension following adequate IVF resuscitation
  - A. Dopamine @ 10 – 20 mcg/kg/min
5. Additional care per provider determined presumptive diagnosis

## Sickle Cell Anemia Related Crisis

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### Advanced Medical Care

1. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
2. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
3. Alternate analgesic: nitrous oxide via patient-controlled inhalation

### Additional Considerations

- \* Sickle cell disease related events
  - Acute chest syndrome
    - Young patients
    - Chest pain, fever, cough, tachypnea, hypoxemia
  - Acute pain crisis
    - Most common clinical manifestation with SCD
  - Aplastic anemia
  - Avascular necrosis
    - Femoral, humeral heads
  - Cholelithiasis
  - Chronic pain
  - Hemolytic anemia
  - Infection
  - Priapism
  - Pulmonary hypertension
  - Stroke



## Vomiting or Diarrhea

**(NCCEP Protocol UP-3)**

### Differential Diagnosis

#### \* Vomiting

- Appendicitis
- Bowel obstruction
- Cholecystitis
- Closed head injury
- DKA
- Food-borne toxin
- Gastroparesis
- Glaucoma
- Increased intracranial pressure
- Inflammatory bowel disease
- Intoxication
- Irritable bowel syndrome
- Medications
- Migraine
- Myocardial infarction
- Pain
- Pancreatitis
- Pregnancy
- Renal calculi
- Urinary tract infection
- Vestibular disorder
- Viral gastroenteritis

#### \* Diarrhea

- Bacterial enteritis
- Gastric bypass
- Inflammatory bowel disease
- Laxative abuse
- Malabsorption
- Medications
- Mesenteric ischemia
- Viral gastroenteritis

### Advanced Medical Care

1. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
2. Ondansetron (Zofran®)
  - A. Adults: 4 – 8 mg IV, IM, PO
  - B. Pediatrics: 0.15 mg/kg IV, IM, PO (maximum 4 mg)
3. Assess blood glucose level and treat as per [Diabetic Protocol](#) as indicated
4. Treat any associated abdominal pain per appropriate protocol

**Sepsis / Suspected Bacterial Infection****(NCCEP UP-15)****Signs and Symptoms**

- \* Generalized weakness
- \* Fatigue / tired
- \* Productive cough
- \* Abdominal pain
- \* Localized redness/swelling
- \* Hyperthermia (temp > 100° or "hot to touch")
- \* Hypothermia (temp < 96° or "cold to touch")

**Potential infection**

- \* Bacteremia
- \* Cellulitis/Abscess
- \* Indwelling device (central line, PICC, Foley catheter)
- \* Intra-abdominal infection
- \* Meningitis
- \* Pneumonia
- \* Urinary tract infection (UTI)
- \* Wound infection

**Advanced Medical Care**

1. Assess vital signs including temperature
  - A. Calculate shock index (HR/SBP)
2. High risk
  - A. Shock index  $\geq 1$
  - B. Hypotension (SBP < 100; MAP < 65 mmHg)
  - C. HR > 120
  - D. GCS  $\leq 14$
  - E. For high risk of serious bacterial infection, provide IVF resuscitation
    - i. Adults: IVF wide open; goal = 40 ml/kg
    - ii. Pediatrics: 10 – 20 ml/kg bolus and reassess
3. Medium risk
  - A. Shock index 0.99 – 0.8
  - B. For medium risk of serious bacterial infection, provide IVF resuscitation:
    - i. 10 – 20 ml/kg and reassess
4. Low risk
  - A. No identified objective criteria
5. For persistent hypotension following adequate IVF resuscitation
  - A. Dopamine @ 10 – 20 mcg/kg/min

**Additional Considerations**

- \* Sepsis indicators
  - Altered mental status
  - Hypotension (SBP < 100 or MAP < 65 mmHg)
  - Hypoxia (SpO<sub>2</sub> < 90%)
  - Tachycardia (HR > 100)
  - Tachypnea (RR > 20)
  - Temperature (> 101.0°F or < 96.8°F)
- \* Droplet precautions:
  - Standard PPE plus
  - Standard surgical mask for providers who accompany patients in the back of the ambulance
  - Surgical mask or NRB O2 mask for the patient
  - Should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected
- \* Airborne precautions:
  - Include standard PPE plus
  - Gown
  - Change of gloves after every patient contact, and strict hand washing precautions
  - Should be utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected
- \* All-hazards precautions:
  - Standard PPE plus
  - Airborne precautions plus
  - Contact precautions
  - Should be 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, Ebola)

**Dialysis / Renal Failure****(NCCEP Protocol AM-3)****Advanced Medical Care**

1. Assess fluid status: IVF bolus for suspected hypovolemia post hemodialysis
  - A. Adults: 250 – 500 ml IV and reassess
  - B. Pediatrics: 10 ml/kg IV and reassess
  - C. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
2. Monitor vital signs frequently with continuous ECG monitoring
3. Consider 12 lead ECG
4. For presumed hyperkalemia
  - A. Adults
    - i. Calcium gluconate 2 grams (20ml of 10% solution) IV, IO
    - ii. Sodium bicarbonate 50 mEq (50 ml) IV, IO
    - iii. Albuterol 5 mg via nebulizer
  - B. Pediatrics
    - i. Calcium gluconate 20 mg/kg IV, IO (0.2 ml/kg of 10% solution); maximum 2 grams (20 ml)
    - ii. Sodium bicarbonate 1 mEq/kg (1 ml/kg) maximum 50 mEq (50 ml) IV, IO
    - iii. Albuterol 2.5 mg via nebulizer
5. Control any access site hemorrhage with direct pressure
  - A. Persistent bleeding: consider MEDIC tourniquet place proximal to the shunt NOT on the bleeding source per **Wound Care – Tourniquet Protocol**
6. For persistent hypotension
  - A. Dopamine @ 10 – 20 mcg/kg/min

**Additional Considerations**

- \* Avoid initiating IV access or taking blood pressure measurements in extremity with a shunt or fistula in place
- \* Consider post-dialysis complications
  - Hypotension
  - Disequilibrium
  - Electrolyte shifts causing weakness, dizziness, nausea/vomiting, seizures
  - Bleeding

## Hypertension

## (NCCEP Protocol AM-4)

### Advanced Medical Care

1. Assess for evidence of hypertensive crisis
  - A. Signs
    - Systolic BP > 185 mm Hg
    - Diastolic BP > 110 mm Hg
    - Measured on two occasions > 5 minutes apart
  - B. Symptoms
    - Altered mental status
    - Cerebrovascular accident
    - Chest pain
    - Congestive heart failure
    - Renal failure
    - Seizure
2. Labetalol 20 mg IV for hypertensive crisis only if:
  - A. Altered mental status
  - B. Pre-eclampsia/eclampsia
  - C. CVA: per Medical Control order
3. Nitroglycerin for hypertensive crisis only if:
  - A. Chest pain
  - B. CHF
4. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
5. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
6. Additional care as indicated by patient presentation

### Additional Considerations

- \* Asymptomatic elevated blood pressure does NOT require emergent treatment to lower the blood pressure
- \* Elevated blood pressure that is the result of respiratory distress (COPD, asthma) requires aggressive treatment of the respiratory distress NOT the blood pressure

## Hypotension

(NCCEP Protocol AM-5/PM-3)

### Advanced Medical Care

1. Identify the cause of shock – management depends on the underlying cause of shock
  - A. Cardiogenic:
    - i. For volume depleted: IVF bolus
      - Adults 250 – 500 ml and reassess
      - Pediatrics 20 ml/kg and reassess
    - ii. For persistent hypotension
      - Dopamine @ 10 – 20 mcg/kg/min
  - B. Hypovolemic:
    - i. IVF resuscitation
      - Adults: wide open
      - Pediatrics 20 ml/kg – may repeat x2 boluses per patient condition
    - ii. Treat any potential trauma (hemorrhagic shock) per appropriate protocol
  - C. Distributive (vasogenic):
    - i. IVF resuscitation
      - Adults: wide open
      - Pediatrics 20 ml/kg – may repeat x2 boluses per patient condition
    - ii. For persistent hypotension
      - Dopamine @ 10 – 20 mcg/kg/min
- \* Additional care as per appropriate presumptive diagnosis protocol

**Additional Considerations**

- \* Shock – Syndrome where there is widespread inadequate tissue perfusion
  - Hypovolemic Shock
    - Medical or surgical condition in which rapid fluid loss results in multiple organ failure due to inadequate circulating volume and subsequent inadequate perfusion
    - Cutaneous fluid loss (burns, excessive sweating)
    - Gastrointestinal fluid loss (vomiting, diarrhea)
    - Hemorrhage
    - Renal fluid loss (diabetes, diuretics)
  - Cardiogenic Shock
    - Decreased cardiac output and evidence of tissue hypoxia in the presence of adequate intravascular volume
    - Beta-blocker overdose
    - Calcium channel blocker overdose
    - Cardiomyopathy
    - Dysrhythmia
    - Infarction
    - Myocardial dysfunction
    - Myocardial toxicity
    - Tricyclic antidepressant overdose
    - Valvular incompetence
  - Vasogenic Shock
    - Excessive vasodilation and the impaired distribution of blood flow
    - Anaphylaxis
    - Drug toxicity
    - Sepsis
  - Neurogenic Shock
    - Specific form of vasogenic shock related to loss of sympathetic tone
    - Spinal cord injury
  - Other Shock States
    - Adrenal crisis
    - Aortic dissection
    - Cardiac tamponade
    - Pulmonary embolus
    - Tension pneumothorax
    - Vena cava obstruction

- \* Shock in the Trauma Patient
  - Aortic transection
  - Cardiac tamponade
  - Hemorrhage
  - Myocardial contusion
  - Spinal cord injury
  - Tension pneumothorax
- \* Undifferentiated Shock in the Medical Patient
  - Myocardial dysfunction (ECG changes, dysrhythmia, JVD, murmur)
  - Unexplained shock (sepsis, drug ingestion, adrenal crisis)
  - Volume depletion (dry mucous membranes, poor skin turgor)
- \* Adrenal crisis
  - Requires IVF resuscitation
  - If patient has specific medication available for adrenal crisis
    - Hydrocortisone (Solu-Cortef®) this may be given per the prescribing **physician's** documented instructions
  - If no specific medication available – contact medical control for
    - Methylprednisolone (Solu-Medrol®)
      - Adults: 125 mg IV, IO
      - Pediatrics: 2 mg/kg IV, IO (maximum 125 mg)



## Fever

**(NCCEP Protocol UP-10)**

### Differential Diagnosis

- \* Drug intoxication
  - Cocaine, methamphetamine
- \* Hyperthermia (environment)
- \* Hyperthyroidism
- \* Infection
- \* Lymphoma, cancer
- \* Medication reaction

### Basic Medical Care

1. Consider IVF administration as indicated per patient condition
2. Antipyretic
  - A. Ibuprofen (Motrin®) – ensure patient should not be NPO
    - i. Adults: 400 – 800 mg PO
    - ii. Pediatrics (> 6 months): 10 mg/kg PO (maximum 400 mg)
  - B. Acetaminophen (Tylenol®)
    - i. Adults: 325 – 1000 mg PO
    - ii. Pediatrics: 15 mg/kg PO (maximum 1000 mg)
3. Ibuprofen and acetaminophen are NOT indicated in instances of elevated temperature as the result of heat related emergencies

### Additional Considerations

- \* Droplet precautions:
  - Standard PPE + surgical mask for providers who accompany patients in the back of the ambulance and surgical mask or NRB O2 mask for the patient
  - Should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected
- \* Airborne precautions:
  - Include standard PPE + gown and change of gloves after every patient contact, and strict hand washing precautions
  - Should be utilized when multi-drug resistant organisms (e.g. MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected
- \* All-hazards precautions:
  - Standard PPE + airborne precautions + contact precautions
  - Should be 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, Ebola)

## **Emergencies Involving Indwelling Central Lines (NCCEP Protocol UP-8)**

### **Catheter Types**

- \* Broviac
- \* Hickman
- \* Permacath
- \* PICC – peripherally inserted central catheter

### **Basic Medical Care**

1. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
2. Assess vital signs
3. Ensure catheter secured

### **Advanced Medical Care**

1. Clean catheter port in standard aseptic fashion
2. Attempt flush with sterile saline
3. Assess for infiltration
  - A. If present, stop infusion of any fluids, medications
4. Assess for hemorrhage at catheter insertion site
  - A. If present, apply direct pressure
5. Assess for evidence of air embolus
  - A. If present, position patient on left side with head down
  - B. Stop infusion
  - C. Clamp off catheter
6. If no difficulties: IVF or medication per appropriate protocol
7. Additional care as per appropriate medical condition protocol

### **Additional Considerations**

- \* Do not place a BP cuff or tourniquet on the same side as a peripherally inserted central line (PICC)
- \* Catheter may be accessed in times of cardiac arrest for ACLS medication administration
  - PICC line
  - Vas Cath hemodialysis catheter
- \* Implanted devices (fully beneath the skin), such as a port-a-cath, Hickman catheter are **NOT** to be accessed by MEDIC personnel
  - These devices require specialized equipment and training for accessing

**Additional Considerations**

- \* Parents describing a brief resolved unexplained event (BRUE – formerly ALTE) or similar episode occurring with an infant should always be transported
  - BRUE is described as a combination of apnea, color change (cyanosis, erythema, or pallor), change in muscle tone (limp), or choking or gagging
    - Infants may appear normal after the episode
    - These infants are at risk for sudden infant death syndrome
- \* Patients with respiratory distress and elevated blood pressure
  - Assess patient to determine if the elevated blood pressure is the cause of the respiratory distress (e.g. CHF)
    - If true, treat blood pressure as part of managing the respiratory distress
  - Assess patient to determine if the elevated blood pressure is a result of the respiratory distress (e.g. COPD or asthma exacerbation)
    - If true, aggressively treat the respiratory distress per protocol
    - The blood pressure does NOT require any direct treatment

## Suspected Highly Infectious Disease

(NCCEP Protocol SC-1)

### Introduction

- \* Transmission occurs via contact with blood/body fluids of infected individuals including:
  - Blood
  - Breast milk
  - Secretions (saliva/sweat)
  - Semen
  - Urine
  - Vomitus/diarrhea
- \* Incubation period is 2 – 21 days (not transmitted prior to onset of symptoms)
- \* Symptoms:
  - Abdominal pain
  - Anorexia
  - Bleeding
  - Diarrhea
  - Fever (>100.4°F)
  - Headache
  - Joint and muscle aches
  - Vomiting
  - Weakness
- \* Patients with any of the above signs/symptoms should specifically be asked if he/she has traveled to Africa in the past 21-days
  - If positive travel to Africa, specifically ask country(ies) of travel
- \* Consider that at-risk countries of travel may change with time
- \* Other Potential highly infectious diseases
  - Ebola – west Africa
  - Lassa – west Africa
  - Marburg – south central Africa
  - MERS (Middle East Respiratory Syndrome) – Arabian Peninsula
  - SARS (Severe Acute Respiratory Syndrome)
  - Nipah Virus – southeast Asia
  - Smallpox
- \* Differential diagnosis
  - Bacteremia/septicemia
  - Malaria
  - Meningococcemia
  - Typhoid fever

**Basic / Advanced Medical Care**

1. EMS personnel should don personal protective equipment (PPE) with any patient with a positive screen (symptoms and travel to Africa in past 21 days) as soon as identified utilizing standard donning procedures for droplet/contact precautions (prior to patient contact if positive screen per CMED):
  - A. Eye protection (goggles / face shield)
  - B. Fluid impervious gown or (Tyvek) full coveralls
  - C. Gloves
  - D. N-95 mask
  - E. Shoe/boot and head covers (if not included with coveralls)
2. Only essential personnel should have any contact with the patient
3. First responder personnel should **not** have patient contact unless critical intervention / assistance required
4. Surgical mask should be placed on any patient with a positive screen for potential highly infectious disease (symptoms + travel)
  - A. Impermeable sheet should be utilized around patient as barrier between patient and EMS equipment/personnel
5. Care as per appropriate protocol (note advisements in #6 below)
6. Do NOT perform the following procedures
  - A. Aerosolizing procedure (nebulizer treatments, suctioning, CPAP)
  - B. Blood draw
  - C. Endotracheal intubation, BIAD, BVM
  - D. IM medication administration
  - E. IV/IO access
7. If supplemental oxygen is required a non-rebreather mask should be utilized
8. Limit utilized equipment to only essential equipment required for needed patient care
9. If positive screen identified, destination will be limited to **CMC or NHPMC** (based on patient hospital system of preference; if no preference, transport to closest (**CMC or NHPMC**) per mobile mapping data
  - A. Contact medical control as soon as a patient with a positive screen is identified
  - B. Provide report to attending physician
  - C. Determine specific portal of entry per facility recommendations
  - D. Upon arrival to destination facility do NOT enter the facility
  - E. Crew will be met by hospital staff in the ambulance bay and patient will be transferred from EMS stretcher to hospital bed in the ambulance bay
10. With negative screen provide care as per appropriate protocol and transport per patient destination general triage protocol

**Additional Considerations**

- \* CMED will screen at call-taking (CMED will advise "Positive EIDS patient" if positive screen)
  - It is imperative that field providers also ask screening questions on scene
- \* Transport of patient with suspected highly infectious disease must be reported to Operations Supervisor
  - Highly infectious disease must be reported to local, state, and federal public health authorities
  - Ensure Public health notified of any patient who refuses transport or is pronounced dead on scene (if positive screen for a highly infectious disease)
- \* If personnel sustain any exposure to patient blood, body fluids, secretions, or excretions immediately wash affected area with soap and water
  - Discontinue any patient care activities to wash / irrigate the affected site
  - Any mucous membrane exposure should receive copious irrigation
- \* Extreme care should be utilized in doffing PPE post transport per standard procedure to ensure no contamination from exposure to used PPE
  - Do not touch outer surface of PPE
  - Do not remove N-95 mask or eye protection prior to gown/coverall removal
- \* Appropriate PPE is required during cleaning / disinfecting of any EMS equipment
  - Utilize appropriate approved disinfectant cleansing solution
  - Equipment includes ambulance interior and surfaces exposed to patient contact
- \* Following patient care activity utilize standard hand hygiene utilizing soap and water for 30 seconds or alcohol-based hand wash
- \* If any personnel exposure occurs notify employee health as soon as feasible following decontamination / cleansing / irrigation of exposure

## High Consequence Pathogens

(NCCEP Protocol SC-2)

### Introduction

- \* Patients should specifically be asked if he/she has traveled internationally in the past 14-days
  - Current high suspicion countries: China, Japan, South Korea, Italy, Iran
  - Or ask if close contact with person(s) who have traveled to at risk locations or is being evaluated for potential emerging infectious disease
- \* Differential diagnosis
  - COVID-19 (Coronavirus)
  - Influenza
  - MERS (Middle East Respiratory Syndrome) – Arabian Peninsula
  - SARS (Severe Acute Respiratory Syndrome) – Asia
  - Bacteremia/septicemia
- \* Transmission occurs via contact with respiratory droplets of infected individuals:
  - Between people who are in close contact with one another
    - ~ 3 – 6 feet for  $\geq 10$  minutes
  - COVID-19
    - It may be possible that a person can get COVID-19 by touching contaminated surface or object that has the virus on it and then touching their own mouth, nose, or eyes
      - This is not believed to be the main way the virus spreads
- \* Symptoms:
  - Fever ( $>100.4^{\circ}\text{F}$ )
  - Cough/upper respiratory illness symptoms
  - Difficulty breathing or shortness of breath
- \* Consider that at-risk countries of travel may change with time \*\*\*\*
- \* Influenza Other Potential highly infectious diseases (see HID protocol)
  - Ebola – west Africa
  - Lassa – west Africa
  - Marburg – south central Africa
  - Nipah Virus – southeast Asia
  - Smallpox

**Basic / Advanced Medical Care**

1. Screening on scene should take place for ALL patients (medical and trauma)
2. EMS personnel should don personal protective equipment (PPE) with any patient with a positive field screen (symptoms and international travel in past 14 days) as soon as identified utilizing standard donning procedures for airborne/droplet precautions
  - A. Eye protection (goggles / face shield)
  - B. Fluid impervious gown
  - C. Gloves
  - D. N-95 mask (surgical mask may be utilized if N-95 mask is not available)
3. For CMED EIDS screen positive – one provider should don a surgical mask with face shield
  - A. Hand the patient a surgical mask to don
  - B. Perform a Field Screen within 5 minutes to verify EIDS status
  - C. For field screen positive ALL care providers who will be within 6 feet of patient don full PPE
  - D. For field screen negative follow standard PPE guidelines
4. Only essential personnel should have any contact with the patient
5. First responder personnel should **NOT** have patient contact unless critical intervention / assistance required
6. Surgical mask should be placed on any patient with a positive screen for a high consequence pathogen = symptoms + travel (until travel has been removed as a risk)
7. Contact operations supervisor as soon as a patient with a positive screen is identified
8. Care as per appropriate protocol (note advisements in #7 below)
9. Avoid the aerosolizing procedures if not distinctly indicated
  - A. Nebulizer treatments, suctioning, high flow nasal cannula, CPAP, SGD, BVM
  - B. **If any aerosolizing procedure is required, PPE as above with an N-95 mask must be utilized**
  - C. Avoid attempts at endotracheal intubation
10. If supplemental oxygen is required a non-rebreather mask should be utilized
11. Limit utilized equipment to only essential equipment required for needed patient care
12. With negative screen provide care as per appropriate protocol and transport per patient destination general triage protocol
13. During encode notify **receiving emergency department of "EIDS positive patient"**

**Additional Considerations**

- \* Driver of transporting ambulance should wear PPE as described above when participating in patient care activities (including patient transport & loading)
  - Remove PPE except for N-95 (or surgical mask) and perform hand hygiene prior **to entering vehicle cab to prevent contamination of driver's compartment**
- \* CMED will screen at call-taking (CMED will advise "Positive EIDS patient" if positive screen)
  - It is imperative that field providers also ask screening questions on scene
  - Transport of patient with suspected high consequence pathogen must be reported to Operations Supervisor (must be reported to local public health authorities)
  - Ensure Supervisor and Public health notified of any patient who refuses transport or is pronounced dead on scene (if positive screen for a high consequence pathogen)



- \* Extreme care should be utilized in doffing PPE post transport per standard procedure to ensure no contamination from exposure to used PPE
  - Do not touch outer surface of PPE
  - Do not remove N-95 mask or eye protection prior to gown/coverall removal
- \* No family members or bystanders should be transported in the ambulance
- \* Appropriate PPE is required during cleaning / disinfecting of any EMS equipment
  - Utilize appropriate approved disinfectant cleansing solution
  - Equipment includes ambulance interior and surfaces exposed to patient contact
- \* Following patient care activity utilize standard hand hygiene utilizing soap and water for 30 seconds or alcohol-based hand sanitizer
- \* If any personnel exposure occurs Supervisor will perform a risk assessment and notify employee health as soon as indicated following decontamination / cleansing / irrigation of exposure
- \* Recommended to wear surgical mask and consider eye protection for any patient with fever; even outside this protocol
- \* Negative Pressure in care compartment:
  - For door or window **available to separate driver's** and care compartment space:
    - Close door/window between driver's and care compartment
    - Operate rear exhaust fan on full
  - For no door or window **available to separate driver's** and care compartment space:
    - **Open outside air vent in driver's** compartment and set rear fan to full
- \* Set vehicle ventilation system to non-recirculating Airborne precautions
  - Standard PPE with fit-tested N95 mask (or PAPR respirator) and utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions
  - Utilized with Aspergillus, Tuberculosis, Measles (rubeola) Chickenpox (varicella-zoster), Smallpox, Influenza, Rhinovirus, Norovirus, and Rotavirus, or zoster (shingles)
- \* Contact precautions
  - Standard PPE with utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions
  - Utilized with GI complaints, blood or body fluids, C diff, scabies, wound and skin infections, MRSA
  - Clostridium difficile (C diff) is not inactivated by alcohol-based cleaners and washing with soap and water is indicated
- \* Droplet precautions
  - Standard PPE plus a standard surgical mask for providers who accompany patients in the treatment compartment and a surgical mask or NRB O2 mask for the patient
  - Utilized when Influenza, Meningitis, Mumps, Streptococcal pharyngitis, Pertussis, Adenovirus, Rhinovirus, SARS, and undiagnosed rashes
- \* All-hazards precautions
  - Standard PPE plus airborne precautions plus contact precautions
  - Utilized during the initial phases of an outbreak when the etiology of the infection is unknown or the causative agent is found to be highly contagious (e.g. COVID19)

## High Consequence Pathogens - COVID-19 Specific

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### Introduction

- \* Patients should specifically be asked if he/she has traveled internationally in the past 14-days
  - Current high suspicion countries: China, Japan, South Korea, Italy, Iran, Europe
  - Current high risk U.S. locations: Washington state, New York
  - Or ask if close contact with person(s) who have traveled to at risk locations or is being evaluated for potential emerging infectious disease
  - As of March 20, 2020 community transmission was noted in North Carolina (patient testing positive with no travel or known at risk exposure); therefore, travel history is much less important in the screen
- \* Differential diagnosis
  - Influenza
  - Bacteremia/septicemia
- \* Transmission occurs via contact with respiratory droplets of infected individuals:
  - Between people who are in close contact with one another
    - ~ 3 – 6 feet for  $\geq 10$  minutes
  - COVID-19
    - It may be possible that a person can get COVID-19 by touching contaminated surface or object that has the virus on it and then touching their own mouth, nose, or eyes
      - This is not believed to be the main way the virus spreads
- \* Symptoms:
  - Fever ( $>100.4^{\circ}\text{F}$ )
  - Cough/upper respiratory illness symptoms
  - Difficulty breathing or shortness of breath
- \* Persons that should be considered high risk
  - Influenza-like illness = temp  $> 100.4$  (or have taken an antipyretic in past 4-6 hours)  
Plus, one of the following:
    - Cough
    - Shortness of breath
    - Known exposure to person with COVID-19 within past 14 days
    - Travel to high risk county or U.S. state
- \* Consider that at-risk sites of travel may change with time \*\*\*\*

**Basic / Advanced Medical Care**

1. Screening on scene should take place for ALL patients (medical and trauma)
2. EMS personnel should don personal protective equipment (PPE) with any patient with a positive field screen (symptoms and international travel in past 14 days) as soon as identified utilizing standard donning procedures for airborne/droplet precautions
  - A. Eye protection (goggles / face shield)
  - B. Fluid impervious gown
  - C. Gloves
  - D. N-95 mask (surgical mask may be utilized if N-95 mask is not available)
3. For CMED EIDS screen positive – one provider should don a surgical mask with face shield
  - A. Hand the patient a surgical mask to don
  - B. Perform a Field Screen within 5 minutes to verify EIDS status
  - C. For field screen positive ALL care providers who will be within 6 feet of patient don full PPE
  - D. For field screen negative follow standard PPE guidelines
4. Only essential personnel should have any contact with the patient
5. First responder personnel should **NOT** have patient contact unless critical intervention / assistance required
6. Surgical mask should be placed on any patient with a positive screen for a high consequence pathogen = symptoms + travel (until travel has been removed as a risk)
7. Contact operations supervisor as soon as a patient with a positive screen is identified
8. **Medical Initial Assessment Protocol or Pediatric Initial Assessment Protocol**
9. Temperature must be assessed on ALL patients
10. Care as per appropriate protocol (note advisements in #7 below)
11. Avoid the aerosolizing procedures if not distinctly indicated
  - D. Nebulizer treatments, suctioning, high flow nasal cannula, CPAP, SGD, BVM, ETT
  - E. **If any aerosolizing procedure is required, PPE as above with an N-95 mask must be utilized**
  - F. Avoid attempts at endotracheal intubation
12. If supplemental oxygen is required a non-rebreather mask should be utilized
13. Limit utilized equipment to only essential equipment required for needed patient care
14. With negative screen provide care as per appropriate protocol and transport per patient destination general triage protocol
15. **During encode notify receiving emergency department of "EIDS positive patient"**
16. If nebulizer is being utilized, this should be halted and held upon arrival to the emergency department until the patient has been placed in their treatment room
17. Use of CPAP must be discussed with the receiving facility prior to arrival and plan for patient transition from ambulance to treatment room clarified prior to arrival
  - A. This may include momentary halting of CPAP during patient movement

**Additional Considerations**

- \* Driver of transporting ambulance should wear PPE as described above when participating in patient care activities (including patient transport & loading)
  - Remove PPE except for N-95 (or surgical mask) and perform hand hygiene prior **to entering vehicle cab to prevent contamination of driver's compartment**
- \* CMED will screen at call-taking (CMED will **advise "Positive EIDS patient" if positive screen**)
  - It is imperative that field providers also ask screening questions on scene
- \* Transport of patient with suspected high consequence pathogen must be reported to Operations Supervisor
  - Must be reported to local public health authorities
  - Ensure Supervisor and Public health notified of any patient who refuses transport or is pronounced dead on scene (if positive screen for a high consequence pathogen)
- \* Extreme care should be utilized in doffing PPE post transport per standard procedure to ensure no contamination from exposure to used PPE
  - Do not touch outer surface of PPE
  - Do not remove N-95 mask or eye protection prior to gown/coverall removal
- \* No family members or bystanders should be transported in the ambulance
- \* Appropriate PPE is required during cleaning / disinfecting of any EMS equipment
  - Utilize appropriate approved disinfectant cleansing solution
  - Equipment includes ambulance interior and surfaces exposed to patient contact
- \* Following patient care activity utilize standard hand hygiene utilizing soap and water for 30 seconds or alcohol-based hand sanitizer
- \* If any personnel exposure occurs Supervisor will perform a risk assessment and notify employee health as soon as indicated following decontamination / cleansing / irrigation of exposure
- \* Recommended to wear surgical mask and consider eye protection for any patient with fever; even outside this protocol
- \* Negative Pressure in care compartment:
  - **For door or window available to separate driver's and care compartment space:**
    - Close door/window between driver's and care compartment
    - Operate rear exhaust fan on full
  - **For no door or window available to separate driver's and care compartment space:**
    - **Open outside air vent in driver's compartment and set rear exhaust fan to full**
    - Set vehicle ventilation system to non-recirculating to bring in maximum outside air

- \* Airborne precautions
  - Standard PPE with fit-tested N95 mask (or PAPR respirator) and utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions
  - Utilized with Aspergillus, Tuberculosis, Measles (rubeola) Chickenpox (varicella-zoster), Smallpox, Influenza, Rhinovirus, Norovirus, and Rotavirus, or zoster (shingles)
- \* Contact precautions
  - Standard PPE with utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions
  - Utilized with GI complaints, blood or body fluids, C diff, scabies, wound and skin infections, MRSA
  - Clostridium difficile (C. diff) is not inactivated by alcohol-based cleaners and washing with soap and water is indicated
- \* Droplet precautions
  - Standard PPE plus a standard surgical mask for providers who accompany patients in the treatment compartment and a surgical mask or NRB O<sub>2</sub> mask for the patient
  - Utilized when Influenza, Meningitis, Mumps, Streptococcal pharyngitis, Pertussis, Adenovirus, Rhinovirus, SARS, and undiagnosed rashes
- \* All-hazards precautions
  - Standard PPE plus airborne precautions plus contact precautions
  - Utilized during the initial phases of an outbreak when the etiology of the infection is unknown or the causative agent is found to be highly contagious (e.g. COVID19)
- \* COVID-19 guide for evaluations of persons under investigation
  - <http://www.cdc.gov/coronavirus/2019-nCoV/clinical-criteria.html>
- \* Follow all operational guidelines for avoiding exposure, reporting exposure, self-monitoring
  - Be aware that guidelines are constantly in a state of updating

## Stab Wound

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### Basic Medical Care

1. Ensure scene safety
2. **Trauma Initial Assessment Protocol or Pediatric Trauma Assessment Protocol**
  - A. If patient found apneic and pulseless without signs of life on arrival, pronounce dead on scene
  - B. For patient noted at any time to have palpable pulses or signs of life, continue resuscitation
  - C. For patient becomes pulseless and apneic and transport time to trauma center is < 15 minutes, continue resuscitation and transport
  - D. For patient becomes pulseless and apneic and transport time to trauma center is > 15 minutes, contact medical control
3. Maintain airway; suction as needed
4. Assess vital signs
5. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
6. Control any active external bleeding with direct pressure
  - A. Apply MEDIC tourniquet for presumed life-threatening extremity hemorrhage not controllable with direct pressure
7. For penetrating injury noted to the chest or back apply chest seal device
8. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization), and the thoracolumbar spine until cervical collar placed and patient secured to the transport stretcher
  - A. Assess neurological status before and after motion restriction
  - B. Patients with isolated penetrating trauma who are neurologically intact do not require cervical collar and spinal immobilization
9. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
10. For penetrating injury noted to the chest or back apply chest seal device
11. For penetrating injury noted to chest or back such that the possibility of a tension pneumothorax exists, and the patient is hemodynamically unstable
  - A. Burp chest seal device if previously placed
12. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries

**Advanced Medical Care**

1. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
2. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
3. Alternative analgesic: nitrous oxide via patient-controlled inhalation
  - A. Contraindicated for suspected pneumothorax
4. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
5. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
6. For penetrating injury noted to the chest or back apply chest seal device
7. For penetrating injury noted to chest or back such that the possibility of a tension pneumothorax exists, and the patient is hemodynamically unstable
  - A. Burp chest seal device if previously placed
  - B. Perform chest needle decompression

**Additional Considerations**

- \* For isolated penetrating wounds: target of fluid resuscitation should be to palpable radial pulse & responsive mental status – not a specific blood pressure measurement
- \* Penetrating wounds without ongoing external bleeding should be treated for possible internal hemorrhage
  - Direct pressure should be applied to the entrance site (stab wound to the groin).
- \* IV lines should always be initiated in route to destination emergency department
- \* The objective for patients sustaining any penetrating injury that results in hemodynamic instability is to arrive at the hospital for definitive care within 30 minutes from the time that the injury occurred
  - Total scene time should not exceed 10 minutes
- \* Patients with isolated penetrating trauma who are neurologically intact do NOT require cervical collar and spinal immobilization
  - Placement onto a long spine board to facilitate patient movement may be beneficial but spinal immobilization with cervical collar is NOT indicated

## Stroke

(NCCEP Protocol UP-14)

### Stroke Types

- \* Thromboembolic (85%)
- \* Hemorrhagic (15%)

### Differential Diagnosis

- |                                 |                                   |
|---------------------------------|-----------------------------------|
| * Drug ingestion                | * Psychiatric                     |
| * Electrolyte abnormality       | * Seizure                         |
| * Environmental exposure        | * Shock                           |
| * Hypoglycemia                  | * Transient ischemic attack (TIA) |
| * Hypoxia                       | * Trauma                          |
| * Post-ictal (Todd's) paralysis | * Tumor                           |

### Basic Medical Care

1. [\*\*Medical Initial Assessment Protocol\*\*](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$ 
  - A. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
5. Assess blood glucose level
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
6. Allow all conscious patients to sit in a position of comfort
7. Perform ***Cincinnati Prehospital Stroke Screen***
  - A. Facial Droop
    - Ask patient to smile and show their teeth
    - Normal: Both sides of face move equally
    - Abnormal: One side of face does not move at all
  - B. Arm Drift:
    - Ask patient to hold both arms straight out for 10 seconds
    - Normal: Both arms move equally or not at all
    - Abnormal: One arm drifts compared to the other
  - C. Speech:
    - Ask patient to repeat phrase: ***"You can't teach an old dog new tricks"***
    - Normal: Patient uses correct words with no slurring
    - Abnormal: Slurred or inappropriate words or mute
8. Identify time of onset of symptoms
  - A. Note if patient awoke from sleep with symptoms
  - B. If unclear time of onset, note time patient last known to be normal



9. Perform the **Field Assessment Stroke Triage for Emergency Destination (FAST-ED)**

- A. **F**acial palsy
  - Normal/minor 0
  - Partial/complete 1
- B. **A**rm weakness
  - No drift 0
  - Drifts or some effort vs. gravity 1
  - No effort vs gravity/no movement 2
- C. **S**peech changes
  - None 0
  - Mild to moderate 1
  - Severe/aphasia/mute 2
- D. **E**ye deviation
  - None 0
  - Partial 1
  - Forced deviation 2
- E. **D**enial/neglect
  - None 0
  - Extinction to bilateral stimulus 1
  - Does not recognize own hand 2
- F. Record total FAST-ED score & report to receiving emergency department

**Advanced Medical Care**

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. For hypoglycemia treat as per [Diabetic Problems Hypoglycemia Protocol](#)
3. For hyperglycemic treat per [Diabetic Problems Hyperglycemia Protocol](#)
4. For hypertension (SBP > 185 and/or DBP > 110)
  - A. Contact Medical Control for potential labetalol administration 10 – 20 mg IV
5. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
6. Ondansetron (Zofran®) for nausea and/or vomiting
  - A. Adults: 4 – 8 mg IV, IM, PO
  - B. Pediatrics: 0.15 mg/kg IV, IM, PO (maximum 4 mg)
7. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
8. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen

**Additional Considerations**

- \* CODE STROKE
  - Onset of symptoms < 24 hours
  - 1 or more of the Cincinnati Prehospital Stroke Screen assessments is abnormal
    - 1 of 3 = 72% probability ischemic stroke
    - 3 of 3 = 85% probability ischemic stroke
- \* FAST-ED screen is utilized to assist in assessing for a large vessel occlusion (LVO) stroke
- \* Ischemic strokes are more common in patients greater than 45 years of age
- \* Hemorrhagic strokes can be seen in any age group
- \* For the patient that cannot provide historical information, it is imperative to obtain as much information as possible from family members or friends prior to scene departure
- \* Acute ischemic strokes typically do not cause seizures, hypotension, or hypoglycemia
  - Seizures are a common presentation for other intracerebral conditions (intracerebral or subarachnoid hemorrhage, tumor, meningitis or other infections, or toxins)
- \* Patients with acute stroke symptoms may be candidates for thrombolytic therapy if they arrive at the hospital within 24 hours of symptom onset
  - Do not inform the patient or family members that the patient will receive thrombolytic therapy, as they may not meet inclusion criteria
- \* Ensure that the FAST-ED score is communicated to the receiving hospital during pre-arrival radio report

## Stroke Transfer tPA Infusion

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### Introduction

- \* tPA infusion will only be initiated by the referring facility
- \* Verify tPA bolus
  - Amount and time administered
- \* Verify tPA total amount to be infused
  - Verify that excess tPA has been withdrawn from the bottle and wasted
  - Time infusion initiated & time infusion to be completed

### Advanced Medical Care

1. Apply cardiac monitor with continuous ECG
2. Assess neurologic exam including GCS and pupil exam
  - A. Repeat neurologic exam every 15 minutes throughout transport
3. Obtain baseline set of vital signs and reassess every 15 minutes throughout transport
  - A. Ensure BP evaluated prior to initiation of transport
    - i. SBP < 185 mmHg
    - ii. DBP < 110 mmHg
  - B. All BP readings should be obtained in limb without tPA infusion
4. Labetalol (Normodyne®) 10 mg IV for SBP  $\geq$  185 or DBP  $\geq$  110 and patient not currently receiving antihypertensive infusion & confirm treatment plan with physician
5. For patient on hypertensive medication infusion initiated by referring facility:
  - A. Nicardipine drip (Cardene®) – increase drip 2.5 mg/hour every 15 minutes until SBP < 180, DBP < 105 mmHg or maximum rate of 15 mg/hour
  - B. Labetalol (Normodyne®) drip – increase drip 2 mg/min every 10 minutes until SBP < 180, DBP < 105 mmHg
6. For SBP < 140, DBP < 80 mmHg and antihypertensive agent is infusing STOP infusion of antihypertensive agent
7. Provide supplemental oxygen per patient condition to maintain SpO<sub>2</sub> = 94 – 97%
8. Only stop tPA infusion if any of the following occur (medical control at receiving facility must be notified as soon as possible if infusion is stopped for any reason)
  - A. Allergic reaction
  - B. Excessive bleeding
  - C. Nausea/vomiting
  - D. Onset of severe headache
  - E. Seizure
  - F. Worsening neurological exam
9. It will be necessary to spike the tPA drip chamber into a bag of NS to complete infusion of tPA that is within the IV tubing

### Additional Considerations

- \* tPA infusion should NOT be stopped simply for transport
- \* tPA infusion must NOT be stopped unless one of the above indications for stopping (#8)
- \* Review IV pump functioning with referring staff prior to departure as necessary

## Traffic Accident

(NCCEP Protocol TB-6)

### Significant Hemorrhage Considerations

- \* External bleeding
- \* Femur fracture
- \* Hemothorax
- \* Intra-abdominal bleeding
- \* Pelvis fracture

### Life Threatening Injury Considerations

- \* Head
  - Airway injury
  - Brain injury
- \* Neck
  - Airway injury
  - Spinal cord injury
- \* Chest
  - Aortic disruption
  - Cardiac tamponade
  - Flail chest
  - Hemothorax
  - Tension pneumothorax
- \* Abdomen
  - Hemorrhage
  - Hollow viscus injury
- \* Other
  - External blood loss
  - Hypothermia
  - Pelvic trauma hemorrhage

### Basic Medical Care

1. Ensure scene safety
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
6. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent

7. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Assess back for additional injuries while log-rolling the patient
  - B. Assess neurological status before and after motion restriction/movement
8. Control any active bleeding sites with manual direct pressure and/or pressure dressing
  - A. Apply MEDIC tourniquet to any potentially life-threatening hemorrhage unable to be controlled with direct pressure
9. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries
10. Splint any long bone deformities or areas where crush injury has occurred
  - A. Dislocated joints should be splinted in position of deformity
  - B. Fractures should be realigned and splinted from joint above through joint below
  - C. Distal pulses should be assessed before and after realignment and splinting
11. Apply appropriate dressing to any open wounds
12. Assess blood glucose level as indicated per patient presentation

### Advanced Medical Care

1. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
2. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
3. Alternative analgesic: nitrous oxide via patient-controlled inhalation
4. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
5. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
6. For injury noted to chest or back such that the possibility of a tension pneumothorax exists, and the patient is hemodynamically unstable:
  - A. Perform chest needle decompression

**Additional Considerations**

- \* For adult with suspected open fracture: cefazolin (Ancef®)
  - **≥ 70 kg: 2 grams IV over 10 minutes**
  - < 70 kg: 1 gram IV over 10 minutes
- \* For pregnant patient
  - Assess gestational age
    - Fundus should be 1 cm above umbilicus for every week >20 weeks
  - Position patient in left lateral position 15 – 30°
  - Crew member may need to manually displace uterus to left side
  - Consider normal hypervolemia that occurs with pregnancy
  - Mother may have lost significant circulating volume **and maintain “normal” vitals**
  - **Fetal perfusion may be greatly reduced even with “normal” vital signs in mother**
- \* Amputated extremities should be placed in saline soaked dressing in container & container placed on ice as available
- \* For unstable pelvic fracture
  - Apply pelvic splint
    - Maintain in place NOT compressed if hemodynamically stable
    - Compress by standard technique if signs of hemorrhagic shock present
- \* Glasgow Coma Score
  - Eye opening (1 – 4)
    1. None
    2. Noxious stimuli
    3. Verbal command
    4. Spontaneous
  - Verbal (1 – 5)
    1. None
    2. Incomprehensible
    3. Inappropriate
    4. Disoriented
    5. Oriented
  - Motor (1 – 6)
    1. None
    2. Decerebrate
    3. Decorticate
    4. Withdrawals
    5. Localizes
    6. Follows commands
- \* Rule-out medical causes of altered mental status in patients with depressed GCS
  - Hypoglycemia
  - Hypoxemia
  - Overdose

- \* Patients should be placed in spinal motion restriction and transported with spinal motion restriction if any of the following are present:
  - Abnormal mental status
  - Intoxicated or under the influence of mind-altering substance
  - Age < 5 years or > 65 years
  - Any posterior midline tenderness
  - Presence of distracting injury
  - Cervical pain with cervical range of motion
    - Patient unable to rotate neck 45 degrees to the left and to the right
    - Do NOT assess range of motion if the patient has any midline cervical spine tenderness to palpation
  - Any focal neurological deficit
  - High risk mechanism of injury
    - ATV crash
    - Ejection from vehicle
    - High speed (>55 mph) or rollover MVC
    - Motorcycle crash
    - Pedestrian or bicyclist struck by motor vehicle
- \* If there is any question or uncertainty; the patient should be placed in spinal motion restriction per [\*\*Spinal Motion Restriction Protocol\*\*](#)
- \* Patients who are found ambulatory on scene may have a cervical collar placed and be transported secured firmly to the stretcher in supine position
- \* The objective for patients sustaining any blunt or penetrating injury that results in hemodynamic instability is to arrive at the hospital for definitive care within 30 minutes from the time that the injury occurred
- \* Unless entrapment/rescue operations occur, total scene time for priority trauma patients should be  $\leq$  10 minutes
- \* IV access should be initiated in route

## Traumatic Injury

(NCCEP Protocol TB-6)

### Basic Medical Care

1. Ensure scene safety
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Maintain airway; suction as needed
4. Assess vital signs
5. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
6. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
7. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. As indicated assess back for additional injuries by log-rolling the patient
  - B. Assess neurological status before and after motion restriction/movement
8. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries
9. Control any active bleeding sites with manual direct pressure and/or pressure dressing
  - A. Apply MEDIC tourniquet to any potentially life-threatening hemorrhage that cannot be controlled with direct pressure
10. Splint any long bone deformities or areas where crush injury has occurred
  - A. Dislocated joints should be splinted in position of deformity
  - B. Fractures should be realigned and splinted from joint above through joint below
  - C. Distal pulses should be assessed before and after realignment and splinting
11. Apply appropriate dressing to any open wounds
12. Assess blood glucose level as indicated per patient presentation



13. For a suspected spinal injury related to an athletic event where the patient has a helmet and shoulder pads in place, the following will be performed for motion restriction:
  - A. Helmet and shoulder pads should both be removed, or both remain in place
    - Do not remove one without removing the other
    - May be removed if athletic trainer available to assist in removing and manual stabilization is maintained throughout the removal process
    - If not removed apply manual stabilization without traction to the cervical spine by holding both sides of the helmet
  - B. Gently remove the protective facemask
    - Athletic Trainer may provide tools and assistance to facilitate this process
  - C. If the spine is not in a neutral position, gently realign
    - Immediately terminate the realignment procedure if the patient complains of increased pain, neurologic deficit or any symptom in any form, muscle spasm or resistance is encountered, airway compromise, it becomes physically difficult to realign, or the patient becomes apprehensive
  - D. Place patient on transport stretcher by standard technique, maintaining cervical spine control at all times
    - Long spine board may be utilized to facilitate patient movement to stretcher
14. For suspected spinal injury related to an athletic event where the patient has a helmet, but no shoulder pads are in use, the follow will be performed for motion restriction:
  - A. Helmet may be removed if athletic trainer available to assist in removing and manual stabilization is maintained throughout the removal process
  - B. Apply manual stabilization to the cervical spine by holding sides of the helmet
  - C. Gently remove the facemask (athletic trainer may be able to assist with this)
  - D. If helmet not removed, apply padding (blanket or sheets) on long spine board to ensure shoulders and back are raised to maintain neutral position of the spinal column
15. Carefully remove helmet, maintaining cervical spine stabilization if needed for airway compromise or indication for airway intervention occurs
16. Long spine board may be utilized for transition from field to stretcher and should be removed once the patient is placed on the transport stretcher
  - A. Placement on spine board for movement to stretcher may occur via:
    - Carefully logroll patient while maintaining spinal stabilization
    - Carefully lift patient via 6-person lift maintaining spinal stabilization and sliding board underneath patient from feet of patient
  - B. It is essential that the transition of patient to spine board to stretcher and off spine board is coordinated among all providers in attendance

**Advanced Medical Care**

1. Obtain 4-lead ECG
2. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
3. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
4. Alternative analgesic: nitrous oxide via patient-controlled inhalation
  - A. Contraindicated with suspected pneumothorax
5. For adult with suspected open fracture: cefazolin (Ancef®)
  - A. **≥ 70 kg: 2 grams IV over 10 minutes**
  - B. **< 70 kg: 1 gram IV over 10 minutes**
6. Advanced Airway management as indicated
  - A. **[Airway: Intubation Protocol](#)**
  - B. **[Airway: BIAD King LT Protocol](#)**
7. Ensure proper tube placement using capnometry and SpO<sub>2</sub>; ventilate with 100% oxygen
8. For injury noted to chest or back such that the possibility of a tension pneumothorax exists, and the patient is hemodynamically unstable:
  - A. Perform chest needle decompression

**Additional considerations**

- \* Consider all possible causes of shock and treat per appropriate protocol
- \* Decompensation in pediatrics is most often airway related
- \* Geriatric patients 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
- \* 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
- \* Patients may become hypothermic even in warm environments

## Head Trauma

**(NCCEP Protocol TB-5)**

### Injury Types

- \* Concussion
- \* Contusion
- \* Epidural hematoma
- \* Skull fracture
- \* Subdural hematoma
- \* Subarachnoid hemorrhage

### Glasgow Coma Score

- \* Eye opening (1 – 4)
  1. None
  2. Noxious stimuli
  3. Verbal command
  4. Spontaneous
- \* Verbal (1 – 5)
  1. None
  2. Incomprehensible
  3. Inappropriate
  4. Disoriented
  5. Oriented
- \* Motor (1 – 6)
  1. None
  2. Decerebrate
  3. Decorticate
  4. Withdrawals
  5. Localizes
  6. Follows commands

### Advanced Medical Care

1. Maintain high index of suspicion for cervical spine fracture and stabilize as indicated
2. **Airway: Adult; Airway: Pediatric Protocol**
  - A. Advanced airway should be considered in all patients with GCS  $\leq$  8
  - B. Nasotracheal intubation is contraindicated with severe facial injury or severe closed head injury with concerns for increased ICP
  - C. Assess and document GCS and neurological exam prior to intubation attempt
3. Ventilate to maintain normal ET $\text{CO}_2$  (35 – 45 mmHg)
4. Hyperventilate only if:
  - A. Rapidly declining neurological status
  - B. Goal of ET $\text{CO}_2$  = 30 mmHg

## Blast Injury

(NCCEP Protocol TB-1)

### Types of Injury

- \* Primary
  - Due to pressure wave of the blast
- \* Secondary
  - Due to impaled objects thrown by the blast
  - Most common cause of morbidity/mortality
- \* Tertiary
  - Due to patient being thrown or falling as a result of the blast

### Basic Medical Care

1. Ensure scene safety
2. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
3. Additional care as per appropriate protocol
  - A. [Burn – Chemical Protocol](#)
  - B. [Burn – Thermal Protocol](#)
  - C. [Crush Syndrome Protocol](#)
  - D. [GSW Protocol](#)
  - E. [Radiation Incident Protocol](#)
4. Open wounds should be covered with sterile dressing
5. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Assess back for additional injuries while log-rolling the patient
  - B. Assess neurological status before and after stabilization/movement

### Advanced Medical Care

1. Continue advanced level care as per appropriate protocol
  - A. [Burn – Chemical Protocol](#)
  - B. [Burn – Thermal Protocol](#)
  - C. [Crush Syndrome Protocol](#)
  - D. [GSW Protocol](#)
  - E. [Radiation Incident Protocol](#)

### Additional Considerations

1. Blast Lung
  - A. Typically occurs with closed spaced or close proximity to explosion
  - B. Symptoms: respiratory distress, hypoxia
  - C. May require early advanced airway management; avoid hyperventilation
2. For intentional explosion: there is concern for secondary device; ensure scene safety and ability to safely remove patient from location

**Crush Trauma****(NCCEP Protocol TB-3)****Basic Medical Care**

1. Assess vital signs
2. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
3. Assess neurovascular status of affected extremity as access available
4. Open wounds should be covered with sterile dressing
5. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Assess back for additional injuries by log-rolling the patient
  - B. Assess neurological status before and after motion restriction/movement
6. Control any active bleeding sites with manual direct pressure and/or pressure dressing
  - A. Apply MEDIC tourniquet to any potentially life-threatening hemorrhage that cannot be controlled with direct pressure
7. Splint any long bone deformities or areas where crush injury has occurred
  - A. Dislocated joints should be splinted in position of deformity
  - B. Fractures should be realigned and splinted from joint above through joint below
  - C. Distal pulses should be assessed before and after realignment and splinting




**Advanced Medical Care**

1. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
2. For anticipated prolonged entrapment sodium bicarbonate
  - A. Adults = 50 mEq (50 ml) IV, IO with IVF initiation
  - B. Pediatrics = 1 mEq/kg (1 ml/kg) IV, IO with IVF initiation (max 50 mEq; 50 ml)
3. Immediately prior to extrication sodium bicarbonate
  - A. Adults = 50 mEq (50 ml) IV, IO
  - B. Pediatrics: 1 mEq/kg (1 ml/kg) maximum 50 mEq (50 ml) IV, IO
4. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing

5. 12-lead ECG as indicated and access available to evaluate for hyperkalemia
6. For signs of hyperkalemia (peaked T-waves, PR segment prolongation, absent p-waves, widening QRS interval, and heart blocks)
  - A. Calcium gluconate (10% solution)
    - i. Adults = 2 grams (20 ml) IV, IO over 2 minutes
    - ii. Pediatrics = 20 mg/kg IO, IV (0.2 ml/kg); maximum 2 grams (20 ml)
  - B. Sodium bicarbonate 1 mEq/kg (maximum 50 mEq) IV, IO
  - C. Albuterol via nebulizer
    - i. Adults: 5 mg
    - ii. Pediatrics: 2.5 mg
7. Alternative analgesic: nitrous oxide via patient-controlled inhalation
  - A. Contraindicated with suspected pneumothorax
8. For adult with suspected open fracture: cefazolin (Ancef®)
  - A. **≥ 70 kg: 2 grams IV**
  - B. **< 70 kg: 1 gram IV**

### Additional Considerations

- \* Hyperkalemia from crush syndrome can produce ECG changes:
  - Peaked T-waves
  - Wide complex
  - Bradycardia
  - Loss of P-wave
  - Heart blocks

| Typical ECG appearance  | Possible ECG abnormalities   |
|---|--|
|  | Peaked T waves<br>Prolonged PR segment   |
|  | Loss of P wave<br>Prolonged QRS complex<br>ST-segment elevation<br>Ectopic beats and escape rhythms  |
|  | Progressive widening of QRS complex<br>Sine wave<br>Ventricular fibrillation<br>Asystole<br>Axis deviations<br>Bundle branch blocks<br>Fascicular blocks |

## Extremity Trauma

(NCCEP Protocol TB-4)

### Basic Medical Care

1. Ensure scene safety
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$
5. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Assess back for additional injuries by log-rolling the patient
  - B. Assess neurological status before and after motion restriction/movement
6. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries
7. Control bleeding with direct pressure
  - A. Apply MEDIC tourniquet for potential life-threatening hemorrhage cannot otherwise be controlled per [Wound Care – Tourniquet Protocol](#)
8. Splint any long bone deformities or areas where crush injury has occurred
  - A. Dislocated joints should be splinted in position of deformity
  - B. Fractures should be realigned and splinted from joint above through joint below
  - C. Distal pulses should be assessed before and after realignment and splinting
9. Apply appropriate dressing to any open wounds
10. Assess neurovascular status of affected extremity
11. Compare injured extremity to unaffected extremity
12. Exposed bone should be covered with sterile saline dressing
13. Assess for signs of compartment syndrome
  - A. Pain out of proportion to injury
  - B. Pain with passive stretching of muscle groups in compartment
  - C. Paresthesia
  - D. Paralysis (late sign)
  - E. Pulselessness (late sign)

### Advanced Medical Care

1. Make all efforts to obtain IV access in uninjured extremity as available
2. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
4. Alternative analgesic: nitrous oxide via patient-controlled inhalation

## Impalement Injury

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### Basic Medical Care

1. Ensure scene safety
2. Assess vital signs
3. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
4. Stabilize impaled object in position to limit any movement during transport
  - A. Splint affected extremity
  - B. In rare instances where removal of the foreign body is necessary – object is **compromising the patient's ability to maintain an airway, or the performance of CPR** – an attempt may be made at careful FB removal
  - C. Effort should be made to cut impaled objects which are immovable from their source location just above the entry point to facilitate transport
  - D. Reassess neurovascular status of affected extremity after any impact on impaled foreign body
5. Impalement injuries involving the eye should be stabilized and both eyes patched (affected eye patched with metal eye shield – no direct pressure to the globe)
6. Transport patient in position that does not place any impact on the impaled object
7. Contact Medical Control if unable to transport patient with the impaled object in place
8. Contact Medical Control if unable to remove the impaled object from its source location

### Advanced Medical Care

1. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
2. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
3. Alternative analgesic: nitrous oxide via patient-controlled inhalation
  - A. Contraindicated with suspected pneumothorax
4. For adult with suspected open fracture: cefazolin (Ancef®)
  - A. **≥ 70 kg: 2 grams IV**
  - B. **< 70 kg: 1 gram IV**



**Additional Considerations**

- \* Amputated extremities should be placed in saline soaked dressing in container & container placed on ice as available (do not place amputated part directly on ice)
  - Splint partial amputations in normal alignment without applying tension to soft tissue
  - Apply sterile saline dressing to amputated part
- \* Rule-out medical causes of altered mental status in patients with depressed GCS
  - Hypoglycemia
  - Hypoxemia
- \* Differential diagnosis of shock in trauma
  - Tension pneumothorax
  - Cardiac tamponade
  - Spinal shock
    - Note: traumatic brain injury is NOT a cause of shock
  - Myocardial contusion / myocardial infarction
- \* Patients should be placed in spinal motion restriction and transported in spinal motion restriction if any of the following are present:
  - Abnormal mental status
  - Intoxicated or under the influence of mind-altering substance
  - Age < 5 years or > 65 years
  - Any posterior midline tenderness
  - Presence of distracting injury
  - Cervical pain with cervical range of motion
    - Patient unable to rotate neck 45 degrees to the left and to the right
    - Do NOT assess range of motion if the patient has any midline cervical spine tenderness to palpation
  - Any focal neurological deficit
  - High risk mechanism of injury
    - ATV crash
    - Ejection from vehicle
    - Fall > 3 feet (5 stairs)
    - High speed (>55 mph) or rollover MVC
    - Pedestrian or bicyclist struck by motor vehicle
    - Diving injury
- \* Patients who are found ambulatory on scene may have a cervical collar placed and be transported secured firmly to the stretcher in supine position

## Unconscious / Syncope

(NCCEP Protocol UP-16)

### Differential Diagnosis

- \* Adverse medication reaction
- \* Cardiac abnormality (MI, CHF)
- \* CNS lesion
- \* Diabetes related
  - o Hypoglycemia
  - o Hyperglycemia (NKHC, DKA)
- \* Drug overdose
- \* Dysrhythmia
- \* Electrolyte abnormality
- \* Environmental
  - o Hyperthermia
  - o Hypothermia
- \* Head trauma
- \* Hemorrhage
- \* Hypotension
- \* Hypoxemia
- \* Infection
  - o Meningitis
  - o Sepsis
- \* Metabolic
  - o Acidosis
  - o Alkalosis
- \* Psychiatric disorder
- \* Pulmonary embolus
- \* Seizure
- \* Stroke
- \* Thyroid abnormality
- \* Toxin Exposure
  - o Alcohol
  - o Carbon monoxide
- \* Tumor
- \* Vasovagal episode

### Basic Medical Care

1. Ensure scene safety
2. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
3. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
4. Maintain airway; suction as needed
5. Assess vital signs
6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Assess back for additional injuries by log-rolling the patient
  - B. Assess neurological status before and after motion restriction/movement
9. Assess blood glucose level as indicated per patient presentation
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex
11. For suspected opioids (narcotics) overdose
  - A. Naloxone (Narcan®)
    - i. Adults: 1 – 2 mg IN
    - ii. Pediatrics: 0.01 – 0.1 mg/kg IN (maximum 2 mg)

**Advanced Medical Care**

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. Obtain 12-lead ECG and refer to appropriate protocol as indicated
3. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
4. For hypoglycemia treat as per [Diabetic Problems Hypoglycemia Protocol](#)
5. For suspected opioids (narcotics) overdose
  - A. Naloxone (Narcan®)
    - i. Adults: 1 – 2 mg IV, IN, IM
    - ii. Pediatrics: 0.01 – 0.1 mg/kg IV, IN, IM (maximum 2 mg)
  - B. May repeat every 5 minutes to maximum of 10 mg
6. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD King LT Protocol](#)
7. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
8. Additional care protocol as indicated per patient condition/presumptive diagnosis

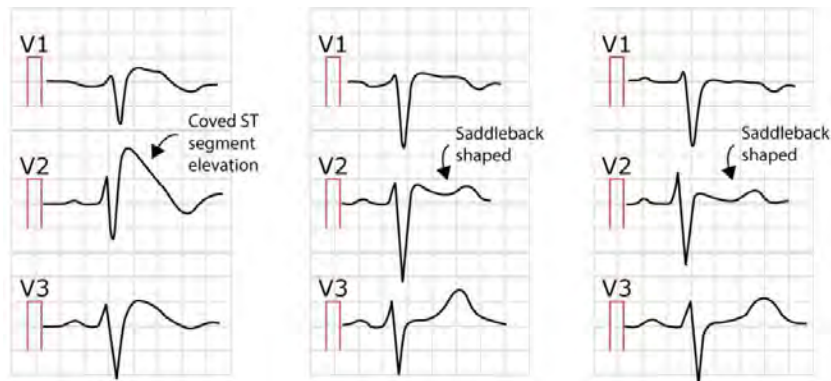
**Additional Considerations**

- \* Patients > 65 syncope is cardiac until proven otherwise
- \* Female patients of child-bearing age consider ectopic pregnancy or other pregnancy related complication
- \* Consider pulmonary embolus for unexplained syncope in patient with risk factors for thromboembolic disease
- \* Syncope with no preceding symptoms or event may be associated with dysrhythmia
- \* Assess for signs and symptoms of trauma if associated or questionable fall with syncope
- \* Consider Hazmat exposure and utilize PPE as indicated
  - Multiple causes may be present simultaneously
- \* Airway management and ventilatory assistance remains paramount and must be performed while preparing naloxone for administration
- \* Naloxone administration may precipitate narcotic withdrawal in patients who chronically abuse narcotics
  - Providers must be prepared to manage acute agitation and/or nausea/vomiting that may result from narcotic withdrawal following naloxone administration
- \* Always rule out medical causes prior to determining behavioral condition as cause

## ECG Considerations

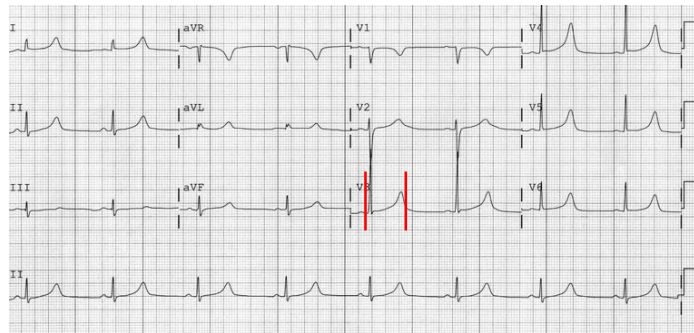
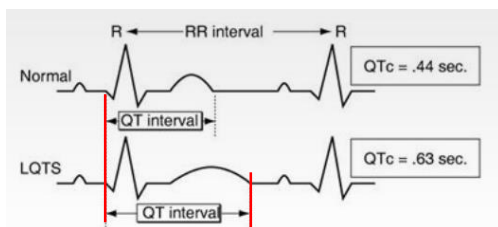
### \* Brugada syndrome

- Disorder characterized by syncope and sudden death associated
- Genetic alteration of sodium channels of cardiac action potential
- Most common in people from Asia; 8-10 times more prevalent in men
- Often asymptomatic, but ECG shows ST-segment elevation in leads V1-V3
- Type 1: coved ST elevation  $> 2\text{mm}$  in  $> 1$  of  $V_1 - V_3$  with negative T-wave
- **Type 2: "saddleback" ST elevation  $> 2\text{mm}$**
- Type 3: morphology as type 1 or 2 but  $< 2\text{mm}$



### \* Long QT Syndrome

- Congenital disorder characterized by a prolongation of the QT interval and a propensity to ventricular tachyarrhythmias, which may lead to syncope, cardiac arrest, or sudden death
- QT interval corrected for heart rate (QTc) that is longer than 0.44 seconds is generally considered to be abnormal, although a normal QTc can be more prolonged in females (up to 0.46sec)
- QT prolongation can lead to polymorphic ventricular tachycardia, or torsade de pointes



## Unknown Problem

---

### Differential Diagnosis

- |                      |                    |                        |
|----------------------|--------------------|------------------------|
| * Abdominal Pain     | * Choking          | * Heart Problem        |
| * Allergic Reaction  | * Convulsions      | * Hemorrhage           |
| * Behavioral Problem | * Diabetic Problem | * Overdose             |
| * Breathing Problem  | * General Illness  | * Pregnancy/childbirth |
| * Cardiac arrest     | * HazMat exposure  | * Stroke               |
| * Chest Pain         | * Headache         | * Traumatic Injury     |

### Basic Medical Care

1. Ensure scene safety
2. [Medical Initial Assessment Protocol](#) or [Pediatric Initial Assessment Protocol](#)
3. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
4. Maintain airway; suction as needed
5. Assess vital signs
6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Assess back for additional injuries by log-rolling the patient
  - B. Assess neurological status before and after immobilization/movement
9. Assess blood glucose level as indicated per patient presentation
  - A. Oral glucose for hypoglycemia and patient alert with intact gag reflex

### Advanced Medical Care

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. 12-lead ECG as per patient history
3. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
4. **Additional care as per appropriate protocol based on patient's presentation**
5. Advanced Airway management as indicated
  - A. [Airway: Intubation Protocol](#)
  - B. [Airway: BIAD Protocol](#)
6. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen

## Transfer - Interfacility

---

### Basic Medical Care

1. [\*\*Universal Patient Care Protocol\*\*](#)
2. Maintain airway; suction as needed
3. Assess vital signs
4. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
5. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent

### Advanced Medical Care

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
3. **Additional care as per appropriate protocol based on patient's presentation**
4. Advanced Airway management as indicated
  - A. [\*\*Airway: Intubation Protocol\*\*](#)
  - B. [\*\*Airway: BIAD Protocol\*\*](#)
5. Ensure proper tube placement using capnometry,  $SpO_2$  and ventilate with 100% oxygen
6. Perform any transfer orders prescribed by the transferring or accepting facility
  - A. All orders performed must be within the scope of practice for a paramedic
  - B. All orders must be recorded on the PCR as per the ordering physician

**Additional Considerations**

- \* Confirm destination facility prior to departure from referring facility
  - Crew will confer with patient and physician together to confirm patient destination prior to departing referring facility
- \* Interhospital (Emergency Department) transfers involve referring and receiving physicians and facilities and therefore destination is NOT based on Mecklenburg EMS Agency destination protocol
  - Destination is based on the physician (facility) to physician (facility) transfer
  - **MEDIC personnel shall NEVER suggest an alternative destination**
  - If the patient changes their destination decision after departing the hospital/ED contact must be made with that facility immediately, to inform them of the **patient's requested change**
- \* If patient decompensates while enroute to a destination facility other than an emergency department; consider diverting to the closest emergency department for patient stabilization as indicated regardless of original orders received
  - Contact medical control for clarification
- \* Medications on continuous infusion requiring titration during transport will require a nurse to accompany the transport
  - Exceptions are nitroglycerin, dopamine, and lidocaine drips
- \* Medications on continuous infusion that do NOT require titration during transport may be transported provided all the following conditions are met:
  - Medication is on the NCMB approved list for Paramedic personnel
  - Paramedic is familiar & comfortable with the medication and the order
  - Medication infusion is such that, should pump failure occur, the infusion can be stopped without detriment to the patient
- \* Medication orders received from the referring physician for single bolus dosing may be followed provided all the following conditions are met:
  - Medication is on the NCMB approved list for Paramedic personnel
  - Paramedic is familiar & comfortable with the medication and the order(s)
  - Detailed parameters for medication dosage are received from referring physician (for clarification the order must be read back to the physician giving the order and documented in the patient care report)
- \* Bedside times during interfacility transfers of CODE STEMI and CODE STROKE patients are as significant as scene times
  - The goal should be < 15 minutes at the referring facility
  - 12-lead ECG does NOT need to be performed by MEDIC prior to transport
- \* Medical control may be contacted at any time for clarification or assistance

## Gunshot Wound

---

### Basic Medical Care

1. Ensure scene safety
2. **Trauma Initial Assessment Protocol or Pediatric Trauma Assessment Protocol**
  - A. For patient found apneic and pulseless without signs of life on arrival, pronounce dead on scene
  - B. For patient noted at any time to have palpable pulses, continue resuscitation
3. Maintain airway; suction as needed
4. Control any active external bleeding with direct pressure
  - A. Apply MEDIC tourniquet for presumed life-threatening extremity hemorrhage not controlled with direct pressure
13. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Assess back for additional injuries by log-rolling the patient
  - B. Assess neurological status before and after motion restriction/movement
  - C. Patients with isolated penetrating trauma who are neurologically intact do not require cervical collar and spinal immobilization
5. Assess vital signs
6. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
7. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
8. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries
9. For penetrating injury noted to the chest or back apply chest seal device

### Advanced Medical Care

1. Obtain rhythm strip and refer to appropriate protocol as indicated
2. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
3. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg any route)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing



4. Alternative analgesic: nitrous oxide via patient-controlled inhalation
  - A. Contraindicated with suspected pneumothorax
5. For adult with suspected open fracture: cefazolin (Ancef®)
  - A. **≥ 70 kg: 2 grams IV over 10 minutes**
  - B. **< 70 kg: 1 gram IV over 10 minutes**
6. Advanced Airway management as indicated
  - A. **Airway: Intubation Protocol**
  - B. **Airway: BIAD Protocol**
7. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
8. For penetrating injury noted to chest or back such that the possibility of a tension pneumothorax exists, and the patient is hemodynamically unstable:
  - A. Perform chest needle decompression

### **Additional Considerations**

- \* For isolated penetrating wounds: target of fluid resuscitation should be to palpable radial pulse & responsive mental status – not a specific blood pressure measurement
- \* Penetrating wounds without ongoing external bleeding should be treated for possible internal hemorrhage
  - Manual direct pressure should be applied to the entrance site (stab wound to the groin or upper thigh region)
- \* IV lines should always be initiated in route to destination emergency department
- \* The objective for patients sustaining any penetrating injury that results in hemodynamic instability is to arrive at the hospital for definitive care within 30 minutes from the time that the injury occurred
  - Total scene time should not exceed 10 minutes
- \* Patients with isolated penetrating trauma who are neurologically intact do NOT require cervical collar and spinal immobilization
  - Placement onto a long spine board to facilitate patient movement may be beneficial but spinal immobilization with cervical collar is NOT indicated

## Traffic Accident – Pedestrian Struck

(NCCEP Protocol TB-6)

### Significant Hemorrhage Considerations

- \* External bleeding
- \* Hemothorax
- \* Intra-abdominal bleeding
- \* Pelvis fracture
- \* Femur fracture

### Basic Medical Care

1. Ensure scene safety
2. [Trauma Initial Assessment Protocol](#) or [Pediatric Trauma Assessment Protocol](#)
3. Maintain airway; suction as needed
4. Assess vital signs
5. Provide supplemental oxygen per patient condition to maintain  $SpO_2 = 94 - 97\%$
6. Provide assisted ventilations with bag-valve mask and 100% oxygen if breathing or ventilatory compromise is apparent
7. For suspected trauma to head or spine, protect and maintain control of the cervical spine, (with manual stabilization) and the thoracolumbar spine until cervical collar placed and patient firmly secured to transport stretcher
  - A. Assess back for additional injuries by log-rolling the patient
  - B. Assess neurological status before and after motion restriction/movement
8. Remove appropriate clothing to fully inspect extremities, chest, and abdomen for any significant injuries
9. Control any active bleeding sites with manual direct pressure and/or pressure dressing
  - C. Apply MEDIC tourniquet to any potentially life-threatening hemorrhage that cannot be controlled with direct pressure
10. Splint any long bone deformities or areas where crush injury has occurred
  - D. Dislocated joints should be splinted in position of deformity
  - E. Fractures should be realigned and splinted from joint above through joint below
  - F. Distal pulses should be assessed before and after realignment and splinting
11. Apply appropriate dressing to any open wounds
12. Assess blood glucose level as indicated per patient presentation

**Advanced Medical Care**

1. Obtain 4-lead ECG and refer to appropriate protocol as indicated
2. IVF resuscitation
  - A. Adults:
    - i. Hemodynamically unstable: IVF wide open
    - ii. Hemodynamically stable: TKO
  - B. Pediatrics
    - i. Hemodynamically unstable: 10 – 20 ml/kg bolus and reassess
    - ii. Hemodynamically stable: TKO
3. Fentanyl (Sublimaze®) for pain control
  - A. Adults:
    - i. 1 – 2 mcg/kg IN (maximum 200 mcg)
    - ii. 0.5 – 1 mcg/kg IV, IM (maximum 100 mcg)
    - iii. May repeat x1 in 15 minutes as indicated (maximum 100 mcg)
  - B. Pediatrics:
    - i. 0.5 – 1 mcg/kg IV, IM, IN (maximum 100 mcg)
    - ii. Contact Medical Control for repeat dosing
4. Alternative analgesic: nitrous oxide via patient-controlled inhalation
  - A. Contraindicated with suspected pneumothorax
5. For adult with suspected open fracture: cefazolin (Ancef®)
  - A. **≥ 70 kg: 2 grams IV over 10 minutes**
  - B. **< 70 kg: 1 gram IV over 10 minutes**
6. If there is any question or uncertainty; the patient should be placed in spinal motion restriction per **Spinal Motion Restriction Protocol**
7. Patients who are found ambulatory on scene may have a cervical collar placed and be transported secured firmly to the stretcher in supine position
8. Advanced Airway management as indicated
  - A. **Airway: Intubation Protocol**
  - B. **Airway: BIAD Protocol**
9. Ensure proper tube placement using capnometry, SpO<sub>2</sub> and ventilate with 100% oxygen
10. For injury noted to chest or back such that the possibility of a tension pneumothorax exists, and the patient is hemodynamically unstable:
  - A. Perform chest needle decompression

**Additional Considerations**

- \* Patients should be placed in spinal motion restriction and transported with spinal motion restriction if any of the following are present:
  - Abnormal mental status
  - Intoxicated or under the influence of mind-altering substance
  - Age < 5 years or > 65 years
  - Any posterior midline tenderness
  - Presence of distracting injury
  - Cervical pain with cervical range of motion
    - Patient unable to rotate neck 45 degrees to the left and to the right
    - Do NOT assess range of motion if the patient has any midline cervical spine tenderness to palpation
  - Any focal neurological deficit
  - High risk mechanism of injury
    - Bicyclist/pedestrian struck by vehicle
- \* Amputated extremities should be placed in saline soaked dressing in container & container placed on ice as available (do not place amputated part directly on ice)
  - Splint partial amputations in normal alignment without applying tension to soft tissue
  - Apply sterile saline dressing to amputated part
- \* Rule-out medical causes of altered mental status in patients with depressed GCS
  - Hypoglycemia
  - Hypoxemia
  - Overdose
- \* Differential diagnosis of shock in trauma
  - Hemorrhage
  - Tension pneumothorax
  - Cardiac tamponade
  - Neurogenic (spinal) shock
    - Note: traumatic brain injury is NOT a cause of shock
  - Myocardial contusion / myocardial infarction



# **Section 4**

## **Clinical Procedures**

## Airway: BIAD-King LT

(NCCEP Procedure AP-2)

### Indications

- \* Cardiac Arrest
- \* Respiratory failure

### Contraindications

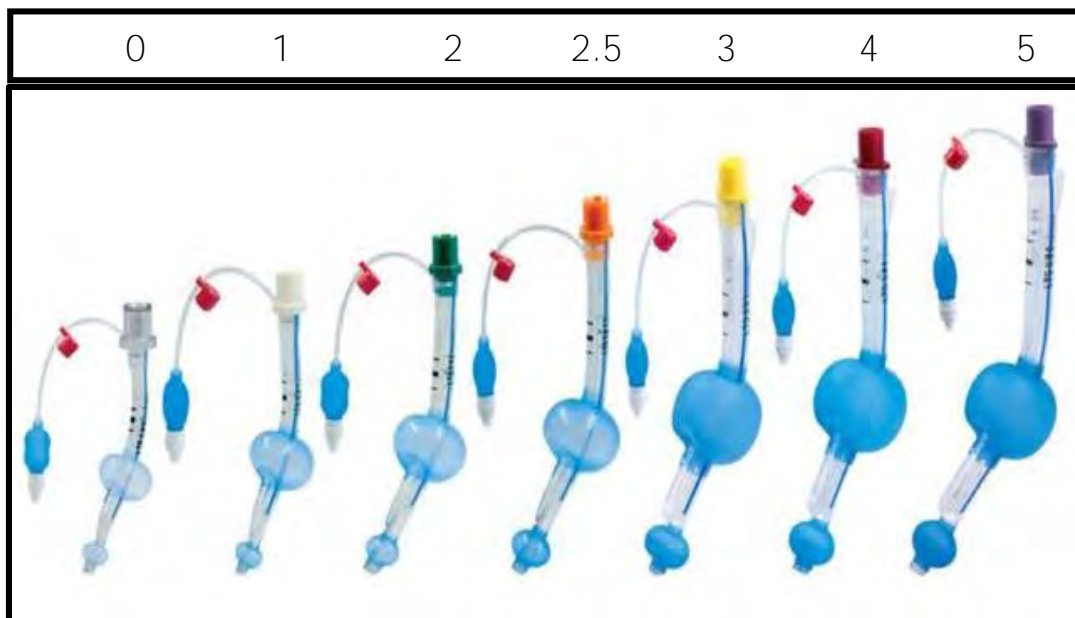
- \* Responsive patients with an intact gag reflex
- \* Patients with known esophageal disease (bleeding, cancer)
- \* Caustic substance ingestion (drain cleaner, lye)

### Complications

- \* Intra-oral trauma

### Equipment

- \* Bag-valve device
- \* Portable oxygen source
- \* King LT-D tube
- \* Orogastric tube
- \* Suction unit
- \* 60 cc syringe
- \* Stethoscope
- \* Tie-down tape
- \* Lubricant



**Procedure**

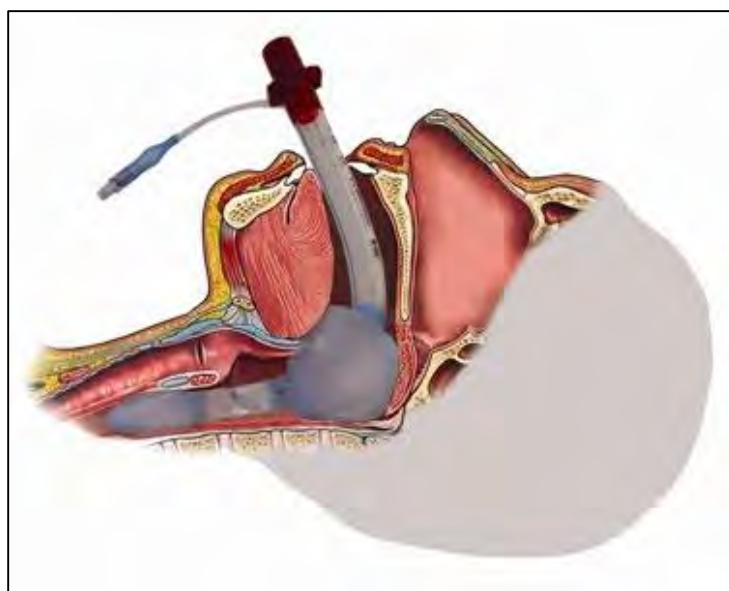
1. Select appropriate tube size based on patient's height
  - A. **Size 0 clear** is used in pediatrics between < 5 kg
  - B. **Size 1 white** is used in pediatrics 5-12 kg
  - C. **Size 2 green** is used in pediatrics between 12-25 kg (3 – 3.5 feet)
  - D. **Size 2.5 orange** is used in pediatrics between 25-35 kg (3.5 – 4.25 feet)
  - E. **Size 3 yellow** is used in adults between 4 – 5 feet
  - F. **Size 4 red** is used in adults between 5 – 6 feet
  - G. **Size 5 purple** is used in adults between >6 feet
2. Test cuff inflation
3. Deflate the cuff completely
4. Apply water-based lubricant to distal & posterior tips of tube
  - A. Avoid lubricant going into the ventilation holes
5. **Position the patient's head**
  - A. Neutral position when C-spine precautions are being observed
  - B. **"Sniffing" position** when non-C-spine precautions are being observed
6. Hold the tube at the connector by the dominant hand
7. Hold the mouth open and apply chin lift maneuver with the non-dominant hand
8. Rotate the tube 45° - 90° so that the blue line touches the side of the mouth
9. Introduce the tip into the mouth and advance behind the base of the tongue
10. As the tube advances, rotate tube back to the midline so the blue line faces the chin
11. Advance until the connector aligns with the teeth or gums
12. Inflate the cuffs to the specified volumes based on the tube size:
 

|                                   |                                 |
|-----------------------------------|---------------------------------|
| A. Size 0 = 10 mL of air          | E. <b>Size 3</b> = 50 mL of air |
| B. Size 1 = 20 mL of air          | F. <b>Size 4</b> = 60 mL of air |
| C. <b>Size 2</b> = 35 mL of air   | G. <b>Size 5</b> = 70 mL of air |
| D. <b>Size 2.5</b> = 40 mL of air |                                 |
13. Attach bag-valve device to the connector and ventilate
14. Confirm proper placement by the following:
  - A. Auscultation of breath sounds
  - B. Assessing pulse oximetry and capnometry
    - i. ETCO<sub>2</sub> waveform or colorimeter color change MUST be confirmed
  - C. Absent epigastric sounds
  - D. Rise and fall of chest
15. Measure length of orogastric tube by stretching the tube as follows:
  - A. Tip at xyphoid
  - B. Stretch up to ear lobe
  - C. Stretch out to mouth
  - D. Hold tube where it hits mouth
16. Lubricate distal end of tube with water-soluble jelly
17. Slowly advance tube through port in LT-D
  - A. May need to momentarily deflate the cuffs of the King LT to advance OG tube
18. Advance tube until appropriate depth reached
19. Attach proximal portion of orogastric tube to suction
20. Secure King LT and OG tube by standard technique using twill tape

**Additional Considerations**

- \* For any doubt as to the functioning status of the King LT airway or the position of the device, the King LT airway should immediately be removed
  - Deflate the balloons
  - Support patient with a BVM utilizing basic adjuncts – OPA, NPA as indicated

|                   | Pediatric |         |          |          | Adult    |          |          |
|-------------------|-----------|---------|----------|----------|----------|----------|----------|
| Tube Size         | 0         | 1       | 2        | 2.5      | 3        | 4        | 5        |
| Connector Color   | Clear     | White   | Green    | Orange   | Yellow   | Red      | Purple   |
| Patient Selection | < 5 Kg    | 5–12 Kg | 12–25 Kg | 25–35 Kg | 4–5 feet | 5–6 feet | > 6 feet |
| Cuff Volume       | 10        | 20      | 35       | 40       | 50       | 60       | 70       |
| Suction Catheter  | 10 F      | 10 F    | 16 F     | 16 F     | 18 F     | 18 F     | 18 F     |





## Airway: Intubation Orotracheal

(NCCEP Procedure AP-6)

### Indications

- \* Anticipated clinical course
  - Impending airway compromise
  - Likely deterioration during transport
- \* Cardiopulmonary arrest
- \* Failure to protect airway
  - Severe head injury with GCS < 8
  - Significantly obtunded with inadequate protection and risk of aspiration
- \* Failure to oxygenate or ventilate
- \* Injury to upper airway structures with compromised oxygenation / ventilation
- \* Profound shock

### Contraindications

- \* Ability to maintain an adequate airway with adequate oxygenation and ventilation with a less invasive maneuver
- \* Patients < 14 years of age
  - Utilize BVM or King LT as patient condition dictates

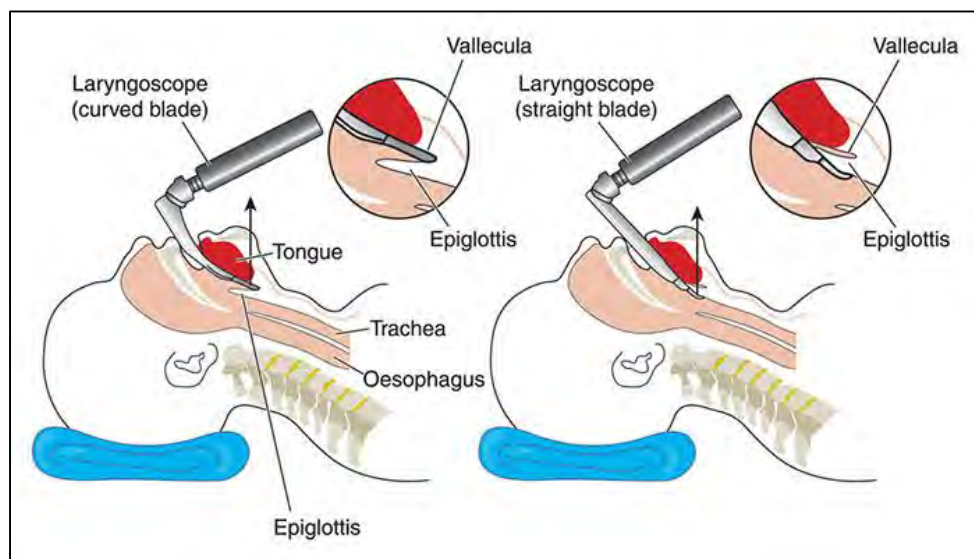
### Complications

- \* Bleeding
- \* Esophageal placement
- \* Fractured teeth
- \* Increased intracranial pressure
- \* Right mainstem bronchial intubation
- \* Trauma
- \* Vocal cord injury
- \* Vomiting with possible aspiration

### Procedure

1. Pre-oxygenate
  - A. Non-rebreather mask @ 15 LPM
  - B. Nasal cannula oxygen @ 10 – 15 LPM – maintain in place throughout the intubation attempt until correct ETT position is confirmed
2. Prepare equipment
  - A. BVM
  - B. Oxygen
  - C. ETT
    - i. Appropriate size plus size smaller & larger available
    - ii. Check bulb
    - iii. Stylet

- D. Laryngoscopes & blades
- E. ETCO<sub>2</sub> detector
- F. Suction
- G. Monitor
  - i. ECG
  - ii. Pulse oximetry
  - iii. ETCO<sub>2</sub> detector
- H. Rescue or difficult airway device (gum elastic bougie, King-LT)
- 3. Hold laryngoscope handle in the left hand and insert extended blade into right corner of **the patient's mouth along the lingual** surface
- 4. Sweep the tongue to the left with the flange of the blade
- 5. Advance the blade posterior along the tongue
  - A. Advance tip of McIntosh blade into vallecula
  - B. Advance tip of Miller blade posterior to epiglottis
- 6. Lift handle / blade to expose vocal cords
- 7. Pass endotracheal tube through vocal cords via direct visualization
- 8. Remove stylet and inflate ETT cuff
- 9. Verify tube placement
  - A. ETCO<sub>2</sub> detector
  - B. Bilateral breath sounds
  - C. Absent epigastric sounds
- 10. Secure tube position
- 11. Consider post-intubation sedation
- 12. Consider physical restraints for patient safety
- 13. Continuous waveform capnography is required during transport
  - A. **Attach a copy of the waveform strip to patients' record**



**Additional Considerations**

- \* Individual intubation attempts **must be discontinued if patient's SpO<sub>2</sub> < 91%**
- \* Patient must be supported with BVM with 100% O<sub>2</sub> between intubation attempts
- \* It is beneficial to place nasal cannula oxygen at 10 – 15 LPM and maintain usage throughout the intubation attempt until ETT is confirmed in the correct position
- \* Movement to a rescue airway device should be made at any time crew member determines that further attempts at intubation would not be successful
- \* Confirmation of endotracheal tube placement
  - Capnometry
    - ETCO<sub>2</sub> colorimeter color change may be utilized as initial confirmation
      - Minimum of 6 breaths are required to confirm positive change
    - ETCO<sub>2</sub> continuous waveform must be utilized throughout transport
  - Direct visualization
    - Intubation should only be performed with the ETT is seen passing through the vocal cords
  - Auscultation to confirm bilateral breath sounds
    - Paramedic performing procedure must always assess
  - Auscultation to exclude epigastric breath sounds
  - Pulse oximetry
- \* At a minimum each of the following will prompt reassessment of ETT placement:
  - Following movement over rough or difficult terrain in the field
  - Following movement into or removal from of the ambulance
- \* The attending paramedic will always oversee patient movement procedures
- \* Ensure the ETT is secured in place with tape or tie-down twill
- \* When the patient is moved into or out of the ambulance, utilize the following procedure:
  - Just prior to movement, the patient will be given one ventilation
  - The bag-valve device will be removed from the endotracheal tube
  - A coordinated movement shall **occur with the paramedic's commands**
  - Once the stretcher is either secured in the ambulance or secured in the elevated position outside the ambulance, the bag-valve device will be reconnected to the endotracheal tube
  - The patient will be given ventilation
- \* The paramedic will repeat an auscultation assessment to confirm tube placement
  - If the assessment is questionable, direct laryngoscopy may be repeated
- \* Capnometry and pulse oximetry will be continuous
- \* If any doubt as to the correct positioning of the ETT the ETT must be removed

## Airway: Intubation Nasal

(NCCEP Procedure AP-7)

### Introduction

- \* Nasotracheal intubation can be done on the awake, breathing patient as an alternative to orotracheal intubation – orotracheal intubation is preferred method in most patients
- \* ***Reserved for patients with clear need of ETI and oropharyngeal access is not possible (massive angioedema of tongue/lips)***

### Indications

- \* Primary method in spontaneously breathing patients in whom orotracheal intubation is not possible but intubation is required (e.g. ACE-Inhibitor angioedema)
- \* Alternative to orotracheal intubation in alert patient with impending respiratory failure (CHF, COPD, asthma, pneumonia)

### Contraindications

- |                                   |   |
|-----------------------------------|---|
| * Age < 12 years                  | * Significant maxillo-facial trauma             |
| * Apnea                           | * Upper airway obstruction                      |
| * Coagulopathy / thrombocytopenia | * Violent or combative / uncooperative patients |
| * Severe head trauma              |   |

### Procedure

1. Preoxygenate with high flow oxygen
2. Place patient in the sniffing position
3. Choose endotracheal size based on the size of the larger nostril
4. Prepare nasal mucosa with lubricating jelly and neosynephrine nasal spray as available
5. Lubricate tracheal end of endotracheal tube
6. Insert tube (without stylet) into nostril with leading edge of bevel away from septum
7. Follow the floor of the nose posterior
8. Advance tube until breath sounds are heard through the tube
9. **Gently slide tube through vocal cord into tracheal during patient's inspiration**
  - A. Patient may likely cough as tube passes into trachea
10. Inflate tube cuff
11. Confirm placement via auscultation
  - A. ETCO<sub>2</sub> detector
  - B. Bilateral breath sounds
  - C. Absent epigastric sounds
12. Secure tube in place
13. Consider post-intubation sedation
14. Continuous waveform capnography is required during transport
  - A. Attach a copy of the **waveform strip to patients' record**

## Airway: Tracheostomy Tube Change

(NCCEP procedure AP-10)

### Indications

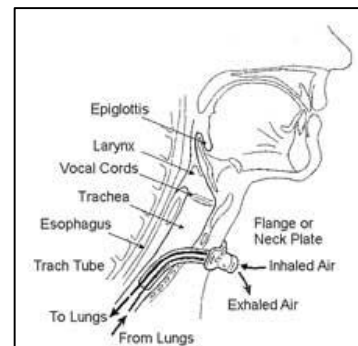
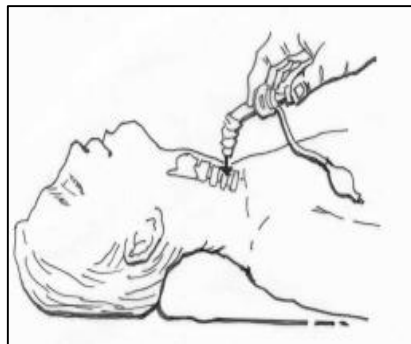
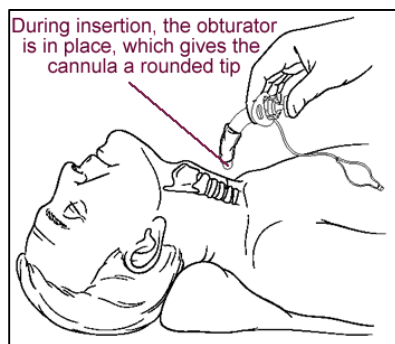
- \* Obstruction of tracheostomy tube or site that does not clear with suctioning or repositioning
- \* Inability to oxygenate/ventilate with no other explanation

### Procedure

1. Prepare and check necessary equipment including device of the same size and 0.5 size smaller than patient's existing device
  - A. Have standard airway management equipment available
2. Appropriately lubricate the replacement tube
3. Pre-oxygenate patient
4. Remove patient from mechanical ventilation device and assist with BVD
5. Deflate cuff (if present) on existing device and remove
6. Insert replacement device and verify placement by standard measures including ET $\text{CO}_2$ 
  - A. Utilize tracheostomy tube obturator as available
7. If unable to place new device, re-attempt replacement with smaller sized device
8. If unable to place new smaller device, use standard airway procedures to assist patient
  - A. [Airway: Adult Protocol](#); [Airway: Pediatric Protocol](#)

### Additional Considerations

- \* More difficulty with tube changing should be anticipated with tracheostomy sites that are < 2 weeks old
- \* Potential complications
  - Airway obstruction
  - Airway device misplacement
  - Bleeding



## Airway: Endotracheal Tube Introducer

(NCCEP Procedure AP-11)

### Objective

- \* Management of patients with predicted difficult airway intubation
- \* Management of patients with failed intubation attempt(s)

### Introduction

- \* GEB is a 60cm long 15F gauge flexible device with a "J" angle at the distal tip
- \* For use in patients > 12 years of age
- \* Useful with grade 3 or 4 views

### Gum Elastic Bougie (GEB) Procedure

1. Position the patient as for standard intubation
2. Insert laryngoscope blade as for airway view
3. Insert the tip of the GEB into the trachea and advance, feeling for ridges of tracheal rings
  - A. Tip of GEB should be facing anterior to feel tracheal rings
  - B. GEB can be advanced until contact with the carina
  - C. If there is no endpoint to advancement of the GEB it is most likely placed in the esophagus and should be removed
4. Thread ETT over the GEB and into the airway
  - A. Keep laryngoscope blade in position to improve ability to pass the ETT into the trachea
5. Advance ETT to standard depth
6. Remove GEB
7. Inflate cuff
8. Ventilate via ETT
9. Confirm placement with standard techniques
10. Secure ETT in place



## Airway: Intubation Confirmation – ETCO<sub>2</sub> Detector (NCCEP AP-12)

### Indications

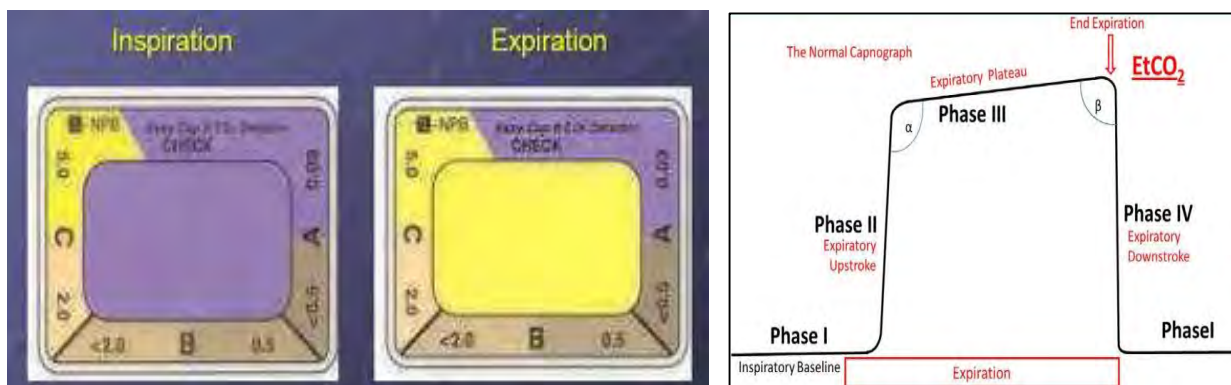
- \* For confirmation of placement following insertion of any airway device

### Procedure

1. MUST be performed on any intubated patient to confirm ETT or BIAD placement
2. Continuous waveform capnography MUST be utilized throughout patient transport to continuously confirm ETT placement
3. Select appropriately sized ETCO<sub>2</sub> detector (*Easy Cap*)
  - A.  $\geq 15$  kg = adult detector
  - B.  $< 15$  kg = pediatric detector
4. Attach end-tidal CO<sub>2</sub> detector to the end of the airway device (ETT, King LT)
5. Assess for color change of the ETCO<sub>2</sub> detector (purple → gold)
  - A. At least six ventilations must be performed through the detector to rule-out possibility of false positive color change
6. If appropriate color change does NOT occur the airway device should be removed, and patient assisted with BVM as indicated
7. Continue ventilations through the *Easy Cap* device
  - A. The *Easy Cap* may be used for up to 2 hours duration
8. Once the patient is secured in the transporting vehicle, a continuous in-line ETCO<sub>2</sub> waveform monitor should be placed and continuous waveform capnography monitored throughout the remainder of the transport

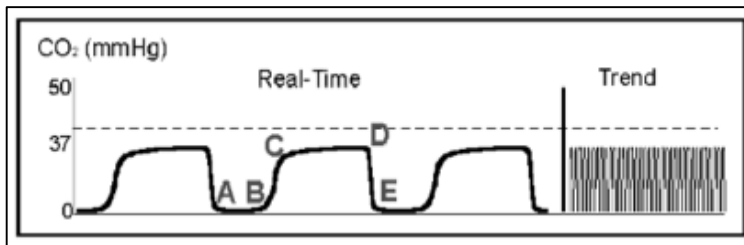
### Additional Considerations

- \* Patients in cardiac arrest may not have CO<sub>2</sub> levels detectable by the *Easy Cap* despite proper placement of the airway device until optimum CPR is performed or adequate cardiac output is re-established
  - Direct visualization may need to be utilized to verify tube position
  - Continuous waveform capnography may be needed to verify tube position

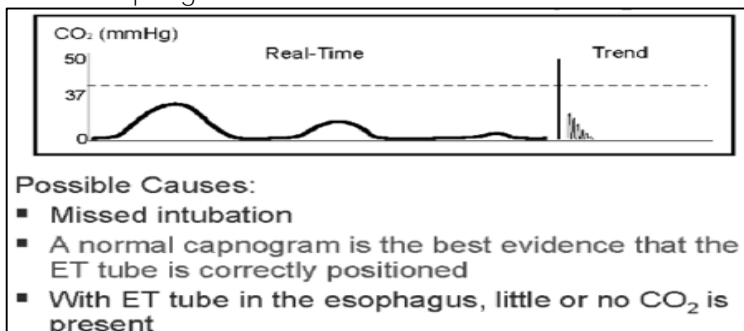


\* ETCO<sub>2</sub> waveforms

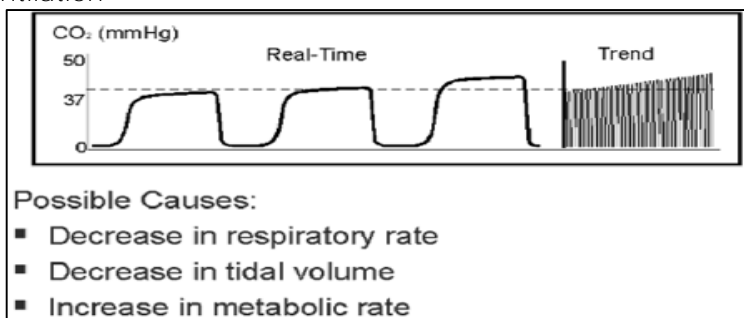
➤ Normal



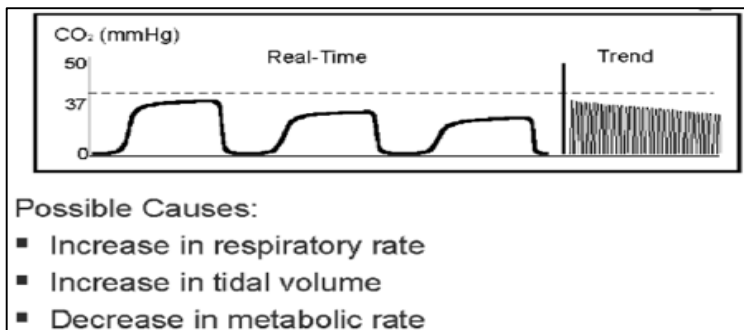
➤ ETT placed in esophagus



➤ Hypoventilation



➤ Hyperventilation



\* Patients in cardiac arrest with sudden increase in ETCO<sub>2</sub> may indicate ROSC

\* ETCO<sub>2</sub> must be documented in PCR

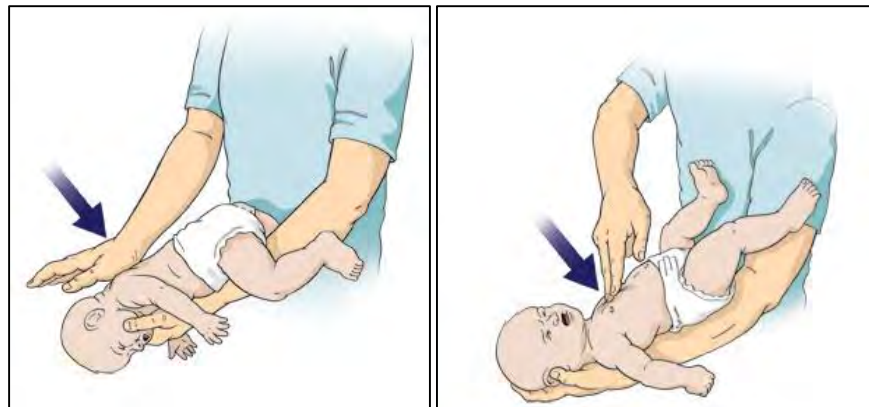


## Airway: Foreign Body Obstruction

(NCCEP Procedure AP-13)

### Procedure

1. Assess degree of airway obstruction by visualization and / or auscultation
2. Do not perform blind finger sweeps in the mouth/oro-pharynx
3. For infant:
  - A. Deliver five (5) back blows
  - B. If no relief of obstruction, deliver five (5) chest thrusts
  - C. If no relief of obstruction, repeat cycle
4. For child:
  - A. Perform sub diaphragmatic thrusts until obstruction relieved
5. For non-pregnant adult:
  - A. Perform sub diaphragmatic thrusts
  - B. If no relief of obstruction, perform chest thrusts
6. For pregnant adult:
  - A. Perform chest thrusts
7. If patient becomes unresponsive perform direct visualization via direct laryngoscopy and if visible remove foreign body using Magill forceps
8. Initiate CPR / ACLS as indicated by patient condition



## Assessment: Adult

(NCCEP procedure ASP-1)

### Airway

1. Assess airway patency
2. Open airway using standard maneuvers (head tilt/chin lift, jaw thrust)
  - A. Utilize jaw thrust maneuver only in patients with potential c-spine injury
3. Insert oral-pharyngeal airway or nasal-pharyngeal airway as indicated
4. Suction as needed to maintain open airway
5. Assess patient's ability to protect airway per [Intubation Protocol](#)

### Breathing

1. Assess respiratory effort and rate
2. Assess breath sounds
3. Assess pulse oximetry
4. Supplemental oxygen as indicated (nasal cannula, face-mask, BVM) based on respiratory assessment, SpO<sub>2</sub> as available
5. Intubate as condition indicates per [Intubation Protocol](#)

### Circulation

1. Assess presence and quality of pulses
2. Assess skin color and level of consciousness
3. Obtain baseline vital signs and initiate continuous ECG monitoring
4. Assess need for intravenous access and fluid resuscitation
5. Control major hemorrhage

### Disability

1. Assess neurological status
  - A. Assess GCS (record lowest and current) or AVPU level of alertness
  - B. Assess for focal neurological deficits

### Additional Considerations

- \* Ensure scene size up, scene safety, and universal precautions
- \* Patient assessment is to be performed on every patient encounter
- \* Assess all applicable vital signs (HR, RR, BP, SpO<sub>2</sub>, ETCO<sub>2</sub>)
- \* Perform focused physical exam based on **patient's** history and presentation
- \* Additional care per appropriate patient care protocol
- \* Reassess patient throughout transport
- \* Adjust care as patient response to treatment warrants
- \* At any point there is a change in the patient's condition restart reassessment

## Assessment: Pain

(NCCEP procedure ASP-2)

### Indications

- \* Assessment of patient's subjective level of pain

### Procedure

1. Assess patient's interpretation of his/her pain
2. 0 – 10 numerical scale
  - A. Zero (0) = no pain
  - B. Ten (10) = worst pain ever
3. Wong – Baker faces scale



A.  
From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: *Wong's Essentials of Pediatric Nursing*, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc

4. FLACC scale
  - A. For use in pre-verbal children or children with cognitive impairment

| Category      | Scoring                  |                                     |                                       |
|---------------|--------------------------|-------------------------------------|---------------------------------------|
|               | 0                        | 1                                   | 2                                     |
| Face          | No particular expression | Occasional grimace or frown         | Frequent quivering chin, clenched jaw |
| Legs          | Normal, relaxed          | Restless, uneasy, tense             | Kicking, drawn up                     |
| Activity      | Normal                   | Squirming, tense, constant shifting | Arched, rigid, jerking                |
| Cry           | None                     | Moans, whimpers                     | Steadily crying, screams, sobs        |
| Consolability | Content, relaxed         | Reassured, distractible             | Difficult to console or comfort       |

5. [Pain Control Protocol](#)
6. Assess patient's response to pain management

### Additional Considerations

- \* Pain is subjective
- \* Measure the patient's perception of his/her pain

**Assessment: Pediatric****(NCCEP procedure ASP-3)****Airway**

1. Assess airway patency
2. Open airway using standard maneuvers (head tilt/chin lift, jaw thrust)
3. Insert oral-pharyngeal airway or nasal-pharyngeal airway as indicated
4. Suction as needed to maintain open airway
5. Assess patient's ability to protect airway per [Airway: Pediatric Protocol](#)

**Breathing**

1. Assess respiratory effort and rate
2. Assess breath sounds
3. Assess pulse oximetry
4. Supplemental oxygen as indicated (nasal cannula, face-mask, BVM) based on respiratory assessment, SpO<sub>2</sub> as available

**Circulation**

1. Assess presence, quality of pulses, and capillary refill
2. Assess skin color and level of consciousness
3. Obtain baseline vital signs and initiate continuous ECG monitoring
4. Assess need for intravenous access and fluid resuscitation

**Disability**

1. Assess neurological status
  - A. Assess GCS (record lowest and current) or AVPU level of alertness
  - B. Assess for focal neurological deficits

**Additional Considerations**

- \* Ensure scene size up, scene safety, and universal precautions
- \* Patient assessment is to be performed on every patient encounter
- \* Assess all applicable vital signs (Temperature, HR, RR, BP, SpO<sub>2</sub>, ETCO<sub>2</sub>)
- \* Utilize Broselow-Luten tape, airway card, or similar system to assist with equipment sizes and medication dosages
- \* Perform a focused physical exam based on patient's history
- \* At any point there is a change in the patient's condition start reassessment at ABC's
- \* Obtain blood glucose level for altered mental status, suspected hypoglycemia, sepsis, seizure, or toxic appearing child

## Blood Glucose Analysis

(NCCEP procedure ASP-4)

### Indications

- \* Need for measurement of blood glucose level
  - Altered mental status
  - Bizarre behavior
  - Diabetes
  - Seizure
  - Unconscious

### Contraindications

- \* None

### Procedure

1. Prepare equipment ensuring QA has been performed on glucometer
  - A. Glucometer
  - B. Reagent test strip
  - C. Alcohol pad
  - D. lancet
2. Cleanse the anterolateral aspect of the digit with alcohol
3. Obtain blood sample via standard lancet technique
4. Place blood on reagent test strip and place test strip into glucometer
5. Assess glucometer measurement
6. [Diabetic Problems Protocol](#) as indicated by glucose measurement
7. Repeat as necessary based on patient's condition

### Additional Considerations

- \* "E" Codes
  - E-1 = damaged test strip or incorrect code key
  - E-2 = incorrect code key
  - E-3 = glucose level extremely high or test strip/meter error
  - E-4 = not enough blood
  - E-5 = code key from expired test strips
  - E-6 = blood applied to test strip before flashing blood drop symbol appeared
  - E-7 = electronic error
  - E-8 = temperature above or below proper range for the system
  - E-9 = low battery
  - E-10 = date/time settings incorrect

## Capnography

(NCCEP procedure ASP-5)

### Indications

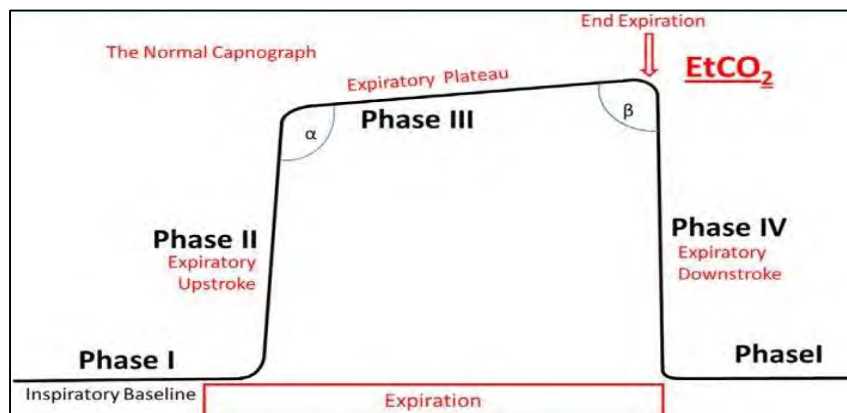
- \* All patients being ventilated with adjunct airway device in place (ETT, King-LT)

### Procedure

1. Prepare equipment
2. Attach in-line  $\text{ETCO}_2$  monitor to device and Phillips MRx monitor
3. Ensure  $\text{ETCO}_2$  waveform is displayed on Phillips MRx monitor
4. Attach strip of  $\text{ETCO}_2$  waveform from the Phillips MRx monitor with the PCR

### Additional Considerations

- \* Any change in the  $\text{ETCO}_2$  waveform mandates a need to immediately re-assess airway device and confirm position
- \* Normal  $\text{ETCO}_2 = 35 - 45$  mm Hg
- \* Normal waveform:



## Pulse Oximetry

(NCCEP procedure ASP-6)

### Indications

- \* Need to assess patient's oxygen saturation
- \* Included in standard set of initial vital signs
- \* All intubated patients

### Procedure

1. Prepare equipment
2. **Attach pulse oximetry sensor to patient's finger in standard fashion**
3. Assess oximetry measurement
  - A. Verify pulse rate per SpO<sub>2</sub> monitor with patient's palpated pulse rate
4. Further treatment per appropriate patient condition protocol

### Additional Considerations

- \* Factors which may adversely affect pulse oximetry readings
  - Poor peripheral circulation
    - Hypotension
    - Hypothermia
  - Fingernail polish
  - Ambient light
  - Irregular cardiac rhythms
  - Carbon monoxide
    - May give false oxygen saturation level as oximetry is unable to determine hemoglobin saturated with CO vs. O<sub>2</sub>
- \* Use the pulse oximetry as an added tool for patient evaluation
  - Treat the patient, not just the data provided by the device
  - SpO<sub>2</sub> reading should never be used to withhold oxygen from a patient in distress
- \* Supplemental oxygen is not required if the SpO<sub>2</sub> is  $\geq 94\%$ , unless there are obvious signs of heart failure, dyspneic, or hypoxic to maintain to 94%

**Stroke Screen: Cincinnati Prehospital****(NCCEP Procedure ASP-8)****Facial Droop:**

- \* Ask patient to smile and show their teeth
  - Normal: Both sides of face move equally
  - Abnormal: One side of face does not move at all

**Arm Drift:**

- \* Ask patient to hold both arms straight out for 10 seconds
  - Normal: Both arms move equally or not at all
  - Abnormal: One arm drifts compared to the other

**Speech:**

- \* Ask patient to repeat phrase: *"You can't teach an old dog new tricks"*
  - Normal: Patient uses correct words with no slurring
  - Abnormal: Slurred or inappropriate words or mute

**Code Stroke**

- \* Less than 24 hours from symptoms onset



## Temperature Measurement

(NCCEP Procedure ASP-9)

### Indications

- \* Need for temperature measurement

### Procedure

1. Place thermometer probe in standard fashion with appropriate probe cover utilized
2. Exergen Temporal Thermometer
  - A. Gently position the probe flush (flat) on the center of the forehead, midway between the eyebrow and the hairline
  - B. Press and hold the SCAN button
  - C. Lightly slide the thermometer across the forehead keeping the sensor flat and in contact with the skin until you reach the hairline
  - A. Lift probe from forehead and touch on neck just behind the ear lobe
  - B. Release the SCAN button and remove the thermometer from the head
  - C. Read the temperature on the display
  - D. Document the temperature in the vitals section of the PCR
3. Assess thermometer reading
4. Further care per appropriate protocol
  - A. [Fever Protocol](#)
  - B. [Heat / Cold Exposure Protocol](#)
  - C. [Post-Resuscitation: Hypothermia Protocol](#)
5. Reassess as indicated by patient condition



## **Orthostatic Blood Pressure Measurement (NCCEP Protocol ASP-10)**

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### **Indications**

- \* Need to further assess potential for significant intravascular volume depletion
- \* History of syncope potentially related to volume depletion

### **Contraindications**

- \* Patient unable to stand or cooperate with procedure
- \* Altered mental status
- \* Suspect pelvic, lower extremity fracture, or need for spinal motion restriction
- \* Hypotension in supine position

### **Procedure**

1. Obtain heart rate and blood pressure with the patient in the supine position
2. Patient should stand for two (2) minutes
3. Obtain heart rate and blood pressure with the patient standing
4. Positive results
  - A. Patient becomes symptomatic (lightheaded, dizzy, near-syncope)
  - B. 30 BPM rise in heart rate
5. For positive refer to appropriate protocol based on cause of volume depletion

### **Additional Considerations**

- \* If patient becomes symptomatic or significantly tachycardic at any time, immediately return patient to supine position

## 12-Lead ECG

(NCCEP Procedure CSP-1)

### Indications

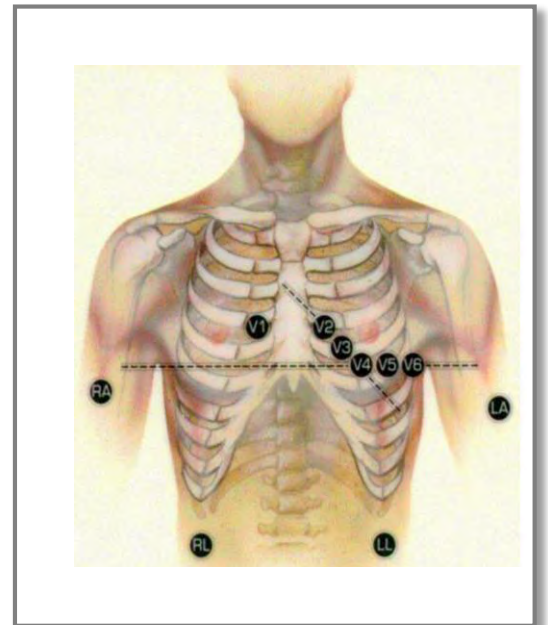
- \* Abnormal rhythm noted on 4-lead ECG
- \* Electrical injuries
- \* Suspected tricyclic antidepressant overdose
- \* Symptoms suspected of cardiac etiology
- \* Syncope

### Contraindications

- \* Unstable patient requiring immediate definitive care

### Procedure

1. Prepare Phillips MRx monitor
2. Apply monitor leads as follows:
  - RA – right arm
  - LA – left arm
  - RL – right leg
  - LL – left leg
  - V1 – 4<sup>th</sup> intercostal space, right sternal border
  - V2 – 4<sup>th</sup> intercostal space, left sternal border
  - V3 – ½ way between V2 & V4
  - V4 – 5<sup>th</sup> intercostal space midclavicular line
  - V5 – level with V4, anterior axillary line
  - V6 – level with V4, mid-axillary line
3. Acquire ECG data and print ECG
4. Review ECG and computer interpretation of ECG
5. Contact MCO for any changes in ECG
6. Attach copy of ECG to the PCR



### Additional Considerations

- \* In patient with potential for STEMI the goal is to obtain 12-lead ECG within 8 minutes of arrival on scene
- \* Patients with 12-lead ECG performed at the referring facility do not require additional ECG by MEDIC unless there is a significant **change in the patient's clinical status**

## Cardiac: Cardioversion

## (NCCEP Procedure CSP-2)

### Indications

- \* Unstable tachydysrhythmia

### Contraindications

- \* Patient is pulseless

### Procedure

1. Assess vital signs and continuous ECG rhythm
2. Apply pacing electrodes
  - A. Anterior / Posterior
  - B. Parasternal / Apex
  - C. Patient must be maintained on continuous ECG monitoring as well
3. **Based on patient's hemodynamic status**
  - A. Midazolam (Versed®) 5 mg IM or 5 – 10 mg IN
  - B. Fentanyl (Sublimaze®) 1 mcg/kg IV, IM, or IN (maximum 100 mcg)
4. Set mode to synchronized
5. Set energy selection to 50 – **150 Joules based on patient's cardiac rhythm**
6. Ensure all personnel are clear from contact with the patient
7. Depress cardioversion button
  - A. Note: synchronized shock may be delayed several cardiac beats as monitor synchronizes to patient rhythm
11. **Assess patient's response to cardioversion**
12. For persistent dysrhythmia increase energy and attempt cardioversion again
13. **Assess patient's response to cardioversion**
14. For dysrhythmia persists, contact MCO
15. If rhythm deteriorates into ventricular fibrillation or pulseless rhythm, immediately follow appropriate protocol for the new dysrhythmia

### Additional Considerations

- \* Energy levels for cardioversion
  - Atrial fibrillation: 150 Joules
    - Repeat at 150 Joules as indicated
  - Atrial flutter: 50 joules
    - Repeat at 100 Joules then 150 Joules as indicated
  - AV nodal re-entrant tachycardia: 50 joules
    - Repeat at 100 Joules then 150 Joules as indicated
  - Ventricular tachycardia: 100 joules
    - Repeat at 150 Joules as indicated

## Cardiac: External Pacing

(NCCEP Procedure CSP=3)

### Indications

- \* Bradycardias with hemodynamic compromise and unresponsive to initial drug therapy
  - Symptomatic 2°, or 3° AVB
  - Symptomatic sick sinus syndrome
  - Symptomatic idioventricular bradycardia
  - Symptomatic atrial fibrillation with slow ventricular response
  - Bradycardia with malignant ventricular escape rhythms
  - Drug induced bradycardia (beta-blockers, calcium channel blockers...)
  - Permanent pacemaker failure

### Contraindications

- \* Asystole cardiac arrest
- \* Bradycardia secondary to hypothermia

### Procedure

1. Assess vital signs and cardiac rhythm
2. Apply pacing pads to patient
  - A. Anterior (-) / Posterior (+)
  - B. Parasternal (-) / Apex (+)
3. **Based on patient's hemodynamic status**
  - A. Midazolam (Versed®) 5 mg IM or 5 – 10 mg IN
  - B. Fentanyl (Sublimaze®) 1 mcg/kg IV, IM, or IN (maximum 100 mcg)
4. Set monitor to pacing mode
  - A. Set HR to 80 beats per minute adult, 100 beats per minute child
  - B. Set milliamp to 10 mA and slowly increase milliamp output until electrical capture noted on monitor
5. Check pulse for mechanical capture
  - A. If no mechanical capture, increase milliamp output until mechanical capture achieved
6. Reassess vital signs and patient condition

### Additional Considerations

- \* Potential symptoms indicating need to initiate external pacing
  - Altered mental status, confusion
  - Chest pain
  - Hypotension
  - Pulmonary edema
- \* Any medication patches (nitroglycerin, clonidine) should be removed prior to pacer pad application

## **Cardiac: Cardiopulmonary Resuscitation (NCCEP Procedure CSP-4)**

### **Indication**

- \* Basic life support for the patient in cardiac arrest
- \* Basic life support for neonatal bradycardia

### **Procedure**

1. Assess for pulse, respirations, responsiveness
2. Perform basic airway maneuver to assess for spontaneous respiratory effort
  - A. Perform jaw thrust if concern for potential cervical spine injury
  - B. Place infants in sniffing position
  - C. For pediatric patient provide two (2) ventilations if no respiratory effort
3. Assess continuous ECG monitoring
4. If no pulse and rhythm appropriate for defibrillation:
  - A. EMS witnessed: [\*\*Ventricular Fibrillation / Pulseless Ventricular Tachycardia Protocol\*\*](#)
  - B. NOT EMS witnessed: initiate chest compressions
5. If no pulse and rhythm not appropriate for defibrillation initiate chest compressions
  - A. Compression rate = 100 – 110/minute
    - i. Infants & children: compress 1/3 – 1/2 depth of the chest
    - ii. Adults: compress 2 inches
6. Reassess pulse/rhythm after 200 compressions
  - A. Provider administering compressions must count aloud every 20<sup>th</sup> compression delivered
7. Place BIAD or initiate BVM ventilations
  - A. Provide ventilations at a rate of 6/minute
    - i. Provide ventilation as provider administering compressions counts aloud every 20<sup>th</sup> compression
  - B. Ensure hyperventilation does NOT occur
  - C. If patient has airway device in place, compressions / breaths do NOT need to be synchronized
8. IVF resuscitation
9. If rhythm changes initiate appropriate new protocol

### **Additional Considerations**

- \* Refer to appropriate ACLS protocol based on rhythm noted and patient condition

## Cardiac: Defibrillation – Automated

(NCCEP Procedure CSP-5)

### Indications

- \* Non-traumatic cardiac arrest in patients > 1 year of age

### Notes

- \* Adult pads:  $\geq$  8 years of age or  $\geq$  55 pounds (25 kg)
- \* Pediatric pads: < 8 years of age or < 55 pounds (25 kg)

### Procedure

1. Confirm cardiac arrest
2. Initiate CPR until AED available
3. Expose chest
4. AED with properly placed battery is ready when:
  - A. An “hourglass” should alternate with a black screen in the AED upper right-hand corner
  - B. If anything, other than this appears, continue CPR and troubleshoot AED
5. Turn AED on and attach AED pads to patient
  - A. Adult
    - i. Inferior to right clavicle
    - ii. Left mid axillary line
  - A. Pediatric
    - i. Anterior chest between nipples
    - ii. Posterior back between scapula
    - iii. Pads must not be touch each other
6. Plug pads into connector next to flashing light
7. Hold CPR and clear the patient for rhythm analysis
8. **Press “Analyze” button**
9. **Defibrillate if AED determines “shock advised”**
  - A. Ensure all personnel clear from contact with patient before energy is delivered and **depress “shock” button**
  - B. **If “no shock advised” continue CPR for 200 compressions and then reanalyze rhythm**
10. Immediately re-establish CPR for 200 compressions (~ two [2] minutes)
11. Assess for pulse
12. For no pulse repeat steps 8 through 9
13. With return of spontaneous circulation initiate **Post Resuscitation Protocol**

## Cardiac: Defibrillation – Manual

(NCCEP Procedure CSP-6)

### Indications

- \* Ventricular fibrillation or pulseless ventricular tachycardia

### Management

1. Initiate CPR until defibrillation available
2. Confirm rhythm on Phillips MRx monitor
  - A. EMS witnessed; defibrillate immediately once defibrillator available
  - B. NON-EMS witnessed; perform CPR for 200 compressions prior to defibrillation
3. Attach defibrillation pads
  - A. Adult
    - i. Inferior to right clavicle
    - ii. Left mid axillary line
  - B. Pediatric
    - i. Anterior chest between nipples
    - ii. Posterior back between scapula
    - iii. Pads must not be touch each other
4. Select energy level
  - A. **Ventricular Fibrillation / Pulseless Ventricular Tachycardia Protocol**
5. Charge defibrillator
6. Ensure all personnel clear from contact with patient
7. Press “**shock**” button to deliver energy to patient
8. Immediately resume CPR
9. CPR for 200 compressions
  - A. Ensure provider performing compressions counts aloud every 20<sup>th</sup> compression
10. Pre-charge defibrillator at compression #180
11. Reassess pulse and rhythm
12. For no pulse and rhythm requires defibrillation repeat steps 5 through 9

### Additional Considerations

- \* Any time rhythm changes convert to appropriate ACLS protocol
- \* Goal is to defibrillation within 6 seconds of holding CPR



## Parenteral Arterial: Line Maintenance

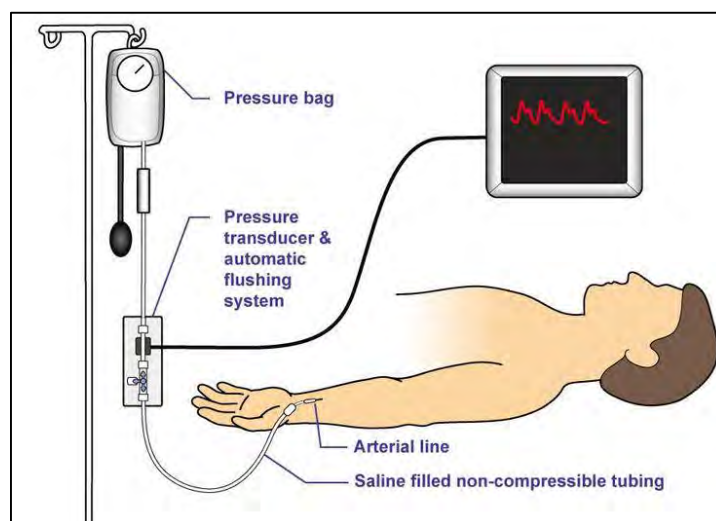
(NCCEP procedure PAS-2)

### Indications

- \* Patient with previously placed arterial line

### Procedure

1. Ensure line is secured
2. Assess site for potential complications of insertion
3. Assess distal extremity perfusion
4. Exchange of transducer line should occur at site closest to patient connection
5. Set the transducer at the level of **the patient's right atrium**
6. Set Phillips MRx for monitoring of arterial pressure wave form
7. Verify pressure measurements with manual pressure for question as to accuracy of arterial line measurements



### Additional Considerations

- \* Do NOT utilize arterial line for administration of fluids or medications

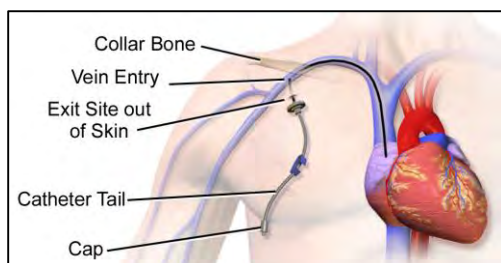
## Parenteral Access: Central Line Maintenance (NCCEP Procedure PAS-4)

### Procedure

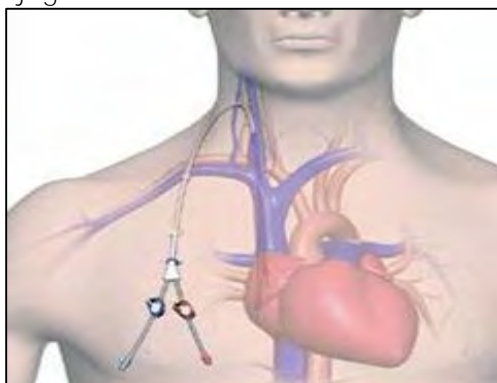
1. Assess line entrance site and depth of insertion
2. Ensure the line is secured in place
3. If catheter becomes dysfunctional or becomes dislodged discontinue infusions and contact medical control

### Additional Considerations

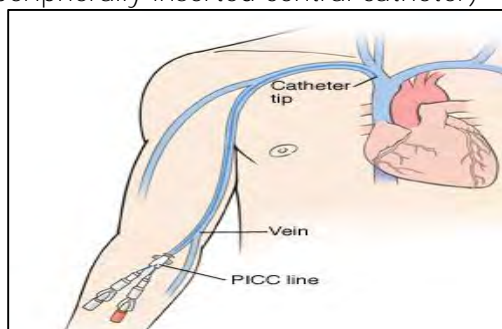
- \* Do NOT manipulate the catheter during transport
- \* Catheter may be utilized for medication and IVF administration if position has been verified by referring physician prior to transport
- \* Subclavian catheter



- \* Internal jugular catheter



- \* PICC (peripherally inserted central catheter)



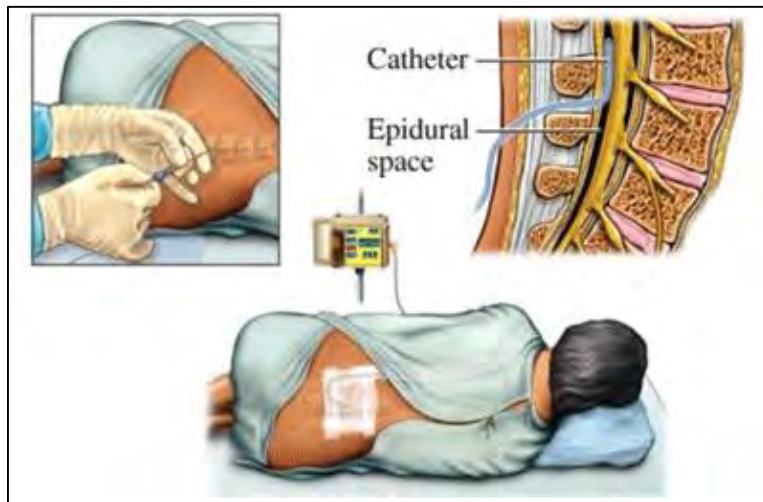
## **Parenteral Access: Epidural Maintenance (NCCEP procedure PAS-5)**

### **Procedure**

1. Ensure catheter is secured
2. Verify any medication, concentration, and dose of medication infusing
3. Assess catheter for any complications to site or catheter placement

### **Additional Considerations**

- \* Do not adjust catheter position
- \* Do not adjust medications without consultation with the referring or accepting physician or Medical Control
- \* Catheter:



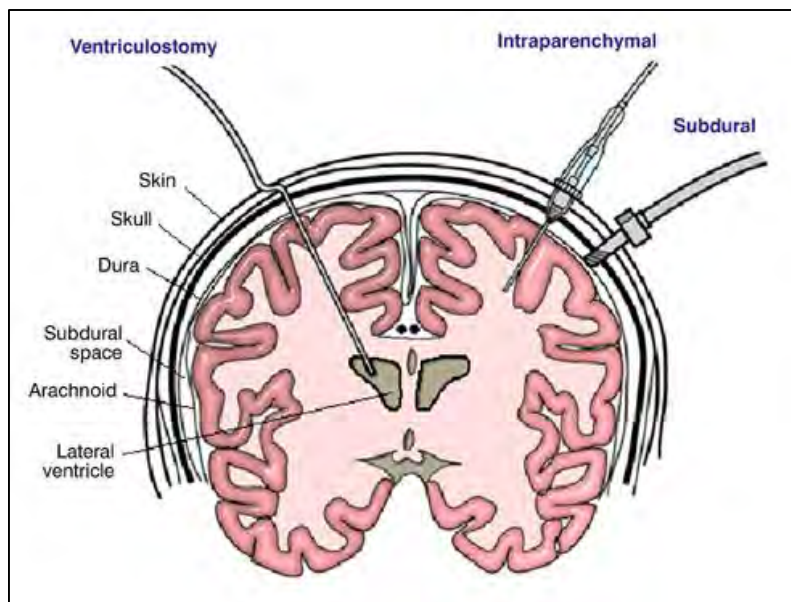
## **Parenteral Access: Ventricular Maintenance (NCCEP Procedure PAS-6)**

### **Procedure**

1. Ensure catheter is secured in place
2. Maintain patient position during transport
3. Maintain catheter drain height in relation to patient during transport

### **Additional Considerations**

- \* Do NOT adjust catheter position



## **Venous Access: Existing Catheters**

**(NCCEP Procedure PAS-7)**

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### **Procedure**

1. Ensure catheter secured
2. Clean catheter port in standard aseptic fashion
3. Attempt flush with sterile saline
4. Assess for infiltration
5. If no difficulties: IVF or medication per appropriate protocol

## **Venous Access: External Jugular Access (NCCEP Procedure PAS-8)**

### **Indications**

- \* Need for IV access in a patient > 8-years of age with no extremity vein obtainable

### **Anatomy**

- \* The external jugular vein begins just posterior to the angle of the mandible
- \* The EJV traverses inferiorly and diagonally over the sternocleidomastoid muscle
- \* The EJV dives deep at the midpoint of the clavicle to empty into the subclavian vein

### **Contraindications**

- \* Absolute
  - Inability to locate landmarks (local hematoma, infection)
  - Subcutaneous emphysema (unless landmarks clearly identifiable)
- \* Relative
  - Cervical collar – if access can be obtained without affecting cervical spine motion restriction then procedure may be performed

### **Complications**

- \* Hematoma
- \* Infection
- \* Phlebitis
- \* Thrombosis

### **Procedure**

1. Prepare equipment
2. Place patient in supine position in mild Trendelenburg (if no contraindications)
3. Turn head to opposite side (if no cervical spine precautions warranted)
4. Locate landmarks
5. Local prep as per peripheral IV site prep
6. Align angiocath over the vein with needle bevel toward the ipsilateral AC joint
7. **"Tourniquet" the vein by pressing on it just superior to the clavicle**
8. Puncture the skin @ 45° angle midway between the angle of the jaw and clavicle
9. Once blood return is noted advance the catheter over the needle
10. Remove needle and place gloved finger over the catheter to prevent air from entering
11. Attach IV tubing and set flow rate
12. Secure line in place with appropriate dressing or tape



### **Additional Considerations**

- \* Do not attempt opposite side of neck following unsuccessful attempt(s) on one side

## Parenteral Access: Venous-Extremity

(NCCEP Procedure PAS-9)

### Objective

- \* Establishment of intravenous access for fluid resuscitation or medication administration in patients with an emergent or potentially emergent medical or traumatic condition

### Procedure

1. Assess patient
  - A. Assess for need for IVF resuscitation
  - B. Assess for need for IV medication administration
2. Upper extremity sites are preferable to lower extremity sites
3. Establish peripheral IV
  - A. Follow standard IV catheter insertion procedure
    - i. Prepare equipment
    - ii. Place constricting band above potential insertion site to restrict venous flow
    - iii. Select site and prep skin in standard fashion
    - iv. Place catheter over needle in standard fashion
    - v. Remove needle and flush catheter with sterile saline
    - vi. Place prn adapter and release constricting band
    - vii. Secure catheter/adapter in place in standard fashion
  - B. For trauma patients establish two (2) large bore IV lines (16G or larger)
4. For IVF
  - A. Fill drip chamber 1/2 full and flush tubing
  - B. Set drip at desired rate as per patient condition
5. If standard peripheral IV access not obtainable or additional access is required
  - A. External Jugular Line per [Parenteral Access: EJ Procedure Protocol](#)
  - B. Intraosseous Line per [Parenteral Access: IO Procedure Protocol](#)
6. If access is not obtainable
  - A. Contact Medical Control for possibility of accessing pre-existing indwelling venous catheters (Dialysis catheters)
    - i. Implanted ports (Hickman, Broviac, etc.) should NOT be accessed as they require specialized needles/equipment not carried by MEDIC
  - B. Pre-existing indwelling venous catheters may be used without Medical Control contact in the event of cardiac arrest or life-threatening condition

## Parenteral Access: Intraosseous

(NCCEP Procedure PAS-11)

### Objective

- \* To secure vascular access in a patient without a peripheral vein obtainable
- \* MEDIC will utilize the EZ-IO™ device

### Indications

- \* Rapid, temporary vascular access when IV access is not readily available in a patient that is hemodynamically unstable or has potential to become hemodynamically unstable
- \* Rapid, temporary vascular access when IV access is not readily available in a patient that requires emergent medication treatment
- \* Cardiac Arrest

### Contraindications

- \* Absolute
  - Easily obtainable (and appropriate) peripheral access
  - Fracture in the same bone
  - Previous orthopedic procedures in same bone
  - Recent attempt at IO access in same bone
- \* Relative
  - Infection / cellulitis in overlying skin
  - Burn in skin and tissue overlying the site
  - Significant pre-existing medical condition (tumor, peripheral vascular disease)
  - Obesity
  - Osteogenesis imperfecta

### Anatomy

- \* Primary site
  - Proximal tibia
    - Anteromedial surface
    - 2 cm distal to the tibial tuberosity
    - Utilize the blue or yellow needle-based amount of soft tissue to reach bone
- \* Secondary sites
  - humerus (patients > 40 kg)
    - Lateral aspect
    - 2 cm distal to the greater tuberosity
    - Utilize the yellow needle
  - Distal tibia
    - Anteromedial surface
    - 2 – 4 cm proximal to the medial malleolus, midline along the tibia



## Equipment

- \* EZ-IO™ driver
- \* EZ-IO™ needle set
- \* EZ-IO™ armband
- \* Skin prep
- \* Extension set
- \* 10ml syringe
- \* Normal saline IVF
- \* Pressure bag
- \* Lidocaine – 2% preservative free or 1% plain

## Procedure

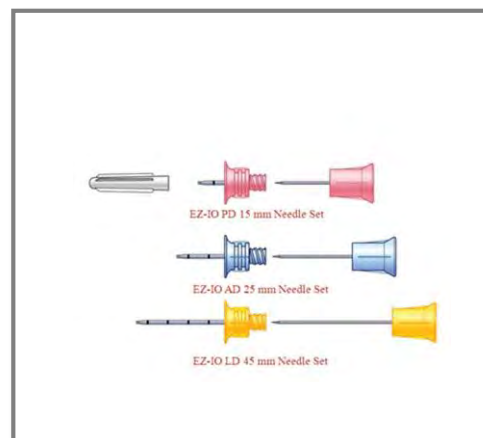
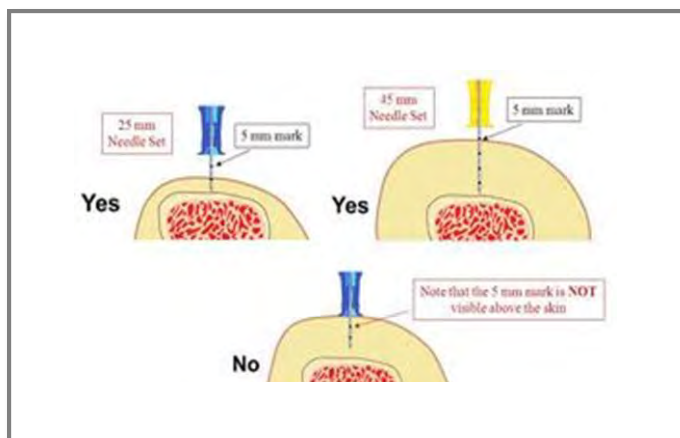
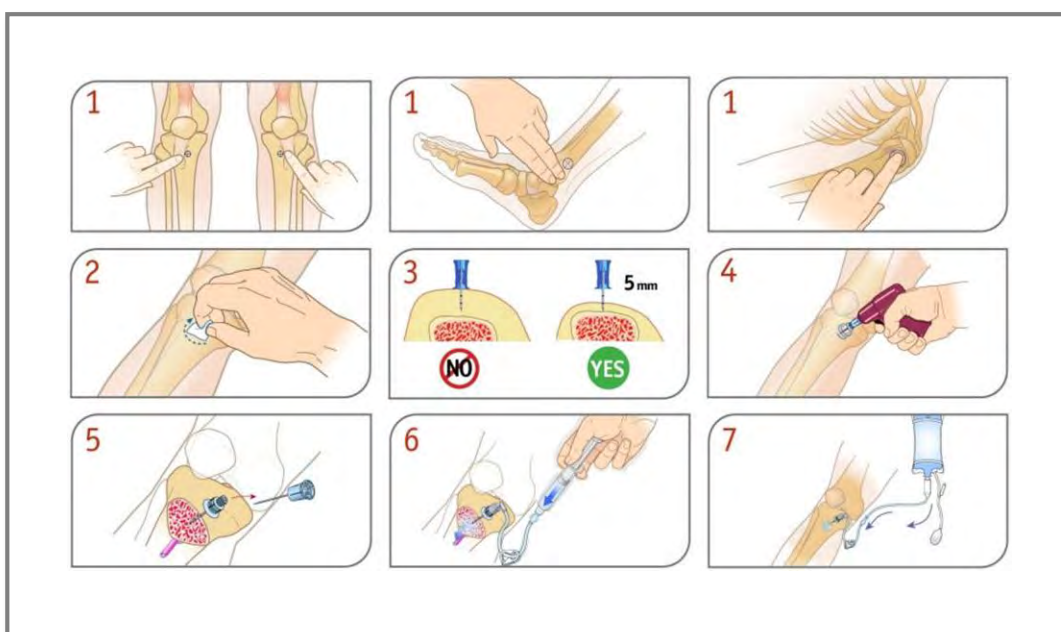
1. Locate insertion site and landmarks
2. Prep insertion site area with aseptic technique
3. For conscious patient – consider infusion of plain lidocaine locally at insertion site
4. Prepare EZ-IO™ driver and needle set
  - A. Select proper needle set (blue, or yellow) based on patient weight
  - B. Pink needle should only be selected for neonatal patients
5. Stabilize the extremity
6. Position needle perpendicular (90°) to the surface of the bone
7. Insert the EZ-IO™ needle set
  - A. Stop when needle flange touches the skin or sudden decrease in resistance is felt
  - B. At least one 5 mm mark should be visible above the skin once the needle is inserted
8. Remove the EZ-IO™ driver
9. Remove stylet from needle set
10. Confirm placement
  - A. Utilize syringe to aspirate blood and flush with 10 ml saline
11. For conscious patient consider for line comfort:
  - A. adults: 20 – 40 mg (1 – 2 ml) of lidocaine 2% (preservative free) IO
  - B. pediatrics: 0.5 mg/kg of lidocaine 2% (preservative free) IO
12. Secure needle in place
13. Connect IVF / medication(s)
  - A. Initiate infusion of IVF via pressure bag for adults
  - B. Utilize syringe for pediatric patients
14. Attach EZ-IO™ **notification wristband on patient's wrist**

## Removal Procedure

1. Attach syringe to EZ-IO™
2. Turn clockwise pull gently pulling in a straight direction while applying pressure to the insertion site
3. Dress site with usual methods

### Additional Considerations

- \* For swelling or soft tissue infiltration noted at IO site – discontinue and remove needle
- \* EZ-IO™ may remain in place for 24 hours
- \* Place EZ-IO™ armband on patient to identify to subsequent care-givers of IO in place and date and time of insertion



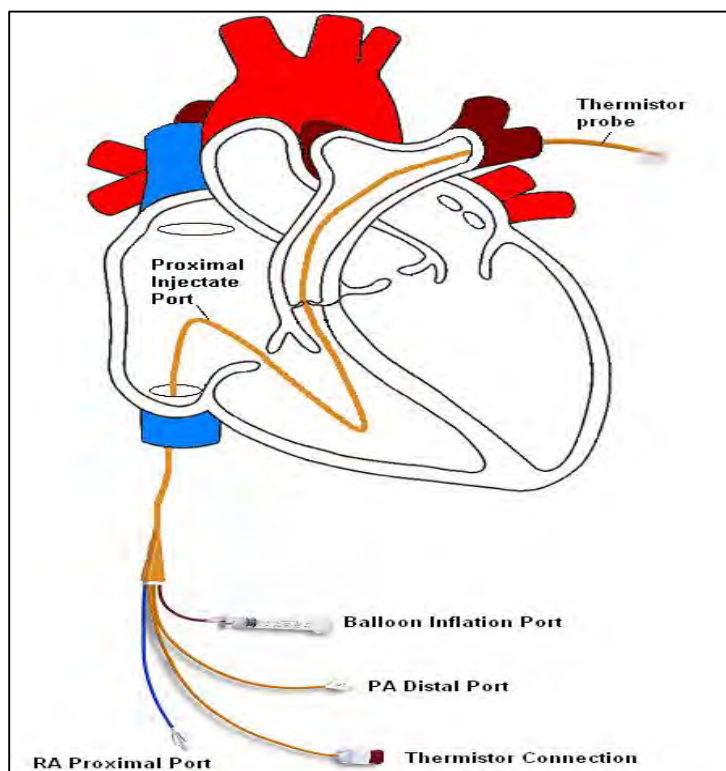
## **Parenteral Access: Swan Ganz Maintenance (NCCEP Procedure PAS-12)**

### **Procedure**

1. Ensure the catheter is secured in place
2. Record the depth of insertion of the catheter
3. Do NOT manipulate the catheter during transport
4. Catheter ports may be utilized for continuation of fluids and / or medications
5. Catheter ports may be utilized for access during transport as needed utilizing standard sterile technique

### **Complications**

- \* Advancement of distal tip of catheter
- \* Bleeding
- \* Dysrhythmia – if tip of catheter is withdrawn to right ventricle of heart



## Airway: Suctioning Advanced

(NCCEP Procedure RSP-1)

### Indications

- \* Obstruction of airway of patient who can no longer maintain a clear airway
- \* Obstruction of a previously placed airway device by secretions, blood, etc.

### Contraindications

- \* None

### Complications

- \* Aspiration
- \* Hypoxia
- \* Laryngospasm
- \* Trauma
- \* Vomiting

### Procedure

1. Pre-oxygenate patient as indicated by patient condition
2. Prepare equipment
  - A. Flexible suction catheter
  - B. Suction tubing
  - C. Suction
  - D. Canister
3. Assess desired depth of suction catheter insertion through standard techniques
4. Remove patient from BVM or mechanical ventilation device if attached
5. Insert suction catheter into airway device
  - A. Ensure that thumb port of suction catheter is uncovered
  - B. Once desired depth of placement is reached occlude the thumb port and withdrawal the suction catheter
  - C. Small amount of normal saline may be instilled to loosen secretions if required
  - D. Suction time should not be > 5 seconds
6. Replace the ventilation device previously in use
7. **Assess patient's response to suctioning**
8. Repeat suctioning as indicated by patient condition

## Airway: Suctioning Basic

(NCCEP procedure RSP-2)

### Indications

- \* Obstruction of airway of patient who can no longer maintain a clear airway
- \* Obstruction of a previously placed airway device

### Contraindications

- \* None

### Complications

- \* Aspiration
- \* Hypoxia
- \* Laryngospasm
- \* Trauma
- \* Vomiting

### Procedure

1. Exam oropharynx and remove potential foreign bodies or other material which may occlude the airway
2. Preoxygenate patient as indicated by patient condition
3. Prepare equipment
  - A. Yankauer suction handle
  - B. Suction tubing
  - C. Suction canister
4. Place suction device into oropharynx
  - A. Alert and cooperative patient may be permitted to perform the suctioning themselves as desired
5. **Assess patient's response to suctioning**
6. Continue airway management as indicated by patient condition

## **Respiratory: Nebulizer Inhalation Therapy (NCCEP Procedure RSP-3)**

### **Indications**

- \* Bronchospasm

### **Contraindications**

- \* Acute congestive heart failure exacerbation

### **Complications**

- \* Nausea
- \* Tachycardia
- \* Tremors

### **Procedure**

1. **Breathing Problems Protocol**
2. Assemble equipment in standard fashion
  - A. Nebulizer chamber
  - B. Mouthpiece
  - C. Oxygen tubing
3. Instill albuterol solution in nebulizer chamber and secure top with mouthpiece to chamber
  - A. Secure facemask to chamber if utilizing mask nebulizer
4. Connect device to oxygen source at adequate flow rate to produce steady visible mist
5. The patient needs to form a good seal around the mouthpiece and inhale normally
  - A. **Place mask over patient's face if utilizing mask nebulizer**
  - B. **Ensure oxygen is on prior to placing mask over patient's face**
6. Continue therapy until all the solution has been depleted
7. Assess response to therapy and repeat as indicated



## Respiratory: NIPPV (CPAP)

(NCCEP Procedure RSP-4)

### Indications

- \* Respiratory distress due to pulmonary edema / CHF
- \* Respiratory distress due to asthma / COPD
- \* Respiratory distress due to pneumonia / aspiration
- \* Submersion with possible aspiration
- \* Toxic inhalation unresponsive to nebulizer therapy

### Contraindications

- \* Systolic BP < 80 mm Hg
- \* GCS < 8
- \* Age < 14 years
- \* Uncooperative patient
- \* Inability of patient to handle secretions
- \* Respiratory distress due to trauma or possible pneumothorax

### Procedure

1. Discuss procedure with the patient
2. Check equipment
  - A. Oxygen source
  - B. Tubing
  - C. Mask
3. Place patient in a comfortable
4. Ensure head of bed elevated  $\geq 30^\circ$
5. Ensure continuous monitoring
6. Ensure adequate oxygen source to device
7. **Place mask of device over patient's mouth & nose ensuring tight seal**
8. Place harness on patient and adjust to ensure tight fitting seal and secure in place
9. Initiate positive pressure at 5 cm H<sub>2</sub>O and slowly titrate to achieve optimum results

#### **Condition**

#### **Maximum pressure**

|                                       |                            |
|---------------------------------------|----------------------------|
| Congestive heart failure              | 5 – 15 cm H <sub>2</sub> O |
| Toxic inhalation unresponsive to nebs | 5 – 15 cm H <sub>2</sub> O |
| Submersion with possible aspiration   | 5 – 15 cm H <sub>2</sub> O |
| Asthma, COPD, reactive airway disease | 3 – 15 cm H <sub>2</sub> O |

10. **Assess patient's response to treatment**
11. **Adjust pressure as indicated by patient's response**
  - A. Discuss with patient as pressure is increased
  - B. Minimize pressure adjustments as much as possible
12. Additional care per appropriate protocol

**Additional Considerations**

- \* As per patient presumptive diagnosis provide albuterol via nebulization in-line with CPAP
- \* Patient must be able to tolerate tight fitting mask and be able to cooperate with treatment
- \* Frequently reassess vital signs check for respiratory response to therapy and watch for any cardiovascular complication to increased intra-thoracic pressure
  - Obtain vital signs and SpO<sub>2</sub> every 5 minutes while patient is on CPAP
  - Discontinue CPAP and assist ventilations with BVM if any of the following occur:
    - Blood pressure < 80 mmHg
    - Patient becomes somnolent or combative
- \* Prior to arrival notify receiving facility CPAP device is in use





## **Respiratory: Respirator Operation**

**(NCCEP Procedure RSP-5)**

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### **Indications**

- \* Transport of intubated patient

### **Procedure**

1. Confirm proper ETT position
2. Ensure adequate oxygen source connected
3. Utilized settings established by referring facility
4. Assess for adequacy of oxygenation and ventilation
5. Continuous waveform capnography must be utilized throughout transport
6. Continuous pulse oximetry must be utilized throughout transport
7. For 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

## Respiratory: Ventilator Operation

(NCCEP Procedure RSP-6)

### 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 therapist) prior to transport
2. All ventilator settings, including respiratory rate, FiO<sub>2</sub>, mode of ventilation, and tidal volumes, PEEP should be recorded prior to initiating transport
3. Specific orders regarding any anticipated changes to ventilator settings as well as causes for significant alarm should be reviewed with the referring medical personnel
4. Once in the transporting unit, confirm adequate oxygen delivery to the ventilator
  - A. Continuous waveform capnography must be utilized throughout transport
  - B. Continuous pulse oximetry must be utilized throughout transport
5. Frequently assess the patient's respiratory status, noting any decreases in oxygen saturation or changes in tidal volumes, peak pressures, etc.
  - A. Frequently assess breath sounds to assess for possible tube displacement during transfer
  - B. Note any changes in ventilator settings or patient condition in the PCR
6. NG or OG tube should be placed in any intubated patient to clear stomach contents
7. For any significant change in patient condition, including vital signs or oxygen saturation or there is a concern regarding ventilator performance/alarms, remove the ventilator from the endotracheal tube and use a bag-valve mask with 100% O<sub>2</sub>
  - A. Contact medical control immediately

### Additional Considerations

- \* Troubleshooting **DOPE** mnemonic
  - **D**isplaced ETT, tracheostomy
  - **O**bstruction
  - **P**neumothorax
  - **E**quipment failure
- \* Typical alarms
  - Low pressure/apnea
    - Loose or disconnected circuit
    - Leak in circuit or at tracheostomy site
  - Low power
    - Internal battery depletion
  - High pressure
    - Plugged/obstructed airway or circuit

## Childbirth

## (NCCEP Procedure USP-1)

### Procedure

1. Gently control the progress of the head
2. Support the head with one hand as it is delivered
3. **Clear the infant's airway by** suctioning with bulb syringe
4. Check to ensure that the umbilical cord is not wrapped around the head / neck (nuchal)
  - A. Gently slip the cord over the head
  - B. Either deliver through it and unwrap after delivery or reduce the cord before the shoulders deliver
5. Help direct the anterior shoulder under the symphysis pubis with downward pressure on **the side of the neonate's head**
6. Apply gentle upward pressure to deliver the posterior shoulder
7. Support the infant through the remainder of the delivery
8. Clamp the cord **approximately two (2) inches from the infant's abdomen and cut**
9. Stimulate the infant and clear the airway
10. Dry and wrap the infant for warmth
11. Assess infants APGAR score at one and five minutes:
12. Deliver the placenta
  - A. Never pull on the umbilical cord to deliver the placenta
13. Massage the fundus of the uterus
14. Monitor for post-partum hemorrhage
15. Notify MCO, Obstetric team, and Neonatal team of emergent delivery
16. For prolapsed cord
  - A. Encourage mother to refrain from pushing
  - B. Place in Trendelenburg position
  - C. Insert fingers into vagina to relieve pressure on cord
  - D. Keep cord moist with saline soaked gauze
17. For breech presentation
  - A. Encourage mother to refrain from pushing
  - B. Place in Trendelenburg position
  - C. Support presenting part(s); do NOT pull
18. For Shoulder Dystocia
  - A. **Hyperflex the mother's hips and thighs towards her chest and apply anterior to posterior pressure with lateral to medial pressure supra-pubic in attempt to rotate the baby's shoulders off the pelvic rim**

| Sign         | 0      | 1                      | 2                  |
|--------------|--------|------------------------|--------------------|
| Heart Rate   | Absent | < 100 BPM              | > 100 BPM          |
| Respirations | Absent | Slow, irregular        | Good, crying       |
| Muscle Tone  | Limp   | Some flexion           | Active motion      |
| Reflexes     | None   | Grimace                | Cough, sneeze, cry |
| Color        | Blue   | Pink, blue extremities | Pink               |

## Decontamination

## (NCCEP Procedure USP-2)

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### Indications

- \* Required for any patient who has been exposed to significant hazardous material, including chemical, biological, or radiological weapons

### Procedure

1. Personnel must be aware of established hot, warm, and cold zones of operation
  - A. MEDIC personnel should NOT enter hot or warm zones unless directed to do so by on scene Incident Command
    - i. This should only occur if emergent life threat is present requiring MEDIC crew management prior to completing patient decontamination
  - B. Personnel must ensure appropriate PPE is in use prior to entry into hot or warm zones
2. Ensure patients from the hot zone undergo appropriate initial decontamination
  - A. High volume water irrigation for liquids
  - B. Carefully brush off any solids
  - C. Removal of clothing
  - D. Irrigation of eyes as indicated
3. Perform initial triage following decontamination procedures
4. Immediate life threats should be addressed prior to technical decontamination
  - A. Personnel must ensure appropriate PPE is in place prior to contact with the patient
5. Patients should remove all clothing and wash gently with soap and water ensuring all body areas are cleansed
6. Ensure potentially contaminated patients have been appropriately decontaminated prior to loading into any ground vehicle
7. Additional care per appropriate protocol

## Gastric Tube Insertion

(NCCEP Procedure USP-3)

### Indications

- \* Gastric decompression of intubated patients or patients with King LT placed
- \* Gastric decompression of patients with recurrent vomiting
- \* Significant upper GI bleeding

### Contraindications

- \* Nasogastric Tube
  - Significant closed head injury – orogastric tube is preferred in intubated patients with a significant closed head injury or significant facial injury

### Procedure

1. Prep nare(s) with oxymetazoline (Afrin®) or neosynephrine nasal spray as patient condition allows for nasogastric tube insertion
2. Estimate tube length required by standard fashion
3. Lubricate the distal end of the tube with KY jelly
4. Flex head
  - A. Contraindicated in patients with potential cervical spine injury
5. Insert tube and advance to desired length
6. Confirm placement via injecting air (20 – 30 ml) into proximal end of tube while performing epigastric auscultation
7. Secure tube in standard fashion
8. Place tube to appropriate suction
9. **Assess patient's response to tube placement**

### Procedure via King LT - Permitted to be placed by EMT

1. Estimate tube length required by standard fashion
2. Lubricate distal 6 - 8" of NG tube and pass into the gastric access lumen of the King LT
3. Confirm placement via injecting air (20 – 30 ml) into proximal end of tube while performing epigastric auscultation
4. Secure in standard fashion
5. Place tube to appropriate suction
6. **Assess patient's response to tube placement**

### Complications

- \* Epistaxis
- \* Passage of tube into the airway

## **Injections: Subcutaneous and Intramuscular (NCCEP Procedure USP-4)**

### **Indications**

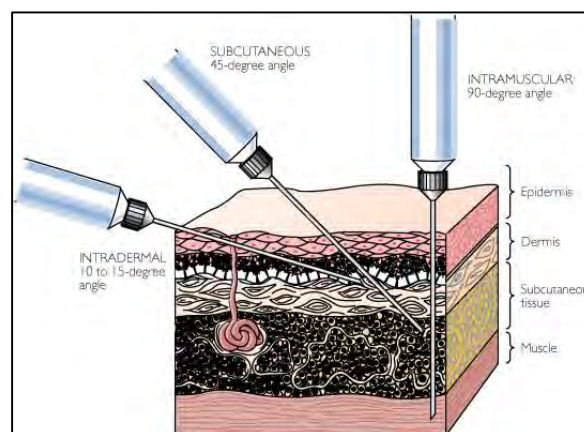
- \* Medication administration

### **Complications**

- \* Bleeding from injection site
- \* Infection
- \* Pain at injection site

### **Procedure**

1. Prepare equipment and medication dose in standard fashion
  - A. Verify medication and dose to be administered
2. Cleanse skin site in standard fashion
  - A. Upper arm preferred for SQ injections
  - B. Arm, buttock, or thigh preferred for IM injections
3. Insert needle into appropriate site in standard fashion
  - A. SQ: 45° angle to pinched skin
  - B. IM: 90° angle to flattened skin
4. Aspirate for potential blood
5. Inject medication
  - A. SQ medication volume should not exceed 1 ml
  - B. IM medication volume should not exceed 3 ml
6. Withdrawal needle
7. Gently massage injection site
8. Assess patient for response to medication



## Injections: Intranasal

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### Indications

- \* Administration of medication approved for intranasal administration

### Complications

- \* Bleeding
- \* Sneezing
- \* Rhinorrhea

### Procedure

1. Prepare equipment and medication dose in standard fashion
  - A. Verify medication and dose to be administered
  - B. Prepare syringe with atomization device
2. Place patient in upright position
3. Insert atomization device into nare
  - A. Gently depress plunger of syringe in single motion to administer 50% of the dose
  - B. Repeat process in opposite nare for remaining 50% of dose
4. Assess patient for response to medication



## **Injections – Immunizations**

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### **Intranasal Procedure**

1. Collect consent form and ensure that all patient information is complete
  - A. Ensure that all indications and contraindications to receiving the immunization are reviewed with and understood by the patient
2. Select medication per protocol and ensure that expiration date on sprayer has not been met or exceeded
3. Determine the appropriate dose that the sprayer or other delivery device contains
  - A. Most sprayers will contain a single complete dose of medication, half of which will be sprayed into each nostril
  - B. The syringe plunger will have a clip affixed to delineate where half the dose would be administered
4. Place the patient in an upright position
5. Gently insert the tip of the sprayer or delivery device into the external nares
6. Using a single motion, rapidly depress the plunger to administer the dose
  - A. Inject until the divider clip prevents further dosing
7. Remove the dose divider clip or similar device
8. Gently insert the tip of the sprayer or delivery device into the opposite external nares
9. Using a single motion, rapidly depress the plunger to administer the remaining dose
10. Monitor for allergic reaction
11. Dispose sprayer or other delivery device in appropriate biohazard or sharps container

### **Intramuscular Procedure**

1. Collect consent form and ensure that all patient information is complete
2. Ensure that all indications and contraindications to receiving the immunization are reviewed with and understood by the patient
3. Select medication per protocol and ensure that expiration date on vial or container has not been met or exceeded
4. Determine the appropriate dose contained in the vial or container
5. Prepare all equipment:
  - A. Syringe and needle
  - B. Alcohol pad
6. Draw appropriate dose of medication in syringe and ensure that all air is removed
7. Select injection site and cleanse the area with alcohol
8. Perform intramuscular injection by standard technique
  - A. Aspirate to ensure absent blood return, and then inject medication
9. Massage injection site
10. Control bleeding
11. Apply dressing or bandage as necessary
12. Monitor for allergic reaction
13. Dispose equipment in appropriate biohazard or sharps container



## Restraints: Physical

(NCCEP procedure USP-5)

### Objective

- \* To provide guidelines relative to the use of patient restraints for patients at risk of harm to themselves or crewmembers

### Guidelines

- \* MEDIC crewmembers will perform a rapid assessment relating to the patient's mental and clinical status to adequately determine need for the use of restraints
- \* The patient and crew safety are paramount while at the same time maintaining patient dignity and well being
- \* Restraints may be used in an emergent situation, in response to dangerous behavior and to protect patients from harming themselves or a crewmember
- \* Chemical restraints may be combined with physical restraints to promote patient comfort
- \* Physical restraints will not be used in a manner that causes undue physical discomfort, harm, or pain to the patient

### Procedure

1. Attempt verbal de-escalation techniques
2. **Assess the patients' mental** and clinical status in determining the need for restraints
  - A. Consult Medical Control for potential need for chemical restraint and / or physical restraints as patient condition allows
3. Patients should be restrained in supine or lateral positions only
4. Avoid constriction by placing two fingers between the restraining device and the patient
5. Document pulses and capillary refill distal to the restraining device every 15 minutes
6. Reassess patient throughout transport for need for continued restraints
7. Document clearly the reason(s) for which the patient requires chemical or physical restraints and any orders received for chemical restraint

### Additional Considerations

- \* Patients must not be restrained in the prone position
- \* Modification of restraint devices or attempting to restrain patients using devices or **techniques that have been used during prior experiences (so called "homemade")** is strictly prohibited
- \* If restraints are required to control aggressive behavior, only authorized restraints are to be used
  - Modification of these devices or attempting to restrain patients using devices or **techniques that have been used during prior experiences (so called "homemade")** is strictly prohibited
  - Tape will not be used unless required to secure an authorized restraint

## Chest Decompression

(NCCEP procedure WTP-1)

### Objective

- \* Improve hemodynamic function through relief of tension pneumothorax (pneumothorax with hemodynamic instability due to increased intrathoracic pressure)

### Indications

- \* Tension pneumothorax
- \* Blunt traumatic cardiac arrest (bilateral)

### Contraindications

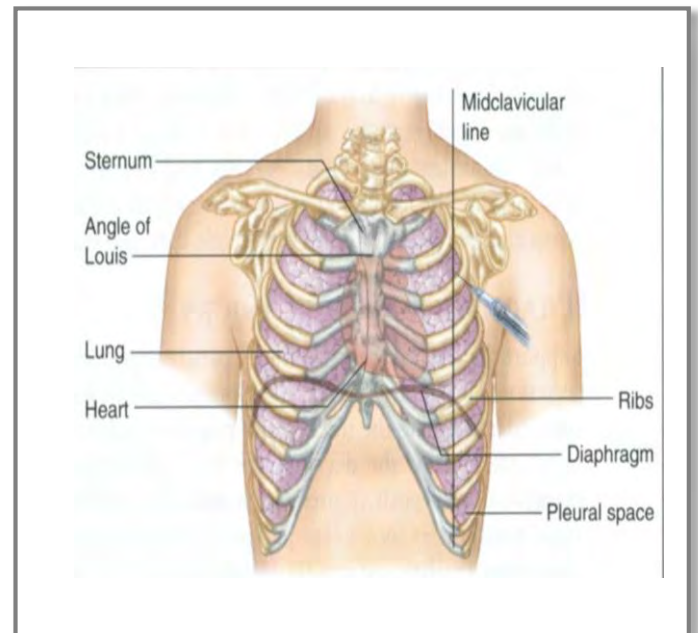
- \* Simple pneumothorax in hemodynamically stable patient

### Clinical Presentation

- \* History of blunt or penetrating trauma
- \* Respiratory distress
- \* Hypotension
- \* Decreased or absent breath sounds
- \* Jugular venous distension (late finding)
- \* Tracheal deviation (late finding)
- \* Positive pressure ventilations

### Procedure

1. Provide supplemental oxygen
2. Exposure chest
3. Identify landmarks
  - A. Affected side for tension pneumothorax
  - B. Bilaterally for blunt trauma arrest
4. Local prep with Betadine
5. Use 12 gauge **3 1/4"** angiocath
6. Insert needle perpendicular to chest wall
  - A. Primary site = Mid-clavicular line just superior to 3<sup>rd</sup> rib (2<sup>nd</sup> intercostal space)
  - B. Alternate site = Mid-axillary line just superior to 5<sup>th</sup> rib (4<sup>th</sup> intercostal space)
7. Monitor for rush of air during insertion
8. Advance catheter fully
9. Remove needle leaving catheter in place
10. Secure catheter in place
11. Do not remove catheter prior to arrival once placed
12. If symptoms recur additional catheters may be required



## Spinal Motion Restriction

(NCCEP procedure WTP-2)

### Indication

- \* Traumatic injury with potential for spinal trauma
- \* Patients should be placed in spinal motion restriction and transported in spinal motion restriction with a cervical collar in place if any of the following are present:
  - Abnormal mental status
  - Intoxicated or under the influence of mind-altering substance
  - Age < 5 years or > 65 years
  - Any posterior midline tenderness
  - Presence of distracting injury
  - Cervical pain with cervical range of motion
    - Patient unable to rotate neck 45 degrees to the left and to the right
    - Do NOT assess range of motion if the patient has any midline cervical spine tenderness to palpation
  - Any focal neurological deficit
  - High risk mechanism of injury
    - ATV crash
    - Ejection from vehicle
    - Fall > 3 feet (5 stairs)
    - High speed (>55 mph) or rollover MVC
    - Pedestrian or bicyclist struck by motor vehicle
    - Diving injury
- \* Patient > 65-years of age & ground level fall should have spinal motion restriction with a cervical collar if any of the above criteria or if any evidence of trauma above the clavicles (this includes simple abrasions or minor contusions)

### Additional Considerations

- \* Patient with the above high risk mechanisms are to have SMR performed even there are not physical exam findings noted in the field
  - Example: MVC rollover at 80 MPH should have SMR performed even if no neck pain, tenderness, and normal neurologic exam
- \* Always error on the side of performing SMR and placing a cervical collar if there is any doubt/concern

**Procedure**

1. Maintain manual spinal motion restriction until equipment gathered
2. Place appropriately sized cervical collar
3. Manual spinal motion restriction must be utilized during any patient movement
4. Remove appropriate clothing to fully inspect the spinal column
5. If the spine is not in a neutral position, gently realign
  - A. Immediately terminate the realignment procedure if the patient complains of increased pain, neurologic deficit or any symptom in any form, muscle spasm or resistance is encountered, airway compromise, it becomes physically difficult to realign, or the patient becomes apprehensive
6. For patient sitting in vehicle or similar position, carefully move by safest method to place supine on spine board maintaining in-line stability
  - A. Ensure that manual stabilization of the cervical spine is maintained throughout
7. Carefully transition patient to transporting EMS stretcher in supine position
  - A. Reassess for neurologic status
8. Carefully remove spine board to transport patient secured firmly on EMS stretcher
  - A. Ensure that manual stabilization of the cervical spine is maintained throughout
9. For a suspected spinal injury related to an athletic event where the patient has a helmet and shoulder pads in place, the following will be performed for motion restriction:
  - A. Helmet and shoulder pads should both be removed, or both remain in place
    - i. Do not remove one without removing the other
    - ii. May be removed if athletic trainer available to assist in removing and manual stabilization is maintained throughout the removal process
    - iii. If not removed apply in-line stabilization without traction to the cervical spine by holding both sides of the helmet
  - B. Gently remove the protective facemask
    - i. Athletic Trainer may provide tools and assistance to facilitate this process
  - C. Place patient on transport stretcher by standard technique, maintaining cervical spine control at all times
10. For suspected spinal injury related to an athletic event where the patient has a helmet, but no shoulder pads are in use, the follow will be performed for motion restriction:
  - A. Helmet may be removed if athletic trainer available to assist in removing and manual stabilization is maintained throughout the removal process
  - B. Apply in-line stabilization to the cervical spine by holding sides of the helmet
  - C. Gently remove the facemask (athletic trainer may be able to assist with this)
  - D. If helmet not removed, apply padding (blanket or sheets) on long spine board to ensure shoulders and back are raised to maintain neutral position of the spinal column
11. Carefully remove helmet, maintaining cervical spine stabilization if needed for airway compromise or indication for airway intervention occurs

**Additional Considerations**

- \* Patient movement from position on ground onto long spine board for transition to EMS stretcher may be accomplished via several methods
  - Multi-person logroll maintaining cervical stabilization and spinal alignment during the maneuver process
  - Multi-person (6-8) lift utilizing 3-4 persons on each side of the patient and in unison lifting patient straight up and sliding long spine board in beneath patient from the feet of the patient
  - Coordinated decision as to the most appropriate method should be made amongst provider prior to patient movement
- \* Spine boards or similar rigid devices, should NOT be used during transport or during inter-facility transfers
  - LSB should be utilized for extrication and / or patient transfers
  - Long or short spine board, scoop stretcher, soft-body splints, etc., should be considered extrication devices rather than transport-devices
- \* Once the patient arrives at the stretcher, REMOVE the rigid spine board device while maintaining spinal alignment using log-roll or multi-rescuer lift techniques and transfer and secure to the stretcher for transport
- \* Spinal Motion Restriction includes a rigid cervical collar, manual spine stabilization, maintaining spinal alignment with movement and transfers, and securing to the ambulance stretcher



## Splinting

### (NCCEP Procedure WTP-3)

#### Indications

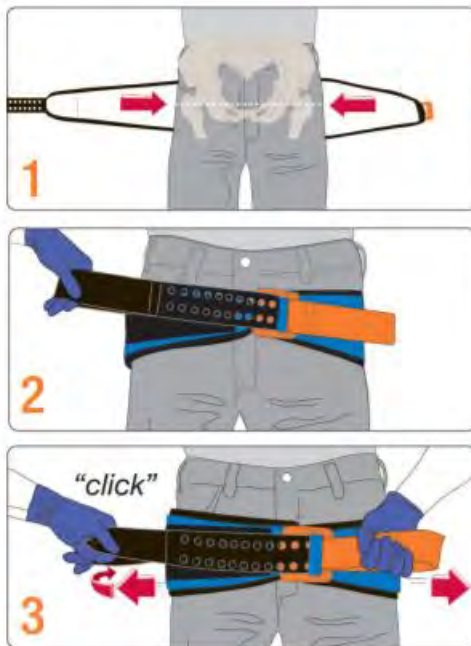
- \* Long bone fractures, severe sprains, or significant soft tissue injuries
- \* Pelvic fracture

#### Procedure

1. [Pain Control Protocol](#)
2. Remove clothing as necessary to fully evaluate the extremity
3. Assess pulse, motor function, and sensation of extremity(ies)
  - A. For pulse diminished attempt reduction of fracture to anatomical position
4. Reassess pulse, motor function, and sensation after any fracture manipulation/splinting
5. Secure the splint proximal and distal to the fracture / injury site
6. Cover open fractures with sterile dressing

#### Additional Considerations

- \* Pelvic splint
  - SAM Pelvic Sling®
    - Place white side of splint beneath patient at level of hips (femoral heads)
    - Close splint by placing black Velcro surface onto blue surface
    - Grab both orange handles and pull in opposite directions until “click” is heard and the free orange handle stops
    - Firmly press the orange handles against the blue surface



- Sheet splint
  - Place sheet folded lengthwise underneath patient at level of the hips
  - Pull opposite ends of sheet across the midline and tighten by twisting the opposite ends together
  - A small wooden rod or similar device may be used to help tighten the sheet
  - Secure in place
  - SAM splint is preferred over sheet binding
- \* Femur splint
  - Place ankle device around ankle
  - Place the proximal end of splint posterior and as proximal to the pelvis as possible (avoid injury to the groin)
    - Secure groin strap
  - Extend the distal end of the splint approximately six (6) inches distal to foot
    - Utilize uninjured extremity to estimate length needed for splint
  - Attach the ankle device to the splint traction crank
  - Pull the femur out to length and secure the splint
  - Reassess pulse, motor function, and sensation
  - Hare traction contraindications
    - Pelvic fracture
    - Open femur fracture with gross contamination
    - Ankle fracture, distal amputation/partial amputation



*Tintinalli, JE, Stapczynski JD, Ma OD, Cline DM, Meckler GD; Tintinalli's Emergency Medicine : A Comprehensive Study Guide, 8<sup>th</sup> Edition*

## Wound Care – General

(NCCEP Procedure WTP-4)

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### Indications

- \* Control of hemorrhage
- \* Protection of open wounds

### Procedure

1. Remove appropriate clothing to fully inspect the body for any significant wounds
2. Apply direct pressure to bleeding wounds
3. Irrigate contaminated wounds with saline as appropriate
4. Cover wounds with sterile gauze dressings
  - A. It may be appropriate to soak some wound dressings in sterile saline to keep underlying tissue moist
  - B. Burns should be dressed only with dry dressings
5. Assess distal motor, sensory, and vascular function before and after dressings are applied to extremity wounds
6. Reassess dressings throughout transport for evidence of re-bleeding



## Wound Care – Hemostatic Agent

(NCCEP Procedure WTP-5)

### Indications

- \* Hemorrhage that cannot be controlled by direct pressure
- \* Hemorrhage control not amendable to application of Mecklenburg EMS tourniquet or utilized in association with application of Mecklenburg EMS tourniquet
- \* Mecklenburg EMS utilizes QuikClot® Combat Gauze

### Contraindications

- \* QuikClot® Combat Gauze
  - Cannot be utilized for open intra-abdominal wounds, open intra-thoracic wounds, or open skull wounds

### Procedure

1. [Trauma Initial Assessment Protocol](#)
2. Apply QuikClot® Combat Gauze to wound
  - A. Examine wound and attempt to identify source of bleeding
    - i. May need to attempt to clear away any pooled blood over the bleeding source
  - B. Pack Combat Gauze directly over the source of bleeding in layering-type fashion
    - i. Gauze roll must be NOT be placed as a single rolled unit
    - ii. Gauze rolled must be placed in layered fashion, unrolling the gauze as it is placed in the wound
  - C. Utilize the entire gauze roll
  - D. Apply 3 minutes of direct pressure to the placed gauze
    - i. Do not lift dressing to re-assess the base of the wound
    - ii. For active bleeding and gauze is soaked through, completely remove the used gauze dressing and replace with a new roll utilizing same placement technique
3. Apply appropriate dressing to wound to secure gauze in place
4. Apply direct pressure to wound



## Wound Care – Conducted Electrical Weapon (NCCEP Procedure WTP-6)

### Indications

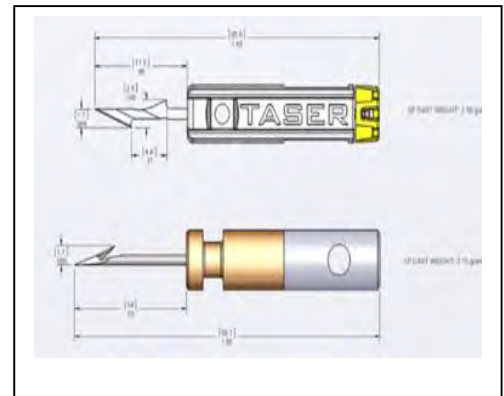
- \* Patient status post Conducted Electrical Weapon (CEW) (e.g. Taser®) deployment with embedded probe(s)

### Contraindications

- \* Probe embedded in neck, female breasts, or male/female genitalia
- \* Patient uncooperative with field removal of embedded probe

### Procedure

1. Assess for evidence of excited delirium
  - A. Delusion, psychosis, altered mental status
  - B. Agitation, extreme excitation, violent behavior
  - C. Hyperthermia
  - D. Tachycardia
  - E. If present transport to Emergency Department for further evaluation
2. Provide necessary stabilizing patient care
3. Ensure probe wires disconnected from weapon
4. Stabilize skin with non-dominant hand
5. Firmly grasp probe with dominant hand and pull in single quick motion
  - A. If unable to remove, transport to emergency department for removal
6. Confirm entire probe has been removed
7. Apply appropriate dressing to wound
8. Inform patient to update tetanus immunization within 7 days of injury if not up to date



### Additional Considerations

- \* Injuries, e.g. extremity fractures, soft tissue contusions, and closed head injuries can occur after falls associated with the sudden loss of muscle control from a CEW
- \* It is important to remember that the patient received a CEW deployment for reasons that were concerning to law enforcement personnel
  - Patient may have been uncooperative or combative, or under the influence of mind-altering substances
  - Etiological factors associated with such behavior may include alcohol intoxication, drug ingestion, overdose, psychosis, hypoxia, or hypoglycemia
- \* Deaths associated with CEW utilization have been associated with *excited delirium*
  - A hyperdopaminergic state characterized by extreme aggression, shouting, delusions, paranoia, strength, and hyperthermia
  - It is common in cocaine users and requires aggressive treatment with benzodiazepines
- \* CEW's devices do not affect pacemakers

## Wound Care – Tourniquet

(NCCEP Procedure WTP-7)

### Indications

- \* Life threatening extremity hemorrhage that cannot be controlled by any other means
- \* Uncontrollable extremity hemorrhage in patient with need for additional procedures/care (e.g. airway management)
- \* Uncontrollable extremity hemorrhage in a patient involved of a mass casualty event with other patients requiring urgent/emergent medical attention

### Contraindications

- \* Hemorrhage to site where tourniquet application is not practical or would not provide necessary hemostasis
- \* Non-extremity hemorrhage
- \* Extremity hemorrhage able to be controlled with direct pressure

### Procedure

1. Place tourniquet on upper arm or thigh proximal to the extremity wound
  - A. For upper extremity, loop may be advanced up the arm proximal to the wound
  - B. For lower extremity, unloop the tourniquet, wrap around the leg proximal to the wound and form loop through the friction buckle
2. Pull the band tight until all slack removed
3. Twist the windlass rod until hemorrhage (bright red bleeding) stops
4. Secure the windlass rod within the windlass rod tri-ring
5. Note time tourniquet is placed (record time on tourniquet and in PCR)
6. Ensure radio report to destination facility includes use of a tourniquet



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# **Section 5**

## **Medication Formulary**

## Medication Formulary Advisory

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### EMT Personnel

- \* The following medications contained within this list and contained within MEDIC's patient care protocols may be utilized by EMT-Basic Personnel
  - Aspirin
  - Albuterol (Proventil®) – only for patients currently prescribed beta-agonist
  - Atropine via auto-injector in mass casualty exposure to nerve agents
  - Diphenhydramine (Benadryl®) PO
  - Epinephrine (1:1,000)
  - Nitroglycerin sublingual – only for patients currently prescribed nitroglycerin
  - Naloxone (Narcan®) intranasal route only
  - Oxygen

### Advanced EMT Personnel

- \* The following medications contained within this list and contained with MEDIC's patient care protocols may be utilized by EMT-Intermediate Personnel
  - All medications and routes listed above for EMT-Basic Personnel
  - Albuterol (Proventil®)
  - Diphenhydramine (Benadryl®) IV, IM
  - Epinephrine IV, IM
  - Glucagon (GlucaGen®)
  - Naloxone (Narcan®) IV
  - Nitroglycerin
  - Intravenous fluids

### Paramedic Personnel

- \* All medications contained within this list and contained within MEDIC's patient care protocols may be utilized by EMT-P Personnel

### Additional Considerations

- \* Personnel may not utilize medications that are NOT on the North Carolina Medical Board Approved Medications for Credentialed EMS Personnel List
- \* The formulary concentrations included here are subject to change due to manufacturing supply – providers MUST assure the current stock concentration prior to administration
- \* Patient RIGHTS for each medication administration
  - Right patient
  - Right medication
  - Right dose
  - Right route
  - Right time

## Acetaminophen (Tylenol®)

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### Indications

- Pain control

### Contraindications

- Known hypersensitivity reaction
- Significant liver disease

### Dose adult

- 650 mg – 975 mg orally

### Dose pediatric

- 15 mg/kg orally

### Adverse effects

- Angioedema
- Hepatotoxicity
- Rash

### Protocols utilizing

- Special Operations

### How supplied

- 325 mg tablet

### Administration

- 1 – 3 tablets PO

## Adenosine (Adenocard®)

### Indications

- Supraventricular Tachycardia (SVT)

### Contraindications

- Known hypersensitivity reaction
- 2<sup>nd</sup> or 3<sup>rd</sup> degree heart block
- Post heart transplant
- Caution in patients with significant reactive airway disease history
- Wide complex irregular rhythm SVT (e.g. WPW with atrial fibrillation)

### Mechanism of action

- Slows/blocks conduction through the AV-Node

### Dose adult

- 6 mg IV rapid push initial dose
- 12 mg IV rapid push subsequent dose(s)

### Pediatric dose

- 0.1 mg/kg IV rapid push initial dose (maximum = 6 mg)
- 0.2 mg/kg IV rapid push subsequent dose(s) (maximum = 12 mg)

### Adverse effects

- Bronchospasm
- Chest pain
- Dysrhythmia (asystole, v. fibrillation/tachycardia, bradycardia, a. fibrillation, Torsades)

### Protocols utilizing

- Heart Problems – Supraventricular tachycardia
- Pediatric supraventricular tachycardia

### How supplied

- Vial: 12 mg in 4 ml = (3 mg per ml)

### Administration

- Initial dose: 2 ml (6 mg) rapid IV push & flushed with NS
- Subsequent: 4ml (12 mg) rapid IV push & flushed with NS
- Pediatric: 0.1 mg/kg rapid IV push

| Pediatric Dosages (0.1 mg/kg) |                      |        | (0.2 mg/kg)          |        |
|-------------------------------|----------------------|--------|----------------------|--------|
| Weight (kg)                   | 1 <sup>st</sup> Dose | Amount | 2 <sup>nd</sup> Dose | Amount |
| 10                            | 1 mg                 | 0.3 ml | 2 mg                 | 0.7 ml |
| 15                            | 1.5 mg               | 0.5 ml | 3 mg                 | 1 ml   |
| 20                            | 2 mg                 | 0.7 ml | 4 mg                 | 1.5 ml |
| 25                            | 2.5 mg               | 0.9 ml | 5 mg                 | 1.8 ml |
| 30                            | 3 mg                 | 1 ml   | 6 mg                 | 2 ml   |



### Caveats

- < 10 second ½ life
- MUST have ECG rhythm strip printing
  - Initiate prior to pushing medication
- Will only CONVERT AV-Nodal Reentrant Tachycardia
- Will assist with diagnosis of other **undefined SVT's**



## Albuterol (Proventil®)

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### Indications

- Reactive airway disease exacerbation (asthma / COPD)

### Contraindications

- Known hypersensitivity reaction

### Mechanism of action

- $\beta$ -2 agonist
- Bronchodilation

### Dose adult

- 5 mg nebulized solution

### Dose pediatric

- 2.5 mg nebulized solution

### Adverse effects

- Hypokalemia
- Nausea/vomiting
- Tachycardia
- Tremor/nervousness

### Protocols utilizing

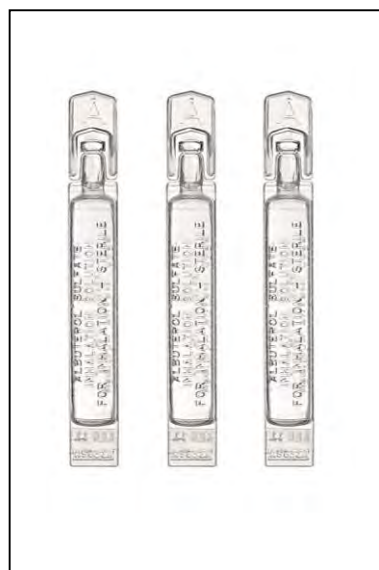
- Allergic Reaction
- Breathing Problems – asthma/COPD
- Heart Problems – hyperkalemia
- Drowning
- Smoke Inhalation

### How supplied

- 2.5 mg in 3 ml (0.083% solution) nebule

### Administration

- Nebulize via HHN
- Nebulize in-line via CPAP, SGD, ETT
- Adults: 2 nebules
- Pediatrics: 1 nebule



## Aspirin

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### Indications

- Chest pain consistent with cardiac etiology

### Contraindications

- Known hypersensitivity reaction
- Known GI bleeding
- Pediatric age

### Mechanism of action

- Anti-platelet aggregation via blocking formation of thromboxane A2

### Dose adult

- 324 mg orally

### Adverse effects

- Angioedema
- Bleeding
- Bronchospasm
- Nausea/vomiting
- Rash

### Protocols utilizing

- Heart Problems – Chest Pain, Myocardial Ischemia
- Chest Pain Myocardial Infarction

### How supplied

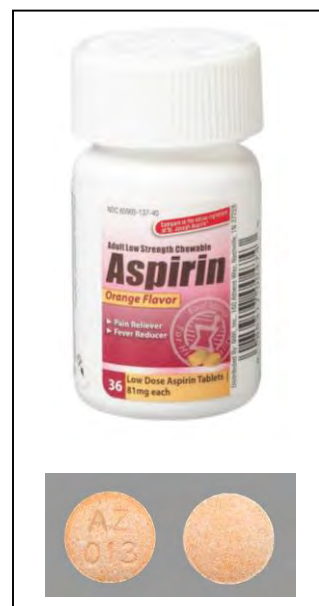
- 81mg chewable tablet

### Administration

- 4 chewable tablets PO

### Caveats

- Hold (must document) if patient has already taken aspirin
- Clinical performance measure:
  - Aspirin administration in STEMI



## Atropine

### Indications

- Symptomatic bradycardia
- Organophosphate overdose
- Nerve agent exposure

### Contraindications

- None

### Mechanism of action

- Anticholinergic; blocks the parasympathetic nervous system

### Dose adult

- 0.5 – 1 mg IV for symptomatic bradycardia
- 2 – 6 mg IV for organophosphate poisoning & repeated prn

### Dose pediatric

- 0.02 mg/kg IV (minimum 0.1 mg; maximum 0.5 mg age < 8 years; 1 mg age > 8 years)

### Adverse effects

- Tachycardia

### Protocols utilizing

- Medical Monitoring – Hazardous Materials
- Carbon Monoxide Exposure
- Heart Problems – Bradycardia; Heart Block 2° type 1
- Pregnancy/Childbirth – Newly Born

### How supplied

- 1 mg in 10 ml = (0.1 mg per ml) prefilled syringe

### Administration

- IV push

| Pediatric Dosages (0.02 mg/kg) |        |        |
|--------------------------------|--------|--------|
| Weight (kg)                    | Dose   | Amount |
| 5                              | 0.1 mg | 0.1 ml |
| 10                             | 0.2 mg | 0.2 ml |
| 15                             | 0.3 mg | 0.3 ml |
| 20                             | 0.4 mg | 0.4 ml |
| 25                             | 0.5 mg | 0.5 ml |
| 30                             | 0.6 mg | 0.6 ml |
| 35                             | 0.7 mg | 0.7 ml |
| 40                             | 0.8 mg | 0.8 ml |
| 45                             | 0.9 mg | 0.9 ml |
| 50                             | 1 mg   | 1 ml   |

### Caveats

- Cardiac effects occur at the SA-Node
  - No effect for 2° type 2 or 3° heart block



## Calcium Gluconate

### Indications

- Hyperkalemia with ECG changes
- Calcium channel blocker overdose
- PEA arrest
- Refractory ventricular fibrillation
- Hypotension or respiratory depression due to magnesium toxicity

### Contraindications

- Known hypersensitivity reaction
- Digoxin (Lanoxin®) toxicity

### Mechanism of action

- Hyperkalemia: increases the myocardial threshold potential, restoring normal gradient

### Dose adult

- 2 grams (20 ml of 10% solution) IV

### Dose pediatric

- 20 mg/kg IV = 0.2 ml/kg (maximum 2 grams of 10% solution), (maximum 20 ml)

### Adverse Effects

- Bradycardia
- Hypotension

### Protocols utilizing

- Cardiac Arrest
- Heart Problems
- Overdose
- Crush Injury

### How Supplied

- 1,000 mg in 10 ml = (100 mg per ml); 10% solution

### Administration

- IV slow push over 2 minutes

| Pediatric Dosages (20 mg/kg) |         |        |
|------------------------------|---------|--------|
| Weight (kg)                  | Dose    | Amount |
| 5                            | 100 mg  | 1 ml   |
| 10                           | 200 mg  | 2 ml   |
| 15                           | 300 mg  | 3 ml   |
| 20                           | 400 mg  | 4 ml   |
| 25                           | 500 mg  | 5 ml   |
| 30                           | 600 mg  | 6 ml   |
| 35                           | 700 mg  | 7 ml   |
| 40                           | 800 mg  | 8 ml   |
| 45                           | 900 mg  | 9 ml   |
| 50                           | 1000 mg | 10 ml  |



## Cefazolin (Ancef®)

### Indications

- Open skeletal fracture

### Contraindications

- Known hypersensitivity reaction to cephalosporin (e.g. cefazolin, cefadroxil, cephalixin, ceftriaxone) or anaphylaxis reaction to penicillin (e.g. amoxicillin, ampicillin)

### Mechanism of action

- Cephalosporin antibiotic

### Dose adult

- Weight  $\geq$  70 kg: 2 grams IV over 10 minutes
- Weight < 70 kg: 1 gram IV over 10 minutes

### Dose pediatric

- N/A

### Protocols utilizing

- Assault
- Falls
- Gunshot wound
- Industrial accident
- Stab wound
- Traffic accident
- Traumatic injury

### How supplied

- 1 gram per vial

### Administration

- Connect 500 ml bag NS to buretrol
- Fill buretrol with 100 ml
- Connect IV tubing to bottom end of buretrol
  - Flush line
- Using the 10 ml NS flush and needle
  - Inject 2.5 ml NS into each cefazolin vial
  - Reconstitution of medication
- Using the same flush and needle, withdraw medication
- Infuse medication through the med port on the buretrol
- Infuse the contents of the buretrol over 10 minutes
  - Using a 10-gtts set this would be 100-gtts/min



## Diltiazem (Cardizem®)

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### Indications

- Supraventricular tachycardia (SVT)

### Contraindications

- Known hypersensitivity reaction
- Hypotension
- Pediatric age

### Mechanism of action

- Calcium channel blocker – prevents calcium flow through slow calcium channels
  - Negative inotrope

### Dose adult

- 15 mg IV over 2 minutes
- 20 mg IV over 2 minutes if no response to initial dose

### Adverse Effects

- Bradycardia
- Hypotension

### Protocols utilizing

- Heart Problems – SVT: Atrial Fibrillation; Atrial Flutter

### How supplied

- 25 mg in 5 ml = (5 mg per ml)

### Administration

- Initial dose: 3 ml (15 mg) IV push over 2 minutes
- Subsequent dose: 4 ml (20 mg) IV push over 2 minutes

### Caveats

- Must be kept refrigerated prior to usage



## Diphenhydramine (Benadryl®)

### Indications

- Allergic reaction
- Dystonic reaction

### Contraindications

- Known hypersensitivity reaction
- Age < 9 months

### Mechanism of action

- Antihistamine (blocks H1 receptor)

### Dose adult

- 25 mg – 50 mg IV, IM, PO

### Dose pediatric

- 1 mg/kg IV, IM, PO (maximum dose = 50 mg)

### Adverse effects

- Sedation
- Confusion

### Protocols utilizing

- Allergic Reaction
- Psychiatric

### How supplied

- Oral: 25 mg in 10 ml = (2.5 mg per ml)
- IV: 50 mg in 1 ml = (50 mg per ml)

### Administration

- PO, slow IV push, or IM

| Pediatric Dosages (1 mg/kg) |       |           |              |
|-----------------------------|-------|-----------|--------------|
| Weight (kg)                 | Dose  | Amount PO | Amount IV/IM |
| 5                           | N/A   | N/A       |              |
| 10                          | 10 mg | 4 ml      | 0.2 ml       |
| 15                          | 15 mg | 6 ml      | 0.3 ml       |
| 20                          | 20 mg | 8 ml      | 0.4 ml       |
| 25                          | 25 mg | 10 ml     | 0.5 ml       |
| 30                          | 30 mg | 12 ml     | 0.6 ml       |
| 35                          | 35 mg | 14 ml     | 0.7 ml       |
| 40                          | 40 mg | 16 ml     | 0.8 ml       |
| 45                          | 45 mg | 18 ml     | 0.9 ml       |
| 50                          | 50 mg | 20 ml     | 1 ml         |



### Caveats

- Pediatric patients > 9-months of age

## Dopamine

### Indications

- Hypotension despite adequate volume resuscitation

### Contraindications

- Known hypersensitivity reaction
- Hypotension due to hypovolemia

### Adverse Effects

- Chest pain/palpitations
- Tachycardia

### Mechanism of action

- Dopamine receptor agonist
- With elevating doses stimulates  $\alpha$ -receptors and  $\beta_1$ -receptors

### Dose adults

- 10 – 20 mcg/kg/min IV

### Dose pediatrics

- 10 – 20 mcg/kg/min IV

### Adverse effects

- Tachycardia
- Dysrhythmia
- Hypertension

### Protocols utilizing

- Allergic reaction
- Cardiac Arrest
- Heart Problems
- Sick Person – Sepsis, Shock

### How Supplied

- 400 mg in 250 ml pre-mixed bag – (1,600 mcg per ml)
- Alternate packaging:
  - 200 – 400 mg vial(s) to be mixed with D5W
  - IVF may be 250 ml – 1000 ml bag
  - Mixed all vials in accompanying IVF for end concentration of 1,600 mcg per ml (400 mg in 250 ml; 800 mg in 500 ml; 1,600 mg in 1000 ml)



### Administration

- Continuous infusion @ 10 – 20 mcg/kg/min
- Rate =  $\frac{\text{dose} * \text{kg} * 60}{\text{concentration}} = \frac{10\text{mcg/min} * 70\text{kg} * 60\text{min}}{1600\text{mcg/ml}} = 26.25 \text{ ml/hour} = 26.25\text{-gtts/min}$  (w/ 60-gtt set)

| Wt (kg) | 10 mcg/kg/min |         | 15 mcg/kg/min |         | 20 mcg/kg/min |         |
|---------|---------------|---------|---------------|---------|---------------|---------|
|         | mcg/min       | ml/hour | mcg/min       | ml/hour | mcg/min       | ml/hour |
| 60      | 600           | 22      | 900           | 34      | 1200          | 45      |
| 70      | 700           | 26      | 1050          | 39      | 1400          | 53      |
| 80      | 800           | 30      | 1200          | 45      | 1600          | 60      |
| 90      | 900           | 34      | 1350          | 51      | 1800          | 68      |
| 100     | 1000          | 38      | 1500          | 56      | 2000          | 75      |



## Epinephrine

### Indications

- Anaphylaxis
- Cardiac arrest: Asystole; PEA; Ventricular fibrillation
- Severe reactive airway disease

### Contraindications

- None

### Mechanism of action

- Stimulates  $\alpha$ -receptors and  $\beta$ -receptors

### Dose adults

- Cardiac arrest: 1 mg (1:10,000) IV, IO
- Anaphylaxis: 0.3 – 0.5 mg (1:1,000) IM

### Dose pediatric

- Cardiac arrest: 0.01 mg/kg (1:10,000) IV, IO (max 1 mg)
- Anaphylaxis: BLS: 0.15 mg (1:1,000) IM (0.15 ml)
- ALS: 0.01 mg/kg (max 0.3 mg)
- Croup: Racemic
  - A. <5 kg: 0.25 ml (½ ampule) of 2.25% solution
  - B. ≥5 kg: 0.5 ml (1 ampule) of 2.25% solution

### Adverse Effects

- Hypertension
- Tachycardia

### Protocols utilizing

- Allergic Reaction
- Breathing Problems – Asthma/COPD
- Breathing Problems – Croup
- Cardiac Arrest
- Heat Problems – Pediatric Bradycardia

### How supplied

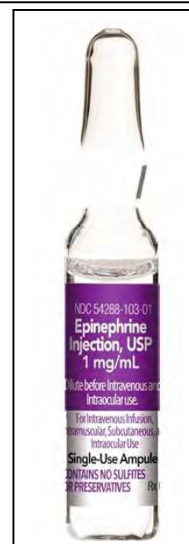
- inhalation solution 2.25% for croup
- 1 mg in 1 ml vial = (1 mg per ml)

### Administration

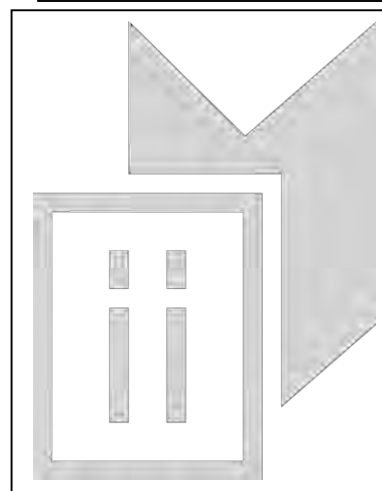
- Nebulized nebule for croup
- IM for anaphylaxis, severe bronchospasm
  - Adult: 0.3 – 0.5 mg (0.3-0.5 ml)
  - Pediatric: BLS: 0.15 mg (0.15 ml)
  - ALS: 0.01 ml/kg; maximum 0.3 ml
- IV for cardiac arrest
  - Using the NS flush syringe withdrawal the full contents of the vial into the 10ml syringe
  - Administer epinephrine IV from the flush syringe
    - Adults: 10 ml
    - Pediatrics: 0.01 ml/kg (max 10 ml)

Epi 1 mg/ml  
for IM usage

Racemic for croup



Epi kit for cardiac arrest



## Fentanyl (Sublimaze®)

### Indications

- Opioid analgesic

### Contraindications

- Known hypersensitivity reaction
- Hypotension
- Hypoventilation

### Mechanism of action

- Synthetic opioid analgesic

### Dose adult

- 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)
- 1 – 2 mcg/kg IN (maximum 200 mcg)
- Repeat dose 1 mcg/kg (maximum 100 mcg any route)

### Dose pediatric

- 0.5 – 1 mcg/kg IV, IM, IO (maximum 100 mcg)

### Adverse Effects

- Respiratory depression
- Altered mental status
- Hypotension
- Chest wall rigidity (with rapid infusion)

### Protocols utilizing

- |                  |                       |                    |
|------------------|-----------------------|--------------------|
| ▪ Abdominal Pain | ▪ Eye Problems        | ▪ Stab Wound       |
| ▪ Animal Bite    | ▪ Falls/Back Injury   | ▪ Traumatic Injury |
| ▪ Back Pain      | ▪ Headache            | ▪ Traffic Accident |
| ▪ Chest Pain     | ▪ Heart Problems      | ▪ Gunshot Wound    |
| ▪ Electrocution  | ▪ Industrial Accident |                    |

### How supplied

- 100 mcg per 2 ml = (50 mcg per ml)

### Administration

- Slow IV push



## Glucagon

### Indications

- Hypoglycemia in patients without IV access
- Altered mental status and unknown glucose level
- Hypotension secondary to beta-blocker or calcium channel blocker overdose

### Contraindications

- Known hypersensitivity

### Dose adult

- 1 mg IM

### Dose pediatric

- $\leq 20$  kg: 0.5 mg IM
- $> 20$  kg: 1 mg IM

### Adverse Effects

- Hypotension

### Protocols utilizing

- Allergic Reaction
- Altered Mental Status
- Diabetic Problem: Hypoglycemia
- Overdose (higher dosage)
- Sick Person
- Unknown Problem

### How supplied

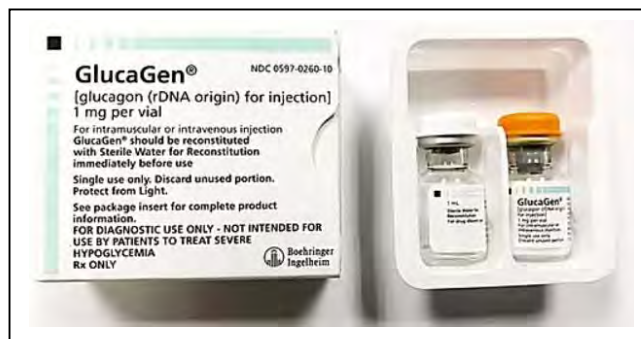
- 1 mg powder vial with 1 ml sterile water vial

### Administration

- Utilizing the vial of sterile water, reconstitute glucagon powder
  - 1 mg in 1 ml
- Withdrawal reconstituted glucagon and administer IM

### Caveats

- Limited utility in patients with limited glycogen stores
  - Severe liver disease
  - Severely malnourished
  - Newborns



## Glucose

### Indications

- Hypoglycemia
- Altered mental status and unknown glucose level

### Contraindications

- None

### Dose adult

- InstaGlucose®: one tube orally
- D10: 100-250ml IV

### Dose pediatric

- > 8 years: D10 @ 5 ml/kg (maximum 100ml)
- 31 days – 8 years: D10 @ 2 ml/kg (maximum 100 ml)
- 0 – 30 days: D10 @ 2 ml/kg
- Repeat as indicated

### Adverse Effects

- Hyperglycemia

### Protocols utilizing

- Altered Mental Status
- Diabetic Problems: Hypoglycemia
- Newly Born
- Psychiatric
- Sick Person
- Unknown Problem

### How supplied

- 10% dextrose in 250 ml NS
- 250 ml = 25 grams dextrose

### Administration

- IV, IO push



## **Ibuprofen (Motrin®)**

---

### **Indications**

- Pain control

### **Contraindications**

- Known hypersensitivity reaction
- Significant renal insufficiency

### **Dose adult**

- 600 mg – 800 mg orally

### **Dose pediatric**

- 15 mg/kg orally (maximum 400 mg)

### **Adverse Effects**

- GI distress
- Nephrotoxicity
- Rash

### **Protocols utilizing**

- Special Operations

## Labetalol (Normodyne®)

---

### Indications

- Hypertensive emergency associated with acute cerebrovascular accident with Medical Control order
- Hypertensive emergency associated with pre-eclampsia / eclampsia

### Contraindications

- Known hypersensitivity reaction

### Mechanism of action

- Blocks  $\alpha$ -1 and  $\beta$ -1 & 2 receptors

### Dose adult

- Hypertensive emergency: 20 mg IV

### Adverse Effects

- Hypotension
- Nausea

### Protocols utilizing

- Pregnancy & Childbirth
- Sick Person
- Stroke
- Unknown Problem

### How supplied

- 100 mg in 20 ml = (5 mg per ml)

### Caveats

- Can be given via standing protocol for pre-eclampsia and eclampsia
- Contact medical control prior to administration in other hypertensive states
- Contact medical control prior to administration in patients who have recently or are suspected of having recently ingested cocaine
  - B-blockade may lead to some additional  $\alpha$  action and further increase blood pressure



## Lidocaine

### Indications

- Ventricular ectopy
- Cardiac arrest – ventricular fibrillation; ventricular tachycardia
- Analgesia related to IO line insertion

### Contraindications

- Known hypersensitivity reaction
- 2<sup>nd</sup> degree type 2 & 3<sup>rd</sup> degree heart block

### Mechanism of action

- Class 1B anti-arrhythmic
  - Blocks sodium channels
  - Decreases myocardial automaticity
- Local anesthetic
  - Blocks sodium channels

### Dose adult

- Cardiac
  - 0.75 – 1.5 mg/kg IV bolus initial dose
  - 0.5 – 0.75 mg/kg IV bolus repeat dose
- IO analgesia
  - 20 – 40 mg (1 – 2 ml) IO

### Dose pediatric

- Cardiac
  - 1 mg/kg IV bolus for ventricular ectopy, cardiac arrest
  - 0.5 mg/kg IV bolus repeat dose for ventricular ectopy or cardiac arrest
- IO analgesia
  - 0.5 mg/kg IO

### Adverse Effects

- Seizure (with toxicity)

### Protocols utilizing

- Cardiac arrest: VFib, VTach; Post-Resuscitation
- Venous Access: Intraosseous

### How supplied

- 100 mg in 5 ml = (20 mg per ml) prefilled syringe

### Administration

- Cardiac arrest
  - IV push
- IO analgesia
  - Slow IV push



## Magnesium sulfate

---

### Indications

- Obstetric: Pre-eclampsia / Eclampsia; Pre-term labor
- Cardiac: Refractory ventricular fibrillation / ventricular tachycardia; Torsades des points
- Pulmonary: Refractory bronchospasm

### Contraindications

- Renal Failure

### Adverse Effects

- Hypotension
- Respiratory depression

### Mechanism of action

▪

### Dose adult

- Obstetric indications: 4 grams IV
- Cardiac indications: 1 – 2 grams IV
- Pulmonary indications: 1 – 2 grams IV

### Dose pediatric

- 25 – 50 mg/kg IV (maximum = 1 gram)

### Protocols utilizing

- Cardiac Arrest
- Breathing Problem
- Heart Problem
- Pregnancy & Childbirth

### How supplied

- 1 gram per 2 ml vial = (500 mg per ml) 50%

### Administration

- IV usage must be diluted with NS
- Bronchospasm
  - Adult: 1 – 2 grams over 5 – 10 minutes
  - Pediatric: 25 – 50 mg/kg over 5 – 10 minutes
- Eclampsia
  - Dilute 4 grams in 150 ml NS
  - Infuse over 15 minutes





## Methylprednisolone (Solu-Medrol®)

---

### Indications

- Allergic reaction
- Reactive airway disease

### Contraindications

- None

### Mechanism of action

- Corticosteroid
- Anti-inflammatory

### Dose adult

- 125 mg IV

### Dose pediatric

- 2 mg/kg IV (maximum 125 mg)

### Protocols utilizing

- Allergic Reaction
- Breathing Problem

### How supplied

- 125 mg powder vial + diluent

### Administration

- Reconstitute utilizing the 2 ml diluent by pushing down activator of the act-o-vial
- Mix thoroughly
  - 125 mg in 2 ml = (62.5 mg per ml)
- Remove top tab of vial
- Withdrawal medication from vial
- Slow IV push



## Midazolam (Versed®)

---

### Indications

- Sedation
- Seizure

### Contraindications

- Hypotension

### Mechanism of action

- Benzodiazepine
  - Enhance CNS activity of gamma-amino-butyric-acid (GABA)

### Dose adult

- 5 mg IM
- 5 – 10 mg IN
- May repeat at 10 – 15-minute intervals as needed following reassessment

### Dose pediatric

- 0.15 mg/kg IM
- 0.2 mg/kg IN
- May repeat at 10 – 15-minute intervals as needed following reassessment

### Adverse Effects

- Confusion
- Hypotension
- Respiratory depression

### Protocols utilizing

- Seizure
- Psychiatric
- Cardiac: Cardioversion
- Cardiac: Transcutaneous pacing

### How supplied

- 5 mg in 1 ml

### Administration

- IM or IN



## Naloxone (Narcan®)

### Indications

- Suspected narcotic overdose

### Contraindications

- None

### Mechanism of action

- Opioid antagonist

### Dose adult

- 1 – 2 mg IV, IN, IO, IM

### Dose pediatric

- 0.01 – 0.1 mg/kg IV, IN, IO, IM (maximum 2 mg)

### Adverse effects

- Nausea/vomiting

### Protocols utilizing

- Altered Mental Status
- Overdose / Toxic Ingestion

### How supplied

- 2 mg in 2 ml = (1 mg/ ml)

### Administration

- IV
  - Push
- IN
  - Via atomizer
  - ½ dose in each nostril
- Repeat Q 5" as indicated

### Caveats

- May precipitate narcotic withdrawal in patients on long-term narcotic medication
- IM is the least preferred route of administration and should only be utilized if other routes are unavailable
- PD and some first responders may have formations that provide a 4 mg dose



## Nitroglycerin (Nitrostat®, Nitro-BID®)

### Indications

- Chest pain consistent with inadequate coronary perfusion
- Hypertensive emergency
- Pulmonary edema

### Contraindication

- Hypotension
- sildenafil (Viagra®), tadalafil (Cialis®), vardenafil (Levitra®) or similar drug use in past 24 hours

### Mechanism of action

- vasodilator

### Dose adult

- 0.4 mg SL
- Repeat every 5 minutes as required by patient condition
- 1" – 2" paste to upper chest wall

### Adverse Effects

- Headache
- Hypotension

### Protocols utilizing

- Hypertension
- Pulmonary Edema
- Cardiogenic Shock
- Heart Problems

### How supplied

- Sublingual tablets
  - 0.4 mg per tablet
- Paste
  - 1 gram per 1"

### Administration

- Tablets
  - 1 tablet sublingual Q 5' as indicated
- Paste
  - 1"– 2" topical based on blood pressure measurement (1 packet = 1")

### Caveats

- Caution in patients experiencing a right ventricular STEMI (inferior)
  - May adversely affect preload



## Nitrous Oxide

---

### Indications

- Acute pain management

### Contraindications

- Bowel obstruction
- Hypotension
- Pneumothorax
- Pregnancy (patient or provider)
- Significant respiratory compromise

### Mechanism of action

- Stimulation of Mu receptor in CNS = analgesia
- Stimulation of GABA receptor in CNS = anxiolysis

### Dose adult

- 50:50 mixture via self-administered device

### Dose pediatric

- 50:50 mixture via self-administered device

### Protocols utilizing

- Multiple

### How supplied

- Preset 50:50 mixture N<sub>2</sub>O:O<sub>2</sub>

### Administration

- Via patient-controlled inhalation device



## Ondansetron (Zofran®)

### Indications

- Recurrent nausea or vomiting

### Contraindications

- Known hypersensitivity reaction

### Mechanism of action

- Serotonin 5-HT<sub>3</sub> receptor antagonist

### Dose adult

- 4 – 8 mg IV, IM, PO

### Dose pediatric

- 0.15 mg/kg IV, IM, PO (for > 6 months of age; maximum = 4 mg)

### Protocols utilizing

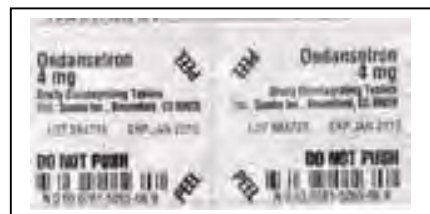
- Sick Person
- Headache
- Overdose
- Carbon Monoxide/Hazardous Materials Exposure

### How supplied

- Oral
  - 4mg disintegrating table
- IV
  - 4 mg in 2 ml = (2 mg per ml)

### Administration

- Oral
  - Adult: 1 – 2 ODT on tongue
  - Pediatric: (0.14 mg/kg) 1 ODT on tongue
- IV
  - Adult: 4 – 8 mg slow IV push
  - Pediatric: 4 mg slow IV push



## Oxygen

---

### Indications

- Chest pain
- Hypoxia
- Preoxygenation for intubation, suctioning
- Respiratory distress

### Contraindications

- None

### Dose adult

- Dependent on patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$ 
  - 1 L – 6 L/min nasal cannula
  - 10 L – 15 L/min non-rebreather mask
  - 15 L/min BVM

### Dose pediatric

- Dependent on patient condition to maintain  $\text{SpO}_2 = 94 - 97\%$ 
  - 1 L – 6 L/min nasal cannula
  - 10 L – 15 L/min non-rebreather mask
  - 15 L/min BVM

### Protocols utilizing

- Any

## Sodium bicarbonate

### Indications

- Cardiac arrest with prolonged resuscitation time
- Severe acidosis ( $\text{pH} < 7.0$ )
- Significant hyperkalemia
- Tricyclic antidepressant overdose with ECG changes
- Significant crush injury

### Contraindications

- Known hypersensitivity

### Mechanism of action

- Plasma buffer ( $\text{HCO}_3^-$ )
- Sodium electrolyte ( $\text{Na}^+$ )

### Dose adult

- 1 amp – 1 mEq/kg IV, IO

### Dose pediatric

- 1 mEq/kg IV, IO

### Protocols utilizing

- Cardiac Arrest
- Traumatic Injury – crush injury
- Heart Problems – dysrhythmia consistent with hyperkalemia
- Overdose

### How supplied

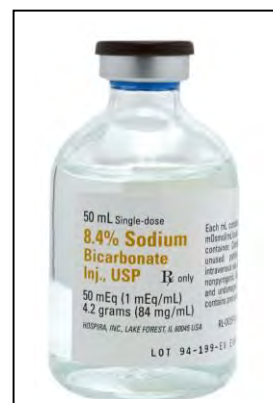
- 50 mEq in 50 ml = (1 mEq per ml)

### Administration

- Adult: 50 ml IV, IO
- Pediatric: 1 ml/kg IV, IO

### Caveats

- In TCA overdose with ECG changes, it is the amount of sodium that is most beneficial
- In severe crush injury/syndrome administer immediately prior to extrication or during entrapment if prolonged entrapment is anticipated





## Sodium thiosulfate

---

### Indications

- Potential cyanide poisoning

### Contraindications

- Known hypersensitivity reaction

### Mechanism of action

- Sulfur donor facilitating the conversion of cyanide to thiocyanate

### Dose adult

- 12.5 grams IV

### Dose pediatric

- 250 mg/kg IV (maximum 12.5 grams)

### Adverse Effects

- Hypotension
- Nausea/vomiting

### Protocols utilizing

- Burns
- Carbon monoxide / toxic inhalation

### How supplied

- 12.5 gm in 50 ml = (250 mg per ml)

### Administration

- Slow IV push
  - Adults 50 ml IV
  - Pediatric: 1 ml/kg (max 50 ml)

### Caveats

- Administered for altered mental status or severe acidemia
- Medication is stored in drawer 3 of patient compartment

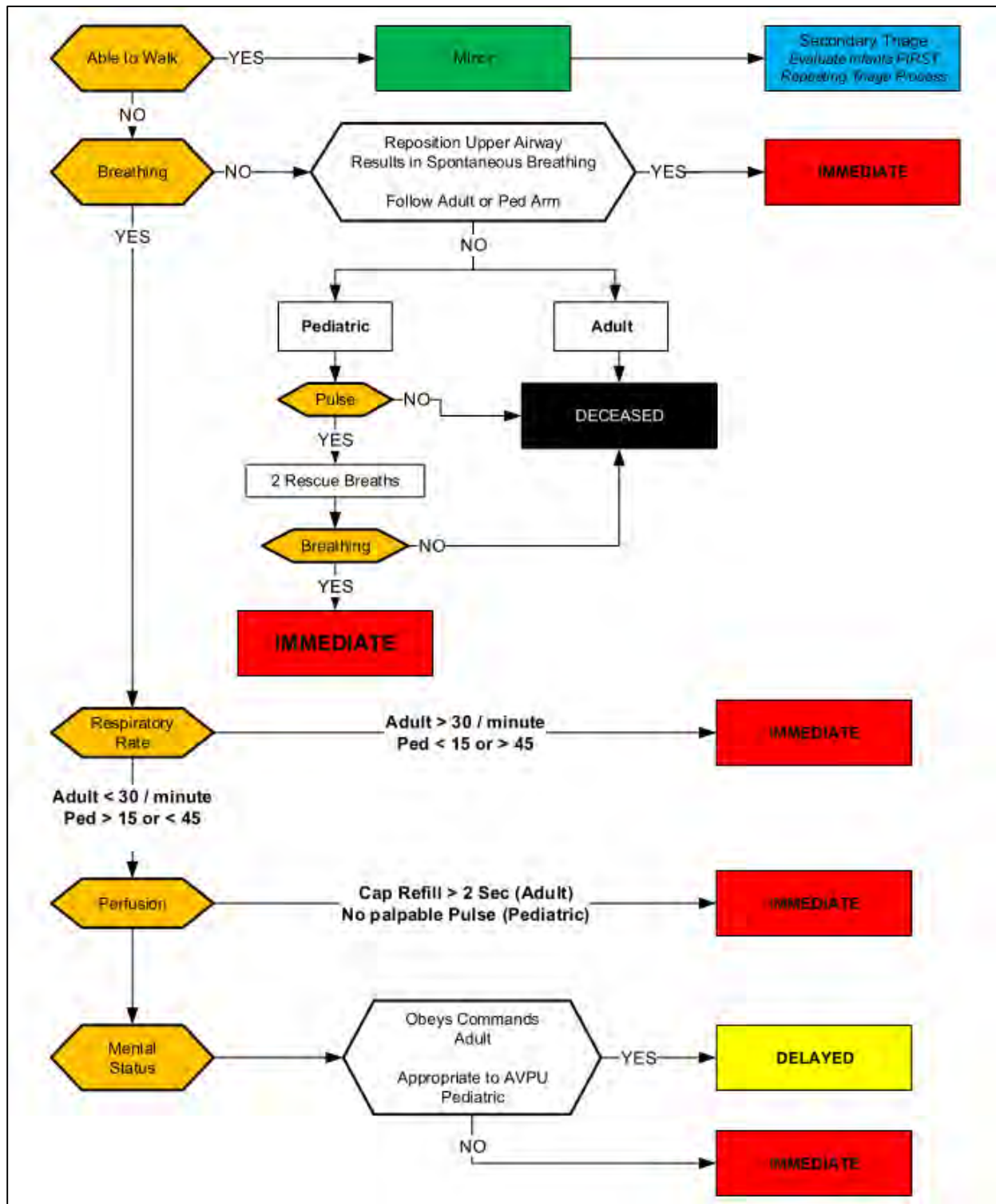


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## **Section 6**

# **Appendix**

**START Triage****(NCCEP Protocol UP-2)**

# Patient Instructions

## UNIVERSAL INSTRUCTIONS:

- YOU HAVE NOT RECEIVED A COMPLETE MEDICAL EVALUATION. SEE A PHYSICIAN AS SOON AS POSSIBLE.
- IF AT ANY TIME AFTER YOU HAVE TAKEN ANY MEDICATION, YOU HAVE TROUBLE BREATHING, START WHEEZING, GET HIVES OR A RASH, OR HAVE ANY UNEXPECTED REACTION, CALL 911 IMMEDIATELY.
- IF YOUR SYMPTOMS WORSEN AT ANY TIME, YOU SHOULD SEE YOUR DOCTOR, GO TO THE EMERGENCY DEPARTMENT OR CALL 911.

## ABDOMINAL PAIN:

- Abdominal pain is also called belly pain. Many illnesses can cause abdominal pain and it is very difficult for EMS to identify the cause.
- Take your temperature every 4 hours.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- Your pain gets worse or is now only in 1 area
- You vomit (throw up) blood or find blood in your bowel movement
- You become dizzy or faint
- Your abdomen becomes distended or swollen
- You have a temperature over 100° F
- You have trouble passing urine
- You have trouble breathing

## BACK PAIN:

- Apply heat to the painful area to help relieve pain. You may use a warm heating pad, whirlpool bath, or warm, moist towels for 10 to 20 minutes every hour.
- Stay in bed as much as possible the first 24 hours.
- Begin normal activities when you can do them without causing pain.
- When picking things up, bend at the hips and knees. Never bend from the waist only.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- You have shooting pains into your buttocks, groin, legs, or arms or the pain increases.
- You have trouble urinating or lose control of your stools or urine.
- You have numbness or weakness in your legs, feet, arms, or hands.

## FEVER:

- Always take medications as directed. Tylenol and Ibuprofen can be taken at the same time.
- If you are taking antibiotics, take them until they are gone, not until you are feeling better.
- Drink extra liquids (1 glass of water, soft drink or gatorade per hour of fever for an adult)
- If the temperature is above 103° F, it can be brought down by a sponge bath with room temperature water. Do not use cold water, a fan, or an alcohol bath.
- Temperature should be taken every 4 hours.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- Temperature is greater than 101° F for 24 hours
- A child becomes less active or alert.
- The Temperature does not come down with Acetaminophen (Tylenol) or Ibuprofen with the appropriate dose.

## HEAD INJURY:

- Immediately after a blow to the head, nausea, and vomiting may occur.
- Individuals who have sustained a head injury must be checked, and if necessary awakened, every 2 hours for the first 24 hours.
- Ice may be placed on the injured area to decrease pain and swelling.
- Only drink clear liquids such as juices, soft drinks, or water the first 12 hours after injury..
- Acetaminophen (Tylenol) or Ibuprofen only may be used for pain.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- The injured person has persistent vomiting, is not able to be awakened, has trouble walking or using an arm or leg, has a seizure, develops unequal pupils, has a clear or bloody fluid coming from the ears or nose, or has strange behavior.

## INSECT BITE/STING:

- A bite or sting typically is a red lump which may have a hole in the center. You may have pain, swelling and a rash. Severe stings may cause a headache and an upset stomach (vomiting).
- Some individuals will have an allergic reaction to a bite or sting. Difficulty breathing or chest pain is an emergency requiring medical care.
- Elevation of the injured area and ice (applied to the area 10 to 20 minutes each hour) will decrease pain and swelling.
- Diphenhydramine (Benadryl) may be used as directed to control itching and hives.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- You develop any chest pain or difficulty breathing.
- The area becomes red, warm, tender, and swollen beyond the area of the bite or sting.
- You develop a temperature above 101° F.

## RESPIRATORY DISTRESS:

- Respiratory Distress is also known as shortness of breath or difficulty breathing.
- Causes of Respiratory Distress include reactions to pollen, dust, animals, molds, foods, drugs, infections, smoke, and respiratory conditions such as Asthma and COPD. If possible avoid any causes which produce respiratory distress.
- If you have seen a physician for this problem, take all medication's as directed.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- Temperature is greater than 101° F.
- The cough, wheezing, or breathing difficulty becomes worse or does not improve even when taking medications.
- You have Chest Pain.
- Sputum (spit) changes from clear to yellow, green, grey, or becomes bloody.
- You are not able to perform normal activities.

## EXTREMITY INJURY:

- Extremity Injuries may consist of cuts, scrapes, bruises, sprains, or broken bones (fractures).
- Apply ice on the injury for 15 to 20 minutes each hour for the first 1 to 2 days.
- Elevate the extremity above the heart as possible for the first 48 hours to decrease pain and swelling.
- Use the extremity as pain allows.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- Temperature is greater than 101° F.
- The bruising, swelling, or pain gets worse despite the treatment listed above.
- Any problems listed on the Wound Care instructions are noted.
- You are unable to move the extremity or if numbness or tingling is noted.
- You are not improved in 24 to 48 hours or you are not normal in 7 to 10 days.

## VOMITING/DIARRHEA:

- Vomiting (throwing up) can be caused by many things. It is common in children, but should be watched closely.
- Diarrhea is most often caused by either a food reaction or infection.
- Dehydration is the most serious problem associated with vomiting or diarrhea.
- Drink clear liquids such as water, apple juice, soft drinks, or gatorade for the first 12 hours or until things improve. Adults should drink 8 to 12 glasses of fluids per day with diarrhea. Children should drink 1 cup of fluid for each loose bowel movement.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- Temperature is greater than 101° F.
- Vomiting or Diarrhea lasts longer than 24 hours, gets worse, or blood is noted.
- You cannot keep fluids down or no urination is noted in 8 hours.

## WOUND CARE:

- Wounds include cuts, scrapes, bites, abrasions, or puncture wounds.
- If the wound begins to bleed, apply pressure over the wound with a clean bandage and elevate the wound above the heart for 5 to 10 minutes.
- Unless instructed otherwise, clean the wound twice daily with soapy water, and keep the wound dry. It is safe to take a shower but do not place the wound in bath or dish water.
- See a physician for a tetanus shot if it has been 10 years or more since your last one.

### Call or see a physician, go to the emergency department, or call 911 immediately if:

- See the Extremity Injury instructions.
- Temperature is greater than 101° F.
- Bruising, swelling, or pain gets worse or bleeding is not controlled as directed above.
- Any signs of infection, such as redness, drainage of yellow fluid or pus, red streaks extending from the wound, or a bad smell is noted.

## Abbreviations

---

|        |  |
|--------|--|
| A&O x3 | alert and oriented to person, place, time                |
| A&O x4 | alter and oriented to person, place, time, current event |
| Ab     | abortion   |
| AED    | automated external defibrillator                         |
| AFib   | atrial fibrillation                                      |
| AAA    | abdominal aortic aneurysm                                |
| ABC    | airway, breathing, circulation                           |
| abd    | abdominal  |
| ACLS   | advanced cardiac life support                            |
| AICD   | automatic implanted cardioverter/defibrillator           |
| AKA    | above knee amputation                                    |
| ALS    | advanced life support                                    |
| AMA    | against medical advice                                   |
| AMS    | altered mental status                                    |
| amt    | amount   |
| apap   | acetaminophen  |
| APGAR  | appearance, pulse, grimace, activity, respirations       |
| ARF    | acute renal failure                                      |
| asa    | aspirin  |
| assoc  | associated   |
| AVPU   | alert, verbal, pain, unresponsive                        |
| BG     | blood glucose  |
| bl     | bilateral  |
| BKA    | below knee amputation                                    |
| BM     | bowel movement   |
| BLS    | basic life support                                       |
| BTLS   | basic trauma life support                                |
| BP     | blood pressure   |
| BS     | breath sounds  |
| BSI    | body substance isolation                                 |
| BVM    | bag-valve-mask   |
| c      | with   |
| ca     | cancer   |
| CABG   | coronary artery bypass graft                             |
| CAD    | coronary artery disease                                  |
| cath   | catheter, catheterization                                |
| CC     | chief complaint  |
| CF     | cystic fibrosis  |
| CFD    | Charlotte Fire Department                                |
| CHF    | congestive heart failure                                 |
| cm     | centimeters  |
| CMPD   | Charlotte Mecklenburg Police Department                  |

|                 |  |
|-----------------|--|
| CNS             | central nervous system                                   |
| C/O             | complains of   |
| CO              | carbon monoxide  |
| CO <sub>2</sub> | carbon dioxide   |
| COPD            | chronic obstructive pulmonary disease                    |
| CP              | chest pain, cerebral palsy                               |
| CPAP            | continuous positive airway pressure                      |
| CPR             | cardiopulmonary resuscitation                            |
| CRI             | chronic renal insufficiency                              |
| C/S             | caesarean section  |
| C-spine         | cervical spine   |
| CTA             | clear to auscultation                                    |
| CVA             | cerebrovascular accident                                 |
| D50             | dextrose 50%   |
| D/C             | discontinue  |
| DDx             | differential diagnosis                                   |
| defib           | defibrillation   |
| DJD             | degenerative joint disease                               |
| DKA             | diabetic ketoacidosis                                    |
| DM              | diabetes mellitus  |
| DNR             | do not resuscitate                                       |
| DOA             | dead on arrival  |
| DOE             | dyspnea on exertion                                      |
| d/t             | due to   |
| DT              | delirium tremens   |
| DTR             | deep tendon reflex                                       |
| DVT             | deep venous thrombosis                                   |
| Dx              | diagnosis  |
| ECG             | electrocardiogram  |
| ED              | emergency department                                     |
| EDC             | estimated date of confinement (due date)                 |
| EEG             | electroencephalogram                                     |
| EGA             | estimated gestational age                                |
| EJ              | external jugular   |
| EKG             | electrocardiogram  |
| EMD             | emergency medical dispatcher                             |
| EMS             | emergency medical services                               |
| EMT-B           | emergency medical technician-basic                       |
| EMT-I           | emergency medical technician-intermediate (Advanced EMT) |
| EMT-P           | emergency medical technician-paramedic                   |
| EOC             | emergency operations center                              |
| EOMI            | extra-ocular movements intact                            |
| ESLD            | end stage liver disease                                  |



|                  |                                     |
|------------------|-------------------------------------|
| ESRD             | end stage renal disease             |
| ETA              | estimated time of arrival           |
| ETT              | endotracheal tube                   |
| etOH             | ethanol (alcohol)                   |
| ext              | extremity, extension                |
| FB               | foreign body                        |
| FD               | fire department                     |
| Fe               | iron                                |
| Flex             | flexion                             |
| Fx               | fracture                            |
| G                | Gravida                             |
| g                | grams                               |
| GCS              | Glasgow coma score                  |
| GERD             | gastro-esophageal reflux disease    |
| GI               | gastrointestinal                    |
| GSW              | gunshot wound                       |
| gtts             | drops, drip                         |
| GU               | genitourinary                       |
| GYN              | gynecology gynecological            |
| H <sub>2</sub> O | water                               |
| HA               | headache                            |
| HazMat           | hazardous materials                 |
| HCO <sub>3</sub> | bicarbonate                         |
| HEENT            | head, eyes, ears, nose, throat      |
| Hg               | mercury                             |
| hosp             | hospital                            |
| HPI              | history of present illness          |
| HR               | heart rate                          |
| hr               | hour                                |
| ht               | height                              |
| HTN              | hypertension                        |
| Hx               | history                             |
| ICS              | incident command system             |
| ICU              | intensive care unit                 |
| IDDM             | insulin dependent diabetes mellitus |
| IM               | intramuscular                       |
| IN               | intranasal                          |
| IO               | intraosseous                        |
| IV               | intravenous                         |
| IVP              | intravenous push                    |
| IVPB             | intravenous piggyback               |



|                   |   |
|-------------------|---|
| J                 | joule   |
| JVD               | jugular venous distension                     |
| K+                | potassium                                     |
| KED               | Kendrick extrication device                   |
| kg                | kilograms                                     |
| KVO               | keep vein open                                |
| L                 | left  |
| L&D               | labor and delivery                            |
| lat               | lateral                                       |
| LAD               | left axis deviation                           |
| LAE               | left atrial enlargement                       |
| lb                | pound   |
| LBBB              | left bundle branch block                      |
| LLQ               | left lower quadrant                           |
| LMP               | last menstrual period                         |
| LOC               | loss of consciousness, level of consciousness |
| LPN               | licensed practical nurse                      |
| L-spine           | lumbar spine                                  |
| L/S-spine         | lumbosacral spine                             |
| LUQ               | left upper quadrant                           |
| LVH               | left ventricular hypertrophy                  |
| MAE               | moves all extremities                         |
| MAL               | mid axillary line                             |
| MAP               | mean arterial pressure                        |
| MCC               | motor cycle crash                             |
| MCI               | mass casualty incident                        |
| MCL               | midclavicular line                            |
| MD                | medical doctor, muscular dystrophy            |
| MDI               | metered dose inhaler                          |
| mcg               | micrograms                                    |
| mEq               | milli-equivalents                             |
| MgSO <sub>4</sub> | magnesium sulfate                             |
| mg                | milligrams                                    |
| MI                | myocardial infarction                         |
| min               | minutes                                       |
| ml                | milliliters                                   |
| mm                | millimeters                                   |
| MOI               | mechanism of injury                           |
| MR                | mental retardation                            |
| MRSA              | methicillin resistant staph aureus            |
| MS                | multiple sclerosis                            |
| MVC               | motor vehicle crash                           |

|                  |                                      |
|------------------|--------------------------------------|
| N <sub>2</sub> O | nitrous oxide                        |
| Na+              | sodium                               |
| N/A              | not applicable, not available        |
| NAD              | no apparent distress                 |
| neb              | nebulizer                            |
| NG               | nasogastric                          |
| NKDA             | no known drug allergies              |
| nl               | normal                               |
| N/V/D            | nausea/vomiting/diarrhea             |
| NC               | nasal cannula                        |
| NP               | nurse practitioner                   |
| NPA              | nasopharyngeal airway                |
| NPO              | nothing by mouth                     |
| NRB              | non-rebreather mask                  |
| NS               | normal saline                        |
| NSAID            | non-steroidal anti-inflammatory drug |
| NSR              | normal sinus rhythm                  |
| NT/ND            | nontender/nondistended               |
| ntg              | nitroglycerin                        |
| NVID             | neurovascularly intact distally      |
|                  |                                      |
| O <sub>2</sub>   | oxygen                               |
| OB               | obstetric, obstetrical               |
| OCP              | oral contraceptive pill              |
| od               | overdose                             |
| OPA              | oropharyngeal airway                 |
| OR               | operating room                       |
| OTC              | over-the-counter                     |
|                  |                                      |
| P                | pulse, parity                        |
| p                | after                                |
| PA               | <b>physician's assistant</b>         |
| PAC              | premature atrial contraction         |
| palp             | palpation                            |
| PALS             | pediatric advanced life support      |
| PCN              | penicillin                           |
| PCR              | patient care report                  |
| PD               | police department                    |
| PE               | pulmonary embolus; physical exam     |
| PEA              | pulseless electrical activity        |
| PEARL            | pupils equal and reactive to light   |
| PMH              | past medical history                 |
| PND              | paroxysmal nocturnal dyspnea         |
| PO               | orally, by mouth                     |
| POV              | privately owned vehicle              |

|                  |   |
|------------------|---|
| ppd              | packs per day                             |
| PPE              | personal protective equipment             |
| PPM              | parts per million                         |
| PRN              | as needed                                 |
| PROM             | pre-mature rupture of membranes           |
| PSVT             | paroxysmal supraventricular tachycardia   |
| Pt               | patient                                   |
| PTA              | prior to arrival                          |
| PTL              | pre-term labor                            |
| PUD              | peptic ulcer disease                      |
| PVC              | premature ventricular contraction         |
| PVD              | peripheral vascular disease               |
|                  |   |
| Q                | every                                     |
|                  |   |
| RAD              | right axis deviation                      |
| RBBB             | right bundle branch block                 |
| RLQ              | right lower quadrant                      |
| RN               | registered nurse                          |
| r/o              | rule out                                  |
| RR               | respiratory rate                          |
| RUQ              | right upper quadrant                      |
| Rx               | prescription, medication                  |
| rxn              | reaction                                  |
|                  |   |
| s                | without                                   |
| SA               | sino-atrial                               |
| SB               | sinus bradycardia                         |
| SBP              | systolic blood pressure                   |
| SL               | sublingual                                |
| SNF              | skilled nursing facility                  |
| Sn/Sx            | signs/symptoms                            |
| SOB              | shortness of breath                       |
| S/P              | status post                               |
| SPO <sub>2</sub> | pulse oxygen saturation                   |
| SQ               | subcutaneous                              |
| SROM             | spontaneous rupture of membranes          |
| SSS              | sick sinus syndrome                       |
| ST               | sinus tachycardia                         |
| S/T              | sore throat                               |
| STD              | sexually transmitted disease              |
| STEMI            | ST-segment elevation myocardia infarction |
| SVD              | spontaneous vaginal delivery              |
| SVT              | supraventricular tachycardia              |
| Sz               | seizure                                   |

|         |                                |
|---------|--------------------------------|
| T       | temperature                    |
| tab     | tablet                         |
| Tb      | tuberculosis                   |
| TBSA    | total body surface area        |
| TCP     | transcutaneous pacing          |
| TM      | tympanic membrane              |
| T-spine | thoracic spine                 |
| TIA     | transient ischemic attack      |
| TKO     | to keep open                   |
| Tx      | treatment, transport, traction |
| UA      | unstable angina                |
| UOA     | upon our arrival               |
| URI     | upper respiratory infection    |
| UTI     | urinary tract infection        |
| VF      | ventricular fibrillation       |
| V/S     | vital signs                    |
| VT      | ventricular tachycardia        |
| WCT     | wide complex tachycardia       |
| WD/WN   | well developed/well nourished  |
| WNL     | within normal limits           |
| WPW     | Wolf-Parkinson-White           |
| wt      | weight                         |
| yo      | years old                      |
| ~       | approximately                  |
| Δ       | change                         |
| =       | equal to                       |
| ≠       | not equal to                   |
| >       | greater than                   |
| <       | less than                      |
| Ø       | no, not, negative              |
| -       | negative                       |
| +       | positive                       |
| ?       | questionable                   |
| 1°      | primary                        |
| 2°      | secondary                      |
| ψ       | psychiatric                    |

## Local Credentialing Requirements

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### Initial Local Credentialing Requirements:

- \* EMT-Basic
  - Successfully obtain North Carolina state credentials prior to beginning FTO ride time requirements
  - Successfully complete all Field Training Officer (FTO) requirements
  - **Successfully complete the Agency's local credentialing examination (Scope of Practice)**
  - Successfully complete basic written examination
  - Successfully complete basic psychomotor skill stations
- \* EMT-Paramedic
  - Successfully obtain North Carolina state credentials prior to beginning FTO ride time requirements
  - Successfully complete all Field Training Officer (FTO) requirements
  - **Successfully complete the Agency's local credentialing examination (Scope of Practice)**
  - Successfully complete advanced written examination
  - Successfully complete advanced psychomotor skill stations
  - Successfully complete the oral board examination as administered by the medical director or EMS fellow

### Renewal of Local Credentials (Every 4 years):

- \* EMT-Basic
  - Complete all required/mandatory continuing education
  - **Successfully complete the Agency's local credentialing examination (Scope of Practice)**
  - Successfully complete basic written examination
  - Successfully complete basic psychomotor skill stations
- \* EMT-Paramedic
  - Complete all required/mandatory continuing education
  - **Successfully complete the Agency's local credentialing examination (Scope of Practice)**
  - Successfully complete advanced written examination
  - Successfully complete advanced psychomotor skill stations
- \* Completing the continuing education requirements will allow the employee to recertify their NC State credentials
  - Scope of Practice examinations will allow the employee to recertify their local credentials and provide care in Mecklenburg County
  - Failure to successfully pass the local credentialing examinations prior to the **expiration date printed on the employee's NC certification card will result in the inability to practice in Mecklenburg County, even if their certification has been renewed at the state level**

## Internal Upgrade Requirements

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### EMT to Paramedic upgrade

- \* Obtain North Carolina Paramedic certification
  - Employee must have graduated from an accredited Paramedic program
  - If the employee did not graduate from an accredited program, they will be required to complete a state approved refresher course prior to moving forward with the upgrade process
- \* The request to upgrade must be received within 6-months (180-days) of Paramedic credential being issued by the North Carolina Office of EMS
  - All requirements for internal upgrade must be completed within 12-months (365-days) of Paramedic credential being issued by NCOEMS
  - If unsuccessful at completing all requirements for internal upgrade within 12-months (365-days), the provider must complete a state approved refresher course prior to moving forward with the upgrade process
  - If requesting upgrade outside of 6-months (180-days) from Paramedic credential being issued by NCOEMS, the provider must complete a state approved refresher course prior to moving forward with the upgrade process

### Mechanism of upgrade

- \* EMT will make the formal request to upgrade to their assigned Operations Supervisor
- \* EMT must be current on all required/mandatory continuing education
- \* Successfully complete all Field Training Officer (FTO) requirements
  - Must be completed in  $\leq 4$  weeks
- \* **Successfully complete the Agency's local credentialing examination (Scope of Practice)**
- \* Successfully complete advanced written examination
- \* Successfully complete advanced psychomotor skill stations
- \* Successfully complete the oral board examination as administered by the medical director or EMS fellow

## Continuing Education Requirements

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### All Provider Levels

- \* The Agency will provide continuing education classes which meet the yearly requirements set by the North Carolina Office of Emergency Medical Services (NCOEMS)
  - Classes may include but are not limited to: classroom learning, simulation, distance learning or on-line requirements
- \* It is the responsibility of each individual to attend continuing education to satisfy Agency and NCOEMS requirements
- \* All continuing education provided by the Agency is a requirement for each employee
  - Certain required continuing education offerings will be designated as mandatory for all credentialed employees
  - Examples of mandatory training may include: Introduction of new equipment/medications, protocol changes or changes to **the provider's** scope of practice
- \* If unable to attend a required or mandatory continuing education session you must contact a member of Medical Services and your direct supervisor
- \* Employees completing make-up sessions will be paid their hourly rate (or time and a half) for class hours
- \* Sessions that consisted of a hands-on or skills demonstration component may not be available for make-up
  - Subsequently, the employee will not be able to obtain the missed continuing education hours

### Designated Mandatory Sessions

- \* An employee must attend a make-up session for any missed mandatory continuing education session within 30 days of the final scheduled offering
- \* An employee who is non-compliant after 30 days *will be removed from the schedule* in a LWOP status until the mandatory session has been completed
- \* If the employee was on approved leave and/or excused from in-service, then the mandatory content must be completed prior to returning to duty
- \* For those employees who are unable to attend a required session or excused for extended periods (e.g. due to illness, injury, vacation), Medical Services will offer and schedule make-up sessions
  - Employees out for extended periods should refer to the extended leave policy below for a list of requirements

## Return to Field Requirements

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### Introduction

- \* Under certain circumstances employees may be excused from field duty for extended periods (e.g. illness or injury, vacation)
- \* Depending upon the length of absence, requirements must be completed to return to duty
- \* These are outlined below for all provider levels (EMT, Advanced EMT, Paramedic)

### ≤ 3 Months

- \* All deficient continuing education sessions/administrative/operations items must be completed PRIOR to returning to duty
- \* The employee may request to ride in a 3<sup>rd</sup> person status to re-acclimate to the field
  - This will be at the discretion of operations

### 3 Months to 6 Months

- \* All deficient continuing education sessions/administrative/operations items must be completed PRIOR to returning to duty
- \* **Successfully complete the Agency's local** credentialing examination (Scope of Practice)
  - Basic/Advanced written examination portion only
- \* The employee may request to ride in a 3<sup>rd</sup> person status to re-acclimate to the field
  - This will be at the discretion of operations.

### 6 Months to 1 year

- \* All deficient continuing education sessions/administrative/operation items must be completed PRIOR to returning to duty
- \* **Successfully complete the Agency's local credentialing** examination (Scope of Practice)
  - Basic/Advanced written examination
  - Basic/Advanced psychomotor skill stations
- \* Successfully complete the oral board examination as administered by the medical director or EMS fellow (Paramedics Only)
- \* The employee may request to ride in a 3<sup>rd</sup> person status to re-acclimate to the field
  - This will be at the discretion of operations

### 1 Year or Greater

- \* Successfully complete an initial NC EMT course or state approved Paramedic Refresher Course depending on level of certification
- \* Successfully complete all Field Training Officer (FTO) requirements
  - Maximum of 4 weeks
- \* **Successfully complete the Agency's local credentialing examination (Scope of Practice)**
  - Basic/Advanced written examination
  - Basic/Advanced psychomotor skill stations
  - Successfully complete the oral board examination as administered by the medical director or EMS fellow (Paramedics Only)



## Clinical Performance Standards

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### Introduction

- \* The department of Medical Services is responsible for providing clinical continuing education and training for all certified medical providers (EMT, AEMT, and Paramedic)
- \* The department is also responsible for the identification of didactic and/or skill competency concerns, formulate a corrective plan of action, and provide remediation of providers as needed
- \* Medical Services monitors clinical quality performance through retrospective review of patient care reports and data analysis of clinical measures - **supporting the Agency's quality improvement functions and clinical research efforts**

### Medical Services Clinical Performance and Proficiency Evaluation Mechanisms

- \* Assesses EMT, AEMT, and Paramedic core knowledge and skill competency through the use of validated scenarios, which interact with advanced technology human patient simulators, against a realistic setting/environment
- \* Evaluation of field personnel performance through ride along observations
- \* Retrospective quality review of electronic patient care report data for selected priorities and categories
- \* Evaluation of new employee candidates through the Assessment Center process by assessing medical knowledge, psychomotor skill sets, and affect and makes recommendation for hiring based on clinical and educational expertise
- \* Medical incidents reviews
  - Represents Medical Services in the medical incident review processes
  - Provides resultant remediation
  - Track, document and report remedial training progress to the Medical Director

### Medical Services Performance and Proficiency Tools

- \* Development and implementation of assessment tools used in the evaluation of current employees for clinically related promotional processes
- \* Development and implementation of various assessment models which evaluate the clinical competency of patient care providers to maintain local credentialing
- \* Remedial training, verbal and written coaching for those medics who are identified as in need through simulation, testing and/or quality improvement processes

**Interval Clinical Performance Measures****\* Clinical Quality Data Sets-**

- Seizures
  - Dispatch complaint and Primary Impression = Seizure
    - Appropriate treatment = blood glucose level
  - Dispatch complaint and Primary Impression = Seizure
    - Appropriate treatment = Versed
- STEMI
  - Patient appears in STEMI database
    - Appropriate treatment = aspirin, aspirin allergy, or aspirin PTA
    - Appropriate treatment = ECG acquired
- Bronchospasm
  - Respiratory distress with history of Asthma or symptom of wheezing
    - Appropriate treatment = albuterol or albuterol PTA
- Pulmonary Edema
  - **Patient with pulmonary edema specified in "symptoms"**
    - Appropriate treatment = nitroglycerin or contraindication of 1st SBP<90 or Medications: sildenafil, tadalafil, or vardenafil
    - Appropriate treatment = NIPPV (CPAP)
- Priority-1 trauma scene times
- STEMI
  - True STEMI vs. false activation
  - 911 to PCI time
  - Radio notification to PCI time
  - Depart scene to catheterization lab table time
- Cardiac arrest
  - Utstein ROSC rates
  - Non- Utstein ROSC rates
  - Post-ROSC 12-lead ECG acquired
  - Elapsed time 911-call to first defibrillation
  - Elapsed time ROSC to depart scene
- Priority 1, 2, 3, 4 response times



# Provider Notes

## Notes

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## Notes

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Medical Excellence. Compassionate Care.