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# Prehospital Care Protocol and Treatment Guidelines

## 2026 R1.11

# NAVIGATION

## If viewing this document as a printed hard copy

The Header color of each section defines the protocol type

A D U L T  P R O T O C O L

Blue – Adult Protocols

P E D I A T R I C  P R O T O C O L

Pink – Pediatric

O B  E M E R G E N C I E S

Purple – OB Emergencies

M E D I C A L  C O N T R O L

Gray – Reference or Policy

Side Tabs

The side tabs highlight where you are in each protocol sub-section

The BLUE highlighted text shows which sub-section you are currently viewing

The GRAY text shows the sub-sections before and after your current selection

## If viewing this document as portable document file

## (.pdf / Adobe Acrobat)

This document is hyperlinked for easy navigation in Adobe Acrobat.

The colored boxes in each protocol tree are linked to the respective pages with further information on the specific procedure, medication, or protocol page. There is an active link when hovering over the text within the colored box and the cursor changes from a bar to a pointer finger. Left clicking will jump to the linked page containing further information. Right clicking and selecting “Previous View” will return you to the page you started at.

This document is also bookmarked with respect to the individual sections. Use the bookmark feature of Adobe Acrobat to display pre-designated bookmarks and click on each to jump between sections.

# KEY TO ALGORITHMS

All algorithms are color coded to denote procedures, which may be performed by each level of certification. To perform procedures color - coded red, Online Medical Control must be contacted for permission. Higher levels of certification will perform lower-level evaluations and procedures when interpreting the algorithms.

The protocol format is for quick reference and does not detail patient assessment, interpretation, or interventions. EMS personnel are accountable for all patient care and documentation to their level of training and lower.

| COLOR CODES | |
|---|---|
| **YELLOW** | EMT – EMT Skill and Assessment Level Interventions |
| **GREEN** | AEMT – Advanced EMT and Assessment Level Interventions |
| **BLUE** | Paramedic Skill and Assessment Level Interventions |
| **RED** | Medical Control Contact / Authorization - Consult Required |

Stop – Do NOT perform intervention if listed criteria are present. Discuss with Online Medical Control if provider feels there is therapeutic value despite the stop.

Caution – Reminder about specific intervention. Do NOT perform action unless listed criteria are met and understood. If question(s), contact Online Medical Control

Time sensitive – Requires timely response by providers within timeframe indicated

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# INTRODUCTION

These protocols and procedures are to be used as guidelines for operation during EMS calls that require medical direction. They are also intended to be guidelines to ensure that personnel are trained in proper pre-hospital patient care.

Procedures are not considered rigid rules, but rather established standards against which EMS practice can be measured.

Treatment protocols are specific orders directing the actions pertaining to techniques and/or medications used by EMS personnel who are required to practice under direct supervision of a physician and under their respective EMS Medical Control authority. Treatment protocols may and should be initiated without prior direct Medical Control contact, especially when the patient's condition and / or situation is life threatening.

Although not identical, these protocols and procedures are derived from the State of Ohio EMS guidelines. Please note that items in this manual are subject to continuous review for the sake of providing members with the most current emergency medical information. Updates to this material may be frequent to maintain a current standard of care to benefit both the patient and the provider of emergency medical care. Please replace older versions with newly updated material as soon as it is issued. Once updated, older versions are to be considered obsolete and are to be discarded to help eliminate confusion.

# ONGOING IMPROVEMENT

To assure these protocols remain relevant and up-to-date, University Hospitals has created an email specific to the ongoing management of this document. Anyone with ideas for improvement should email uhemsprotocols@uhhospitals.org with their suggestions. If there are specific questions about intent, meaning, or interpretation of the protocols, these should be directed to one's EMS coordinator or Medical Director.

The above listed email will serve as a singular collection point for all corrections, and suggestions. Please understand that protocol changes are an ongoing, progressive, process requiring involvement of many parties to bring to print. Not all suggestions can or will be used, but all will be reviewed by the protocol committee and the Medical Directors. We look forward to your suggestions and corrections to assure that we field the finest pre-hospital care protocol.

# INTRODUCTION

# MEDICAL CONTROL GENERAL GUIDELINES

1. The patient history should not be obtained at the expense of the patient. Life-threatening problems detected during the primary assessment ***must*** be treated first.

2. Cardiac arrest due to trauma is not treated by medical cardiac arrest protocols. Penetrating trauma patients should be transported promptly with CPR, control of hemorrhage, cervical spine immobilization, and other indicated procedures attempted enroute.

3. In patients with non-life-threatening emergencies who require IV's, only two attempts at IV insertion should be attempted in the field; additional attempts should be made enroute.

4. In patients requiring IV's, as a courtesy to the patient and emergency department, attempts should be made to obtain a full set of lab work. A patient IV should not be compromised to obtain a set of lab work.

5. Patient transport, or other needed treatments, must not be delayed for multiple attempts at endotracheal intubation. Limit to two attempts pre-hospital.

6. Verbally repeat all orders received before their initiation.

7. Any adult medical patient or patients of any age with a cardiac history, irregular pulse, unstable blood pressure, dyspnea, chest pain, or syncope must be placed on a cardiac monitor.

8. Where clinically indicated, obtain a diagnostic EKG, and transmit to the emergency department. The transmission must include the patient's name, age, and sex.

9. When transferring lower-level prehospital care to a higher level of prehospital care, a thorough consult should be performed between caregivers describing initial patient presentation and care rendered to the point of transfer.

10. If the patient's condition does not seem to fit a protocol or protocols, contact Online Medical Control for guidance.

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

12. Medical patients will be transported in the most efficient manner possible considering the medical condition. Advanced life support therapy should be provided at the scene if it would positively impact patient care. Justification for scene times greater than 20 minutes should be documented.

# INTRODUCTION

# UNIVERSAL PATIENT CARE PROTOCOL

ESTABLISH SCENE SAFETY

**PATIENT ASSESSMENT**
ADULT PATIENT ASSESSMENT PROCEDURE
PEDIATRIC PATIENT ASSESSMENT PROCEDURE

→ Cardiac Arrest?
→ CARDIAC ARREST PROTOCOL

**AIRWAY / BREATHING**
ADULT AIRWAY PROTOCOL
PEDIATRIC AIRWAY PROTOCOL

**CIRCULATION**
ADULT SHOCK PROTOCOL
PEDIATRIC SHOCK PROTOCOL

SPINAL MOTION RESTRICTION PROCEDURE
Where indicated

**VITAL SIGNS**
Heart Rate
Respirations
Blood Pressure
Room Air $SpO_2$ – Apply O2 if needed to maintain $SpO_2 \geq 94$ unless specific protocol requires high flow $O_2$
4 lead / Diagnostic EKG
Blood glucose where indicated

**Go to Appropriate Protocol**

**Patient Does NOT Fit Any Protocol?**
**CONTACT ONLINE MEDICAL CONTROL**

Decontaminate and remove clothes if patient is exposed to any dangerous or noxious substances

At a minimum, a defibrillator and basic airway management supplies shall be taken to the initial contact of the patient in cases dispatched as;
Airway or respiratory in nature,
Alterations in mental status including seizure, stroke, or dizziness / vertigo, chest pain or cardiac in nature, or unknown medical cases

Keep monitoring equipment on patient until proper bedside transfer at the receiving hospital in all critical patients such as;
Respiratory distress, intubated, shock, ACS, dysrhythmias, ROSC, anaphylaxis, hyperkalemia, dialysis, syncope, toxic ingestions, sedated patients and trauma

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

## Universal Patient Care Key Points

- **Any patient contact, whether it results in an EMS transport or not, must have a completed PCR.**
- **Exam: Minimal exam if not noted on the specific protocol is vital signs, mental status, and location of injury or complaint.**
- **Required vital signs on every patient include BP, pulse, respirations, and pain scale.**
- A pediatric patient is defined by the weight-based system, If the patient does not fit on the system, they are considered adult.
- Timing of transport should be based on patient's clinical condition and the transport policy.

**General**

- All patient care and documentation **MUST** be appropriate for your level of training and within the standard of care of the State of Ohio.
- Minimize over-ventilation. Ventilate Adults 1 breath every 6 seconds (10 breaths / min) with BVM or advanced airway. Ventilate pediatrics 1 breath every 2 - 3 seconds (20 – 30 breaths / min) with or without and advanced airway.
- Refer to the Post Resuscitation Cardiac Arrest Protocol for all resuscitated cardiac arrest patients.
- One provider can begin resuscitation and treatment while the other performs the assessment.
- It may be necessary to reference several protocols while treating a patient.
- Refer to the appropriate protocol and provide the required interventions as indicated.
- Additional focus may be needed in specific areas as indicated by the patient's chief complaint.
- Airway management and oxygen administration should be initiated based upon the results of the patient assessment and the protocols.
- IV's should be initiated in all patients based upon the results of the patient assessment and the Intravenous Access Procedure. Attempt to draw blood samples whenever an IV is initiated. However, do not jeopardize the IV for the blood samples.
- IV's are generally preferred over IO access. Attempts should be made to establish IV's. If IO access is necessary, humeral head IO's offer greater flow rates and are preferred over tibial IO. Other clinical factors should be considered when deciding any vascular access, as they may dictate delivery of care.
- Administer cardiac monitoring and perform a diagnostic EKG based upon the results of patient assessment or protocols.
- EMT and Advanced EMT's may apply the cardiac monitor, print a strip, and transfer the strip to the emergency department but may not interpret the rhythm.
- If indicated and possible, perform a diagnostic EKG before moving to the squad and prior to any medication administration.
- Check the patient's Blood Glucose Level based upon the patient's assessment and the protocols.
- When assessing for pain, use a 0-10 pain scale; 0 = no pain; 10 = worst pain ever experienced.
- It is mandatory to document the reason why an intervention was not performed if it was indicated.
- If Online Medical Control requests that a functioning paramedic perform an intervention outside of the protocol, the functioning paramedic may follow the orders if **ALL** of the following apply:
    - The patient's condition could be severely affected if the intervention is not performed.
    - The paramedic has documented training in the intervention within the last 3 years.
    - The intervention is in the recognized scope of practice for paramedics in the state of Ohio.
    - The paramedic has received permission to perform the intervention from Online Medical Control.
    - Online Medical Control was notified that the intervention is not in the protocol.

**Adult**

- Patients who are taking rate control medications may not have an elevated heart rate, but may still be in shock.
- General weakness can be a symptom of a life threatening illness.
- Hip fractures and dislocations in the elderly have a high mortality rate.
- What would be considered a minor or moderate injury in the adult patient can be life threatening in the elderly.
- Diabetic patients may have abnormal presentations of AMI and other conditions due to neuropathy.
- A medical cardiac arrest is not a "load and go" situation. It is in the best interest of the patient to perform all initial interventions (Defib, CPR, ETT, IV) and 1-2 rounds of medications prior to transport.
- An adult patient is considered hypotensive if their systolic BP is 90 mmHg or less or a MAP < 65.
- Assess the patient after every 250 ml of normal saline, and continue with fluid resuscitation until it is no longer indicated.

**Pediatric**

- Assess the pediatric patient after every fluid bolus of normal saline, and continue with fluid resuscitation until it is no longer indicated.
- Refer to the Pediatric Intraosseous Procedure, if indicated.
- It may be necessary to alter the order of the assessment (except for the Initial Assessment) based upon the developmental stage of the patient.
- A pediatric trauma patient is any trauma patient who is less than 16 years old.
- Refer to the Pediatric Vital Signs Chart, as needed.

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ADULT PROTOCOL

# AIRWAY / BREATHING GUIDELINES

## GUIDELINES OF AIRWAY / BREATHING ASSESSMENT

**PARTIAL OBSTRUCTION**
- May include coughing with some air movement. Give 100% Oxygen and encourage the patient to cough. Monitor for changes. Transport immediately and be prepared for a total obstruction to develop.

**FOREIGN BODY AIRWAY OBSTRUCTIONS (FBAO)**
- Should be removed immediately if able. Visualize airway and either suction or sweep out liquids and other materials. Solids must be hooked with an instrument. A laryngoscope may be used for direct visualization of the airway. If unable to clear airway by these methods, use Heimlich maneuver and abdominal or chest thrusts as appropriate.

**STRIDOR**
- High pitched crowing sound caused by obstruction of the upper airway.

**WHEEZING**
- A whistling or sighing sound, usually lower airway and found upon expiration.

**RALES**
- Fine to coarse crackles representing fluid in the lower airway.

**RHONCHI**
- Coarse upper airway sound representing various levels of upper airway obstruction.

**COPD**
- Pulmonary disease (as emphysema or chronic bronchitis) that is characterized by chronic typically irreversible airway obstruction resulting in prolonged exhalation.

**CROUP**
- Inflammation, edema, and subsequent obstruction of the larynx, trachea, and bronchi especially of infants and young children that is typically caused by a virus and is marked by episodes of difficulty breathing and hoarse metallic cough.

**EPIGLOTTITIS**
- Inflammation of the epiglottis usually caused by HIB microbes, now uncommon in children.

## MANAGEMENT OF TRACHEOSTOMY PATIENTS

**Tracheostomies come in 2 types**
- Cuffed tracheostomy – has a distal cuff to create seal in patient trachea. Necessary for patients requiring mechanical ventilation. There is a ET tube like pilot balloon to verify cuff patency once placed in the tracheal stoma. Select devices may be filled with saline rather than air, this is device specific. Nearly all will be filled with air.
- Uncuffed tracheostomy – does not have distal cuff and does not seal in the trachea. This type is used for spontaneously breathing patients who require an alternate airway due to upper airway defect. These patients may be able to speak with the use of special tracheostomies or valves.

**Tracheostomies have 2 essential parts**
- Outer cannula – This is the base that secures in the tracheal stoma. If it is cuffed tracheostomy, the cuff is on this section. There are "wings" that allow for attachment of a tie around the patient's neck. Some recently placed devices may be sutured in place.
- Inner cannula – is removeable for cleaning / replacement. Usually clips or is locked in with a quarter turn detent.

**Management of tracheostomy patients**
- Have suction equipment on hand throughout all phases of treatment and transport suction to maintain patency as required.
- If a tracheostomy becomes dislodged and cannot be reinserted, use a ET tube sized to the stoma size.
- If a tracheostomy comes out and can be reinserted or needs changed, utilize a bougie (tube changer) if available to insert into stoma and "railroad" the tracheostomy over the bougie into place.
- Check all cuffed tracheostomy cuffs for patency, add additional air if an air leak can be appreciated around stoma.
- If a tracheostomy patient cannot be bagged effectively suspect mucous plug. Alternate trachea lavage with saline, suction, and bagging until resolved.
- If a tracheostomy patient presents with increased work of breathing, remove, and inspect inner cannula.
- Pediatric tracheostomies may not have inner cannulas due to their size
- Take an extra tracheostomy kit or inner cannula with you during transport if available at pickup location
- Patients and their care givers are frequently very adept at managing these devices, utilize them as a resource
- See procedures section for STOMA AND TRACHEOSTOMY CARE procedures

## KEY POINTS

**Airway Assessment:**
- If you don't have an airway – you don't have anything!
- C-spine precautions must be considered prior to the insertion of airway adjuncts. Provide manual stabilization prior to insertion.
- See PEDIATRIC Section for pediatric airway management.

**Breathing Assessment:**
- Be sure that the airway is open before assessing breathing.
- When assessing breathing, observe rate, quality, depth, and equality of chest movement.
- COPD patients maintain on low flow oxygen (usually <2 L which keeps their O2 Sat in the 90's%), and some may stop breathing on high flow. However - if the COPD patient needs high flow oxygen - it should be given. Be prepared to support breathing with BVM if needed.
- Always record vital signs when treating breathing problems.

| ADJUNCT | INDICATIONS | CONTRAINDICATIONS | COMMENTS |
|---|---|---|---|
| Suction | Indispensable for all patients with fluid or particulate debris in airway | NONE | No more than 15 seconds per attempt |
| Modified jaw thrust | Initial airway maneuver for all trauma patients | NONE | None of these adjuncts protects against aspiration in patient with depressed consciousness |
| Hyperextension of neck | Opening airway of non-trauma patient | Potential cervical spine injury | None of these adjuncts protects against aspiration in patient with depressed consciousness |
| Nasal airway | Obstruction by tongue with gag reflex present | Potential mid-face injury | None of these adjuncts protects against aspiration in patient with depressed consciousness |
| Oral airway | Obstruction to tongue, etc. | Positive gag reflex | None of these adjuncts protects against aspiration in patient with depressed consciousness |
| Orotracheal intubation | Failure of above; provides airway protection | NONE | Difficult in patients with severe maxillofacial injuries |
| LMA / iGel (Extraglottic Device) Blind Insertion Airway Device (BIAD) | Difficult airway<br>Airway device for BLS providers | NONE | Requires training prior to use<br>Size appropriately |
| King Airway (Extraglottic Device) Blind Insertion Airway Device (BIAD) | Difficult airway<br>Airway device for BLS providers | NONE | Primary salvage airway<br>Size appropriately |
| Needle cricothyrotomy IF TRAINED | High obstructed airway – unable to clear. Unable to establish any other airway. | Must be able to identify cricoid ring. Not best for anterior neck trauma. | Provides route for temporary oxygenation only<br>Requires special training prior to use |
| Quicktrach or other cricothyrotomy device IF TRAINED | High obstructed airway – unable to clear. Unable to establish any other airway. | Must be able to identify cricoid ring. Not best for anterior neck trauma. | Cricothyrotomy kits requires special training prior to use |
| Surgical cricothyrotomy IF TRAINED | High obstructed airway – unable to clear. Unable to establish any other airway. | Must be able to identify cricoid ring. | Surgical cricothyrotomy kits requires special training prior to use |

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

ADULT PROTOCOL

# AIRWAY

UNIVERSAL PATIENT CARE PROTOCOL

Assess ABC's Respiratory Rate, Effort, and Adequacy

**Adequate**

Consider Supplemental OXYGEN
⚠ COPD Patients

Treat per specific protocol

**Inadequate**

BASIC MANUVERS FIRST
Open airway
Nasal / Oral Airway
Bag-Valve-Mask

## Not Protecting / Anticipated Loss

CAPNOGRAPHY PROCEDURE Required

Sedative Analgesic

***Consider*** Sedation ***Prior*** To Advanced Airway Placement
*IF PATIENT RESPONDS TO PAIN*
KETAMINE 1 mg / kg IV / IO - Usual Dose 100 mg
q 2 min prn – Max 200 mg

Sedative

OR
MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN – q 5 min prn – Max 10 mg
OR
LORazepam
1 – 2 mg IV / IO / IM / IN – q 10 min prn – Max 4 mg
⚠ If Midazolam or LORazepam Unavailable,
See Medication Section for DiazePAM

Analgesic

AND
fentaNYL
25 mcg doses until pain tolerance prn q2 mins - Max 200 mcg

Consider RSI Protocol *APPROVED DEPARTMENTS ONLY*

Apply nasal cannula 15 LPM during intubation attempts

INTUBATION PROCEDURE
STOP Max 2 Intubation Attempts
STOP AEMT Apneic or Pulseless and Apneic Patient Only
⚠ Document Failed Attempt(s)

Extraglottic (BIAD) AIRWAY Device
STOP No Medications Down Extraglottic (BIAD) Airway
STOP EMT Use in Pulseless & Apneic Patient Only
⚠ Esophageal Disease

Additional Sedation Required
***After*** Advanced Airway Placement – Consider
KETAMINE 1 mg / kg IV / IO
OR
MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN – q 10 min prn – Max 10 mg
OR
LORazepam
1 – 2 mg IV / IO / IM / IN – q 10 min prn – Max 4 mg
⚠ If Midazolam or LORazepam Unavailable,
See Medication Section for DiazePAM

## Obstructed Airway

SEE FOREIGN BODY AIRWAY OBSTRUCTION PROTCOL

Foreign body airway obstruction (FBAO) Maneuvers

Direct Laryngoscopy
Attempt Removal with Magill Forceps

CRICOTHYROTOMY
NEEDLE, KIT, or SURGICAL
As provided and trained
STOP Must Have Prior Medical Control
Training / Approval

CAPNOGRAPHY PROCEDURE Required

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# AIRWAY



| INDICATIONS | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Apnea<br>• Coughing<br>• Choking<br>• Inability to speak<br>• Unresponsive<br>• Burns<br>• Trauma | • Witnessed aspiration<br>• Sudden episode of choking<br>• Gagging<br>• Audible stridor<br>• Change in skin color<br>• Decreased LOC<br>• Increased or decreased Respiratory rate<br>• Labored breathing<br>• Unproductive cough | • Cardiac arrest<br>• Respiratory arrest<br>• Anaphylaxis<br>• Esophageal obstruction |

Extraglottic airway device / BIAD (Blind Insertion Airway Device)
Examples (not limited to); iGel, King Airway, LMA, Etc.

Differentiate airway obstruction from esophageal obstruction.
If esophageal obstruction, place patient in position of comfort, suction as needed and treat pain.

## KEY POINTS

- **EMT may only place extraglottic (BIAD) airways in pulseless and apneic patients.**
- **Advanced EMT's may perform orotracheal intubation or place an extraglottic (BIAD) airway on apneic or apneic and pulseless patients.**
- Capnography is mandatory with all methods of intubation. Document results.
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic - use oxygen, not a paper bag.
- Sellick's maneuver should be used to assist with difficult intubations.
- Paramedics should consider using an extraglottic (BIAD) airway if they are unable to Intubate. Consider c-collar to maintain ETT placement for all intubated patients to maintain tube.
- Consider the use of intubation aids such as a bougie or video laryngoscope to facilitate intubation.
- Ketamine use in pregnancy is a risk / benefit assessment per case. Consult Medical Control if there are questions.
- Ketamine is the preferred induction agent with asthmatic patients

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

ADULT PROTOCOL

# CONGESTIVE HEART FAILURE (CHF) / PULMONARY EDEMA

UNIVERSAL PATIENT CARE PROTOCOL

DIAGNOSTIC EKG PROCEDURE

1st Patient Contact to EKG <10 Min

IV / IO PROCEDURE

## Mild

Adequate BP

Apply OXYGEN 100%

NITROGLYCERIN
0.4 mg (400 mcg) SL – q 5 min

- SBP <110
- Erectile Dysfunction / Pulmonary Hypertension Drug Within 48 Hrs.

Consider
CPAP PROCEDURE

- Hypotension
- Untreated Vomiting

Monitor and Reassess

## Moderate / Severe

Adequate BP

Apply OXYGEN 100%

CAPNOGRAPHY PROCEDURE

NITROGLYCERIN
0.4 mg (400 mcg) SL
THEN
Repeat q 5 min if SBP >120

- SBP <110
- Erectile Dysfunction / Pulmonary Hypertension Drug Within 48 Hrs.

CPAP PROCEDURE

- Hypotension
- Untreated Vomiting

If Wheezing
ALBUTEROL / IPRATROPIUM

- EMT may administer only with proper training or ONLINE Medical Control

## Cardiogenic Shock
**Hypotensive**

**SBP < 90 and NO RADIAL PULSES**
Pale, cool, clammy, hypotensive, acute MI in progress, severe pulmonary edema

- Do NOT Give Vasodilators
- Do NOT Apply ITD
- May consider application of CPAP with concurrent fluid bolus
- If HR is causing shock, See Specific HR Protocol

OXYGEN 100%
Bag – Valve Mask
Gentle Ventilation

Refer to Cardiogenic Shock Protocol

**EPINEPHrine**
**PUSH DOSE**
Make 10 mcg / ml
10 mcg (1 ml) prn - slow push
Titrate to effect
To Maintain MAP > 65
or SBP 90 if MAP Unavailable or Radial Pulses

- May use up to 50 mcg (5 ml) per dose if needed

Consider Intubation
Once BP Corrected

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# CONGESTIVE HEART FAILURE (CHF) / PULMONARY EDEMA



| I – MILD | II – MODERATE | III – SEVERE |
|---|---|---|
| **Heart Rate**<br>Normal range<br><br>**Blood Pressure**<br>Normal or slightly elevated<br><br>**Breath Sounds**<br>Bilateral rales<br>Rhonchi<br>Wheezing possible<br>Some difficulty breathing | **Heart Rate**<br>Tachycardia<br><br>**Blood Pressure**<br>Elevated<br><br>**Breath Sounds**<br>Bilateral diffuse rales<br>Wheezing possible<br>Diminished<br>Working hard to breath<br>Frothy sputum may occur | **Heart Rate**<br>Tachycardia then drops to bradycardia<br><br>**Blood Pressure**<br>Elevated HIGH then drops to Hypotension<br><br>**Breath Sounds**<br>May be ominously quiet<br>Fatigued from work of breathing |

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Congestive heart failure<br>• Past medical history<br>• Medications Ex. Digoxin (Lanoxin), Furosemide (Lasix)<br>• Erectile dysfunction medication use<br>• Cardiac history - past myocardial infarction<br>• Patient > 75 years old | • Respiratory distress, bilateral rales<br>• Apprehension, orthopnea<br>• Jugular vein distention<br>• Pink, frothy sputum<br>• Diaphoresis<br>• Hypotension, shock<br>• Chest pain<br>• Positive hepato-jugular reflux (HJR)<br>• Orthopnea | • Myocardial infarction<br>• Congestive heart failure<br>• Asthma<br>• Anaphylaxis<br>• Aspiration<br>• COPD<br>• Pleural effusion<br>• Pneumonia<br>• Pulmonary embolus<br>• Pericardial tamponade |

**Differentiate CHF vs. Pneumonia**

| Congestive Heart Failure Signs and Symptoms | Pneumonia Signs and Symptoms |
|---|---|
| • Afebrile<br>• Jugular venous distension (JVD)<br>• Positive hepato-jugular reflux (HJR)<br>• Bilateral rales<br>• Distal edema<br>• Orthopnea<br>• History of CHF | • Febrile<br>• Cough<br>• History of infectious illness<br>• Unilateral rales<br>• No distal edema<br>• No jugular venous distension (JVD)<br>• No hepato-jugular reflux (HJR) |

| KEY POINTS |
|---|
| • Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro<br>• Obtain diagnostic EKG to evaluate for M.I.<br>• Differentiate and document CHF vs. pneumonia.<br>• Monitor for hypotension after administration of Nitroglycerin.<br>• Monitor for hypotension while using CPAP, specifically with Nitroglycerine.<br>• DO NOT administer Nitroglycerin (Nitro-Stat) to a patient who took an erectile dysfunction (ED) medication; Sildenafil (Viagra), Tadalafil (Cialas), Vardenafil (Levitra), etc. or pulmonary hypertension medication (PHTN) within the last 48 hours. Ask all patients. |

ADULT PROTOCOL

# FOREIGN BODY AIRWAY OBSTRUCTION (FBAO) - ADULT

UNIVERSAL PATIENT CARE PROTOCOL

Head Tilt / Chin Lift / Jaw Thrust
Airway Maneuvers

| Coughing Conscious | Complete Obstruction Conscious | Complete Obstruction Unconscious |
|---|---|---|
| Encourage Patient to Cough | Abdominal Thrusts | Visualize<br>Remove Obvious Obstructions |
| OXYGEN<br>10 – 15 L NRB | | Open Airway / Rescue Breathing |
| | | Chest Thrusts / Back Blows |
| | | If unable to ventilate, reposition head and attempt again |
| | | If unable to ventilate, continue sequence |
| | | Direct Laryngoscopy<br>Attempt Removal with Magill Forceps |
| | | If unable to remove obstruction<br>CRICOTHYROTOMY<br>NEEDLE, KIT, or SURGICAL<br>As provided and trained<br>STOP Must Have Prior Med Control Training / Approval |

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# FOREIGN BODY AIRWAY OBSTRUCTION (FBAO) - ADULT



| INDICATIONS | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Coughing<br>• Choking<br>• Inability to speak<br>• Unresponsive | • Witnessed aspiration<br>• Sudden episode of choking<br>• Gagging<br>• Audible stridor<br>• Change in skin color<br>• Decreased LOC<br>• Increased or decreased<br>• Respiratory rate<br>• Labored breathing<br>• Unproductive cough | • Cardiac arrest<br>• Respiratory arrest<br>• Anaphylaxis<br>• Esophageal obstruction |

| KEY POINTS |
|---|
| • With complete obstruction, positive-pressure ventilation may be successful.<br>• Needle cricothyrotomy will provide short term oxygenation only (not ventilation) and is used to “buy time” until other interventions can assure appropriate ventilation.<br>• Cricothyrotomy kits have a larger internal diameter than needle cric and thus will provide some minimal ventilation.<br>• Needle cricothyrotomy and cricothyrotomy kits are bridge devices to surgical intervention. |

ADULT PROTOCOL

# RAPID SEQUENCE INTUBATION (RSI)

FOR DEPARTMENTS / PARAMEDICS WHO HAVE RECEIVED TRAINING AND MEDICAL CONTROL APPROVAL ONLY

STOP Current Approval / Special Training Required
STOP Must Have at Least 3 Personnel
2 Being Paramedics
⚠ Video Laryngoscopy Must Be Available
⚠ Have Back-Up Airways Available
⚠ Paralytics Do Not Change Poor Anatomy

RSI will likely cause cardiovascular collapse if attempted in the already hypotensive patient – **Resuscitate prior to RSI**

UNIVERSAL PATIENT CARE PROTOCOL

BASIC MANUVERS FIRST
Open airway
Nasal / Oral Airway
Bag-Valve-Mask

IV / IO PROCEDURE

Apply nasal cannula 15 LPM during intubation attempts

CAPNOGRAPHY PROCEDURE Required

***Indications***

- $SpO_2$ < 90% on high flow O2
- Respiratory rate <10 or >32
- Partial airway obstruction due to blood, secretions, trauma, or GCS less than 8
- Respiratory exhaustion or inevitable loss of the airway

Meets Criteria

KETAMINE
1 - 2 mg / kg IV / IO - Usual Dose 100 mg

⚠ If Ketamine unavailable, then
ETOMIDATE 0.2 – 0.3 mg / kg IV / IO
Usual Dose 20 mg – No Repeat

Then
ROCURONIUM
1 mg / kg IV / IO – Usual Dose 100 mg

⚠ If Rocuronium unavailable, then SUCCINYLCHOLINE
1 – 1.5 mg / kg IV / IO – Average Dose 100 mg – No Repeat
STOP See additional SUCCINYLCHOLINE warnings on next page

INTUBATION PROCEDURE
STOP Max 2 Intubation Attempts
⚠ Document Failed Attempt(s)

Extraglottic (BIAD) Airway Device If Intubation Unsuccessful

Post Intubation Sedation
After 20 min or sooner if clinical signs of undersedation - as needed
KETAMINE 1 mg / kg IV / IO

⚠ If Ketamine unavailable, then
MIDAZOLAM 2.5 mg IV / IO
OR
LORazepam 1 mg IV / IO

If Evidence of Pain
fentaNYL 1mcg / kg doses until pain tolerance prn

ONLY IF additional paralysis is needed
ROCURONIUM
1 mg / kg IV / IO – Usual Dose 100 mg

***Caution***

Paralysis lasts longer than the induction / sedative agents
Re-dose ketamine (or benzodiazepine and fentanyl) at 20 min or sooner if patient displays signs of undersedation, which may include
Hypertension, Tachycardia, Facial Grimacing, Tearing, and Wakefulness

**Ventilate to maintain CAPNOGRAPHY and PULSE OXIMETRY**

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

ADULT PROTOCOL

# RAPID SEQUENCE INTUBATION (RSI)

| INDICATIONS | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • $SpO_2$ < 90% on high flow $O_2$<br>• Respiratory rate <10 or >32<br>• Partial airway obstruction due to blood, secretions, trauma, or GCS 8 or less<br>• Respiratory exhaustion or inevitable loss of the airway | • Gagging<br>• Audible stridor<br>• Change in skin color<br>• Decreased LOC<br>• Increased or decreased Respiratory rate<br>• Labored breathing | • Cardiac arrest<br>• Respiratory arrest<br>• Respiratory failure<br>• Anaphylaxis<br>• Esophageal obstruction |

***Restrictions and Conditions for Procedure***

- You must be approved and trained by Medical Control in Rapid Sequence Intubation
- Video laryngoscopy must be available
- Salvage airways (extraglottic airways) must be available
- Capnography must be available
- A minimum of 3 EMS personnel are available to facilitate the procedure, 2 of which are Paramedics

***The "P's" of Rapid Sequence Intubation***

- P = Preparation
- P = Preoxygenation
- P = Paralysis with Induction
- P = Protection
- P = Placement of the Tube
- P = Post-Induction Management

Only if ROCURONIUM unavailable and using SUCCINYLCHOLINE

- STOP Burn or Crush Injury > 24hr old
- STOP HX: Muscular Dystrophy, Multiple Sclerosis, Amyotrophic Lateral Sclerosis (ALS)
- STOP HX: Malignant Hyperthermia (including family)
- STOP Hyperkalemia or Renal Failure

## INTUBATION CHECKLIST

| Preparation | Procedural Equipment | Back-Up Plan |
|---|---|---|
| ☐ Pulse Ox & ECG monitor<br>☐ Functional IV WITH fluids attached – 2 optimal<br>☐ Appropriate Medications drawn – each in own syringe without extra<br>☐ Medication verified by second crew member<br>☐ Pre-oxygenation (NRB, BVM, or CPAP) 100% Fio2<br>☐ Position patient – towel roll behind head (not shoulders) | ☐ Oxygen - BVM on source 1 Nasal Cannula on source 2<br>☐ Ensure enough for extrication (if applicable)<br>☐ ETCo2 in-line detector connected, monitor initialized<br>☐ Suction on and functioning<br>☐ Video laryngoscope -functioning – recording if capable<br>☐ Tube with intact pilot balloon<br>☐ Syringe (10ml)<br>☐ Bougie<br>☐ Stylet as back up<br>☐ Stethoscope<br>☐ Commercial tube holder<br>☐ Wrist Restraints | ☐ Prepare for hypotension (even if not in shock)<br>☐ IV fluids spiked and hung (not running unless needed)<br>☐ Prepare push dose epi<br>☐ Back-up handle, blade(s), tube(s), and stylet<br>☐ Extraglottic airway out and sized<br>☐ Surgical airway equipment available |

## KEY POINTS

- Waveform Capnography is required before, during, and after intubation attempts. Ventilate to maintain Capnography and $SpO_2$.
- Paralytics are never given alone. It is always preceded by an induction agent (a hypnotic / sedative medication) such as Ketamine or Etomidate .
- Set up and test all equipment prior to intubation attempt, including suction and back-up airways
- Limit attempts post paralysis to 2 attempts then utilize an extraglottic airway such as a King or an LMA.
- Do not attempt RSI if the team is not able or trained to perform a cricothyrotomy, either surgical or cricothyrotomy kit.
- Once paralytics are administered the airway must be managed from that point forward.
- Apply a nasal cannula to supply 15 LPM during the intubation attempts to maintain oxygen saturation
- Consider Mallampati grade to determine difficulty PRIOR to intubation attempt
- A 30% Change in HR or BP post procedure suggests light sedation and additional sedation must be added.
- If Succinylcholine is used there is no repeat dosing for additional paralysis.
- Succinylcholine is contraindicated in persons with personal or family history of malignant hyperthermia, skeletal muscle myopathies, known or suspected hyperkalemia, and hypersensitivity to the medication.
- If patient becomes hyperthermic post administration of Succinylcholine advise receiving facility immediately stressing it was post Succinylcholine administration. Begin cooling measures per the HYPERTHERMIA PROTOCOL / HEAT EXPOSURE.
- Larger doses of Succinylcholine may be required in myasthenia gravis.
- Ketamine is the preferred induction agent with asthmatic patients.

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

ADULT PROTOCOL

# RESPIRATORY DISTRESS / ASTHMA / COPD

UNIVERSAL PATIENT CARE PROTOCOL

OXYGEN

DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

IV / IO PROCEDURE

## Mild – Severe Distress

Treat with aerosol
ALBUTEROL / IPRATROPIUM
Oxygen as needed

STOP EMT may administer only with proper training or ONLINE Medical Control

Oxygen as needed
Continuous pulse-ox
Repeat aerosols as needed
ALBUTEROL / IPRATROPIUM

Unresolved or Worsening Distress – Treat as Moderate / Severe Distress

## Moderate / Severe Distress

CAPNOGRAPHY PROCEDURE

Increased Work of Breathing
Consider
CPAP PROCEDURE

⚠ Hypotension

⚠ Untreated Vomiting

Consider
MAGNESIUM SULFATE
2 Grams IV over 20 minutes

methylPREDNISolone
125 mg IV / IO / IM / PO
No Repeat

## Peri-Arrest / Not Moving Air

AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

EPINEPHrine 1 mg / ml
0.3 – 0.5 mg IM – q 5 min prn

Treat with CONTINOUS aerosols
ALBUTEROL / IPRATROPIUM
Oxygen as needed

STOP EMT may administer only with proper training or ONLINE Medical Control

MAGNESIUM SULFATE
2 Grams IV over 20 minutes

methylPREDNISolone
125 mg IV / IO / IM / PO
No Repeat

If ventilation improves with above treatments
Consider
CPAP PROCEDURE

⚠ Hypotension

## Severe Distress with *STRIDOR*

CAPNOGRAPHY PROCEDURE

Tachypnea, bradypnea, stridor, accessory muscle use, difficulty speaking, $CO_2$ narcosis
Treat with aerosol
RACEMIC EPINEPHRINE
Unit Dose (2.25% 0.5ml)
mixed in 3ml of Normal Saline
Nebulized – No Repeat

STOP NOT for Foreign Body Airway Obstructions

⚠ If Racemic Epinephrine is unavailable, see medication section for aerosol EPINEPHrine 1mg / ml

BE PREPARED for Emergency Airway

CRICOTHYROTOMY
NEEDLE, KIT, or SURGICAL
As provided and trained

***If Patient Occludes Airway***

STOP Must Have Med Command Training / Approval

methylPREDNISolone
125 mg IV / IO / IM – No Repeat

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# RESPIRATORY DISTRESS / ASTHMA / COPD



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Asthma; COPD -- chronic bronchitis, emphysema, congestive heart failure<br>• Home treatment (oxygen, nebulizer)<br>• Medications (Theophylline, steroids, inhalers)<br>• Toxic exposure, smoke inhalation | • Shortness of breath<br>• Pursed lip breathing<br>• Decreased ability to speak<br>• Increased respiratory rate and effort<br>• Wheezing, rhonchi<br>• Use of accessory muscles<br>• Fever, cough<br>• Tachycardia<br>• Tripod position | • Asthma<br>• Anaphylaxis<br>• Aspiration<br>• COPD (emphysema, bronchitis)<br>• Pleural effusion<br>• Pneumonia<br>• Pulmonary embolus<br>• Pneumothorax<br>• Cardiac (MI or CHF)<br>• Pericardial tamponade<br>• Hyperventilation<br>• Inhaled toxin (Carbon monoxide, etc.) |

**CPAP should be used as a last resort in asthmatic / COPD patents who are HYPOXEMIC. Prepare to intubate and ventilate**.

**SEVERE ASTHMA / STATUS ASTHMATICUS patients not moving air or is not moving the mist from an aerosol treatment give EPINEPHrine 1 mg / ml 0.3 - 0.5 mg IM.**

## KEY POINTS

- Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro
- **Status asthmaticus** - severe prolonged asthma attack unresponsive to therapy - life threatening!
- If the patient is over 50 years of age, has a history of cardiac disease, or if the patient's heart rate is >120 EPINEPHrine may precipitate cardiac ischemia.
- Monitor pulse oximetry continuously during treatment and transport.
- A silent chest in respiratory distress is a pre - respiratory arrest sign.
- Be alert for respiratory depression in COPD patients on prolonged high flow oxygen administration.
- DO NOT withhold oxygen from hypoxic patients.
- If Albuterol and / or Ipratropium is given, monitor the patient's cardiac rhythm and initiate IV.
- Patient with known COPD, asthma and a history of steroid use should receive IV MethylPREDNISolone (Solu-Medrol). Use with caution in diabetics (hyperglycemia), GI bleeds, and febrile patients (sepsis / infections).
- Assure enough expiration time when ventilating COPD or asthma patients to prevent breath stacking and allow for $CO_2$ elimination.
- Albuterol and Ipratropium can be given down an ETT or tracheostomy during ventilation if there is evidence of bronchoconstriction.
- IM epinephrine not helpful in COPD or Emphysema. Utilized for severe asthma

ADULT PROTOCOL

# TRAUMATIC BREATHING

UNIVERSAL PATIENT CARE PROTOCOL
**Evidence of Trauma – Blunt or Penetrating**
Abnormal or absent breath sounds, inadequate respiratory rate, unequal symmetry, diminished chest excursion, cyanosis

Identify Treatable Causes

- Assess for Patency – Consider Jaw Thrust Airway Maneuver
  Give High Flow Oxygen
- **Sucking Chest Wound**
  Apply 3-sided Occlusive Dressing or Commercial Chest Seal
- **Flail Chest**
  Assist with Ventilation – Gentle Positive Pressure
  Consider CPAP if isolated chest trauma and no hypotension / shock / tension pneumothorax and spontaneous adequate respiration
- **Penetrating Object**
  Immobilize Object
  Apply Sterile Saline Dressing
- If S&S of Tension Pneumothorax
  (Difficulty bagging, absent breath sounds, hypotensive or pulseless)
  TRAUMATIC NEEDLE CHEST DECOMPRESSION PROCEDURE
  ⚠ Be Prepared to Repeat *IF* S&S Return

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

**KEY POINTS**

- These injuries involve the airway and are life-threatening.
- Do not become distracted by non-life-threatening injuries that appear terrible.
- A **sucking chest wound** is when the thorax is open to the outside. The occlusive dressing may be anything such as petroleum gauze, plastic, or a defibrillator pad. Tape only 3 sides down so that excess intrathoracic pressure can escape, preventing a tension pneumothorax. It may help respirations to place patient on the injured side, allowing unaffected lung to expand easier.
- A **flail chest** is when there are extensive rib fractures present, causing a loose segment of the chest wall resulting in paradoxical and ineffective air movement. Positive pressure breathing via BVM will help push the segment and the normal chest wall out with inhalation and to move inward together with exhalation, getting them working together again. Do not use too much pressure, as to prevent additional damage or pneumothorax.
- A **penetrating object** must be immobilized by any means possible. If it is very large, cutting may be possible, with care taken to not move it while making the cut. Place an occlusive & bulky dressing over the entry wound.
- A **tension pneumothorax** is life threatening, look for *HYPOTENSION*, unequal breath sounds, JVD, increasing respiratory distress, and decreasing mental status. The pleura must be decompressed with a needle to provide relief. Use the intercostal space between the 2nd and 3rd ribs on the midclavicular line, going in on the top side of the 3rd rib. Alternate site, 5th intercostal space mid axillary or anterior axillary line. Once the catheter is placed, watch closely for re-occlusion. Be prepared to repeat decompression if signs of tension pneumothorax return. Use a long 3 - 3 ¼" 14-gauge needle based on the patient.

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# SECTION 3 - CIRCULATION / SHOCK PROTOCOLS

Shock Guidelines ..... 2-3
Anaphylactic Shock / Reaction ..... 4-3
Cardiogenic Shock ..... 5-3
Hypovolemic Shock ..... 5-3
Neurogenic Shock ..... 5-3
Septic Shock ..... 5-3

ADULT PROTOCOL

# SHOCK GUIDELINES

| TYPES OF SHOCK | SIGNS AND SYMPTOMS |
|---|---|
| CARDIOGENIC SHOCK | • Hypotension<br>• Difficulty breathing<br>• Cool, clammy skin<br>• Weakness |
| HYPOVOLEMIC SHOCK | • Tachycardia<br>• Weak, thready pulse<br>• Hypotension with narrow pulse pressure<br>• Hypotension or falling systolic BP<br>• Pale skin<br>• Clammy or dry skin<br>• Dyspnea<br>• Altered LOC / coma<br>• Decreased urine output<br>• Restlessness<br>• Irritability<br>• Decreased urine output |
| ANAPHYLACTIC SHOCK (Distributive Shock) | • Hypotension<br>• Severe respiratory distress<br>• Shock<br>• Dyspnea<br>• Wheezing<br>• Hoarseness / stridor<br>• Cyanosis<br>• Facial / airway edema<br>• Urticaria / hives<br>• Warm burning feeling<br>• Itching<br>• Rhinorrhea<br>• Altered LOC / coma<br>• Pulmonary edema |
| NEUROGENIC SHOCK (Distributive Shock) | • Hypotension with a narrow pulse pressure<br>• Evidence of trauma (lacerations, bruising, swelling, deformity)<br>• Normal or bradycardic HR<br>• Compromise in neurological function<br>• Normal or flushed skin color |
| SEPTIC SHOCK (Distributive Shock) | • Hypotension with a narrow pulse pressure<br>• Dyspnea<br>• Febrile<br>• Tachycardia<br>• Signs of infection<br>• History of UTI<br>• Hypovolemia (Fever, Sweating)<br>• Dehydration<br>• Altered LOC / coma |
| OBSTRUCTIVE SHOCK | • Obstruction that interferes with preload / afterload<br>• Commonly caused by tension pneumothorax / pulmonary embolism<br>• Hypotension<br>• Chest pain<br>• Hypoxia<br>• Absent lung sounds (tension pneumothorax)<br>• Present lung sounds (pulmonary embolism) |

# SHOCK



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic<br>• Fluid loss - vomiting, diarrhea, fever<br>• Infection<br>• Cardiac ischemia (MI, CHF)<br>• Medications<br>• Allergic reaction<br>• Pregnancy | • Restlessness, confusion<br>• Weakness, dizziness<br>• Weak, rapid pulse<br>• Pale, cool, clammy skin<br>• Delayed capillary refill<br>• Hypotension<br>• Coffee-ground emesis<br>• Tarry stools | • Shock<br>• Hypovolemic<br>• Cardiogenic<br>• Septic<br>• Neurogenic<br>• Anaphylactic<br>• Ectopic pregnancy<br>• Dysrhythmias<br>• Pulmonary embolus<br>• Tension pneumothorax<br>• Medication effect / overdose<br>• Vasovagal hypotension<br>• Physiologic (pregnancy) |

## KEY POINTS

- Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- Hypotension can be defined as a systolic blood pressure of less than 90 systolic or MAP less than 65.
- Consider performing orthostatic vital signs on patients in non-trauma situations if suspected blood or fluid loss.
- Consider all possible causes of shock and treat per appropriate protocol.

**Anaphylactic Shock**

- Anaphylactic shock is the involvement of 2 or more body systems. Consider IM EPINEPHrine.
- **Do not confuse EPINEPHrine 1 mg / ml IM and 0.1 mg / ml IV.**
- Treat patients with a history of anaphylaxis aggressively.
- Routine assessment and supportive care of the patient's respiratory and cardiovascular systems is required.
- When possible, remove any stingers.

**Cardiogenic Shock**

- Circulatory failure is due to inadequate cardiac function.
- Be aware of patients with congenital defects.
- Cardiogenic shock exists in the prehospital setting when an MI is suspected and there is no specific indication of volume related shock.
- Pulmonary edema or CHF may cause cardiogenic shock. (Pediatrics with congenital heart defects may rarely have pulmonary edema)
- Marked, symptomatic tachycardia and bradycardia will also cause cardiogenic shock. Fix rate first.

**Hypovolemic Shock**

- Patients suffering from hemorrhagic shock secondary to trauma, should be treated under the Trauma Criteria, and should be rapidly transported to the nearest appropriate facility.
- Initiate a second large bore IV for all patients in hypovolemic shock, resuscitate to a MAP of at least 65 or a SBP of 90 (100 SBP if >70 years old) or radial pulses where MAP is unavailable.

**Septic Shock**

- Hypotensive septic shock patients require aggressive fluid resuscitation and should receive vasopressor support if not responding to fluid challenges.
- Be alert for septic shock in the elderly.

**Addisonian Crisis / Adrenal Crisis**

- Not a field diagnosis. Patient / family / historian should be aware of diagnosis. They are coached to make sure the patient gets IV steroids emergently. May have their own prescribed injectable steroids for EMS to administer. Check for medical alert tags / bracelet.
- Presents with Dehydration and/or severe vomiting and diarrhea stabbing pain in the abdomen, low back, or legs, low blood pressure (shock), low blood sugar, loss of consciousness.
- Emergent steroid administration in addition to other standard resuscitation techniques. (ex. BGL correction and fluid resuscitation). Use patient supplied steroids before EMS supplied if available.

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

ADULT PROTOCOL

# ANAPHYLACTIC REACTION / SHOCK

UNIVERSAL PATIENT CARE PROTOCOL

OXYGEN

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

Apply Cardiac Monitor and Assess Vitals

Consider ITD PROCEDURE

***DO NOT CONFUSE***

EPINEPHrine

| | |
|---|---|
| 1mg / ml (1000 mcg / ml) | 1:1000 IM Epi |
| 0.1 mg / ml (100 mcg / ml) | 1:10,000 Cardiac Epi |
| 10 mcg / ml | Push Dose Epi |

## Mild

Rash, itching,
**No** difficulty breathing or throat tightening,
B/P – normal limits

diphenhydrAMINE
25 - 50 mg IV / IO / IM
No Repeat

Consider
EPINEPHrine
**1 mg / ml Concentration**
0.3 - 0.5 mg IM
or AUTO-INJECTOR
If history of severe reaction or 2 or more body systems involved
q 10 min prn

STOP Never given IV

STOP EMT may draw and administer IM only with proper training

## Moderate / Severe

**Radial Pulses Present**
Rash, itching,
Airway compromise,
Wheezing, Swelling,
GI Symptoms
**Hypotension**

EPINEPHrine
**1 mg / ml Concentration**
0.3 - 0.5 mg IM
or AUTO-INJECTOR
q 5 min prn

STOP Never given IV

STOP EMT may draw and administer IM only with proper training

diphenhydrAMINE
50 mg IV / IO / IM
No Repeat

IV NORMAL SALINE BOLUS
20 ml / kg
To Maintain MAP > 65
or SBP 90 if MAP Unavailable
or Radial Pulses

ALBUTEROL / IPRATROPIUM
Aerosol - Monitor Airway

STOP EMT may administer only with proper training or ONLINE Medical Control

methylPREDISolone
125 mg IV / IO / IM – No Repeat

## Impending Arrest
Anaphylactic Shock

**Weak, Thready or**
**NO Radial Pulses**
**Severe Hypotension**
**Any AGE**
Decreased LOC
Airway compromise

Secure Airway and Ventilate

Double Check

EPINEPHrine
**0.1 mg / ml (100 mcg / ml)**
Concentration
IV / IO
100 mcg (1 ml) every minute
until return of BP / Radial pulse
500 mcg (5 ml) Max

STOP 0.1 mg / ml Concentration IV ONLY

⚠ Slow IV

**If only EMT / AEMT available or NO / delayed vascular access**
EPINEPHrine
**1 mg / ml Concentration**
0.3 - 0.5 mg IM
or AUTO-INJECTOR
q 5 min prn

STOP Never given IV

STOP EMT may draw and administer IM only with proper training

IV NORMAL SALINE BOLUS
20 ml / kg
To Maintain MAP > 65
or SBP 90 if MAP Unavailable
or Radial Pulses

diphenhydrAMINE
50 mg IV / IO / IM
No Repeat

methylPREDISolone
125 mg IV / IO / IM – No Repeat

Follow ACLS

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

ADULT PROTOCOL

# HYPOVOLEMIC, NEUROGENIC, CARDIOGENIC, AND SEPTIC SHOCK

Airway / Breathing | Circulation / Shock | Cardiac | Medical | Trauma

***DO NOT CONFUSE***
EPINEPHrine

| | |
|---|---|
| 1mg / ml (1000 mcg / ml) | 1:1000 IM Epi |
| 0.1 mg / ml (100 mcg / ml) | 1:10,000 Cardiac Epi |
| 10 mcg / ml | Push Dose Epi |

UNIVERSAL PATIENT CARE PROTOCOL

AIRWAY PROTOCOL
Monitor Lung Sounds for Fluid Overload

OXYGEN

IV / IO PROCEDURE

Apply Cardiac Monitor and Assess Vitals

CAPNOGRAPHY PROCEDURE

**Adrenal / Addisonian Crisis**
History of Condition with dehydration, severe vomiting and diarrhea, loss of consciousness, low blood pressure, and / or stabbing pain in the abdomen, low back, or legs.
EMS PERMITTTED TO GIVE PATIENT PRESCRIBED IV STERIODS IF AVAILABLE (Preferred)
Only if unavailable, methylPREDISolone 125 mg IV / IO / IM / PO

## Hypovolemic Shock

Dehydration or Non-Traumatic Bleeding

If Traumatic Shock See Specific Trauma Protocol

Consider ITD Procedure

IV NORMAL SALINE BOLUS
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses

If externally visible non-traumatic bleeding (ex vaginal bleeding) with evidence of current / previous uncontrolled hemorrhage, HR > 120 and / or SBP < 90
Consider TRANEXAMIC ACID (TXA)
1 -2 Gram mixed in 100 ml D5W over 10 mins

BLOOD GLUCOSE PROCEDURE

## Cardiogenic Shock

If Shock Due to HR, See Specific HR Protocol

STOP NO ITD Procedure

IV NORMAL SALINE 500 ml max

DIAGNOSTIC EKG

BLOOD GLUCOSE PROCEDURE

EPINEPHrine PUSH DOSE
Make 10 mcg / ml
10 mcg (1 ml) prn - slow push
Titrate to effect
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses
⚠ May use up to 50 mcg (5 ml) per dose if needed

## Neurogenic Shock

Consider SPINAL MOTION RESTRICTION PROCEDURE

Consider ITD Procedure

IV NORMAL SALINE BOLUS
20 ml / kg
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses

BLOOD GLUCOSE PROCEDURE

EPINEPHrine PUSH DOSE
Make 10 mcg / ml
10 mcg (1 ml) prn - slow push
Titrate to effect
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses
⚠ May use up to 50 mcg (5 ml) per dose if needed

## Septic Shock

Identify Possible SIRS Patient or Severe Sepsis Patient
Use Checklist on Following Page
NOTIFY RECEIVING FACILITY – SEPSIS ALERT

DIAGNOSTIC EKG

BLOOD GLUCOSE PROCEDURE

IV NORMAL SALINE BOLUS
20 ml / kg
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses

Consider ITD Procedure

EPINEPHrine PUSH DOSE
Make 10 mcg / ml
10 mcg (1 ml) prn - slow push
Titrate to effect
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses
⚠ May use up to 50 mcg (5 ml) per dose if needed

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

ADULT PROTOCOL

# HYPOVOLEMIC, NEUROGENIC, CARDIOGENIC, AND SEPTIC SHOCK

## SIRS Checklist

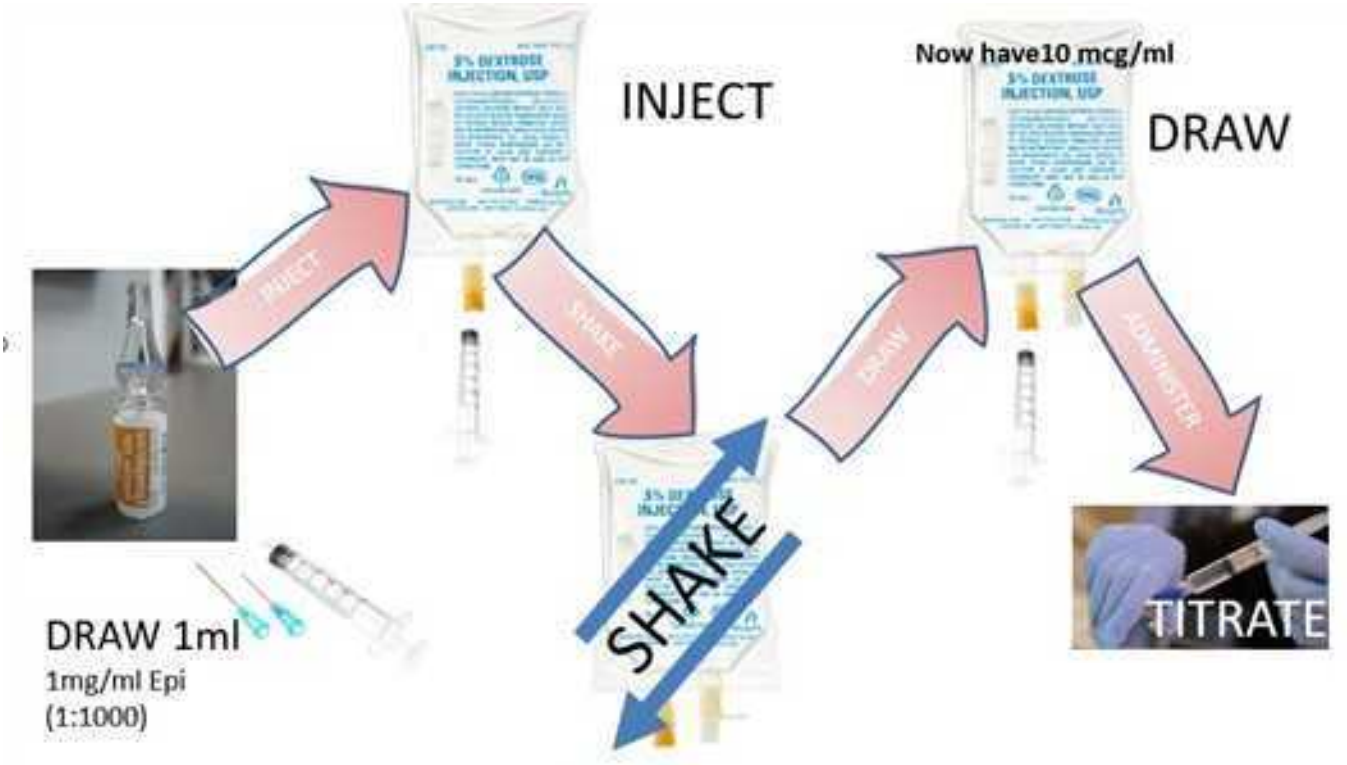
| Clinical Findings | History |
|---|---|
| Temp > 38.3C (100.9F) or < 36C (96.8F)<br>Heart Rate > 90 BPM<br>Respiratory Rate > 20 BPM ***or***<br>Capnography < 32 mmHg<br>Altered Mental Status<br>SBP <90 or MAP <70<br>Need for CPAP | Pneumonia<br>Urinary Tract Infection<br>Cellulitis<br>Septic Arthritis<br>Diarrhea<br>ABD pain<br>Wound Infection<br>Decubitus Ulcer<br>Indwelling Catheter or Device<br>Fever<br>Decreased urine output last 8 hours<br>Prolonged bleeding |

## Severe Sepsis Checklist

Clinical Findings (Present and *NEW* to Patient)

SBP < 90
$SPo_2$ < 90
No Urine Output last 8 Hours
Prolonged bleeding from gums
Lactate ≥ 4

**Push Dose EPINEPHrine Preparation**
**Mix 1 mg EPINEPHrine of 1mg / ml in 100 ml of D5 or Normal Saline**
***This makes 10 mcg / ml concentration***
**Shake bag well to mix**
**Draw from bag and administer**
**10 mcg (1 ml) prn - Titrated to Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses**
**May give up to 50 mcg (5 ml) per dose if required**



# SECTION 4 - CARDIAC PROTOCOLS


Chest Pain.....2-4
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Bradycardia .....6-4
Narrow - Complex Tachycardia .....8-4
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Ventricular Fibrillation (V-FIB) / Pulseless Ventricular Tachycardia .....18-4
Ventricular Fibrillation (V-FIB) / Pulseless Ventricular Tachycardia with ECPR .....20-4
Refractory Ventricular Fibrillation (V-FIB) / Pulseless Ventricular Tachycardia..... 22-4
Post - Resuscitation Cardiac Care .....24-4

ADULT PROTOCOL

# CHEST PAIN

UNIVERSAL PATIENT CARE PROTOCOL

DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

OXYGEN / PULSE OXIMETRY PROCEDURE

CAPNOGRAPHY PROCEDURE

IV PROCEDURE

Identify Causes
Treat Per Specific Protocol

All chest pain in not cardiac in nature
A proper history and physical exam will help differentiate cause

The ACS Protocol and its agents (Aspirin, Nitro, Heparin, Brilinta) are only for cases suspected to be cardiac in nature

- Trauma – Treat per Traumatic Breathing Protocol
- Hypoxia – Treat per Airway / Breathing Protocols
- Cardiac Chest Pain
  Treat Per Acute Coronary Syndrome Protocol
- Sharp / Ripping / Tearing Pain
  Treat Per Pain Management Protocol
  STOP No Aspirin
- Chest Pain with Fever / Cough / Rhonci
  Treat per Pain Management Protocol
- Spontaneous Pneumothorax
  Treat per Pain Management Protocol
- GI / Esophageal Pain
  Treat per Pain Management Protocol

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# CHEST PAIN

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Age<br>• Medications<br>• Past medical history (MI, angina, diabetes)<br>• Allergies<br>• Recent physical exertion<br>• **O**nset<br>• **P**alliation / **P**rovocation<br>• **Q**uality (crampy, constant, sharp, dull, etc.)<br>• **R**egion / **R**adiation / **R**eferred<br>• **S**everity (1-10)<br>• **T**ime (duration / repetition) | • CP (pain, pressure, aching, tightness)<br>• Location (substernal, epigastric, arm, jaw, neck, shoulder)<br>• Radiation of pain<br>• Pale, diaphoresis<br>• Shortness of breath<br>• Nausea, vomiting, dizziness | • Trauma vs. medical<br>• Angina vs. myocardial infarction<br>• Pericarditis<br>• Pulmonary embolism<br>• Asthma / COPD<br>• Pneumothorax<br>• Aortic dissection or aneurysm<br>• GE reflux or hiatal hernia<br>• Esophageal spasm<br>• Chest wall injury or pain<br>• Pleural pain |

**KEY POINTS**

- Consider differential diagnosis points on all chest pain cases
- Treatment of non-cardiac chest pain with Aspirin / Nitroglycerine / Heparin / Ticagrelor may be harmful or deadly to the patient
- The history and physical exam often provides the most clues as to causation
- Diagnostic EKG's are still indicated in all non-cardiac cases of chest pain
- Trauma trumps medical – if a patient sustained trauma as a result of a medical chest pain cause, the trauma is treated first.
- IV analgesia can be given in all cases of chest pain if indicated.

ADULT PROTOCOL

# ACUTE CORONARY SYNDROME

UNIVERSAL PATIENT CARE PROTOCOL

Do not routinely give OXYGEN unless $SpO_2$ <94% - may treat SOB

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE – Consider 2nd IV if STEMI

DIAGNOSTIC EKG PROCEDURE - LEFT
Look for ST Elevation - **Transmit to ED**

1ST Contact to EKG and Transmission < 10 Min

⚠ In trauma with ACS treat only with fentanyl

**EKG INDICATES STEMI - CONSULT PHYSICIAN IF UNSURE**

Strongly encourage transport to hospital with interventional cath lab (PCI) when STEMI is present on diagnostic EKG – Initiate STEMI Alert

**If unremarkable LEFT EKG and presentation consistent with MI**
DIAGNOSTIC EKG PROCEDURE – RIGHT (V4R)
**DO NOT DELAY TRANSPORT TO ACQUIRE RIGHT SIDED DIAGNOSTIC EKG**
*Assure adequate IV and BP before*
NITROGLYCERINE (NITRO-STAT) if right sided infarction

**Use caution with acute septal wall MI**
(V1, V2) – Watch for AV blocks – Consider placing pacing pads

ASPIRIN
324 mg chew and swallow
(81 mg / tab x4) No Repeat

NITROGLYCERIN
0.4 mg (400 mcg) SL
(If SBP >110 with IV or SBP >120 without IV)
q 5 min prn up to 3 doses ***if working***
STOP Erectile Dysfunction / Pulmonary HTN drug use within 48 hrs
⚠ EMT use requires On-Line Medical Control
⚠ Continue with other treatment between Nitro Doses

*If cocaine or stimulant Induced STEMI*
Treat per Toxic Ingestion / Exposure / Overdose – Sympathomimetic Overdose (Stimulants) Column

If Nausea / Vomiting
Treat Per
NAUSEA / VOMITING PROTOCOL

Treatment if Paramedic or Online Medical Control Confirmed STEMI
STOP Complete checklist on next page before administering Brilinta / Heparin

TICAGRELOR (BRILINTA)
180 mg Chew and Swallow PO – No Repeat
STOP Do Not Administer if Already on Antiplatelets – *See Key Points*
STOP Do Not Administer if cocaine or stimulant Induced STEMI

HEPARIN
60 Units / kg IV / IO
Max Dose 4000 Units – No Repeat
STOP Do Not Administer if Already on Anticoagulants – *See Key Points*
STOP Do Not Administer if cocaine or stimulant Induced STEMI

CONSIDER fentaNYL
25 – 100 mcg IV / IO / IM / IN - q 10 min prn – 200 mcg max
⚠ If fentaNYL is unavailable, See Medication Section for Morphine Sulfate
⚠ Routine use of opiate pain control discouraged if TICAGRELOR being utilized – interferes with absorption

**NO STEMI ON EKG - ISCHEMIC CHEST PAIN**

ASPIRIN
324 mg chew and swallow
(81 mg / tab x4) – No Repeat

NITROGLYCERIN (NITRO-STAT)
0.4 mg (400 mcg) SL
(If SBP >110 with IV or SBP >120 without IV)
q 5 min prn up to 3 doses
STOP Erectile Dysfunction / Pulmonary HTN drug use within 48 hrs
⚠ EMT use requires On-Line Medical Control

fentaNYL
25 – 100 mcg IV / IO / IM / IN - q 10 min prn – 200 mcg max
⚠ If fentaNYL is unavailable, See Medication Section for Morphine Sulfate

If Nausea / Vomiting
Treat Per
NAUSEA / VOMITING PROTOCOL

**TRANSPORT** to appropriate facility **(PCI)**
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

ADULT PROTOCOL

# ACUTE CORONARY SYNDROME

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Age<br>• Medications<br>• Past medical history (MI, angina, diabetes)<br>• Allergies<br>• Recent physical exertion<br>• **O**nset<br>• **P**alliation / **P**rovocation<br>• **Q**uality (crampy, constant, sharp, dull, etc.)<br>• **R**egion / **R**adiation / **R**eferred<br>• **S**everity (1-10)<br>• **T**ime (duration / repetition) | • CP (pain, pressure, aching, tightness)<br>• Location (substernal, epigastric, arm, jaw, neck, shoulder)<br>• Radiation of pain<br>• Pale, diaphoresis<br>• Shortness of breath<br>• Nausea, vomiting, dizziness | • Trauma vs. medical<br>• Angina vs. myocardial infarction<br>• Pericarditis<br>• Pulmonary embolism<br>• Asthma / COPD<br>• Pneumothorax<br>• Aortic dissection or aneurysm<br>• GE reflux or hiatal hernia<br>• Esophageal spasm<br>• Chest wall injury or pain<br>• Pleural pain |

| ***STEMI Checklist Before EMS administration of TICAGRELOR or HEPARIN*** | ***Do Not Administer TICAGRELOR*** *if already on antiplatelet medications* | ***Do Not Administer HEPARIN*** *if already on anticoagulant medications* |
|---|---|---|
| 1. NO sharp ripping / tearing chest or back pain or known dissection<br>2. NO Altered mental status<br>3. Known or concern for bleeding (ex., vomiting blood, black tarry stool, hemoptysis, frank rectal bleeding, GI bleeds, blood in urine, etc.)<br>4. Trauma / CPR (Post arrest)<br>5. Severe Headache<br>6. Consult Medical Control if STEMI mimickers present | Clopidogrel (Plavix), Ticagrelor (Brilinta), Prasugrel (Effient), Ticlopidine (Ticlid) | Apixaban (Eliquis), Dabigatran (Pradaxa), Edoxaban (Savaysa), Fondaparinux (Arixtra), Rivaroxaban (Xarelto), Warfarin (Coumadin, Jantoven), Betrixaban (Bevyxxa) |

**Consider STEMI Mimickers**

| | |
|---|---|
| • Left ventricular hypertrophy<br>• Left bundle branch block<br>• Early repolarization<br>• Right bundle branch block | • Ventricular aneurysm<br>• Hyperkalemia<br>• Ventricular paced rhythms<br>• Pericarditis |

**STEMI Diagnostic Criteria**

- ≥1 mm ST Elevation from baseline in two or more anatomically contiguous leads
- 1 mm = 1 small EKG box

| | | | |
|---|---|---|---|
| I – Lateral | aVR | V1 – Septal | V4 – Anterior |
| II – Inferior | aVL – Lateral | V2 – Septal | V5 – Lateral |
| III – Inferior | aVF – Inferior | V3 – Anterior | V6 – Lateral |

**KEY POINTS**

- Make the scene safe: All chest pain patients must have an IV and diagnostic EKG.
- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro.
- If patient has taken Nitroglycerin without relief, consider potency of the medication.
- If positive ECG changes, establish a second IV while enroute to the hospital.
- Monitor for hypotension after administration of Nitroglycerin or FentaNYL.
- Nitroglycerin or FentaNYL may be repeated per dosing guidelines in the MEDICATIONS SECTION.
- Diabetics / geriatric patients often have atypical pain, vague, or only generalized complaints. Be suspicious of a "silent MI".
- Refer to the BRADYCARDIA PROTOCOL (HR < 60 bpm) or NARROW COMPLEX TACHYCARDIA PROTOCOL (HR > 150 bpm) if indicated.
- If the patient becomes hypotensive from Nitroglycerin, FentaNYL administration, place the patient in the Trendelenburg position and administer a Normal Saline bolus.
- Be prepared to administer Narcan if the patient experiences respiratory depression due to FentaNYL administration.
- If pulmonary edema is present, refer to the CHF / ACUTE PULMONARY EDEMA PROTOCOL. Consider other causes of chest pain such as aortic aneurysms, pericarditis, esophageal reflux, pneumonia, pneumothorax, costochondritis, pleurisy, pancreatitis, appendicitis, cholecystitis (gallbladder), and pulmonary embolism.
- Aspirin can be administered to a patient on Coumadin (Warfarin) unless the patient's physician has advised them otherwise.
- If the patient took a dose of Aspirin that was less than 324 mg in the last (24) hours, then additional Aspirin can be administered to achieve a therapeutic dose of 324 mg.
- DO NOT administer Nitroglycerin (Nitro-stat) to a patient who took an erectile dysfunction medication; Sildenafil (Viagra), Tadalafil (Cialas), Vardenafil (Levitra), etc. within the last 48 hours due to potential severe hypotension.
- Nitroglycerin (Nitro-stat) can be administered to a patient by EMS if the patient has already taken their own prior to your arrival. Document it if the patient had any changes in their symptoms or a headache after taking their own Nitroglycerin. Nitroglycerin can be administered to a hypertensive patient complaining of chest discomfort without Medical Control permission.
- Nitroglycerin can be administered without an IV if patient has a BP greater than 120 mmHg.
- DO NOT treat PVC's with Amiodarone unless patient develops runs of V-Tach or has sustained V-tach.
- Pulse oximetry is not an indicator of myocardial perfusion.
- Only administer oxygen if the patient is hypoxic with a $SpO_2$ of less than 94. Do not withhold oxygen from patients that are short of breath regardless of $SpO_2$.
- Once applied to a known or suspected ACS patient do not remove a diagnostic EKG, even if the initial EKG is unremarkable. Some devices continue to look for ST segment changes and will alert if there are changes.
- Consider repeat diagnostic EKG if condition changes or lengthy transport.

ADULT PROTOCOL

# BRADYCARDIA

UNIVERSAL PATIENT CARE PROTOCOL

APPLY CARDIAC MONITOR

OXYGEN

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

Consider hyperkalemia as cause and treat per HYPERKALEMIA protocol if EKG and history supports the decision

**Stable**

Continual Monitoring and Reassessment

DIAGNOSTIC EKG PROCEDURE
Look for ST Elevation - Transmit to ED

Be Prepared for Decompensation
Consider placing pacing pads
Prepare medications

**Unstable**
Hypotensive / Symptomatic
SBP < 90 / No Radial Pulses / AMS

ATROPINE 1 mg IV / IO
q 3 – 5 mins prn *if working*
Max 3 mg

*OR*

Consider Sedation
MIDAZOLAM 2.5 mg IV / IO or 5 mg IM / IN
q 5 min prn – Max 10 mg
OR
LORazepam 1 – 2 mg IV / IO / IM / IN
q 10 min prn – Max 4 mg

⚠ If Midazolam or LORazepam Unavailable, See Medication Section for DiazePAM

⚠ Capnography Required

EXTERNAL TRANSCUTANEOUS PACING PROCEDURE

*OR*

**EPINEPHrine**
**PUSH DOSE**
Make 10 mcg / ml
10 mcg (1 ml) prn - slow push
Titrate to effect
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses

⚠ May use up to 50 mcg (5 ml) per dose if needed

IV NORMAL SALINE BOLUS
To Maintain MAP > 65
or SBP 90 if MAP Unavailable or Radial Pulses

DIAGNOSTIC EKG PROCEDURE
Look for ST Elevation - Transmit to ED

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# BRADYCARDIA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Medications<br>• Beta-blocker use<br>• Calcium channel blocker use<br>• Clonidine use<br>• Digitalis use<br>• Pacemaker | • HR < 60 / min<br>• Chest pain<br>• Respiratory distress<br>• Hypotension or shock<br>• Altered mental status<br>• Syncope | • Acute myocardial infarction<br>• Hypoxia<br>• Hypothermia<br>• Sinus bradycardia<br>• Athletes<br>• Head injury (elevated ICP) or stroke<br>• Spinal cord lesion<br>• Sick sinus syndrome<br>• AV blocks (1°, 2°, or 3°) |



## KEY POINTS

- Exam: Mental Status, Neck, Heart, Lungs, Neuro
- The use of Amiodarone in heart block can worsen bradycardia and lead to asystole.
- Treatment of bradycardia is based upon the presence or absence of hypotension.
- If hypotension exists, treat, If blood pressure is adequate, monitor only but have all treatment modalities immediately available if the patient decompensates.
- Transcutaneous pacing is the treatment of choice for Type II second-degree heart blocks and third-degree heart blocks.
- Transcutaneous pacing in demand mode will shut off if patient's intrinsic heart rate rises above the set pacer rate.
- If the patient is critical and an IV is not established, initiate pacing use intranasal sedation if required.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- If bradycardia is a result of calcium channel blocker or beta blocker overdose, follow the Toxic Ingestion / Exposure / Overdose protocol.

ADULT PROTOCOL

# NARROW – COMPLEX TACHYCARDIA

UNIVERSAL PATIENT CARE PROTOCOL

APPLY CARDIAC MONITOR

OXYGEN

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

Identify Rhythm type Regular or Irregular

Asymptomatic patients usually need nothing more than supportive care. Plan for changes.

Consider if the tachycardia is compensatory or caused by underlying issue (i.e. fever, dehydration, etc.) Treat underlying cause

## Symptomatic Stable / Regular (SVT)

*Does not have P waves*
or Aberrant Wide Complex Regular SVT
If unsure, consult OLMC

DIAGNOSTIC EKG PROCEDURE

Attempt Vagal Maneuvers (NO carotid massage)

ADENOSINE
6 mg IV push followed by 20 ml Normal Saline push
STOP (Not for rapid Atrial Fibrillation or WPW)

IF **No Response** 1 – 2 minutes

ADENOSINE
12 mg IV push followed by 20 ml Normal Saline
No Repeat

IF **No Response** 1 – 2 minutes

Consider METOPROLOL 5 mg IV / IO
⚠ DO NOT CONFUSE WITH LABETALOL
⚠ Ask about additional dosing while on call with OLMC

**Repeat** DIAGNOSTIC EKG

## Symptomatic Stable / Irregular (A-Fib)

DIAGNOSTIC EKG PROCEDURE

Supportive Care, Treatment of Symptoms and Close Observation are all that is generally required

NORMAL SALINE
Consider Fluid Bolus to Rule out Hypovolemia / Dehydration as Cause of Tachycardia
STOP If signs / symptoms of heart failure

Consider METOPROLOL 5 mg IV / IO
⚠ DO NOT CONFUSE WITH LABETALOL
⚠ Ask about additional dosing while on call with OLMC

**Repeat** DIAGNOSTIC EKG

## Unstable / Regular or Irregular

SBP < 90, No Radial Pulses, AMS, Chest Pain, Shock

Use **EXTREME** Caution When Cardioverting ***IRREGULAR*** Tachycardias.
**SIGNFICIANT** Potential to Cause CVA, specifically if Greater Than 48 Hours Duration

Consider Sedation
MIDAZOLAM 2.5 mg IV / IO or 5 mg IM / IN
q 5 min prn – Max 10 mg
OR
LORazepam 1 – 2 mg IV / IO / IM / IN
q 10 min prn – Max 4 mg
⚠ If Midazolam or LORazepam Unavailable, See Medication Section for DiazePAM
⚠ Capnography Required

Synchronized CARDIOVERSION
200 J or Device Recommendation
⚠ Irregular Rhythms / Atrial fibrillation

No Response 1 –2 minutes

Repeat Synchronized CARDIOVERSION
300, 360 J or Device Recommendation
⚠ Irregular Rhythms / Atrial fibrillation

**After Conversion** DIAGNOSTIC EKG PROCEDURE

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

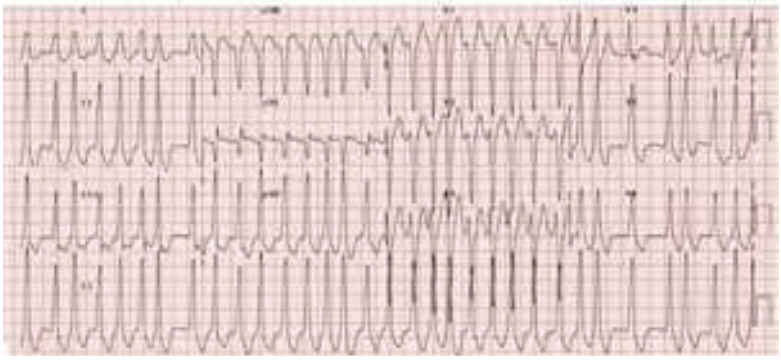
# NARROW – COMPLEX TACHYCARDIA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Medications (Aminophylline, diet pills, thyroid supplements, decongestants, digoxin)<br>• Diet (caffeine, chocolate)<br>• Drugs (nicotine, cocaine)<br>• Past medical history<br>• History of palpitations / heart racing<br>• Syncope / near syncope | • HR > 150 bpm<br>• QRS < .12 Sec<br>• Dizziness, CP, SOB<br>• Potential presenting rhythm<br>• Sinus tachycardia<br>• Atrial fibrillation / flutter<br>• Multifocal atrial tachycardia | • Heart disease (WPW, valvular)<br>• Sick sinus syndrome<br>• Myocardial infarction<br>• Electrolyte imbalance<br>• Exertion, pain, emotional stress<br>• Fever<br>• Hypoxia<br>• Hypovolemia or anemia<br>• Drug effect / overdose (see HX)<br>• Hyperthyroidism<br>• Pulmonary embolus |

Known Atrial Fibrillation
NO ADENOSINE

Wolf Parkinson White (WPW)
NO ADENOSINE



Atrial Fibrillation / Wolf Parkinson White (WPW) / RVR
NO ADENOSINE

## KEY POINTS

- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro
- Monitor for respiratory depression and hypotension associated with Lorazepam.
- Continuous pulse oximetry is required for all tachycardic patients.
- Document all rhythm changes with monitor strips and obtain monitor strips with each intervention.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- Examples of vagal maneuvers include bearing down, coughing, or blowing into a syringe. DO NOT perform a carotid massage.
- If possible, the IV should be initiated in either AC.
- Consider applying the cardioversion / pacing pads prior to Adenosine administration.
- When administering Adenosine, raise the patient's arm and immediately follow the bolus with 20 ml rapid bolus of normal saline.
- Record 3-Lead EKG strips during Adenosine administration.
- Perform a diagnostic EKG prior to and after Adenosine conversion or after cardioversion.
- If the patient converts into ventricular fibrillation or pulseless ventricular tachycardia immediately DEFIBRILLATE the patient and refer to the appropriate protocol and treat accordingly. Be sure to switch the defibrillator out of "Sync" before defibrillating.
- Give a copy of the EKGs and / or code summaries with the receiving facility upon arrival.
- Transient periods of sinus bradycardia and ventricular ectopy are common after termination of SVT.
- It is unlikely that symptoms of instability are caused primarily by the tachycardia when the HR is <150 unless there is impaired ventricular function.
- Pay attention for P waves. Sinus tach from underlying problems require treatment of the underlying problem. Ex. PE, hypovolemia.

ADULT PROTOCOL

# WIDE – COMPLEX TACHYCARDIA – With Pulse

Rule out Paced Rhythm

Pacer spikes may not be present with current pacemaker technology, confirm by history / physical exam

UNIVERSAL PATIENT CARE PROTOCOL

APPLY CARDIAC MONITOR

OXYGEN

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

Identify Rhythm type Regular or Irregular

Consider hyperkalemia as cause and treat per HYPERKALEMIA protocol if EKG and history supports the decision such a wide complex rhythm with HR < 130

## Stable / Regular

DIAGNOSTIC EKG PROCEDURE

Attempt Vagal Maneuvers (NO carotid massage)

AMIODARONE
150 mg IV / IO
mix in 100 ml D5W
Over 10 minutes

- STOP If HR < 130 (Consider other causes such as hyperkalemia)
- STOP Must have USEABLE DIAGNOSTIC EKG and Have Transmitted to Hospital
- STOP **IF PREGNANT** – USE LIDOCAINE, see Medication Section
- ⚠ If Amiodarone Unavailable, See Medication Section for Lidocaine

**ONLY IF MONOMORPHIC WIDE COMPLEX TACHYCARDIA** (Thought to be aberrant SVT)
***MAY CONSIDER***
Treatment by Narrow Complex Tachycardia Protocol

**Repeat** DIAGNOSTIC EKG PROCEDURE

## Stable / Irregular

DIAGNOSTIC EKG PROCEDURE

Attempt Vagal Maneuvers (NO carotid massage)

If Torsades de pointes
MAGNESEIUM SULFATE
2 grams IV / IO
Over 20 minutes
May Repeat if Necessary to Max 4 Grams in 1 Hour

AMIODARONE
150 mg IV / IO
mix in 100 ml D5W
Over 10 minutes

- STOP If HR < 130 (Consider other causes such as hyperkalemia)
- STOP Must have USEABLE DIAGNOSTIC EKG and Have Transmitted to Hospital
- STOP **IF PREGNANT** – USE LIDOCAINE, see Medication Section
- ⚠ If Amiodarone Unavailable, See Medication Section for Lidocaine

**Repeat** DIAGNOSTIC EKG PROCEDURE

## Unstable / Regular or Irregular

SBP < 90, No Radial Pulses, AMS, Chest Pain, Shock

Consider Sedation
MIDAZOLAM 2.5 mg IV / IO or 5 mg IM / IN
q 5 min prn – Max 10 mg
OR
LORazepam 1 – 2 mg IV / IO / IM / IN
q 10 min prn – Max 4 mg

⚠ If Midazolam or LORazepam Unavailable, See Medication Section for DiazePAM

Synchronized CARDIOVERSION
200 J or Device Recommendation
⚠ Irregular Rhythms / Atrial fibrillation

**If Torsades de pointes**
*DEFIBRILATE*
200 J or Device Recommendation

No Response 1 –2 minutes

Repeat Synchronized CARDIOVERSION
300, 360 J or Device Recommendation
⚠ Irregular Rhythms / Atrial fibrillation

**If Torsades de pointes**
REPEAT *DEFIBRILATION*
300, 360 J or Device Recommendation

Consider Medications if Electricity Unsuccessful

AMIODARONE
150 mg IV / IO
mix in 100 ml D5W
Over 10 minutes

- STOP If HR < 130 (Consider other causes such as hyperkalemia)
- STOP **IF PREGNANT** – USE LIDOCAINE See Medication Section
- ⚠ If Amiodarone Unavailable, See Medication Section for Lidocaine

If Torsades de pointes
MAGNESEIUM SULFATE
2 grams IV / IO
Over 20 minutes
May Repeat if Necessary to Max 4 Grams in 1 Hour

**After Conversion**
DIAGNOSTIC EKG PROCEDURE

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# WIDE– COMPLEX TACHYCARDIA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history / medications, diet, drugs.<br>• Syncope / near syncope<br>• Palpitations<br>• Pacemaker<br>• Allergies: Amiodarone (Cordarone) | • Ventricular tachycardia on ECG (runs or sustained)<br>• Conscious, rapid pulse<br>• Chest pain, shortness of breath<br>• Dizziness<br>• Rate usually 150 + bpm for sustained V-Tach | • Artifact / device failure<br>• Cardiac<br>• Endocrine / metabolic<br>• Drugs<br>• Pulmonary |

## KEY POINTS

- Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro
- Polymorphic V-Tach (Torsades de Pointes) may benefit from the administration of Magnesium Sulfate.
- Polymorphic V-Tach (Torsades de Pointes) requires defibrillation rather than synchronized cardioversion.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- If the patient relapses back into wide complex tachycardia / ventricular tachycardia, initiate synchronized cardioversion with the joules setting that previously cardioverted the patient.
- Record 3 / 4 - Lead EKG strips during medication administration.
- Perform a Diagnostic EKG prior to and after medication administration, or synchronized cardioversion of wide complex tachycardia / ventricular tachycardia.
- Perform a code summary and attach it to the patient run report.
- Be sure to treat the patient and not the monitor.

ADULT PROTOCOL

# CARDIAC ARREST (BLS)

UNIVERSAL PATIENT CARE PROTOCOL

Criteria for Death → REFER TO DOA GUIDELINES CONTACT ONLINE MEDICAL CONTROL

Criteria for DNR → Review DNR Comfort Care Guidelines CONTACT ONLINE MEDICAL CONTROL

Begin CPR Immediately

Attach Cardiac Monitor Defibrillator / AED as soon as available → Go to Appropriate Protocol

Identify known dialysis patients in asystole, V-Fib or pulseless V-Tach

Deliver Shock x 1 if Shockable

Immediately Resume CPR - 2 minutes

IV / IO PROCEDURE

AIRWAY PROTOCOL

Deliver Shock x 1 if Shockable

Maintain CPR / Airway

Follow AED Prompts
(if applicable)

Continue CPR

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

GO TO POST RESUSCITATION CARDIAC CARE

IF ALS CARE AVAILABLE IN FIELD
Patients in cardiac arrest SHOULD be worked on scene UNLESS special resuscitation circumstances exist that would benefit from hospital treatment unavailable in the field

Field Termination
BLS
1. Arrest not witnessed by EMS / first responders
2. No ROSC has been obtained after 20 min of CPR
3. Non-shockable rhythm

Field Termination
ALS
1. Arrest not witnessed by EMS / first responders
2. Advanced Airway in Place
3. Vascular Access in Place
4. Continuous CPR During Resuscitation
5. At Least 2 Rounds of ACLS Medications
6. Asystole Confirmed in 2 leads or bradycardic wide complex PEA.
7. 20 Minutes of Resuscitation
8. An intra-arrest capnography reading <10 indicates no perfusion and may be helpful in considering termination or efforts.

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

ADULT PROTOCOL

# CARDIAC ARREST

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Events leading to arrest<br>• Estimated downtime<br>• Past medical history<br>• Medications<br>• Existence of terminal illness<br>• Signs of lividity, rigor mortis<br>• DNR | • Unresponsive<br>• Apneic<br>• Pulseless | • Medical vs. trauma<br>• V-fib vs. pulseless V-tach<br>• Asystole<br>• Pulseless electrical activity (PEA) |

Strongly encourage transport of **resuscitated** patient to facility with PCI where available.

## KEY POINTS

- Exam: Mental Status
- Always minimize interruptions to chest compressions.
- Success is based on proper planning and execution. Procedures require space and patient access, make room to work.
- Reassess airway frequently and with every patient move.
- Maternal arrest - Treat mother per appropriate protocol with immediate notification to Online Medical Control and rapid transport.
- When IV access failed or difficult, humeral head IO are preferred routes over tibial IO for resuscitation
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- Attempt to obtain patient history from family members or bystanders.
  - Estimated down time
  - Medical history
  - Complaints prior to arrest
  - Bystander CPR prior to EMS arrival
  - AED use prior to EMS arrival
- Administer Dextrose only if the patient has a blood glucose level < 70 mg / dl. Dextrose should be administered as soon as hypoglycemia is determined.
- Reassess the patient if the interventions do not produce any changes.
- If indicated, refer to the TERMINATION OF RESUSCITATION EFFORTS POLICY.
- If patient is pregnant and in cardiac arrest, manually manipulate the uterus to the left during CPR
- If shockable rhythm and in an area with eCPR (ECMO CPR) capability at the receiving hospital, those eCPR guidelines for resuscitation and abbreviated field treatment may be followed. This requires specific training and education for the EMS agencies in the catchment area where these programs are being conducted.

ADULT PROTOCOL

# HYPOTHERMIC CARDIAC ARREST

UNIVERSAL PATIENT CARE PROTOCOL

Criteria for Death

Criteria for DNR

REFER TO DOA GUIDELINES
CONTACT ONLINE MEDICAL CONTROL

Review DNR Comfort Care Guidelines
CONTACT ONLINE MEDICAL CONTROL

**EXPECTED CASE USE FOR THIS PROTOCOL**
Patient is believed to be in cardiac arrest DUE TO hypothermia

Begin CPR Immediately
If patient rectal temp is
≥ 30 degrees C (86 degrees F) follow STANDARD CARDIAC ARREST PROTOCOLS

Go to Appropriate Protocol

Identify known dialysis patients in asystole, V-Fib or pulseless V-Tach

If rectal temp is
< 30 degrees C (86 degrees F)

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

Continue Warming

GO TO POST RESUSCITATION CARDIAC CARE PROTOCOL

Ventilate – HALF standard rate
5 breaths / min

Attach Cardiac Monitor
Defibrillator / AED as soon as available

Deliver Shock x 1 if Shockable
Limit to single attempt until warmed
Use highest available Joule setting

IV / IO PROCEDURE

*Warm during arrest*

- Remove wet clothing if applicable, dry and cover patient
- Move to warmed area, increase ambient heat
- Apply heat packs to groin, axilla, and neck
- Consider warmed IV fluids if available

Withold cardioactive medications until temp > ≥ 30 degrees C (86 degrees F)
May give dextrose products

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

**SPECIAL TRANSPORT CONSIDERATIONS**
Consider transport direct to a center capable of emergent ECMO
It is better to transport to a center than can do emergent ECMO even if it is much further away.
All ECPR centers can place patients on ECMO for hypothermia, but some non-ECPR centers can also.
Call medical control to discuss.

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPOTHERMIC CARDIAC ARREST



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Events leading to arrest<br>• Estimated downtime<br>• Past medical history<br>• Medications<br>• Existence of terminal illness<br>• Signs of lividity, rigor mortis<br>• DNR | • Unresponsive<br>• Apneic<br>• Pulseless | • Medical vs. trauma<br>• V-fib vs. pulseless V-tach<br>• Asystole<br>• Pulseless electrical activity (PEA) |

## KEY POINTS

- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe bradycardia.
- Shivering stops below 90° F (32° C).
- Hot packs can be activated and placed in the armpit and groin area if available.
- Care should be taken not to place the packs directly against the patient's skin.
- Consider withholding CPR if patient has organized rhythm. Discuss with Online Medical Control.
- Patients with low core temperatures may not respond to ALS drug interventions. Discuss ACLS drug use with Online Medical Control in severely hypothermic patients.
- Maintain warming procedure and supportive care. Warming procedures includes removing wet clothing, limiting exposure, and covering the patient with warm blankets if available.
- The most common mechanism of death in hypothermia is ventricular fibrillation. If the hypothermia victim is in ventricular fibrillation, CPR should be initiated. If V-FIB is not present, then all treatment and transport decisions should be tempered by the fact that V-FIB can be caused by rough handling, noxious stimuli, or even minor mechanical disturbances, this means that respiratory support with 100% oxygen should be done gently, including intubation, avoiding hyperventilation.
- The heart is most likely to fibrillate between 85 - 88° F (29 - 31° C.) Defibrillate VF / VT x1 if no change, perform CPR and defer repeat defibrillation attempts until patient has been rewarmed.

ADULT PROTOCOL

# ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

UNIVERSAL PATIENT CARE PROTOCOL

Criteria for Death

Criteria for DNR

Refer to DOA Guidelines CONTACT ONLINE MEDICAL CONTROL

Review DNR Comfort Care Guidelines CONTACT ONLINE MEDICAL CONTROL

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

GO TO POST RESUSCITATION CARDIAC CARE PROTOCOL

Begin CPR Immediately

AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

IF ALS CARE AVAILABLE IN FIELD
Patients in cardiac arrest SHOULD be worked on scene UNLESS special resuscitation circumstances exist that would benefit from hospital treatment unavailable in the field

Apply Cardiac Monitor / AED

Asystole / PEA Persists

Continue CPR

Field Termination
BLS
1. Arrest not witnessed by EMS / first responders
2. No ROSC has been obtained after 20 min of CPR
3. Non-shockable rhythm

Field Termination
ALS
1. Arrest not witnessed by EMS / first responders
2. Advanced Airway in Place
3. Vascular Access in Place
4. Continuous CPR During Resuscitation
5. At Least 2 Rounds of ACLS Medications
6. Asystole Confirmed in 2 leads or bradycardic wide complex PEA.
7. 20 Minutes of Resuscitation
8. An intra-arrest capnography reading <10 indicates no perfusion and may be helpful in considering termination or efforts.

IV / IO PROCEDURE

⚠ EPINEPHrine (ADRENALINE) as soon as possible after vascular access

Known dialysis patient or history concerning for hyperkalemia

EPINEPHrine
1 mg IV / IO of 0.1 mg / ml
q 3 - 5 minutes

Flush IV Line Then
CALCIUM GLUCONATE
3 Grams SLOW IV / IO
OR
CALCIUM CHLORIDE
1 Gram SLOW IV / IO
q 5 mins prn if available
DO NOT MIX WITH SODIUM BICARBONATE IN SAME LINE

Flush IV Line Then
SODIUM BICARBONATE
1 mEq / kg up to 200 mEq IV / IO

Continue CPR

Consider Termination – See Field Termination of Resuscitative Efforts Policy

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

If patient awakens during CPR or CPR device use, despite a non-life sustaining rhythm that interferes with treatment consider one of the following medications
KETAMINE
FENTANYL
MIDAZOLAM
LORAZEPAM
Use usual adult dosing
Repeat as needed to yield patient response permitting resuscitation

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Medications<br>• Events leading to arrest<br>• End stage renal disease<br>• Estimated downtime<br>• Suspected hypothermia<br>• Suspected overdose<br>• DNR<br>• Tricyclics<br>• Digitalis<br>• Beta blockers<br>• Calcium channel blockers | • Pulseless<br>• Apneic<br>• No electrical activity on ECG<br>• Cyanosis | • Medical vs. trauma<br>• Hypoxia<br>• Potassium (hypo / hyper)<br>• Acidosis<br>• Hypothermia<br>• Device (lead) error<br>• Death<br>• Hypovolemia<br>• Cardiac tamponade<br>• Drug overdose (Tricyclics, digitalis, beta blockers, calcium channel blockers<br>• Massive myocardial infarction<br>• Tension pneumothorax<br>• Pulmonary embolus |

| CONSIDER TREATABLE CAUSES | |
|---|---|
| • Hypovolemia<br>• Hypo-hyperkalemia<br>• Hypoxia<br>• Hypoglycemia<br>• Hydrogen ion (acidosis)<br>• Hypothermia | • Toxins<br>• Tamponade (cardiac)<br>• Tension pneumothorax<br>• Thrombosis (coronary or pulmonary)<br>• Trauma |

Strongly encourage transport of **resuscitated** patient to facility with PCI where available.

## KEY POINTS

- Exam: Mental Status
- Always minimize interruptions to chest compressions.
- When IV access failed or difficult, humeral head IO are preferred routes over tibial IO for resuscitation.
- Always confirm asystole in more than one lead.
- Consider each possible cause listed in the differential: Survival is based on identifying and correcting the cause!
- Discussion with Online Medical Control can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.
- If the patient converts to another rhythm, refer to the appropriate protocol and treat accordingly.
- Early identification and treatment of reversible causes of PEA increases the chance of a successful outcome.
- Consider volume infusion for all patients in PEA. Be alert for fluid overload.
- Treat as ventricular fibrillation if you cannot differentiate between asystole and fine ventricular fibrillation.
- Dextrose should only be administered to a patient with a confirmed blood glucose level less than 70 mg / dl.
- If patient is pregnant and in cardiac arrest, manually manipulate the uterus to the left during CPR

ADULT PROTOCOL

# VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA

UNIVERSAL PATIENT CARE PROTOCOL

Criteria for DNR

Criteria for Death

Review DNR Comfort Care Guidelines
CONTACT ONLINE MEDICAL CONTROL

Refer to DOA Guidelines
CONTACT ONLINE MEDICAL CONTROL

Begin CPR Immediately

IF ALS CARE AVAILABLE IN FIELD
Patients in cardiac arrest SHOULD be worked on scene UNLESS special resuscitation circumstances exist that would benefit from hospital treatment unavailable in the field

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

GO TO POST RESUSCITATION CARDIAC CARE

Apply Cardiac Monitor
Defibrillator / AED – Confirm V-Fib / VTach

Defibrillate 200 J or Device Recommendation

Immediately resume CPR / 2 minutes

AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

If patient awakens during CPR or CPR device use, despite a non-life sustaining rhythm that interferes with treatment consider one of the following medications
KETAMINE
FENTANYL
MIDAZOLAM
LORAZEPAM
Use usual adult dosing
Repeat as needed to yield patient response permitting resuscitation

Reassess Rhythm

Defibrillate 300 J or Device Recommendation

Immediately resume CPR / 2 minutes

EPINEPHrine
1 mg IV / IO of 0.1 mg / ml
q 3 - 5 minutes

Known dialysis patient or history concerning for hyperkalemia

Flush IV Line Then
CALCIUM GLUCONATE
3 Grams SLOW IV / IO
OR
CALCIUM CHLORIDE
1 Gram SLOW IV / IO
q 5 mins prn if available

STOP DO NOT MIX WITH SODIUM BICARBONATE IN SAME LINE

Flush IV Line Then
SODIUM BICARBONATE
1 mEq / kg up to 200 mEq
IV / IO

Reassess Rhythm

Defibrillate 360 J or Device Recommendation

Immediately resume CPR / 2 minute

Give ONE Antiarrhythmic during CPR

AMIODARONE
300 mg IV / IO
May repeat @ 150 mg IV / IO
in 3 - 5 minutes – Max 450 mg

⚠ If Amiodarone Unavailable, See Medication Section for Lidocaine

CONSIDER
MAGNESIUM SULFATE
2 grams over 1 - 2 minutes IV / IO
(Torsades, Alcoholism, Malnutrition ONLY)
May Repeat 2 gram dose up to max 4 grams

Defibrillate 360 J or Device Recommendation

Immediately resume CPR / 2 minute

Go to Refractory V-FIB / V-TACH protocol if unresolved

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

Consider Field Termination of Resuscitative Efforts

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Estimated down time<br>• Past medical history<br>• Medications<br>• Events leading to arrest<br>• Renal failure / dialysis<br>• DNR | • Unresponsive, apneic, pulseless<br>• Ventricular fibrillation or ventricular tachycardia on ECG | • Asystole<br>• Artifact / device failure<br>• Cardiac<br>• Endocrine / metabolic<br>• Drugs<br>• Pulmonary embolus |

Strongly encourage transport of **resuscitated** patient to facility with PCI where available.

## KEY POINTS

- Exam: Mental Status
- Always minimize interruptions to chest compressions.
- When IV access failed or difficult, humeral head IO are preferred routes over tibial IO for resuscitation.
- Effective CPR should be as continuous as possible with a minimum of 5 cycles or 2 minutes.
- Reassess and document endotracheal tube placement and Capnography frequently, after every move, and at discharge.
- Polymorphic V-Tach (Torsades de Pointes) may benefit from administration of Magnesium Sulfate.
- If the patient converts to another rhythm, or has a return of circulation, refer to the appropriate protocol and treat accordingly.
- If the patient converts back to ventricular fibrillation or pulseless ventricular tachycardia after being converted to ANY other rhythm, defibrillate at the previous setting used.
- Defibrillation following effective CPR is the definitive therapy for ventricular fibrillation and pulseless ventricular tachycardia. Magnesium Sulfate should be administered early in the arrest if hypomagnesemia (chronic alcoholic or malnourished patients) is suspected.
- If patient is pregnant and in cardiac arrest, manually manipulate the uterus to the left during CPR
- Zoll and Phillips equivalency settings are 120,150,200 Joules to Physio Control / Stryker 200,300,360 Joules. If unsure about settings use highest joule setting per AHA.
- Damage to defibrillators during double sequential defibrillation may not be covered by manufacturers, use the technique with prior approval from your department
- Do not delay transport or make stops to obtain a second defibrillator to accomplish double sequential defibrillation. This is only for situations where two are already on scene. The defibrillators do not have to be of the same make / model.
- Dextrose should only be administered to a patient with a confirmed blood glucose level less than 70 mg / dl.
- If shockable rhythm and in an area with eCPR (ECMO CPR) capability at the receiving hospital, those eCPR guidelines for resuscitation and abbreviated field treatment may be followed. This requires specific training and education for the EMS agencies in the catchment area where these programs are being conducted.

Airway / Breathing | Circulation / Shock | Cardiac | Medical | Trauma

ADULT PROTOCOL

# VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA for ECPR Departments

UNIVERSAL PATIENT CARE PROTOCOL

Criteria for DNR → Review DNR Comfort Care Guidelines CONTACT ONLINE MEDICAL CONTROL

Criteria for Death → Refer to DOA Guidelines CONTACT ONLINE MEDICAL CONTROL

Begin CPR Immediately

ONLY in cases where eCPR center is within 30 mins transport time and initial defibrillation fails move towards transport

Apply Cardiac Monitor
Defibrillator / AED – Confirm V-Fib / V-Tach

Defibrillate 200 J or Device Recommendation

Immediately resume CPR / 2 minutes

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

GO TO POST RESUSCITATION CARDIAC CARE

AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

If patient awakens during CPR or CPR device use, despite a non-life sustaining rhythm that interferes with treatment consider one of the following medications
KETAMINE
FENTANYL
MIDAZOLAM
LORAZEPAM
Use usual adult dosing
Repeat as needed to yield patient response permitting resuscitation

**EVALUATE ECPR CRITERIA**

**Inclusion Criteria**

- Approximate age 18 - 70 years
- Witnessed Arrest
- Initial rhythm VT / VF
- Expected transport time to Hospital Providing ECPR < 30 minutes
- Able to provide mechanical CPR
- End Tidal CO2 > 10

**Exclusion Criteria**

- Clear advanced directives with DNR status
- Long term care facility / Nursing Home
- Known terminal illness

**Once Criteria met, Immediately Notify receiving eCPR center**
**Individualized care should always be considered**
**The ECPR facility should be contacted for unique considerations**
Move towards ambulance for transport
Continue standard of care treatments enroute

Known dialysis patient or history concerning for hyperkalemia

Reassess Rhythm

Defibrillate 300 J or Device Recommendation

Immediately resume CPR / 2 minutes

EPINEPHrine
1 mg IV / IO of 0.1 mg / ml
q 3 - 5 minutes

AMIODARONE
300 mg IV / IO
May repeat @ 150 mg IV / IO
in 3 - 5 minutes – Max 450 mg

⚠ If Amiodarone Unavailable, See Medication Section for Lidocaine

Flush IV Line Then
CALCIUM GLUCONATE
3 Grams SLOW IV / IO
OR
CALCIUM CHLORIDE
1 Gram SLOW IV / IO
q 5 mins prn if available

STOP DO NOT MIX WITH SODIUM BICARBONATE IN SAME LINE

Reassess Rhythm

Defibrillate 360 J or Device Recommendation

Immediately resume CPR / 2 minute

Give ONE Antiarrhythmic during CPR

CONSIDER
MAGNESIUM SULFATE
2 grams over 1 - 2 minutes IV / IO
(Torsades, Alcoholism, Malnutrition ONLY)
May Repeat 2 gram dose up to max 4 grams

Flush IV Line Then
SODIUM BICARBONATE
1 mEq / kg up to 200 mEq
IV / IO

Defibrillate 360 J or Device Recommendation

Immediately resume CPR / 2 minute

**TRANSPORT** to appropriate ***ECPR facility*** **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA for ECPR Departments



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Estimated down time<br>• Past medical history<br>• Medications<br>• Events leading to arrest<br>• Renal failure / dialysis<br>• DNR | • Unresponsive, apneic, pulseless<br>• Ventricular fibrillation or ventricular tachycardia on ECG | • Asystole<br>• Artifact / device failure<br>• Cardiac<br>• Endocrine / metabolic<br>• Drugs<br>• Pulmonary embolus |

**ECPR Centers**
Cleveland Clinic Main Campus
UH Cleveland Medical Center

## KEY POINTS – ECPR

- If shockable rhythm and in an area with ECPR (ECMO CPR) capability at the receiving hospital, those ECPR guidelines for resuscitation and abbreviated field treatment may be followed
- If ROSC is achieved during transport, EMS should continue to the ECPR center that they were originally transporting to
- Standard treatments for V-FIB / V-Tach applies during transport if ECPR criteria met
- Specific cases not explicitly included in the inclusion or exclusion criteria should be discussed with the ECPR center real time
- Successful outcomes of ECPR hinges on early identification, early notification of the ECPR center, and timely transport and transfer of the patient
- Mechanical CPR is paramount during care for maintenance of quality CPR – apply as soon as possible

## KEY POINTS – V-FIB / V-TACH

- Exam: Mental Status
- Always minimize interruptions to chest compressions.
- When IV access failed or difficult, humeral head IO are preferred routes over tibial IO for resuscitation.
- Effective CPR should be as continuous as possible with a minimum of 5 cycles or 2 minutes.
- Reassess and document endotracheal tube placement and Capnography frequently, after every move, and at discharge.
- Polymorphic V-Tach (Torsades de Pointes) may benefit from administration of Magnesium Sulfate.
- If the patient converts to another rhythm, or has a return of circulation, refer to the appropriate protocol and treat accordingly.
- If the patient converts back to ventricular fibrillation or pulseless ventricular tachycardia after being converted to ANY other rhythm, defibrillate at the previous setting used.
- Defibrillation following effective CPR is the definitive therapy for ventricular fibrillation and pulseless ventricular tachycardia. Magnesium Sulfate should be administered early in the arrest if hypomagnesemia (chronic alcoholic or malnourished patients) is suspected.
- If patient is pregnant and in cardiac arrest, manually manipulate the uterus to the left during CPR
- Zoll and Phillips equivalency settings are 120,150,200 Joules to Physio Control / Stryker 200,300,360 Joules. If unsure about settings use highest joule setting per AHA.
- Damage to defibrillators during double sequential defibrillation may not be covered by manufacturers, use the technique with prior approval from your department
- Dextrose should only be administered to a patient with a confirmed blood glucose level less than 70 mg / dl.

ADULT PROTOCOL

# REFRACTORY VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA

Reassess and assure that all previous interventions are functioning as expected

1. Oxygen supply to BVM still appropriate
2. Airway properly in place with a capnography waveform
3. CPR is optimized / Device in proper position
4. Defib Pads properly adhered and positioned

Consider Transport and / or Medical Direction Contact

**Refractory or V-FIB / V-TACH**
Patient stays in V-FIB / V-TACH after exhausting the V-FIB / V-TACH algorithm

**RECURRANT V-FIB / V-TACH**
Patient goes back into V-VIB / V-TACH after a conversion to another rhythm from EMS interventions

## Consider Treatable Causes

- Hypovolemia
- Hypo-hyperkalemia
- Hypoxia
- Hypoglycemia
- Hydrogen ion (acidosis)
- Hypothermia
- Toxins
- Tamponade (cardiac)
- Tension pneumothorax
- Thrombosis (coronary or pulmonary)
- Trauma

CONSIDER
ELECTRICAL VECTOR CHANGE
Add Anterior / Posterior Pads Attempt Defibrillation

Then / Or CONSIDER
DOUBLE SEQUENTIAL DEFIBRILLATION
If capable, after minimum of 4 unsuccessful EMS defibrillations

Continue EPINEPHrine
1 mg IV / IO of 0.1 mg / ml
q 3 - 5 minutes

Consider OTHER anti-arrhythmics NOT given during arrest

LIDOCAINE
1 - 1.5 mg / kg IV / IO First Dose
0.5 – 0.75 mg / kg IV / IO Second Dose if needed
(max dose 3 mg / kg)

*OR*

MAGNESIUM SULFATE
2 grams over 1 - 2 minutes IV / IO
May Repeat 2 ram dose prn up to Max 6 grams

*OR*

AMIODARONE
300 mg IV / IO
May repeat @ 150 mg IV / IO
in 3 - 5 minutes – Max 450 mg

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

Consider Field Termination of Resuscitative Efforts

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# REFRACTORY VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Estimated down time<br>• Past medical history<br>• Medications<br>• Events leading to arrest<br>• Renal failure / dialysis<br>• DNR | • Unresponsive, apneic, pulseless<br>• Ventricular fibrillation or ventricular tachycardia on ECG | • Asystole<br>• Artifact / device failure<br>• Cardiac<br>• Endocrine / metabolic<br>• Drugs<br>• Pulmonary embolus |

Strongly encourage transport of **resuscitated** patient to facility with PCI where available.

## KEY POINTS

- Exam: Mental Status
- Always minimize interruptions to chest compressions.
- When IV access failed or difficult, humeral head IO are preferred routes over tibial IO for resuscitation.
- Effective CPR should be as continuous as possible with a minimum of 5 cycles or 2 minutes.
- Reassess and document endotracheal tube placement and Capnography frequently, after every move, and at discharge.
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- Zoll and Phillips equivalency settings are 120,150,200 Joules to Physio Control / Stryker 200,300,360 Joules. If unsure about settings use highest joule setting per AHA.
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- Do not delay transport or make stops to obtain a second defibrillator to accomplish double sequential defibrillation. This is only for situations where two are already on scene. The defibrillators do not have to be of the same make / model.
- Dextrose should only be administered to a patient with a confirmed blood glucose level less than 70 mg / dl.

ADULT PROTOCOL

# POST – RESUSCITATION CARDIAC CARE

Strongly encourage transport of **resuscitated** patient to facility with hypothermic resuscitation protocol and PCI where available.

Assure Secured Airway

Continue Ventilatory Support with OXYGEN Target $SpO_2$ 92 – 98%

CAPNOGRAPHY PROCEDURE Target $CO_2$ 35 - 45

Assure IV / IO Access Patency

DIAGNOSTIC EKG PROCEDURE

Vital Signs

Consider hyperkalemia as cause and treat per HYPERKALEMIA protocol if EKG and history supports the decision

Treat fever with cooling measures

## Bradycardia

Treat per BRADYCARDIA PROTOCOL

## Hypotension

IV NORMAL SALINE BOLUS To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses

**EPINEPHrine PUSH DOSE**
Make 10 mcg / ml
10 mcg (1 ml) prn - slow push
Titrate to effect
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses
⚠ May use up to 50 mcg (5 ml) per dose if needed

## Electrical Conversion

Supportive Care Only Anti-arrhythmic not necessary unless there is gross ventricular ectopy

## Anti-Arrhythmic Conversion

No Post Arrest Anti-Arrhythmic Administered

If arrest reoccurs, revert to appropriate protocol and / or initial successful treatment

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# POST – RESUSCITATION CARDIAC CARE



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Respiratory arrest<br>• Cardiac arrest | • Return of pulse | • Continue to address specific differentials associated with the original dysrhythmia |

## KEY POINTS

- Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro
- Most patients immediately post resuscitation will require ventilatory assistance.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring.
- Appropriate post-resuscitation management can best be planned in consultation with Online Medical Control.
- This is the period of time between restoration of spontaneous circulation and the transfer of care at the emergency department. The focus is aimed at optimizing oxygenation and perfusion.
- Post resuscitation SVT should initially be left alone, but routinely monitor the patient. Follow NARROW COMPLEX TACHYCARDIA PROTOCOL or contact Medical Control.
- If the patient is profoundly bradycardic, refer to the BRADYCARDIA PROTOCOL and treat accordingly.
- Only administer oxygen if the patient is hypoxic with a $SpO_2$ of 94 or less. Do not withhold oxygen from patients that are short of breath regardless of $SpO_2$.

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# SECTION 5 - MEDICAL EMERGENCIES PROTOCOLS


Abdominal Pain ..... 2-5
Alcohol Related Emergencies ..... 4-5
Altered Level of Consciousness ..... 6-5
Allergic Reaction (see section 4-3 Anaphylactic Shock / Reaction) ..... 4-3
Behavioral / Agitation / Combative ..... 8-5
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Hyperthermia / Heat Exposure ..... 16-5
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Hypothermia / Frostbite ..... 20-5
Nausea / Vomiting ..... 22-5
Pain Management ..... 24-5
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Syncope / Near Syncope ..... 30-5
Toxic Ingestion / Exposure / Overdose ..... 32-5
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Toxic Inhalation / Ingestion – Cyanide ..... 36-5
Toxic Inhalation – Carbon Monoxide ..... 38-5
Toxic Exposure – Hydrogen Fluoride Exposure ..... 40-5

ADULT PROTOCOL

# ABDOMINAL PAIN

UNIVERSAL PATIENT CARE PROTOCOL

IV PROCEDURE
NORMAL SALINE BOLUS
To Maintain MAP > 65
or SBP 90 if MAP Unavailable or Radial Pulses
**IF HYPOTENSIVE**

Consider ACUTE CORNARY SYNDROME PROTOCOL

DIAGNOSTIC EKG PROCEDURE
1ST Contact to EKG and Transmission < 10 Min

NAUSEA AND VOMITING PROTOCOL

PAIN MANAMGENT PROTOCOL

CAPNOGRAPHY PROCEDURE

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

Differentiate Flank Pain from Abdominal Pain and Treat per Pain Management Protocol

# ABDOMINAL PAIN



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Age<br>• Past medical / surgical history<br>• Medications<br>• Onset<br>• Palliation / provocation<br>• Quality (crampy, constant, sharp, dull, etc.)<br>• Region / radiation / referred pain<br>• Severity (1-10)<br>• Time (duration / repetition)<br>• Fever<br>• Last meal eaten<br>• Last bowel movement / emesis<br>• Menstrual history (pregnancy) | • Pain (location / migration)<br>• Tenderness<br>• Nausea<br>• Vomiting<br>• Diarrhea<br>• Dysuria<br>• Constipation<br>• Vaginal bleeding / discharge<br>• Pregnancy<br><br>**Associated symptoms:**<br>**(Helpful to localize source)**<br>• Fever, headache, weakness, malaise, myalgias, cough, headache, mental status changes, rash | • Pneumonia or pulmonary embolus<br>• Liver (hepatitis, CHF)<br>• Peptic ulcer disease / gastritis<br>• Gallbladder<br>• Myocardial infarction<br>• Pancreatitis<br>• Kidney stone<br>• Abdominal aneurysm<br>• Appendicitis<br>• Bladder / prostate disorder<br>• Pelvic (PID, ectopic pregnancy, ovarian cyst)<br>• Spleen enlargement<br>• Diverticulitis<br>• Bowel obstruction<br>• Gastroenteritis (infectious) |

## KEY POINTS

- Required Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neuro
- Abdominal pain in women of childbearing age should be treated as an ectopic pregnancy until proven otherwise.
- The diagnosis of abdominal aneurysm should be considered with abdominal pain in patients over 50.
- Appendicitis may present with vague, peri-umbilical pain, which migrates, to the RLQ over time.
- It is important to remember that abdominal pain can be caused by many different disease processes. The organ systems that may be involved in abdominal pain include esophagus, stomach, intestinal tract, liver, pancreas, spleen, kidneys, male and female genital organs, bladder, as well as referred pain from the chest that can involve the heart, lungs, or pleura. Abdominal pain may also be caused by muscular and skeletal problems.
- Abdominal pain emergencies are likely to lead to death due to hypovolemia. There may also be severe electrolyte abnormalities that can cause arrhythmias.
- Myocardial infarction may present as abdominal pain especially in the diabetic and elderly.
- In some patients, cardiac chest pain may manifest as abdominal pain. Consider this in all patients with abdominal pain, especially patients with diabetes and in women.
- Because the abdominal pain may be of cardiac origin, perform cardiac monitoring and a diagnostic EKG.
- DKA may present with abdominal pain, nausea, and vomiting. Check blood glucose level.
- Ketamine use in pregnancy is a risk / benefit assessment per case. Consult Medical Control if there are questions

ADULT PROTOCOL

# ALCOHOL / WITHDRAWAL RELATED EMERGENCIES

All AEMT Medication Administrations on this page require PRIOR agency Medical Director approval and training to use off-line

UNIVERSAL PATIENT CARE PROTOCOL
RULE OUT OTHER CAUSES / CONCURRENT ISSUES
OXYGEN to maintain $SpO_2$ >94 by NC when possible
IV / IO PROCEDURE
Apply Cardiac Monitor and Assess Vitals
BLOOD GLUCOSE PROCEDURE

**Transport Restrained or Medicated patients supine or in lateral position only**

Administer
THIAMINE 100 mg IV or IM
No Repeat
If IV / IO DEXTROSE required to treat Hypoglycemia in the Chronic Alcoholic Patient

## Mild Symptoms

Nausea, Vomiting, Headache, Dehydration, Protecting own Airway, Dizzy, Lightheaded, Responsive

Treat per NAUSEA AND VOMITING PROTOCOL

IV NORMAL SALINE BOLUS
20 ml / kg
If Signs of Dehydration or To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses

## Violent / Combative

Combative, Violent, Irrational Behavior, Threat to Self or Others

⚠ **NOT FOR** Obnoxious patient who is otherwise not a threat and is following commands

Summon Law Enforcement
Make Scene Safe

Treat per BEHAVIORAL / AGITATION / COMBATIVE PROTOCOL

CAPNOGRAPHY PROCEDURE Required

## Obtunded

Unresponsive or only Mildly to Noxious Stimuli, Snoring, Questionable ability to Protect Airway, Possibly Vomiting

Protect Airway
AIRWAY PROTOCOL

Position on Left Side
Have Suction Immediately Available

Consider Need for Advanced Airway Placement

CAPNOGRAPHY PROCEDURE Required

IV NORMAL SALINE BOLUS
20 ml / kg
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses

NAUSEA AND VOMITING PROTOCOL

DIAGNOSTIC EKG PROCEDURE

## Alcohol / Benzos / Barbiturate Withdrawal

Chronic Alcoholic, Chronic Benzo / Barbiturate use, Shaking, Sweating, Fever, Hallucinations, Seizures, Tachycardia, HTN

COOLING MEASURES IF FEBRILE

If Patient Agitated, Consider
MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN q 5 min prn - Max 10 mg
OR
LORazepam
1 – 2 mg IV / IO / IM / IN q 10 min prn - Max 4 mg
⚠ If Midazolam or LORazepam Unavailable, See Medication Section for diazePAM

CAPNOGRAPHY PROCEDURE Required

IV NORMAL SALINE BOLUS
20 ml / kg
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses

If Patient BECOMES Combative, Violent, Threat to Self or Others
Follow Second Column

NAUSEA AND VOMITING PROTOCOL

DIAGNOSTIC EKG PROCEDURE

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# ALCOHOL / WITHDRAWAL RELATED EMERGENCIES

## ALL RESPONDERS SHOULD HAVE A HEIGHTENED AWARENESS OF SCENE SAFETY

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Substance abuse / overdose<br>• Situational crisis<br>• Psychiatric illness / medications<br>• Injury to self or threats to others<br>• Medic alert tag<br>• Diabetes | • Anxiety, agitation, confusion<br>• Affect change, hallucinations<br>• Delusional thoughts, bizarre behavior<br>• Combative violent<br>• Expression of suicidal / homicidal thoughts | • See Altered Mental Status differential diagnosis<br>• Alcohol Intoxication<br>• Toxin / substance abuse<br>• Medication effect / OD<br>• Withdrawal syndromes<br>• Depression<br>• Bipolar (manic-depressive)<br>• Schizophrenia<br>• Anxiety disorders |
| **Agitated – Non-Combative**<br>Patient is experiencing a period of high anxiety seemingly from a psychiatric event not otherwise treatable by EMS who is not a treat to self or others | **Combative – Not Violent**<br>Patient is a treat to self or others and can be controlled and restrained with appropriate help without significant risk to the providers | **Combative – Violent**<br>Patient is in a violent state that puts providers at significant risk despite appropriate help |

**Criteria for Restraint Use:**

- Patient out of control and may cause harm to self or others.
- Necessary force required for patient control without causing harm.
- **Position of patient must not impede airway or breathing.**
- Restraints must not impede circulation.
- Place mask on patient for body secretion protection. May use surgical mask, or Non-rebreather if patient needs oxygen.
- Use supine or lateral positioning ONLY.
- MSP checks are required every 15 min.
- DOCUMENT methods used.
- Medication should be used in conjunction with physical restraint when available.

**Criteria for medication use for combative / violent patients:**

- Patient out of control and may cause harm to self or others.
- Patient is NOT a medical patient (treat underlying causes).
- Patient is an ADULT patient.
- Medications can be given safely without harm to patient or EMS.
- Use minimum force required for patient control without causing harm.
- **Position of patient must not impede airway or breathing.**
- DOCUMENT methods used.

### RASS (Richmond Agitation Sedation Score)

| | | |
|---|---|---|
| +4 | Combative | Overtly combative, violent, immediate danger to staff |
| +3 | Very Agitated | Pulls or removes tube(s) or catheter(s); aggressive |
| +2 | Agitated | Frequent non-purposeful movement, fights ventilator |
| +1 | Restless | Anxious but movements not aggressive vigorous |
| 0 | Alert and Calm | |
| -1 | Drowsy | Not fully alert, but has sustained awakening (eye-opening/eye contact) to *voice* **(>10 seconds)** |
| -2 | Light Sedation | Briefly awakens with eye contact to *voice* **(<10 seconds)** |
| -3 | Moderate Sedation | Movement or eye opening to *voice* **(but no eye contact)** |
| -4 | Deep Sedation | No response to voice, but movement or eye opening to *physical* stimulation |
| -5 | Unarousable | No response to *voice or physical* stimulation |

| Emergence Symptoms | Extrapyramidal Symptoms (EPS) | Neuroleptic Malignant Syndrome |
|---|---|---|
| Confusion<br>Excitement<br>Irrational Behavior<br>Hallucinations | Involuntary Movements<br>Purposeless Movements<br>Tongue Protrusion - Rapid Eye Blinking<br>Facial Grimacing - Lip Smacking / Puckering | Increased Body Temp > 38C (100.4F)<br>Muscle Rigidity<br>Diaphoresis<br>Altered LOC |

### KEY POINTS

- Exam: Mental Status, Skin, Heart, Lungs, Neuro
- Your safety first!!
- Be sure to consider all possible medical / trauma causes for behavior. (Hypoglycemia, overdose, substance abuse, hypoxia, head injury, seizure, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- The safety of on scene personnel is the priority. Protect yourself and others by summoning law enforcement to assure everyone's safety and if necessary, to enable you to render care. Do not approach the patient if he / she is armed with a weapon.
- Be alert for rapidly changing behaviors.
- Limit patient stimulation and use de-escalation techniques.
- Handcuffs applied by law enforcement applied to patients **NOT in custody / under arrest** may be switched to soft restraints for transport
- Handcuffs applied by law enforcement to patients **IN custody / under arrest** require a law enforcement officer to remain available to adjust restraints as necessary for the patient's safety. This policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment to establish scene control.
- Consider treatment of agitation / anxiety combativeness for patients requiring restraint procedure.
- Use of Ketamine and / or Midazolam for behavioral emergencies by AEMTs requires training and approval from the agencies Medical Director before they can use the medications off-line.
- Ketamine use in pregnancy is a risk / benefit assessment per case. Consult Medical Control if there are questions.
- Patients who have used stimulant drugs or have struggled with law enforcement may be at increased risk of metabolic acidosis.
- Rapid / deep breathing or respiratory distress may be indicative of metabolic acidosis.

ADULT PROTOCOL

# ALTERED LEVEL OF CONSCIOUSNESS

UNIVERSAL PATIENT CARE PROTOCOL

Consider SPINAL MOTION RESTRICTION

AIRWAY PROTOCOL

DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

OXYGEN / PULSE OXIMETRY PROCEDURE

CAPNOGRAPHY PROCEDURE

BLOOD GLUCOSE PROCEDURE

IV PROCEDURE

Identify Treatable Causes
Treat Per Specific Protocol

- Seizure – Treat per Seizure Protocol
- Hypoxia – Treat per Airway / Breathing Protocols
- Anaphylaxis / Allergic Reaction
- Sepsis – Treat per Septic Shock Protocol
- Hypotension – Treat per Specific Shock Protocols
- Arrhythmia – Treat per Correct Arrhythmia Protocol
- Psychiatric – Treat per Behavioral Emergencies
- Hypo / Hyperglycemia – Treat per Diabetic Protocol
- Hypo / Hyperthermia – Treat per Specific Protocol
- Stroke CVA / TIA – Treat per Stroke Protocol
- Overdose – Treat per Toxic Ingestion Protocol
- Head Trauma – Treat per Head Trauma Protocol

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# ALTERED LEVEL OF CONSCIOUSNESS

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Known diabetic, medic alert tag<br>• Drugs, drug paraphernalia<br>• Report of illicit drug use or toxic ingestion<br>• Past medical history<br>• Medications<br>• History of trauma | • Decreased mental status<br>• Change in baseline mental status<br>• Bizarre behavior<br>• Hypoglycemia (cool, diaphoretic skin)<br>• Hyperglycemia (warm, dry skin; fruity breath; Kussmaul resps; signs of dehydration) | • Head trauma<br>• CNS (stroke, tumor, seizure, infection)<br>• Cardiac (MI, CHF)<br>• Infection<br>• Thyroid (hyper / hypo)<br>• Shock (septic, metabolic, traumatic)<br>• Diabetes (hyper / hypoglycemia)<br>• Toxicological incident<br>• Acidosis / alkalosis<br>• Environmental exposure<br>• Pulmonary (hypoxia)<br>• Electrolyte abnormality<br>• Psychiatric disorder |

## KEY POINTS

- Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- Be aware of AMS as potential sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia and need Thiamine before glucose.
- Low glucose (< 70), normal glucose (70 - 120), high glucose (> 250).
- Consider restraints if necessary for patient's and / or personnel's protection per the restraint procedure.
- Protect the patient airway and support ABCs.
- Document the patient's Glasgow coma score pre-and post-treatment.
- Signs and symptoms of narcotic overdose include respiratory depression and altered mental status.
- Naloxone administration may cause the patient to go into acute opiate withdraw, which includes vomiting, agitation, and / or combative behavior. Always be prepared for combative behavior.
- Naloxone may wear off in as little as 20 minutes causing the patient to become more sedate and possibly hypoventilate. All A&O 4 patients having received Naloxone should be transported. If patient refuses transport, contact Online Medical Control before release.

ADULT PROTOCOL

# BEHAVIORAL / AGITATION / COMBATIVE

**Identify and Correct Treatable Medical Emergencies Such as Hypoxemia, Sepsis, Seizure, Encephalitis, Hypoglycemia, or Stroke**

If patient is Hyperthermic begin cooling with ice packs in groin and axilla.

SCENE SAFETY
SUMMON LAW ENFORCEMENT

UNIVERSAL PATIENT CARE PROTOCOL

Remove patient from Stressful environment

Verbal techniques
(Reassurance, calm, establish rapport)

BLOOD GLUCOSE PROCEDURE

**Treat Suspected Problems per Appropriate Protocol**
AMS - Overdose - Head Trauma - Hypoglycemia

**Transport Restrained or Medicated patients supine or in lateral positions only**
**- Never Prone -**

## Agitation – Not Combative

MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN
q 5 min prn - Max 10 mg
OR
LORazepam
1 – 2 mg IV / IO / IM / IN
q 10 min prn - Max 4 mg

STOP Do not use Midazolam or LORazepam and OLANZapine together

STOP AEMT use requires prior agency MD Approval and Training

⚠ If Midazolam (Versed) or LORazepam Unavailable,
See Medication Section for diazePAM

*Or* may Consider
*WITH PSYCHOSIS patient only*
OLANZapine
Orally Disintegrating Tablet
10 mg Oral – No Repeat
Instead of Midazolam

CAPNOGRAPHY PROCEDURE Required

## Combative – not Violent
## Risk to Self or others

RESTRAINT PROCEDURE

HALOPERIDOL
5 mg IM ONLY
OR
DroPERidol
5mg IM ONLY
Either - Over Age 65 Give 2.5 mg
IM ONLY –No Repeat

AND / OR
MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN
q 5 min prn - Max 10 mg
OR
LORazepam
1 – 2 mg IV / IO / IM / IN
q 10 min prn - Max 4 mg

STOP AEMT use requires prior agency MD Approval and Training

⚠ If Midazolam or LORazepam Unavailable,
See Medication Section for diazePAM

Any time After Injection: If Fasciculations, Extrapyramidal, Symptoms (EPS) Like Dystonia

diphenhydrAMINE
25 - 50 mg IV / IM – No Repeat
May Give Prophylactically

STOP **Do not mix** HALOPERIDOL or DroPERidol and diphenhydrAMINE **in the same syringe** - Incompatible

CAPNOGRAPHY PROCEDURE Required

## Combative - Violent
## ***Significant*** Threat to Providers

RESTRAINT PROCEDURE

KETAMINE
250 mg IM
USE 100 mg / ml Concentration
May Repeat 250 mg IM Only
in 5 Min if NO RESPONSE – Max 500 mg

STOP AEMT use requires prior agency MD Approval and Training

If Signs of Emergence After KETAMINE Administer
MIDAZOLAM
2.5 mg IV / IO or 5 mg
IM / IN q 5 min prn - Max 10 mg
OR
LORazepam
1 – 2 mg IV / IO / IM / IN
q 10 min prn - Max 4 mg

STOP AEMT use requires prior agency MD Approval and Training

⚠ Notify receiving Physician Ketamine administered so patient presentation is not misconstrued as other etiology

⚠ If Midazolam or LORazepam Unavailable,
See Medication Section for diazePAM

CAPNOGRAPHY PROCEDURE Required

Constant reassessment of ABC's, personal, and patient safety

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# BEHAVIORAL / AGITATION / COMBATIVE

## ALL RESPONDERS SHOULD HAVE A HEIGHTENED AWARENESS OF SCENE SAFETY

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Situational crisis<br>• Psychiatric illness / medications<br>• Injury to self or threats to others<br>• Medic alert tag<br>• Substance abuse / overdose<br>• Diabetes | • Anxiety, agitation, confusion<br>• Affect change, hallucinations<br>• Delusional thoughts, bizarre behavior<br>• Combative violent<br>• Expression of suicidal / homicidal thoughts | • See Altered Mental Status differential diagnosis<br>• Alcohol Intoxication<br>• Toxin / substance abuse<br>• Medication effect / OD<br>• Withdrawal syndromes<br>• Depression<br>• Bipolar (manic-depressive)<br>• Schizophrenia<br>• Anxiety disorders |
| **Agitated – Non-Combative**<br>Patient is experiencing a period of high anxiety seemingly from a psychiatric event not otherwise treatable by EMS who is not a treat to self or others | **Combative – Not Violent**<br>Patient is a treat to self or others and can be controlled and restrained with appropriate help without significant risk to the providers | **Combative – Violent**<br>Patient is in a violent state that puts providers at significant risk despite appropriate help |

**Criteria for Restraint Use:**

- Patient out of control and may cause harm to self or others – document these in PCR.
- Necessary force required for patient control without causing harm.
- **Position of patient must not impede airway or breathing.**
- Restraints must not impede circulation.
- Place mask on patient for body secretion protection. May use surgical mask, or Non-rebreather if patient needs oxygen.
- Use supine or lateral positioning ONLY.
- MSP checks are required every 15 min.
- DOCUMENT methods used.
- Medication should be used in conjunction with physical restraint when available.

**Criteria for medication use for combative / violent patients:**

- Patient out of control and may cause harm to self or others – document these in PCR.
- Patient is NOT a medical patient (treat underlying causes).
- Patient is an ADULT patient.
- Medications can be given safely without harm to patient or EMS.
- Use minimum force required for patient control without causing harm.
- **Position of patient must not impede airway or breathing.**
- DOCUMENT methods used.

## RASS (Richmond Agitation Sedation Score)

| | | |
|---|---|---|
| +4 | Combative | Overtly combative, violent, immediate danger to staff |
| +3 | Very Agitated | Pulls or removes tube(s) or catheter(s); aggressive |
| +2 | Agitated | Frequent non-purposeful movement, fights ventilator |
| +1 | Restless | Anxious but movements not aggressive vigorous |
| 0 | Alert and Calm | |
| -1 | Drowsy | Not fully alert, but has sustained awakening (eye-opening/eye contact) to *voice* **(>10 seconds)** |
| -2 | Light Sedation | Briefly awakens with eye contact to *voice* **(<10 seconds)** |
| -3 | Moderate Sedation | Movement or eye opening to *voice* **(but no eye contact)** |
| -4 | Deep Sedation | No response to voice, but movement or eye opening to *physical* stimulation |
| -5 | Unarousable | No response to *voice or physical* stimulation |

| Emergence Symptoms | Extrapyramidal Symptoms (EPS) | Neuroleptic Malignant Syndrome |
|---|---|---|
| Confusion<br>Excitement<br>Irrational Behavior<br>Hallucinations | Involuntary Movements<br>Purposeless Movements<br>Tongue Protrusion - Rapid Eye Blinking<br>Facial Grimacing - Lip Smacking / Puckering | Increased Body Temp > 38C (100.4F)<br>Muscle Rigidity<br>Diaphoresis<br>Altered LOC |

## KEY POINTS

- Exam: Mental Status, Skin, Heart, Lungs, Neuro
- All psychiatric patients must have medical clearance at a hospital ED before transport to a mental health facility.
- Your safety first!!
- Be sure to consider all possible medical / trauma causes for behavior. (Hypoglycemia, overdose, substance abuse, hypoxia, head injury, seizure, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- The safety of on scene personnel is the priority. Protect yourself and others by summoning law enforcement to assure everyone's safety and if necessary, to enable you to render care. Do not approach the patient if he / she is armed with a weapon. Once restrained assure that the patient is searched for weapons.
- Consider the medical causes of acute psychosis. Causes may include head trauma, hypoglycemia, acute intoxication, sepsis, CNS insult and hypoxia.
- Suicide ideation or attempts must be transported for evaluation.
- Be alert for rapidly changing behaviors.
- Limit patient stimulation and use de-escalation techniques.
- If the patient has been placed in handcuffs by a law enforcement agency, then a member from that agency MUST ride with the patient in the ambulance to the hospital.
- Consider treatment of agitation / anxiety combativeness for patients requiring restraint procedure.
- Use of Ketamine and / or Midazolam for behavioral emergencies by AEMTs requires training and approval from the agencies Medical Director before they can use the medications off-line.
- Ketamine use in pregnancy is a risk / benefit assessment per case. Consult Medical Control if there are questions.
- Patients who have used stimulant drugs or have struggled with law enforcement may be at increased risk of metabolic acidosis.
- Rapid / deep breathing or respiratory distress may be indicative of metabolic acidosis.
- Transport to facilities with appropriate police / security

ADULT PROTOCOL

# DIABETIC EMERGENCIES

UNIVERSAL PATIENT CARE PROTOCOL

BLOOD GLUCOSE PROCEDURE

IV PROCEDURE

## Glucose < 70 or symptomatic

ORAL GLUCOSE
15 -37.5 grams – may repeat prn
Only If Alert

*OR*

THIAMINE
100 mg IV or IM – No Repeat
If Chronic Alcoholism or Malnourished

DEXTROSE 10%
Glucose < 40 mg/dl
25 Grams IV / IO
Glucose 40 – 70 mg/dl
12.5 Grams IV / IO
May repeat prn
⚠ If DEXTROSE 10% Is unavailable, see medication section for DEXTROSE 50%

*OR*

If No Vascular Access
GLUCAGON
1 mg IM – q 10 min prn - Max 2 mg
STOP EMT may administer only with proper training
⚠ Long time to onset of action

Recheck Blood Glucose Level

## Glucose 70 – 250

No Diabetic Treatment Required

## Glucose > 250

NORMAL SALINE
20 ml / kg if signs / symptoms of Dehydration and NO Contraindications

Monitor and Reassess

DIAGNOSTIC EKG PROCEDURE

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# DIABETIC EMERGENCIES

## HYPOGLYCEMIA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Known diabetic, medic alert tag<br>• Past medical history<br>• Medications<br>• Last meal<br>• Recent Blood Sugar Analysis | • Altered level of consciousness<br>• Dizziness<br>• Irritability<br>• Diaphoresis<br>• Convulsions<br>• Hunger<br>• Confusion | • ETOH<br>• Toxic Overdose<br>• Trauma<br>• Seizure<br>• Syncope<br>• CNS disorder<br>• Stroke<br>• Pre-existing condition |

## HYPERGLYCEMIA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Known diabetic, medic alert tag<br>• Past medical history<br>• Medications<br>• Last meal<br>• Recent BGL check | • Altered level of consciousness / coma<br>• Abdominal pain<br>• Nausea / vomiting<br>• Dehydration<br>• Frequent thirst and urination<br>• General weakness malaise<br>• Hypovolemic shock<br>• Hyperventilation<br>• Deep / rapid respirations | • ETOH<br>• Toxic overdose<br>• Trauma<br>• Seizure<br>• Syncope<br>• CSN disorder<br>• Stroke<br>• Diabetic ketoacidosis |

**Hypoglycemic patients who are receiving oral hypoglycemics should be STRONGLY urged to be transported to the hospital. The half-life of such oral medications is long, and these patients will need to be closely monitored for recurrent hypoglycemia.**

### KEY POINTS

**Hyperglycemia:**

- Diabetic ketoacidosis (DKA) is a complication of diabetes mellitus. It can occur when insulin levels become inadequate to meet the metabolic demands of the body for a prolonged amount of time (onset can be within 12 - 24 hours). Without enough insulin, the blood glucose increases, and cellular glucose depletes. The body removes excess blood glucose by dumping it into the urine. Pediatric patients in DKA should be treated as hyperglycemic under the Pediatric Diabetic Emergency Protocol.
- Patients can have hyperglycemia without having DKA.

**Hypoglycemia:**

- Always suspect hypoglycemia in patients with an altered mental status.
- If a blood glucose analysis is not available, a patient with altered mental status and signs and symptoms consistent with hypoglycemia should receive Dextrose or Glucagon (GlucaGen).
- Dextrose is used to elevate BGL ***but it will not maintain it.*** The patient will need to follow up with a meal (carbs), if not transported to a hospital.

**Miscellaneous:**

- If IV access is successful after Glucagon (GlucaGen) IM and the patient is still symptomatic, Dextrose IV / IO can be administered.
- For alcoholic or malnourished patients, give 100 mg Thiamine IV or IM before giving glucose to avoid possible Wernicke's encephalopathy.
- Shut off wearable insulin pumps if patient is hypoglycemic.
- Treat if the patients' blood glucose is 70 or less, or any level with signs and symptoms.
- Glucagon unlikely to be useful in malnourished patients.

ADULT PROTOCOL

# DIALYSIS / RENAL PATIENT

UNIVERSAL PATIENT CARE PROTOCOL

CAPNOGRAPHY PROCEDURE

AIRWAY PROTOCOL

IV / IO PROCEDURE

DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

Breathing Difficulty
Treat per RESPIRATORY DISTRESS Protocol or
CONGESTIVE HEART FAILURE Protocol based on Lung

Missed Dialysis with Cardiac Changes
Treat per HYPERKALEMIA Protocol

Chest Pain
Treat with ACUTE CORONARY SYMPTOMS Protocol

Symptomatic HYPERtension
Blurred Vision Headache Diaphoresis
DISCUSS each case with Online Medical Control
After STROKE ASSESMENT

Symptomatic HYPOtension
***Pre-Dialysis*** Consider Septic Shock / Cardiogenic Shock
***Post Dialysis*** Consider Volume Depletion
Treat Per Appropriate Shock Protocol
CONSIDER ITD PROCEDURE
STOP NO ITD if Cardiogenic Shock

Bleeding Catheter / Shunt
Apply Pressure Over Site / Pressure Points
Apply Tourniquet if risk of Exsanguination
Above and Below Site - Not over Shunt
Hemostatic Agents may be considered in
CHEST and GROIN ACCESS ONLY

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# DIALYSIS / RENAL PATIENT

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Renal failure<br>• Dialysis treatment<br>• Anemia<br>• Dialysis treatment schedule<br>• Previous implications<br>• Long term catheter access<br>• Shunt access<br>• Hyperkalemia | • Hypotension<br>• Bleeding<br>• Fever<br>• Electrolyte imbalances<br>• Nausea<br>• Vomiting<br>• Altered mental status<br>• Seizure<br>• Dysrhythmias | • Congestive heart failure<br>• Pericarditis<br>• Diabetic problem |

## KEY POINTS

The chronic renal dialysis patient has numerous medical problems. The kidneys help maintain electrolyte balance, acid-base balance and rid the body of metabolic waste. Kidney failure results in a build-up of toxins within the body, which can cause many problems.

Dialysis is a process, which filters out the toxins, excess fluids and restores electrolyte balance. The process may be done in two ways:

1. **Peritoneal Dialysis**
   Toxins are absorbed by osmosis through a solution infused into the peritoneal cavity; and then drained out. The solution is placed into the abdomen by means of a catheter, which is placed below the navel. This process must be done frequently, as frequently as every 12 hours for a period of 1 - 2 hours.

2. **Hemodialysis**
   Removes toxins by directly filtering the blood using equipment that functions like an electric kidney, circulating the blood through a Shunt that is connected to a vein and an artery. This process usually needs to be done every 2 - 3 days for a period of 3 - 5 hours. A permanent shunt can be surgically formed as a fistula.

**POSSIBLE COMPLICATIONS OF DIALYSIS TREATMENT**

1. Hypotension (15-30%)
   - May result in angina, MI, dysrhythmia, altered mental status, and seizure
2. Removal of therapeutic medications
   - Example: Tegretol
3. Disequilibrium syndrome
   - Cause: shift of urea and / or electrolytes
   - Signs and symptoms: Nausea and / or vomiting, altered mentation, or seizure
4. Bleeding
   - These patients are often treated with heparin and they may have a low platelet count
   - Bleeding may be at the catheter site, retro peritoneal, gastrointestinal, or subdural
5. Equipment malfunctions
   - Possible air embolus
   - Possible fever or endotoxin

- Do not take blood pressure in arm that has the active shunt.
- A renal patient in full cardiac arrest should be treated according to current ACLS guidelines.

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

ADULT PROTOCOL

# HYPERKALEMIA

Prophylactically apply pacing / defib pads and prepare for decompensation

Pacing may be ineffective until after pharmacologic treatments have been used

Patient has history consistent with hyperkalemia
Available Recent Lab Work
Missed Dialysis
Kidney Failure (Consider Causes - Dehydration, Failure to Thrive)
Burns / Trauma
Uncontrolled Diabetes / Insulin Deficiency
Addison's Disease
Crush Injury / Compartment Syndrome
Medications (K+ Sparing diuretics, ACE inhibitors, Antibiotics, ARB's, NSAIDS, Immunosuppressants)
Excessive Potassium Intake

UNIVERSAL PATIENT CARE PROTOCOL

AIRWAY PROTOCOL
Monitor Lung Sounds for Fluid Overload

OXYGEN

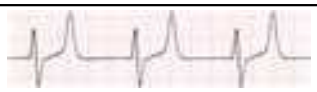
IV / IO PROCEDURE

DIAGNOSTIC EKG PROCEDURE and Assess Vitals

CAPNOGRAPHY PROCEDURE

EKG CHANGES

Wide Complex QRS or
Peaked T Waves or Bradycardia
***Or any combination of these***
Suspected Hyperkalemia



ALBUTEROL
Serial Albuterol Treatments Only During Entire Transport
10mg (x4 2.5mg Unit Doses)
ALBUTEROL ONLY – NO IPRATROPIUM

Flush IV then
CALCIUM GLUCONATE
3 Grams IV / IO or
CALCIUM CHLORIDE
1 GRAM IV / IO
May repeat if available and EKG changes reoccur

IV NORMAL SALINE BOLUS
IF SIGNS OF DEHYDRATION AND NO CONTRAINDICATIONS
20 ml / kg
To Maintain MAP > 65
*or SBP 90 if MAP Unavailable or Radial Pulses*

IF EKG WIDE OR BECOMES SINE WAVE

ONLY IF EKG IS SINE WAVE

TREAT IMMEDIATLY

Flush IV then
CALCIUM GLUCONATE
3 Grams IV / IO or
CALCIUM CHLORIDE
1 GRAM IV / IO
May repeat if available and EKG changes reoccur

STOP

DO NOT MIX IN THE SAME LINE AT SAME TIME

Flush IV then
SODIUM BICARBONATE
1 mEq / kg – IV / IO
May repeat if available and EKG changes reoccur

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPERKALEMIA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Missed Dialysis<br>• Metabolic acidosis<br>• Addison's disease<br>• Burns<br>• DKA<br>• Dehydration<br>• ACE inhibitor use<br>• Diuretic Use<br>• NSIDS chronic use<br>• Digitalis toxicity<br>• Antibiotic use<br>• ARB use<br>• Kidney failure<br>• Trauma (Crush / Compartment Syndrome)<br>• Immunosuppressant use<br>• Excessive potassium intake | • Peaked T-waves<br>  ○ Narrow and tall<br>  ○ Taller than 5 mm in the limb leads<br>  ○ Taller than 10 mm in the precordial leads<br>• Flattened P-waves<br>  ○ Widening of P-waves prior to their disappearance<br>  ○ The lack of P-waves can result in the appearance of a junctional rhythm<br>• Prolonged PR Interval<br>• Widened QRS complexes<br>• Depressed ST-segment<br>• Sine waves<br>  ○ Broad QRS complex and tall T-wave<br>• AV blocks<br>• Ventricular dysrhythmias<br>  ○ Remember that slower wide rhythms are often common with hyperkalemia—keep this on the list of differentials!<br>• Asystole | • Sinus bradycardia<br>• Wide complex unknown origin rhythms<br>• Bundle branch blocks<br>• Sodium channel blocker OD<br>• Beta Blocker OD<br>• Calcium Channel Blocker OD<br>• STEMI<br>• V-tach |

Stages of hyperkalemia and their potassium lab values:

- Normal potassium levels: 3.5–5.5 mEq/L
- Mild hyperkalemia: 5.5–6.5 mEq/L
- Moderate hyperkalemia: 6.5–8.0 mEq/L
- Severe hyperkalemia: more than 8.0 mEq/L

## KEY POINTS

- A wide, fast, regular rhythm does not always equate to ventricular tachycardia. Remember that hyperkalemia can be a v-tach mimic.
- In cases where we have a great story for hyperkalemia, it is potentially beneficial to start resuscitation with the thought of treating hyperkalemia prior to standard ACLS.
- Certain medications traditionally used to treat ventricular tachycardia, such as amiodarone, can lose effectiveness in the presence of hyperkalemia.
- Calcium, whether chloride or gluconate, stabilizes the cardiac membrane and reduces myocardial irritability.
- Albuterol is a beta-adrenergic agonist that assists with the movement of potassium from the extracellular space into the intracellular space.
- While there is substantial evidence to limit the routine use of sodium bicarbonate in out-of-hospital cardiac arrest and diabetic ketoacidosis, there is benefit in giving it in hyperkalemia.
- Focus less on the numerical value and more on the severity of symptoms based on the change rate of the potassium value.

ADULT PROTOCOL

# HYPERTHERMIA / HEAT EXPOSURE

Providers may use purpose made continuous core body temperature monitoring devices is already in place or if provided. Regular spot check thermometers are insufficient. If purpose made continuous core body temperature devices unavailable, then use mental status as the indicator to remove from cooling

UNIVERSAL PATIENT CARE PROTOCOL
Document Patient Temperature
Remove Patient from Heat Source
Remove Patient Clothing
Increase Air Flow around patient
CAPNOGRAPHY PROCEDURE

If immersion cooling has been initiated prior to EMS arrival by on scene providers, do not interrupt cooling for assessment or treatment until cooling period has completed per this protocol

## HEAT EXAUSTION (NO AMS)

Apply coldest water available or ICE water if possible
Apply ICE PACKS to Patient (Groin, Axilla, and Posterior neck)
Consider Cooling Collar

IV / IO PROCEDURE
IV Normal Saline
Bolus 20 ml / kg
CHILLED SALINE IF AVAILABLE

## HEAT STROKE (+AMS) Immersion Unavailable

Apply coldest water available or ICE water if possible
Apply ICE PACKS to Patient (Groin, Axilla, and Posterior neck)
Consider Cooling Collar

IV / IO PROCEDURE
IF HYPOTENSIVE - IV Normal Saline
Bolus 20 ml / kg
IF NORMOTENSIVE - IV Normal Saline
TKO
CHILLED SALINE IF AVAILABLE

## HEAT SROKE (+AMS) Immersion Available

COLD WATER / ICE IMMERSION AVAILABLE
Or
CAN BE PREPARED IN 5 mins
Use any local assets / supplies to accomplish this
STAYING AND GETTING CORE TEMP DOWN IS IMPERATIVE

Submerge as far up to neck as possible – keep head above water with towel or sheet under arms
Agitate the water
Keep immersed for 10 – 20 mins or return of normal mental status
OR
Core temp ≤ 102F (40C) if purpose made continuous core temp monitoring device available

⚠ If mental status fails to return to normal after 20 mins, look for other causes and / or contact Medical Control

Do not interrupt submersion cooling for vomiting, bowel movement, combativeness, or seizures

IV / IO PROCEDURE
IF HYPOTENSIVE - IV Normal Saline
Bolus 20 ml / kg
IF NORMOTENSIVE - IV Normal Saline
TKO
CHILLED SALINE IF AVAILABLE

Transport with early notification to receiving hospital to begin preparing ice bath / cooling measures as needed
BLOOD GLUCOSE PROCEDURE
Cardiac Monitor / DIAGNOSTIC EKG Procedure
Monitor and Reassess
**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPERTHERMIA / HEAT EXPOSURE



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Age<br>• Exposure to increased temperatures and humidity<br>• Past medical history / medications<br>• Extreme exertion<br>• Time and length of exposure<br>• Poor PO intake<br>• Fatigue and / or muscle cramping | • Altered mental status or unconsciousness<br>• Hot, dry, or sweaty skin<br>• Hypotension or shock<br>• Seizures<br>• Nausea | • Fever (infection)<br>• Dehydration<br>• Medications<br>• Hyperthyroidism (storm)<br>• Delirium tremens (DT's)<br>• Heat cramps<br>• Heat exhaustion<br>• Heat stroke<br>• CNS lesions or tumors |

| Heat Exhaustion: Dehydration | Heat Stroke: Cerebral Edema |
|---|---|
| • Muscular / abdominal cramping<br>• General weakness<br>• Diaphoresis<br>• Febrile<br>• Confusion<br>• Dry mouth / thirsty<br>• Tachycardia<br>• BP normal or orthostatic hypotension | • Confusion<br>• Bizarre behavior<br>• Skin hot dry, febrile<br>• Tachycardia<br>• Hypotensive<br>• Seizure<br>• Coma |

## KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro
- Patients at risk for heat emergencies include neonates, infants, geriatric patients, and patients with mental illness. Other contributory factors may include heart medications, diuretics, cold medications, tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, amphetamines, and salicylates may elevate body temperatures.
- Heat exposure can occur either due to increased environmental temperatures or prolonged exercise or a
- combination of both. Environments with temperature > 90° F and humidity > 60% present the most risk.
- Sweating generally disappears as body temperature rises
- **Heat Cramps** consists of benign muscle cramping 2° to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion** consists of dehydration, salt depletion, dizziness, fever, headache, cramping, nausea, and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke** consists of dehydration, tachycardia, hypotension, elevated temperature, and altered mental status. Requires cooling
- On scene cooling by submersion in ice water for heat stroke is imperative. Take time to prepare and submerge patient if suitable tub, ice, and water are available or can be set up in less than the transport time to the hospital or 5 mins. The hospital is unlikely to have immediate availability of an ice bath. Utilize available resources as soon as available to prevent patient deterioration.
- A body bag with ice and water can be used as a makeshift tub if necessary or during transport if additional cooling is required.
- Agitating the water will help with convection and cooling
- Shivering may occur as patient is cooled. Do not discontinue cooling until mental status or target core temperature is achieved.
- Heat stroke occurs when the cooling mechanism of the body (sweating) ceases due to temperature overload and / or electrolyte imbalances. Be alert for cardiac dysrhythmias for the patient with heat stroke.
- In patents with significant hyperthermia (temp > 104° F) begin actively cooling with natural or chemical ice packs applied to the patients' groin, armpits (axilla), and back of neck if submersion is unavailable.
- Use best cooling options available prior to transport when feasible cool patient before transport.

ADULT PROTOCOL

# HYPERTENSIVE EMERGENCIES

UNIVERSAL PATIENT CARE PROTOCOL

IV / IO PROTOCOL

Assess Neuro Status – Record and Trend GCS
Stroke Exam

DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

BLOOD GLUCOSE PROCEDURE

Consider Potential Causes

↓

Concurrent Chest Pain? - Refer to ACS Protocol

Concurrent Pulmonary Edema? - Treat Per CHF / Pulmonary Edema Protocol

↓

Discontinuation / Non –Compliance with Anti-Hypertensive Medications) – Supportive Care

Head Trauma (Cushing's Reflex) – See Head Trauma Protocol

Sympathomimetics (Cocaine, Amphetamines, Etc.) – See Toxic Ingestion / Exposure / Overdose

Aortic Dissection – Supportive Care / Pain Management

Pre-Eclampsia / Eclampsia – See OB Emergencies

↓

Consult Online Medical Control
If EMS Needs Consideration of Other Interventions
on a Per Case Basis

TRANSPORT
Head Up ≥ 30 Degrees Position

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPERTENSIVE EMERGENCIES

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Documented hypertension<br>• Related diseases: diabetes, CVA renal failure, cardiac<br>• Medications (compliance?)<br>• Pregnancy | One of these:<br>• Systolic BP 220 or greater<br>• Diastolic BP 120 or greater<br><br>AND at least one of these:<br>• Headache<br>• Nosebleed<br>• Blurred vision<br>• Dizziness | • Hypertensive encephalopathy<br>• Primary CNS Injury (Cushing's response = bradycardia with hypertension)<br>• Myocardial infarction<br>• Aortic dissection<br>• Pre-eclampsia / Eclampsia<br>• Sympathomimetic ingestion (cocaine) |



## KEY POINTS

- Prehospital treatment of hypertension is very conservative because a CVA in progress may be made worse by a drop in B/P following aggressive hypertension treatment.
- Consider treatment ONLY if patient has signs and symptoms of CHF or cardiac chest pain!
- Hypertensive emergencies are life threatening emergencies characterized by an acute elevation in blood pressure AND end-organ damage to the cardiac, CNS or renal systems. These crisis situations may occur when patients have poorly controlled chronic hypertension.
- All symptomatic patients with hypertension should be transported with their head elevated.
- Evidence of neurological deficit includes confusion, slurred speech, facial asymmetry, focal weakness, coma, lethargy, and seizure activity.
- Evidence of cardiac impairment includes angina, jugular vein distention, chest discomfort and pulmonary edema.
- Toxic ingestion such as cocaine may present with a hypertensive emergency.
- Hypertension can be a neuroprotective reflex in patients with increased intracranial pressure.

ADULT PROTOCOL

# HYPOTHERMIA / FROSTBITE

UNIVERSAL PATIENT CARE PROTOCOL

AIRWAY PROTOCOL

OXYGEN

CAPNOGRAPHY PROCEDURE

Remove wet clothing

Handle Patient Gently

Indirectly Apply Hot Packs and / or Blankets
and Turn Up Vehicle Heat

BLOOD GLUCOSE PROCEDURE

IV / IO PROCEDURE

CARDIAC MONITORING PROCEDURE

Appropriate Protocol(s)
Based on Patient Signs and Symptoms

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

# HYPOTHERMIA / FROSTBITE



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Medications<br>• Exposure to environment even in normal temperatures<br>• Exposure to extreme cold<br>• Extremes of age<br>• Drug use: alcohol, barbiturates<br>• Infections / sepsis<br>• Length of exposure / wetness | • Cold, clammy<br>• Shivering<br>• Mental status changes<br>• Extremity pain or sensory abnormality<br>• Bradycardia<br>• Hypotension or shock | • Sepsis<br>• Environmental exposure<br>• Hypoglycemia<br>• CNS dysfunction<br>• Stroke<br>• Head injury<br>• Spinal cord injury |

## KEY POINTS

- Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro
- Hypothermic / drowning / near drowning patients that appear cold and dead are NOT dead until they are warm and dead, or have other signs of obvious death (putrification, traumatic injury unsustainable to life).
- Defined as core temperature < 93.2° F (34° C).
- Extremes of age are most susceptible (i.e., young, and old).
- Patients with low core temperatures will not respond to ALS drug interventions. Maintain warming procedure and supportive care. Warming procedures includes removing wet clothing, limiting exposure, and covering the patient with warm blankets if available.
- Do not allow patients with frozen extremities to ambulate.
- Do not attempt to rewarm deep frostbite unless there is an extreme delay in transport, and there is a no risk that the affected body part will be refrozen. Contact Medical Control prior to rewarming a deep frostbite injury.
- With temperature less than 86° F (30° C) ventricular fibrillation is common cause of death. Handling patients gently may prevent this.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe bradycardia.
- Shivering stops below 90° F (32° C).
- Hot packs can be activated and placed in the armpit and groin area if available.
- Care should be taken not to place the packs directly against the patient's skin.
- Consider withholding CPR if patient has organized rhythm. Discuss with Online Medical Control.
- Patients with low core temperatures may not respond to ALS drug interventions. Discuss ACLS drug use with Online Medical Control in severely hypothermic patients.
- Maintain warming procedure and supportive care. Warming procedures includes removing wet clothing, limiting exposure, and covering the patient with warm blankets if available.
- The most common mechanism of death in hypothermia is ventricular fibrillation. If the hypothermia victim is in ventricular fibrillation, CPR should be initiated. If V-FIB is not present, then all treatment and transport decisions should be tempered by the fact that V-FIB can be caused by rough handling, noxious stimuli, or even minor mechanical disturbances, this means that respiratory support with 100% oxygen should be done gently, including intubation, avoiding hyperventilation.
- The heart is most likely to fibrillate between 85 - 88° F (29 - 31° C.) Defibrillate VF / VT x1 if no change, perform CPR and defer repeat defibrillation attempts until patient has been rewarmed.
- Superficial frostbite can be treated by using the patient's own body heat.

ADULT PROTOCOL

# NAUSEA / VOMITING

UNIVERSAL PATIENT CARE PROTOCOL

Administer OXYGEN

IV PROCEDURE

Patient has Nausea or Vomiting

Consider DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

May consider having patient inhale vapors from
Isopropyl Alcohol Prep Pad
May provide some relief from nausea for some patients

ONDANSETRON 4 mg IV / IM
q 10 min prn - Max 8 mg

STOP Do not administer either if EKG obtained and QT > 500ms (2.5 large EKG boxes)

OR
METOCLOPRAMIDE 10 mg IV / IM – No Repeat

STOP Do not administer either if EKG obtained and QT > 500ms (2.5 large EKG boxes)

⚠ Over the age of 65

⚠ Given with sedatives

⚠ Kidney disease

⚠ If patient develops akathisia (restlessness / panic) after administration treat with diphenhydramine 25 – 50 mg IV / IM

OR
ONDANSETRON
Orally Disintegrating Tablet
4 mg Oral – q 10 min prn - Max 8 mg

STOP EMT may administer only with proper training or ONLINE Medical Control >12 years old

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

For Motion Sickness / Vertigo substitute
diphenhydrAMINE
25 - 50 mg IV / IM
No Repeat

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

ADULT PROTOCOL

# NAUSEA / VOMITING

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Nausea<br>• Vomiting<br>• Medication(s) administration such as narcotic analgesics | • Complaints of nausea and / or vomiting | • Consider AMI / DIAGNOSTIC EKG<br>• Gastroenteritis<br>• Toxic ingestion / food poisoning<br>• Bowel obstruction<br>• Appendicitis<br>• Gastritis<br>• Cholecystitis (gallbladder)<br>• Hepatitis / cirrhosis<br>• Headaches / migraine<br>• Pregnancy<br>• Hypertensive crisis<br>• Electrolyte imbalances<br>• DKA<br>• Intracranial pressure<br>• Sepsis / infections |

## KEY POINTS

- Position patient to protect airway as appropriate. (Recovery position, sitting up, etc.)
- Immediately position entire patient or their head to side if patient begins vomiting then retrieve suction.
- Patients with altered LOC and nausea / vomiting need to have airway maintenance prioritized before medication.
- Prepare and test suction prior to its need.
- Give Ondansetron or Metoclopramide over at least 2 minutes, slow IV. Follow up with second dose in if symptoms unresolved.
- Treat patients early, no need to wait for patient to begin vomiting to administer Ondansetron or Metoclopramide.
- Patients receiving medications such as narcotic analgesics may require concurrent administration of Ondansetron or Metoclopramide to reduce nausea associated with such medications.

ADULT PROTOCOL

# PAIN MANAGEMENT

**PATIENT HAS:**

- Burns
- Intractable Flank Pain
- Intractable Back Pain
- Musculoskeletal and / or Fracture Pain
- Sickle Cell Pain Crisis (Use Supplemental $O_2$)
- Unremitting Abdominal Pain (NOT OB)

Pain Other Than Listed
Contact Online Medical Control

**NOT FOR**
Altered Mentation, Traumatic Abdominal Pain, Head Trauma, Hypovolemia

Narcotic Analgesic

fentaNYL
25 – 100 mcg IV / IO / IM / IN - q 10 min prn – 200 mcg max
- ⚠ Preferred analgesic for trauma / ACS
- ⚠ Push slow IV / IO
- ⚠ Reduce dose over 65, liver or kidney disease
- ⚠ If Fentanyl is unavailable, see medication section for Morphine Sulfate

*OR*

Narcotic Analgesic

HYDROmorphone
0.5 - 1 mg IV / IO / IM - q 10 mins prn – 2 mg max
- ⚠ Preferred analgesic for extended duration / unremitting pain
- ⚠ Reduce dose over 65, liver or kidney disease
- ⚠ If HYDROmorphone is unavailable, see medication section for Morphine Sulfate

*OR*

Non-Narcotic Analgesic

KETAMINE
10 mg IV / IO / IM / IN - q 10 mins prn - 30 mg max
USE 10 mg / ml Concentration

*And / OR*

Anti-Inflammatory

KETOROLAC
15 mg IV / IO – No Repeat
30 mg IM – No Repeat
- Over 65 or kidney disease
- Any recent or suspected bleeding (GI bleeds, CVA, Vascular Issues)
- Allergy/Hypersensitivity to NSAIDS, Asthmatics w/ sensitivity to NSAIDS
- Known or obvious pregnancy, Nursing mothers
- ⚠ Preferred analgesic for kidney stones, Flank pain

Consider as needed for Nausea / Vomiting
NAUSEA / VOMITING PROTOCOL

CAPNOGRAPHY PROCEDURE

Monitor Airway, Breathing, Vitals

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

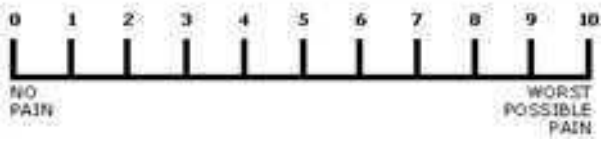
# PAIN MANAGEMENT

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Age / onset<br>• Location<br>• Duration<br>• Severity (0 - 10)<br>• Past medical history<br>• Medications<br>• Drug allergies | • Severity (pain scale)<br>• Quality (sharp, dull, etc.)<br>• Radiation<br>• Relation to movement, respiration<br>• Increased with palpation of area | • Per the specific protocol<br>• Musculoskeletal<br>• Visceral (abdominal)<br>• Cardiac<br>• Pleuritic (respiratory)<br>• Neurogenic<br>• Renal (colic) |

## PAIN SCALE

**The Wong-Baker Faces Pain Rating Scale**

Designed for children aged 3 years and older, the Wong-Baker Faces Pain Rating Scale is also helpful for elderly patients who may be cognitively impaired. If offers a visual description for those who don't have the verbal skills to explain how their symptoms make them feel.




To use this scale, your doctor should explain that each face shows how a person in pain is feeling. That is, a person may feel happy because he or she has no pain (hurt), or a person may feel sad because he or she has some or a lot of pain.

**A Numerical Pain Scale**

A numerical pain scale allows you to describe the intensity of your discomfort in numbers ranging from 0 to 10 (depending on the scale). Rating the intensity of sensation is one way of helping your doctor determine treatment. Numerical pain scales may include words or descriptions to better label your symptoms, from feeling no pain to experiencing excruciating pain. Some researchers believe that this type of combination scale may be most sensitive to gender and ethnic differences in describing pain.

## KEY POINTS

- Exam: Mental Status, Area of Pain, Neuro
- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).
- Pain severity (0-10) is a vital sign to be recorded pre, and post medication delivery and at disposition.
- Use analgesia for suspected cardiac chest pain within the ACS protocol.
- Abdominal pain patients must have a diagnostic EKG to rule out cardiac involvement.
- Vital signs should be obtained pre, 10 minutes post, and at disposition with all pain medications.
- Contraindications to HYDROmorphone, or FentaNYL use include hypotension, head injury, respiratory distress, or severe COPD.
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive pain medications must be observed 15 minutes for drug reaction.
- The patient's vital signs must be routinely reassessed.
- Have Naloxone on hand if the patient has respiratory depression or hypotension after HYDROmorphone, or FentaNYL administration. Be prepared to ventilate.
- DO NOT administer narcotic analgesics if there is any suspicion of a head injury.
- All patients who receive medication for pain must have continuous ECG monitoring, pulse oximetry.
- Capnography is required if patient already has narcotic analgesics on board prior to supplementation.
- Capnography is required if second doses of narcotic analgesics are required to control the patient's pain.
- Consider asking patient history of opiate addiction – consider non-narcotic options.
- Ketamine use in pregnancy is a risk / benefit assessment per case. Consult Medical Control if there are questions.

ADULT PROTOCOL

# SEIZURES

UNIVERSAL PATIENT CARE PROTOCOL

AIRWAY PROTOCOL

Consider Spinal Motion Restriction

CAPNOGRAPHY PROCEDURE

OXYGEN / VENTILATE DURING SEIZURE BASED ON CAPNOGRAPHY AS REQUIRED

Loosen Patient Clothing / Protect Patient

IV PROCEDURE

Check Blood Glucose Level

BGL > 70 and Status Epilepticus?

MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN – q 5 min prn - Max 10 mg
OR
LORazepam
1 – 4 mg IV / IO / IM / IN – ***q 5 min prn*** - Max 4 mg

⚠ Capnography Required

⚠ If Midazolam or LORazepam Unavailable, See Medication Section for DiazePAM

Refractory Seizure
After 2 doses of benzodiazepines

KETAMINE
IV / IO - 100 mg diluted in 100 ml wide open
-or- IM - 100 mg undiluted
Consider repeat if no changes q 5 min

DIAGNOSTIC EKG PROCEDURE

Monitor and Reassess

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# SEIZURES

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Reported / witnessed seizure activity<br>• Previous seizure history<br>• Medical alert tag information<br>• Seizure medications<br>• History of trauma<br>• History of diabetes<br>• History of pregnancy | • Decreased mental status<br>• Sleepiness<br>• Incontinence<br>• Observed seizure activity<br>• Evidence of trauma | • CNS (head) trauma<br>• Tumor<br>• Metabolic, hepatic, or renal failure<br>• Hypoxia<br>• Electrolyte abnormality (na, ca, mg)<br>• Drugs, medications, non-compliance<br>• Infection / fever<br>• Alcohol withdrawal<br>• Eclampsia<br>• Stroke<br>• Hyperthermia |

**Categories of Seizures**

| | |
|---|---|
| **Complex = Unconscious** | **Focal = Partial, Localized** |
| **Simple = Conscious** | **Generalized = All Body** |

- **Simple Focal**
- **Simple Generalized**
- **Complex Focal**
- **Complex Generalized**

## KEY POINTS

- Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro
- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures** (generalized) are associated with loss of consciousness, incontinence, and possibly tongue trauma.
- **Focal seizures** (petit mal) effect only a part of the body and are not usually associated with a loss of consciousness.
- **For any seizure in a pregnant patient, follow the OB Emergencies Protocol and call Online Medical Control**
- Benzodiazepine administration is reserved for patients who are actively seizing only, not for prophylaxis of seizures.
- Be prepared to manage the airway and breathing of patients who have received benzodiazepines such as Lorazepam or Midazolam
- Jacksonian seizures are seizures that start as a focal seizure and become generalized.
- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse. Lorazepam is well absorbed when administered IM but takes up to 15 minutes to act. It should be given IV or intranasally (IN) with an atomizer.
- The seizure has usually stopped by the time the EMS personnel arrive and the patient will be found in the postictal state.
- There are many causes for seizures including epilepsy, head trauma, tumor, overdose, infection, hypoglycemia, and withdrawal. Be sure to consider these when doing your assessment.
- Routinely assess the patient's airway.
- If the patient is combative and postictal, DO NOT use the Restraint Procedure before assessing for / treating hypoglycemia and hypoxia.
- If the patient is actively seizing, move any objects that may injure the patient. Protect, but do not try to restrain them.

ADULT PROTOCOL

# STROKE / CVA

UNIVERSAL PATIENT CARE PROTOCOL
AIRWAY PROTOCOL
OXYGEN
CAPNOGRAPHY PROCEDURE

BLOOD GLUCOSE PROCEDURE
Cincinnati Prehospital Stroke Screen – On Scene

**Cincinnati Pre-Hospital Stroke Assessment On Scene**

| | |
|---|---|
| Level of Consciousness | Awake & alert |
| Facial Droop | Both sides move equally well on smile/grimace |
| Motor—Arm Drift (eyes closed) | Raised arms do not drift down (both together) |
| Speech | Repeats You can't teach an old dog new tricks using correct words and no slurring |

Identify Last Time Known Normal - Record
Identify Point of Contact for Last Known Normal Obtain Phone Number - Record
Identify Last Dose and Time of Anticoagulant IF Applicable - Record
Move to Ambulance Rapid Transport

En-Route Conduct VAN+ Exam
DIAGNOSTIC EKG Procedure

**VAN+ Exam Pre-Hospital Stroke Assessment En-Route**

Deficits in face, arm, speech or other stroke symptoms
- No → Continue to monitor
- Yes ↓

Arm weakness
- No → Van Negative Move to assess Ataxia
- Yes ↓

Vision Gaze deviation or field cut
- Yes → VAN Positive Notify ED Provider
- No ↓

Aphasia Expressive (Name watch or pen) Receptive (Follows commands)
- Yes → VAN Positive Notify ED Provider
- No ↓

Neglect Ignore one side of body or sensory
- Yes → VAN Positive Notify ED Provider
- No ↓

VAN – Negative
Assess Posterior Circulation: Ataxia

No ↓

Ataxia Assessment Finger to Nose Heel to Shin → Communicate Findings to ED Provider

Relay Stroke Exam to Hospital
IV PROCEDURE
2 Large Bore if Possible

LABETALOL
10 mg IVP SLOW over 2 min
ONLY IF SBP > 220 or DBP > 120 verified by 2 readings,
in different 2 locations, at least 1 manual
Reassess in 10 – 15 mins and repeat
LABETALOL only
20 mg IVP SLOW over 2 min
if SBP > 220 or DBP > 120 verified by 2 readings

**CONSIDER THROMBECTOMY CAPABLE STROKE CENTER**
**IF SYMPTOMS >4.5 HOURS or on Anti-Coagulants**
**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Direction where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# STROKE / CVA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Previous CVA, TIA's<br>• Previous cardiac / vascular surgery<br>• Associated diseases: diabetes, hypertension, CAD<br>• Atrial fibrillation<br>• Medications (blood thinners)<br>• History of trauma | • Altered mental status<br>• Weakness / paralysis<br>• Blindness or other sensory loss<br>• Aphasia<br>• Syncope<br>• Vertigo / dizziness<br>• Vomiting<br>• Headache<br>• Seizures<br>• Respiratory pattern change<br>• Hyper / hypotension | • See Altered Mental Status<br>• TIA (transient ischemic attack)<br>• Seizure<br>• Hypoglycemia<br>• Stroke<br>• Thrombotic<br>• Embolic<br>• Hemorrhagic<br>• Tumor<br>• Trauma |

**Determine the following – Notify Receiving Hospital and Document**

Identify Last Time Known Normal and the Associated Clinical Story

*Determine if patient is on any anticoagulant medications*

Apixaban (Eliquis), Dabigatran (Pradaxa), Edoxaban (Savaysa), Fondaparinux (Arixtra), Rivaroxaban (Xarelto), Warfarin (Coumadin, Jantoven), Betrixaban (Bevyxxa)

**KEY POINTS**

- Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- Onset of symptoms is defined as the last witnessed time the patient was symptom free. (i.e., awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom free)
- The differential diagnosis listed on the Altered Mental Status Protocol should also be considered.
- Elevated blood pressure is commonly present with stroke. Treat chest pain / discomfort per ACS protocol.
- Be alert for airway problems (swallowing difficulty, vomiting, diminished or absent gag reflex).
- Hypoglycemia can present as a localized neurological deficit, especially in the elderly.
- Patients who experience transient ischemic attack (TIA) develop most of the same signs and symptoms as those who are experiencing a stroke. The signs and symptoms of TIA' s can last from minutes up to one day. Thus, the patient may initially present with typical signs and symptoms of a stroke, but those findings may progressively resolve. The patient needs to be transported, without delay, to the most appropriate hospital for further evaluation.
- Document the time of onset for the symptoms, or the last time the patient was seen "normal" for them.
- Reassess neurological deficit every 10 minutes and document the findings. Evidence of neurological deficit includes confusion, slurred speech, facial asymmetry and focal weakness, coma, lethargy, aphasia, dysarthria, and seizure activity.
- Hypertensive emergencies are life threatening emergencies characterized by an acute elevation in blood pressure AND end-organ damage to the cardiac, CNS or renal systems. These crisis situations may occur when patients have poorly controlled chronic hypertension or stroke.
- Document pts GCS score.
- Check patient's pupils and rule out head trauma.
- All symptomatic patients with hypertension should be transported with their head elevated.
- Hypertension can be a neuroprotective reflex in patients with increased intracranial pressure.

ADULT PROTOCOL

# SYNCOPE / NEAR SYNCOPE

UNIVERSAL PATIENT CARE PROTOCOL

Consider SPINAL MOTION RESTRICTION

AIRWAY PROTOCOL

DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

OXYGEN / PULSE OXIMETRY PROCEDURE

CAPNOGRAPHY PROCEDURE

BLOOD GLUCOSE PROCEDURE

IV PROCEDURE

Identify Treatable Causes
Treat Per Specific Protocol

Take cardiac monitor to patient's side. Apply cardiac monitor ASAP once on scene. Maintain monitoring throughout transport including into hospital bed.

- Seizure – Treat per Seizure Protocol
- Hypoxia – Treat per Airway / Breathing Protocols
- Anaphylaxis / Allergic Reaction
- Sepsis – Treat per Septic Shock Protocol
- Hypotension – Treat per Specific Shock Protocols
- Arrhythmia – Treat per Correct Arrhythmia Protocol
- Psychiatric – Treat per Behavioral Emergencies
- Hypo / Hyperglycemia – Treat per Diabetic Protocol
- Hypo / Hyperthermia – Treat per Specific Protocol
- Stroke CVA / TIA – Treat per Stroke Protocol
- Overdose – Treat per Toxic Ingestion Protocol
- Head Trauma – Treat per Head Trauma Protocol

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | MED CONTROL Consult

# SYNCOPE / NEAR SYNCOPE



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Onset, duration, event recall,<br>• Cardiac (arrythmias, MI, stents, CHF, myocarditis, long QT)<br>• Stroke / TIA<br>• Blood loss (internal, external, GI, rectal)<br>• Volume loss (sweating, vomiting, diarrhea, urination)<br>• Medications (compliance, new, changes, dose, types)<br>• Electrolyte imbalances<br>• Pregnancy or possibility (last menstrual period)<br>• Recent activity, event(s) preceding<br>• Seizure<br>• Fever | • Loss of consciousness / near loss of consciousness<br>• Dizziness / lightheadedness<br>• Palpitations<br>• Bradycardia / tachycardia<br>• Irregular pulse<br>• Hypo / hyperglycemia<br>• Hypotension<br>• Nausea, vomiting, diarrhea<br>• Pale<br>• Neuro deficits<br>• S1Q3T3 EKG pattern<br>• Brugada Syndrome EKG patterns | • Vasovagal (BM, urination, coughing, GI stimulation)<br>• Cardiac (arrythmia, MI, valve disorders)<br>• Drug / medication induced<br>• Orthostatic Hypotension<br>• Pulmonary embolism<br>• Hypoglycemia<br>• Electrolyte imbalance<br>• Dehydration<br>• Hypovolemia<br>• Stroke / TIA<br>• Anaphylaxis<br>• Seizure<br>• Autonomic failure (MS, Parkinson's, DM, age, spinal cord injuries)<br>• Cardiac tamponade<br>• Aortic dissection<br>• Toxicological |

Syncope or Near Syncope in patients of ANY AGE indicates a temporary lack of perfusion to the brain. EMS should have a high index of suspicion and encourage transport for complete assessment despite patient return to baseline. Risk for future complications or death is high in many patients based on cause. Syncope may have many causes, evaluate the patient completely and diligently. medical

| Brugada EKG Pattern (High Risk Cardiac Death) | Type I | Type II | Type III |
|---|---|---|---|
| J wave amplitude | >= 2mm | >= 2mm | >= 2mm |
| T wave | Negative | Positive or biphasic | Positive |
| ST-T configuration | Coved type | Saddleback | Saddleback |
| ST segment (terminal portion) | Gradually descending | Elevated >= 1mm | Elevated |

| S1Q3T3 EKG Pattern (High Risk for PE) | |
|---|---|
| Lead I | Large S Wave Present |
| Lead III | Q Wave Present |
| Lead III | T Wave Inverted |

## KEY POINTS

- Required Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neuro
- Do not write off marginal vitals or findings as "normal". These cases need to be evaluated in depth.
- History of preceding events is crucial to understanding cause. Determine onset, duration, LOC, patient recall of events, speed of recovery, neuro presentations, incontinence.
- Consider family history.
- Consider myocarditis if current or recent viral illness.
- Consider ectopic pregnancy if pregnancy known or suspected.
- CHF are extremely high-risk cases due to potential for arrhythmia.
- Pay attention to diagnostic EKG intervals, U waves, ectopic beats.
- Near syncope does not mean less risk.
- More than 25% of geriatric syncope is a cardiac arrythmia.
- Syncope / near syncope patients should be transported even with identified and EMS treatable causes.

ADULT PROTOCOL

# TOXIC INGESTION / EXPOSURE / OVERDOSE

If Suspected Carbon Monoxide (CO) or Cyanide Poisoning see Specific Protocol

UNIVERSAL PATIENT CARE PROTOCOL
AIRWAY PROTOCOL
OXYGEN
IV / IO PROCEDURE
DIAGNOSTIC EKG PROCEDURE and Assess Vitals
BLOOD GLUCOSE PROCEDURE
CAPNOGRAPHY PROCEDURE

Decontaminate and remove clothes if patient is exposed to any dangerous or noxious substances

## Narcotic Overdose AMS / Respiratory Depression

***TAKE PPE PRECAUTIONS***
GLOVES / MASK minimum
Contact / aerosol risk with fentanyl-based substances

ASSURE BLS VENTILATION WITH BVM

Support Hemodynamically
Utilize Shock Protocol

NALOXONE
2 – 8 mg IN Atomized
SUMMON ALS IF NO RESPONSE TO IN DOSE

NALOXONE
1 - 2 mg
IV / IM / IO

May repeat every 2 min as necessary if obvious or suspected opiate OD until respiratory improvement or 12 mg Max

If patient is unresponsive to Naloxone supply is exhausted, or the medication is unavailable, consider Advanced Airway and Support Hemodynamically

## Salicylate (ASA) Overdose *NOT Tylenol (Acetaminophen)*

If Patient is Tachypneic
SODIUM BICARBONATE
1 mEq / kg SLOW
IV / IO

**IF AMS *REGARDLESS OF BGL READING***
DEXTROSE 10%
12.5 Grams IV / IO
May repeat prn
⚠ If DEXTROSE 10% Is unavailable, see medication section for DEXTROSE 50%

IF AMS and NORMAL (Bad) or LOW respiratory rate
BVM and ventilatory rate to make Co2 of 30

If candidate for advanced airway
SODIUM BICARBONATE
1 mEq / kg SLOW
IV / IO
Prior to attempt

## Sympathomimetic Overdose *(Stimulants)*

COOLING MEASURES IF FEBRILE

**IF PATIENT AGITATED OR HAS CHEST PAIN**
MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN q 5 min prn - Max 10 mg
OR
LORazepam
1 – 2 mg IV / IO / IM / IN
q 5 min prn - Max 4 mg
⚠ If Midazolam or LORazepam Unavailable, See Medication Section for diazePAM

IV NORMAL SALINE BOLUS
20 ml / kg

If DIAGNOSTIC EKG suggestive of STEMI – Treat per ACS protocol

## Organophosphates / Carbamates

ATROPINE
1 mg IV / IO
q 3 – 5 Minutes prn as needed to control secretions
⚠ Given to dry secretions
⚠ No max dose

Consider Advanced Airway / RSI Protocol Where Indicated

May use DuoDote kit if available – see Nerve Agent Antidote Kit Protocol

**IF SEIZURES**
MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN q 5 min prn - Max 10 mg
OR
LORazepam
1 – 2 mg IV / IO / IM / IN
q 5 min prn - Max 4 mg
⚠ If Midazolam or LORazepam Unavailable, See Medication Section for diazePAM

**IF WHEEZING**
Treat with aerosol
ALBUTEROL / IPRATROPIUM
STOP EMT may administer only with proper training or ONLINE Medical Control

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# TOXIC INGESTION / EXPOSURE / OVERDOSE

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Ingestion or suspected ingestion of a potentially toxic substance<br>• Substance ingested, route, quantity<br>• Time of ingestion<br>• Reason (suicidal, accidental, criminal)<br>• Available medications in home<br>• Past medical history, medications | • Mental status changes<br>• Hypo / hypertension<br>• Decreased respiratory rate<br>• Tachycardia, dysrhythmias<br>• Seizures | • Tricyclic antidepressants (TCAs)<br>• Acetaminophen (Tylenol)<br>• Depressants<br>• Stimulants<br>• Anticholinergic<br>• Cardiac medications<br>• Solvents, alcohols, Cleaning agents<br>• Insecticides (organophosphates)<br>• Respiratory depression<br>• Other organophosphates<br>• Carbamates |

## KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, and emesis to ED.
- **Tricyclic**: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen**: initially normal or nausea / vomiting. If not detected and treated, causes irreversible liver failure.
- **Depressants**: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils.
- **Stimulants**: increased HR, increased BP, increased temperature, dilated pupils, and seizures.
- **Anticholinergic**s: increased HR, increased temperature, dilated pupils, and mental status changes.
- **Cardiac Medications**: dysrhythmias and mental status changes.
- **Solvents**: nausea, vomiting, and mental status changes.
- **Insecticides**: increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
- Consider restraints if necessary for patient's and / or personnel's protection per the Restraint Procedure.
- If it can be done safely, take whatever container the substance came from to the hospital along with readily obtainable samples of medication unless this results in an unreasonable delay of transport.
- If applicable, DO NOT transport a patient to the hospital until properly decontaminated.
- Naloxone (Narcan) administration may cause the patient to go into acute opiate withdraw, which includes vomiting, agitation, and / or combative behavior. Always be prepared for combative behavior.
- Naloxone (Narcan) goal is to reverse life threating respiratory depression
- Naloxone (Narcan) may wear off in as little as 20 minutes causing the patient to become more sedate and possibly hypoventilate. All A&O 4 patients having received Naloxone (Narcan) should be transported. If patient refuses transport, contact Online Medical Control before release.

**CARBON MONOXIDE POISONING OR CYANIDE POISONING – SEE SPECIFIC PROTOCOL**

POISON CONTROL 1-800-222-1222

ADULT PROTOCOL

# TOXIC INGESTION / EXPOSURE / OVERDOSE CARDIOTOXIC MEDICATIONS

Always suspect multiple substances and treat for all identified

Therapies listed may need to all be used together in severe cases

UNIVERSAL PATIENT CARE PROTOCOL
AIRWAY PROTOCOL / OXYGEN
IV / IO PROCEDURE
DIAGNOSTIC EKG PROCEDURE and Assess Vitals
Treat Per Presenting EKG Rhythm
BLOOD GLUCOSE PROCEDURE
CAPNOGRAPHY PROCEDURE

Prophylactically apply pacing / defib pads and prepare for decompensation

Bradycardia

Potential Causes
Calcium Channel Blockers
BETA BLOCKER
"LOL" Drugs

Reference list on next page

TRANSCUTANEOUS PACING PROCEDURE

CALCIUM CHLORIDE
1 Gram IV / IO
OR
CALCIUM GLUCONATE
1 – 3 Grams IV / IO
May repeat either if available and EKG changes reoccur

IV NORMAL SALINE BOLUS
20 ml / kg
To Maintain MAP > 65
or SBP 90 if MAP Unavailable or Radial Pulses

EPINEPHrine
PUSH DOSE
Make 10 mcg / ml
10 mcg (1 ml) prn - slow push
Titrate to effect
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses
⚠ May use up to 50 mcg
(5 ml) per dose if needed

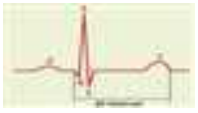
May consider adding
ATROPINE 1 mg IV / IO
q 3 – 5 mins prn
Max 3 mg

AVR – R wave final part of QRS
QRS >120ms
(3 small EKG boxes)

Potential Causes
Sodium Channel Blockers / Tricyclic Anti – Depressants

Reference list on next page

SODIUM BICARBONATE
1 mEq / kg SLOW IV / IO
Until QRS narrows / condition improves
If no improvement, Contact ONLINE MEDICAL CONTROL
May repeat if available and EKG changes reoccur



Prolonged QT

Potential Causes
Potassium Channel Blockers

Reference list on next page

MAGNESIUM SULFATE
2 grams IV / IO
To reduce risk of Torsades
Does not address the Potassium blockade
Supportive Care
Witnessed episodes of Torsades or QT > 500ms (2.5 large EKG boxes)

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# TOXIC INGESTION / EXPOSURE / OVERDOSE
# CARDIOTOXIC MEDICATIONS



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Ingestion or suspected ingestion of a potentially toxic substance<br>• Substance ingested, route, quantity<br>• Time of ingestion<br>• Reason (suicidal, accidental, criminal)<br>• Available medications in home<br>• Past medical history, medications | • Mental status changes<br>• Hypo / hypertension<br>• Decreased respiratory rate<br>• Tachycardia, dysrhythmias<br>• Seizures | • Tricyclic antidepressants (TCAs)<br>• Acetaminophen (Tylenol)<br>• Depressants<br>• Stimulants<br>• Anticholinergic<br>• Cardiac medications<br>• Solvents, alcohols, cleaning agents<br>• Insecticides (organophosphates)<br>• Respiratory depression<br>• Other organophosphates<br>• Carbamates |

| Common Beta Blockers (Rate Inhibiting) | Common Calcium Channel Blockers (Rate Inhibiting) | | Common Potassium Channel Blockers (QT Prolonging) | Common Sodium Channel Blockers (QRS Widening) | |
|---|---|---|---|---|---|
| Acebutolol | Acalas | Isoptin | Amiodarone | Adapin | Pertofrane |
| Atenolol | Adalat | Lacidipine | Azimilide | Ajmaline | Phenytoin |
| Betapace | Amlodipine | Lacipil | Bretylium | Amitriptyline | Procainamide |
| Betoxolol | Aranidipine | Landel | Clofilium | Anafranil | Propafenone |
| Bisoprolol | Atelec | Lercanidipine | Dofetilide | Benadryl | Protriptyline |
| Brevibloc | Azelnidipine | Madipine | Ibutilide | Calcium | Quinidine |
| Carvedilol | Barnidipine | Manidipine | Nifekalant | Cannabidiol | Saxitoxin |
| Coreg | Baylotensin | Motens | Sematilide | Clomipramine | Sinequn |
| Corgard | Baymycard | Nicardipine | Sotalol | Desipramine | Sparteine |
| Esmolol | Benidipine | Nifedipine | Tedisamil | Diphenhydramine | Surmontil |
| Inderal | Calan | Nilvadipine | Vernakalant | Disopyramide | Tetrodotoxin |
| Innopran XL | Calblock | Nimodipine | | Doxepin | Tocainide |
| Kerlone | Calslot | Nimotop | | Elavil | Tofranil |
| Labetolol | Carden SR | Nisoldipine | | Encainide | Trimipramine |
| Levatol | Cardene | Nitrendipine | | Endep | Vivactil |
| Lopressor | Cardif | Nitrepin | | Flecainide | |
| Metoprolol | Cardizem | Nivadil | | Imipramine | |
| Nadolol | Cilnidipine | Norvasc | | Lamotrigine | |
| Nebivolol | Cinalong | Plendil | | Lidocaine | |
| Pindolol | Clevidipine | Pranidipine | | Ludiomil | |
| Propranolol | Cleviprex | Procardia | | Maprotine | |
| Sectral | Coniel | Procorum | | Mexiletine | |
| Sotalol | Diltiazem | Sapresta | | Moricizine | |
| Tenormin | Efonidipine | Siscard | | Neosaxitoxin | |
| Timolol | Felodipine | Sular | | Norpramin | |
| Trandate | Gallopamil | Syscor | | Nortryptyline | |
| Zabeta | Hypoca | Verapamil | | Pamelor | |

| OTHER QT PROLONGING AGENTS | | | |
|---|---|---|---|
| Haloperidol | Droperidol | Chlorpromazine | Pimozide |
| Citalopram | Escitalopram | Tricyclic Antidepressants | Clarithromycin |
| Erythromycin | Fluoroquinolones | Fluconazole | Itraconazole |
| Voriconazole | Posaconazole | Pentamidine | Methadone |
| Cocaine | Loperamide | Ondansetron | Propofol |
| Arsenic Trioxide | Sunitinib | Vandetanib | |

## KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, and emesis to ED.
- **Tricyclic**: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen**: initially normal or nausea / vomiting. If not detected and treated, causes irreversible liver failure.
- **Depressants**: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils.
- **Stimulants**: increased HR, increased BP, increased temperature, dilated pupils, and seizures.
- **Anticholinergic**s: increased HR, increased temperature, dilated pupils, and mental status changes.
- **Cardiac Medications**: dysrhythmias and mental status changes.
- **Solvents**: nausea, vomiting, and mental status changes.
- **Insecticides**: increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
- Consider restraints if necessary for patient's and / or personnel's protection per the Restraint Procedure.
- If it can be done safely, take whatever container the substance came from to the hospital along with readily obtainable samples of medication unless this results in an unreasonable delay of transport.
- If applicable, DO NOT transport a patient to the hospital until properly decontaminated.

POISON CONTROL 1-800-222-1222

ADULT PROTOCOL

# TOXIC INHALATION / INGESTION
# CYANIDE

**POTENTIAL EXPOSURES**

Smoke Inhalation

Intentional or unintentional poisoning or ingestion of Laetrile (vitamin B17) or multiple fruit pits.

Industrial exposure such as metal plating and recovery, plastics, industrial uses of hydrogen cyanide or medical complications from the use of sodium nitroprusside.

UNIVERSAL PATIENT CARE PROTOCOL

Cyanide Ingestion or Inhalation

Immediately Remove
From Continued Exposure
Avoid Exertion to Limit
Tissue Oxygen Demand
Determine Exposure Time

APPLY HIGH FLOW OXYGEN

CAPNOGRAPHY PROCEDURE

Secure Airway If Comatose or Compromised Airway Follow AIRWAY PROTOCOL

CARDIAC MONITORING PROCEDURE

PULSE OXIMETRY
PULSE CO-OXIMETRY (If Available)

IV / IO PROCEDURE
To Maintain MAP > 65
or SBP 90 if MAP Unavailable or Radial Pulses
Place 2 IV's
Draw blood sample if considering / supplied with Hydroxocobalamin (Cyanokit)

Hydroxocobalamin if supplied / available
Reconstitute medication with 200 ml of Normal Saline (or to fill line)
Mix thoroughly but do not shake
5 grams IV drip SLOW over 15 - 20 minutes
Monitor for hypotension

EPINEPHrine
PUSH DOSE
**Make 10 mcg / ml**
**10 mcg (1 ml) prn - slow push**
**Titrate to effect**
To Maintain MAP > 65 or SBP 90 if MAP Unavailable or Radial Pulses
⚠ May use up to 50 mcg (5 ml) per dose if needed

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

**Aggressive airway management with delivery of 100% oxygen can be lifesaving.** Supportive care with administration of oxygen alone has proven effective in a number of poisonings. It can also treat potential simultaneous CO exposure.

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# TOXIC INHALATION / INGESTION
# CYANIDE

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Inhalation or ingestion of cyanides<br>• Duration of exposure<br>• Reason (suicidal, accidental, criminal)<br>• Past medical history, medications | • Malaise, fatigue, drowsiness<br>• Reddened skin<br>• Dyspnea<br>• Chest pain<br>• Nausea / vomiting<br>• Abdominal pain<br>• Dizziness / vertigo<br>• Memory disturbances<br>• Syncope<br>• Seizures<br>• Coma | • Flu / severe cold<br>• Chronic fatigue<br>• Migraine<br>• Myocardial infarction / ACS<br>• Encephalitis<br>• Anaphylaxis<br>• Other ingested toxins<br>• Pulmonary embolism |

POISON CONTROL 1-800-222-1222

| KEY POINTS |
|---|
| • Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro<br>• Cyanide is generally considered to be a rare source of poisoning.<br>• Cyanide exposure occurs relatively frequently in patients with smoke inhalation from fires.<br>• Numerous forms of cyanide exist, including gaseous hydrogen cyanide (HCN), water-soluble potassium and sodium cyanide salts, and poorly water-soluble mercury, copper, gold, and silver cyanide salts.<br>• Several synthesized (polyacrylonitrile, polyurethane, polyamide, urea-formaldehyde, melamine) and natural (wool, silk) compounds produce HCN when burned.<br>• Industry widely uses nitriles as solvents and in the manufacturing of plastics. Nitriles may release HCN during burning or when metabolized following absorption by the skin or gastrointestinal tract.<br>• Cyanide poisoning also may occur in other industries, particularly in the metal trades, mining, electroplating, jewelry manufacturing, and x-ray film recovery.<br>• Depending on its form, cyanide may cause toxicity through parenteral administration, inhalation, ingestion, or dermal absorption.<br>• Rapid aggressive therapy, consisting of supportive care and antidote administration, is lifesaving.<br>• The delay between exposure and onset of symptoms depends on type of cyanide involved, route of entry, and dose. Rapidity of symptom onset, depending on the type of cyanide exposure, occurs in the following order (most rapid to least rapid): gas, soluble salt, insoluble salt, and cyanogens. |

ADULT PROTOCOL

# TOXIC INHALATION
# CARBON MONOXIDE

CO Levels

<10% Mild
10% - 20% Moderate
>20% Severe

Special Considerations for Pregnant Females and Children

UNIVERSAL PATIENT CARE PROTOCOL

Known or Suspected Carbon Monoxide Poisoning

Immediately Remove
From Continued Exposure
Avoid Exertion to Limit
Tissue Oxygen Demand
Determine Exposure Time

APPLY HIGH FLOW OXYGEN
CPAP PROCEDURE if CO >10 %

CAPNOGRAPHY PROCEDURE

Secure Airway If Comatose or Compromised Airway Follow AIRWAY PROTOCOL

CARDIAC MONITORING PROCEDURE

PULSE OXIMETRY
PULSE CO-OXIMETRY (IF AVAILABLE)

IV / IO PROCEDURE
DRAW BLOOD SAMPLE FOR CO LEVELS

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

**Aggressive airway management with delivery of 100% oxygen can be lifesaving.** Supportive care with administration of oxygen alone has proven effective in a number of poisonings. It can also treat potential simultaneous CO exposure.

# TOXIC INHALATION
# CARBON MONOXIDE



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Inhalation of potentially carbon monoxide containing atmosphere<br>• Duration of exposure<br>• Reason (suicidal, accidental, criminal)<br>• Past medical history, medications | • Malaise, fatigue, drowsiness<br>• Flu like symptoms<br>• Headache<br>• Dyspnea<br>• Nausea / vomiting<br>• Diarrhea<br>• Abdominal pain<br>• Dizziness<br>• Visual disturbances<br>• Memory disturbances<br>• Syncope<br>• Seizures<br>• Coma<br>• Incontinence | • Flu / severe cold<br>• Chronic fatigue<br>• Migraine<br>• Myocardial infarction<br>• Diabetic emergencies<br>• Altitude sickness<br>• Ingested toxins<br>• Meningitis<br>• Hypothyroidism |

CO Levels

<10% Mild
10% - 20% Moderate
>20% Severe
Special Considerations for Pregnant Females and Children

## KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- Consider CO poisoning with any patient exposed to products of combustion.
- Causes and exposure may include malfunctioning gas appliances, vehicle exhaust, improper use of gas burning heaters, animal dung, environmental waste, and fires.
- Normal CO levels do not necessarily mean there was not CO poisoning. This is especially true if the patient has already received extensive oxygen therapy.
- Patients that show signs and symptoms at lower CO levels include pregnant females, infants, children, and the elderly.
- Vitals may be normal but could be tachycardic, hypo or hypertensive.
- Cherry red skin is rarely seen.
- PREGNANT patients are special circumstances as the affinity for fetal hemoglobin to carbon monoxide is very high and therapy including hyperbaric care is considered early on.
- Patients that demonstrate altered mental status may NOT sign refusals for treatment or transport.
- Known or suspected CO poisoning patients should receive high flow oxygen despite $SpO_2$ readings.
- The use of a pulse oximeter is not effective in the diagnosis of carbon monoxide poisoning, as patients suffering from carbon monoxide poisoning may have a normal oxygen saturation level on a pulse oximeter.
- **Pulse oximetry is still used on all CO poisonings as hypoxia in addition to the CO represents serious compounding respiratory issues possibly from other causes.**
- Pulse CO-oximeters estimate carboxyhemoglobin levels with a non-invasive finger clip similar to a pulse oximeter.

ADULT PROTOCOL

# TOXIC EXPOSURE
# HYDROGEN FLUORIDE EXPOSURE

| PATHOPHYSIOLOGY AND ROUTES | SIGNS AND SYMPTOMS | SOURCES AND USES |
|---|---|---|
| Gas or liquid can cause corrosive burns to skin and deep underlying tissue. Also binds to calcium and magnesium of nerve pathways, bone and blood stream resulting in symptoms of depolarization producing excruciating pain and cardiac dysthymias<br>**Inhalation**<br>**Skin Absorption**<br>**Ingestion** | • Corrosive burns<br>• Erythema<br>• Excruciating pain<br>• Respiratory burns<br>• Pulmonary Edema<br>• Cardiac Dysthymia due to hypocalcemia<br>• Hypomagnesemia<br>• Seizures<br>• ST segment abnormalities<br>• Symptoms may take hours to present | • Hydrogen Fluoride<br>• Hydrofluoric acid<br>• Industrial ceramic production<br>• Glass etching<br>**SPECIAL PRECAUTIONS**<br>• Hydrofluoric acid can cause serious, painful burns of the skin. Specialized medical treatment is required.<br>• Burns larger than 25 square inches may result in serious systemic toxicity.<br>• Hydrofluoric acid is a highly corrosive acid which can severely burn skin, eyes and mucous membranes. Vapors can also burn other tissues |

Potential exposure with signs/symptoms consistent with exposure

Remove patient from continued exposure – ***CALL FOR HAZ-MAT RESPONSE***

Assure proper decon has been performed prior to patient contact

Assure adequate airway, ventilation and oxygenation. Secure airway against secretions

Establish 2 large bore IV's in non-exposed areas if possible
20 ml / kg Normal Saline if Hypotensive

**Skin Burns**
- Soak in Iced BENZALKONIUM CHLORIDE (ZEPHIRAN) 0.13% or wrap in soaked towels which are frequently re-wetted
- If hemodynamically Stable, consider pain relief with narcotics
- CALCIUM GLUCONATE 2.5% gel topically over burned area

**Eye Injury**
- Saline flush for 3 minutes
- Apply topical TETRACAINE 1 -2 drops for pain relief
- Flush with 1% CALCIUM GLUCONATE irrigation solution Consider use of Morgan Lens if available and trained

**Inhalation Injury**
- Administer 100% Oxygen by NRB
- Administer 2.5% CALCIUM GLUCONATE continuously by nebulizer

**Ingestion**
- Do NOT induce Vomiting
- Dilute with water
- Administer Milk of Magnesia

**In cases of suspected <u>systemic</u> toxicity**

Administer 10% CALCIUM GLUCONATE 0.1 to 0.2 ml / kg - Up to 10 ml IV

DIAGNOSTIC EKG PROCEDURE

⚠ Assure that receiving facility has access to 10% CALCIUM GLUCONATE

Administer MAGNESIUM SULFATE 1 - 2 grams IV

TRANSPORT to appropriate facility CONTACT receiving facility NOTIFY of HAZ-MAT Situation
CONSULT Medical Direction where indicated APPROPRIATE transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# SECTION 6 - TRAUMA PROTOCOLS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Rule of Nines – Burn Chart ..... 26-6

# TRAUMA EMERGENCIES

## The Golden Period

### GUIDELINES FOR LOAD AND GO TRAUMA TRANSPORTS

### INDICATIONS

- Uncorrectable airway obstruction
- Tension pneumothorax
- Pericardial tamponade
- Penetrating chest wounds with signs of shock
- Hemothorax with signs of shock
- Head trauma with unilaterally dilated pupils
- Head trauma with rapidly deteriorating condition
- Unconsciousness

### KEY POINTS

- A trauma victim is considered to be a pediatric patient if they are 15 years old or younger.
- Once the patient is determined to be an actual or potential major trauma / multiple system patient, personnel on scene and / or medical control must quickly determine the appropriate course of action including:
    1. Requesting aeromedical evacuation from scene. See AEROMEDICAL TRANSPORT PROCEDURE.
    2. Ground transportation directly to an appropriate facility.
- Major trauma patients are to be transported to the closest **Trauma Center**.
- Contact the receiving hospital for all major trauma or critical patients.
- Cover open wounds, burns, and eviscerations.
- With the exception of airway control, initiate ALS enroute when transporting major trauma patients.
- If the EMT is unable to access patient airway and ventilate, transport to the closest facility for airway stabilization.
- The on scene time for major trauma patients should not exceed 10 minutes without a documented, acceptable reason for the delay.
- All major trauma patients should receive oxygen administration, an IV(s), and cardiac monitoring.
- Provide a documented reason if an intervention could not be performed.

**Mass Casualty Incidents (MCI)**

- Upon arrival at a MCI, the first arriving unit should notify their dispatch of the need to implement the mass casualty plan, call for additional resources, establish a safe staging area, and estimate the total number of victims.
- Each EMS service has a pre-defined coordinating facility based on their county's mass casualty plan. It is the responsibility of the responding jurisdiction to notify their appropriate coordinating hospital as soon as possible, giving a brief description of the incident and the estimated number of victims. The coordinating facility will then notify the receiving hospitals of the MCI. The transportation officer should maintain a constant contact with the coordinating facility until the scene has been cleared of salvageable victims.
- Refer to the county MCI protocol

**THE GOLDEN PERIOD FOR THE PATIENT BEGINS WHEN THE TRAUMA HAPPENS**
**DO NOT WASTE VALUABLE TIME ON SCENE**

ADULT PROTOCOL

# TRAUMA GUIDELINES

Emergency medical service personnel shall use the following criteria, consistent with their certification, to evaluate whether an injured person qualifies as an adult trauma victim or pediatric trauma victim, in conjunction with the definition of trauma per the State of Ohio Trauma Triage Guidelines.

**An Adult Trauma Victim is a person 16 years – 64 years exhibiting one or more of the following physiologic or anatomic conditions:**

| **Physiologic conditions** | **Anatomic conditions** |
|---|---|
| • Glasgow Coma Scale less than or equal to 13;<br>• Loss of consciousness greater than 5 minutes;<br>• Deterioration in level of consciousness at the scene or during transport;<br>• Failure to localize to pain;<br>• Respiratory rate < 10 or > 29;<br>• Requires ventilator support;<br>• Requires relief of tension pneumothorax;<br>• Pulse > 120 in combination with evidence of hemorrhagic shock;<br>• Systolic blood pressure < 90, or absent radial pulse with carotid pulse present; | • Penetrating trauma to the head, neck, or torso;<br>• Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;<br>• Injuries to the head, neck, or torso where the following physical findings are present:<br>  ○ Visible crush injury;<br>  ○ Abdominal tenderness, distention, or seatbelt sign;<br>  ○ Pelvic fracture;<br>  ○ Flail chest;<br>• Injuries to the extremities where the following physical findings are present:<br>• Amputations proximal to the wrist or ankle;<br>  ○ Visible crush injury;<br>  ○ Fractures of two or more proximal long bones;<br>  ○ Evidence of neurovascular compromise.<br>• Signs or symptoms of spinal cord injury;<br>• 2nd or 3rd Degree > 10% total BSA, or other significant burns involving the face, feet, hands, genitalia, or airway.<br>• Open skull injury<br>• Vehicle telemetry data consistent with a high risk for injury |

**A Geriatric Trauma Victim is a person greater than 65 years exhibiting one or more of the following physiologic or anatomic conditions:**

| **Physiologic conditions** | **Anatomic conditions** |
|---|---|
| • Glasgow Coma Scale less than or equal to 14 with a known or suspected traumatic brain injury;<br>• Glasgow Coma Scale less than or equal to 13;<br>• Loss of consciousness greater than 5 minutes;<br>• Deterioration in level of consciousness at the scene or during transport;<br>• Failure to localize to pain;<br>• Respiratory rate < 10 or > 29;<br>• Requires ventilator support;<br>• Requires relief of tension pneumothorax;<br>• Pulse > 120 in combination with evidence of hemorrhagic shock;<br>• Systolic blood pressure < 100, or absent radial pulse with carotid pulse present; | • Penetrating trauma to the head, neck, or torso;<br>• Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;<br>• Injuries to the head, neck, or torso where the following physical findings are present:<br>  ○ Visible crush injury;<br>  ○ Abdominal tenderness, distention, or seatbelt sign;<br>  ○ Pelvic fracture;<br>  ○ Flail chest;<br>• Injuries to the extremities where the following physical findings are present:<br>• Amputations proximal to the wrist or ankle;<br>  ○ Visible crush injury;<br>  ○ Fractures of two or more proximal long bones;<br>  ○ Fractures of one proximal long bones from motor vehicle crash;<br>  ○ Evidence of neurovascular compromise.<br>• Signs or symptoms of spinal cord injury;<br>• 2nd or 3rd Degree > 10% total BSA, or other significant burns involving the face, feet, hands, genitalia, or airway.<br>• Open skull injury<br>• Pedestrian struck by motor vehicle<br>• Fall from any height, including standing, with evidence of traumatic brain injury.<br>• Vehicle telemetry data consistent with a high risk for injury |

**Field Trauma Triage Criteria: Mechanism of Injury (MOI) & Special Considerations**

| **Co-Morbid Diseases and Special Considerations:** | **Mechanisms of Injury (MOI)** |
|---|---|
| • Age < 5 or > 55<br>• Cardiac disease<br>• Respiratory disease<br>• Diabetes<br>• Immunosuppression<br>• Morbid obesity<br>• Pregnancy<br>• Substance abuse / intoxication<br>• Liver disease<br>• Renal disease<br>• Bleeding disorder / anticoagulation | • High speed MVC<br>• Ejection from vehicle<br>• Vehicle rollover<br>• Death in same passenger compartment<br>• Extrication time > 20 minutes<br>• Falls greater than 10 feet<br>• Vehicle versus bicycle / pedestrian<br>• Pedestrian **struck**, thrown or run over<br>• Motorcycle crash > 20 mph with separation of rider from bike<br>• **Fall from any height, including standing, with signs of traumatic brain injury** |

## Burned trauma patients are first seen at a Trauma Center

**KEY POINTS**

**Exceptions to Mandatory Transport to a Trauma Center:**

- Emergency Medical Service personnel shall transport a trauma victim directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric care, unless one or more of the following exceptions apply:

  1. It is medically necessary to transport the victim to another hospital for initial assessment and stabilization before transfer to an adult or pediatric trauma center;
  2. It is unsafe or medically inappropriate to transport the victim directly to an adult or pediatric trauma center due to adverse weather or ground conditions or excessive transport time;
  3. Transporting the victim to an adult or pediatric trauma center would cause a shortage of local emergency medical service resources;
  4. No appropriate adult or pediatric trauma center is able to receive and provide adult or pediatric trauma care to the trauma victim without undue delay;
  5. Before transport of a patient begins, the patient requests to be taken to a particular hospital that is not a trauma center or, if the patient is less than eighteen years of age or is not able to communicate, such a request is made by an adult member of the patient's family or a legal representative of the patient.

**Glasgow Coma Scale**

| **INFANT** | **Eye Opening** | **ADULT** |
|---|---|---|
| *Birth to age 4* | | *Age 4 to Adult* |
| 4 Spontaneously | | Spontaneously 4 |
| 3 To speech | | To command 3 |
| 2 To pain | | To pain 2 |
| 1 No response | | No Response 1 |
| | **Best Verbal Response** | |
| 5 Coos, babbles | | Oriented 5 |
| 4 Irritable cries | | Confused 4 |
| 3 Cries to pain | | Inappropriate words 3 |
| 2 Moans, grunts | | Incomprehensible 2 |
| 1 No response | | No response 1 |
| | **Best Motor Response** | |
| 6 Spontaneous | | Obeys commands 6 |
| 5 Localizes pain | | Localizes pain 5 |
| 4 Withdraws from pain | | Withdraws from pain 4 |
| 3 Flexion (decorticate) | | Flexion (decorticate) 3 |
| 2 Extension (decerebrate) | | Extension (decerebrate) 2 |
| 1 No response | | No response 1 |
| ___ = TOTAL | | TOTAL = ___ |

# NOTS ADULT TRAUMA FIELD TRIAGE

**Step 1- Measure vital signs and level of consciousness of patient with a traumatic mechanism**

- Glasgow Coma Scale < 13 with traumatic mechanism
- Hypotension or Shock Index >1
- Respiratory rate < 10 or> 29 breaths/minute or requiring airway/ventilator support

**Step 2- Assess anatomy of injury**

- Significant penetrating injuries to the head, neck, torso or extremities proximal the elbow or knee
- Presence of/suspicion of a flail chest
- Two or more proximal long-bone fractures
- Crushed, degloved, threatened, pulseless or mangled extremity
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fracture
- Suspected Spinal Cord Injury

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

- Falls
  - Adults > 10ft (one story is equal to 10 ft.)
- High-risk auto crash
  - Intrusion: Including roof: > 12 in. occupant site, >18 in. any site
  - Extrication time over 20 minutes
  - Ejection (partial or complete) from automobile
  - Death in same passenger compartment
  - Vehicle telemetry data consistent with high risk of injury
- Auto vs. Pedestrian/Bicyclist thrown, run over or with significant (> 20 mph) impact
- Motorcycle crash > 20 mph
- Other motorized equipment crashes where the patient has the potential of significant injury

**Step 4-Assess special patient or system considerations of trauma patients**

- GCS: 12-14 with evidence of traumatic injury
- Age- ≥ 65 years old to a Trauma Center
- Anticoagulant and bleeding disorders on prescription blood thinners
- Significant burns (+/- trauma mechanism) or inhalation injury, chemical injury electrical injury or frostbite triage to burn center
- Open fractures regardless of location of fracture, except single digit fractures
- Pregnancy > 20 weeks gestation
- EMS Provider Judgment- When in doubt transfer to a trauma center

**Step 5- Patients not meeting above criteria**

**NOTS Transfer Line:**
**1-216-778-7850**

Special considerations: Every effort should be made to honor patient/family wishes and to keep family members together unless the accepting facility lacks the resources to manage the patient.

**Red/Priority 1**
Take to a trauma center, these patients should be transported preferentially to the highest level of care within the trauma system. If transport to a Level I will add greater than 15 minutes, transport to the nearest trauma facility

**Yellow/Priority 2**
Transport patient to nearest trauma center within trauma system, need not be the highest level of trauma center

**Green/Priority 3**
Transport to the closest appropriate emergency department

ADULT PROTOCOL

# ABDOMINAL TRAUMA

UNIVERSAL PATIENT CARE PROTOCOL

BLEEDING / HEMORRHAGE CONTROL PROCEDURE

AIRWAY PROTOCOL

CONSIDER SPINAL MOTION RESTRICTION PROCEDURE

OXYGEN

CAPNOGRAPHY PROCEDURE

Determine if Load & Go

Multiple Trauma Protocol if criteria

Evisceration: Cover, clean saline dressing to loosely stabilize

Penetrating Object: Cover, clean saline dressing – Immobilize object. If too large to transport – attempt to cut with care not to further injure tissue

Penetrating Wounds: Cover, clean saline dressing. Look for exit wound

Blunt Trauma: Assess for change – distention. Note mechanism

IV / IO PROCEDURE
To Maintain MAP > 65
or SBP 90 (100 systolic if >70 years old) if MAP Unavailable or Radial Pulses

If evidence of current / previous uncontrolled hemorrhage, HR > 120 and / or SBP < 90, within 60 mins of injury
Consider TRANEXAMIC ACID (TXA)
2 Grams (2000 mg) IV / IO ***slow push*** over 10 min ***-or-***
2 Grams IV / IO (2000 mg) mixed in 100 ml D5W over 10 mins

Monitor and Reassess

INITATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# ABDOMINAL TRAUMA



| MECHANISM | SIGNS & SYMPTOMS |
|---|---|
| • Blunt | • Altered mental status<br>• Shock<br>• Distention<br>• Swelling<br>• Bulging<br>• Nausea and vomiting |
| • Penetrating | • Altered mental status<br>• Bleeding<br>• Tenderness<br>• Pain<br>• Distention<br>• Evisceration<br>• Discoloration<br>• Entrance / exit wounds<br>• Nausea & vomiting |

**KEY POINTS**

Trauma to the abdomen is either Blunt or Penetrating. Blunt injuries are harder to detect and diagnose, and have a death rate twice that of penetrating wounds. Key signs and symptoms of blunt trauma include a patient in shock with no obvious injuries. Distention of the abdomen is an indication of internal hemorrhage. Pain may not be a significant factor. Many abdominal trauma injuries are Load & Go cases.

- Look for both an entrance and exit wound for all penetrating trauma, and treat accordingly.
- For all major trauma patients, the on scene time should be less than ten minutes.
- Pelvic pain with hypotension or tachycardia should have a pelvic binder placed.

ADULT PROTOCOL

# BURNS

UNIVERSAL PATIENT CARE PROTOCOL

CONSIDER SPINAL MOTION RESTRICTION PROCEDURE

AIRWAY PROTOCOL

OXYGEN

CAPNOGRAPHY PROCEDURE

If Chest, Neck, Face, Airway Involvement – Prepare for Invasive Airway Procedures
**INTUBATION - only if evidence of airway compromise**
CRICOTHYROTOMY - NEEDLE, KIT, or SURGICAL
As provided and trained
In rare circumstances for life saving measures only

Remove rings, bracelets, and other constricting items

See Rule of 9's chart at the end of this section

## Thermal

If burn < 10% body surface area (using rule of nines)
Cool down wound with NORMAL SALINE

Cover burn with dry sterile sheet or dressings

IV / IO PROCEDURE
If Burns ≥ 20% then 80 drops / min (Macrodrip set)
note to exceed 500 ml / hr - otherwise KVO

PAIN MANAGEMENT PROTOCOL

## Chemical

Eye Injury
Continuous flushing with Normal Saline

Remove clothing and / or expose area

Flush area with NORMAL SALINE for 10 – 15 minutes

PAIN MANAGEMENT PROTOCOL

Initiate Trauma Alert

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# BURNS



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Type of exposure (heat, gas, chemical)<br>• Inhalation injury<br>• Time of injury<br>• Past medical history<br>• Medications<br>• Other trauma<br>• Loss of consciousness<br>• Tetanus / immunization status | • Burns, pain, swelling<br>• Dizziness<br>• Loss of consciousness<br>• Hypotension / shock<br>• Airway compromise / distress<br>• Singed facial or nasal hair<br>• Hoarseness / wheezing | • Superficial (1°) red and painful<br>• Partial thickness (2°) superficial partial thickness, deep partial thickness, blistering<br>• Full thickness (3°) painless and charred or leathery skin<br>• Chemical<br>• Thermal<br>• Electrical<br>• Radiation |

## KEY POINTS

- Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro
- **Intubation is only required in cases with airway compromise.**
- Critical Burns: >25% body surface area (BSA); full thickness burns >10% BSA; partial thickness superficial partial thickness, deep partial thickness and full thickness burns to face, eyes, hand or feet; electrical burns; respiratory burns; deep chemical burns; burns with extremes of age or chronic disease; and burns with associated major traumatic injury. These burns may require hospital admission or transfer to a burn center.
- Potential CO exposure should be treated with 100% oxygen.
- Circumferential burns to extremities are dangerous due to potential vascular compromise partial thickness to soft tissue swelling.
- Burn patients are prone to hypothermia – Never apply ice or cool burns that involve >10% body surface area.
- Do not overlook the possibility of multiple system trauma.
- Do not overlook the possibility of child abuse with children and burn injuries.
- See appendix for rule of nines.

1. **Thermal (dry and moist):**
   a. Stop burning process: i.e. remove patient from heat source, cool skin, remove clothing
   b. If patient starts to shiver or skin is cool, stop cooling process.
   c. Estimate extent (%) and depth of burn (see chart). Determine seriousness (see chart) of burn, contact Medical Control and transport accordingly. Cover burn areas with sterile dressing.
2. **Radiation Burns:**
   a. Treat as thermal burns except when burn is contaminated with radioactive source, then treat as chemical burn.
   b. Wear appropriate protective clothing when dealing with contamination.
   c. Contact HAZ MAT TEAM for assistance in contamination cases.
3. **Chemical Burns:**
   a. Wear appropriate protective clothing and respirators.
   b. Remove patient from contaminated area to decontamination site (NOT SQUAD).
   c. Determine chemicals involved; contact appropriate agency for chemical information.
   d. Remove patient's clothing and flush skin.
   e. Leave contaminated clothes at scene. Cover patient over and under before loading into squad.
   f. Patient should be transported by personnel not involved in decontamination process.
   g. Determine severity (see chart), contact Medical Control and transport accordingly.
   h. Relay type of substance involved to Medical Control.
4. **Electrical Burns:**
   a. Shut down electrical source; do not attempt to remove patient until electricity is CONFIRMED to be shut off.
   b. Assess for visible entrance and exit wounds and treat as thermal burns.
   c. Assess for internal injury, i.e., vascular damage, tissue damage, fractures, and treat accordingly.
   d. Determine severity of burn, contact Medical Control and transport accordingly.
5. **Inhalation Burns:**
   a. Always suspect inhalation burns when the patient is found in closed smoky environment and / or exhibits any of the following: burns to face / neck, singed nasal hairs, cough and / or stridor, soot in sputum.
   b. Provide oxygen therapy, contact Medical Control and transport.

- Handle patients gently to avoid further damage of the patient's skin**.**
- If the patient is exposed to a chemical, whenever possible, get the name of the chemical, and document it on the patient run report. **DO NOT** transport any hazardous materials with the patient.
- Look for signs of dehydration and shock.
- Initiate early intubation for symptomatic patients with inhalation burns.
- Patients with major burns should be transported to the a Regional Burn Center.
- Patients with unstable airway or who are rapidly deteriorating should be transported to the closest appropriate facility.
- Patients with large surface burns lose the ability to regulate their body temperature. Avoid heat loss by covering the patient.

ADULT PROTOCOL

# CHEST TRAUMA

UNIVERSAL PATIENT CARE PROTOCOL

BLEEDING / HEMORRHAGE CONTROL PROCEDURE

AIRWAY PROTOCOL

**SPINAL MOTION RESTRICTION PROTOCOL**

HIGH FLOW OXYGEN

CAPNOGRAPHY PROCEDURE

If S&S of Tension Pneumothorax
(Difficulty bagging, absent breath sounds, hypotensive or pulseless)
TRAUMATIC NEEDLE CHEST DECOMPRESSION PROCEDURE
⚠ Be Prepared to Repeat *IF* S&S Return

IV / IO PROCEDURE
To Maintain MAP > 65
or SBP 90 (100 systolic if >70 years old) if MAP Unavailable or Radial Pulses

If evidence of current / previous uncontrolled hemorrhage,
HR > 120 and / or SBP < 90, within 60 mins of injury
Consider TRANEXAMIC ACID (TXA)
2 Grams (2000 mg) IV / IO ***slow push*** over 10 min ***-or-***
2 Grams IV / IO (2000 mg) mixed in 100 ml D5W over 10 mins

APPLY CARDIAC MONITOR

**Cardiac Tamponade:** Assess for Beck's Triad (Hypotension, +JVD and muffled heart sounds). Paradoxical Pulse (no radial pulse when breathing in) is likely. LOAD AND GO

**Massive Hemothorax:** Shock, then difficulty breathing. No JVD, decreased breath sounds, dull to percussion. LOAD AND GO

**Open Pneumothorax / Sucking Chest Wound:** Close wound with occlusive dressing secured on THREE SIDES or Commercial Chest Seal. LOAD AND GO

**Flail Chest:** Assist with Ventilation – Gentle Positive Pressure - Consider CPAP if isolated chest trauma and no hypotension / shock / tension pneumothorax and spontaneous adequate respiration. LOAD AND GO

**Suspected:** Traumatic Aortic Rupture, Tracheal or Bronchial Tree Injury, Myocardial Contusion, Diaphragmatic Tears, Esophageal Injury, And Pulmonary Contusion:
Ensure an Airway, Administer Oxygen, LOAD AND GO

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# CHEST TRAUMA



## SIGNS AND SYMPTOMS

| SIMPLE PNEUMOTHORAX | OPEN PNEUMOTHORAX | TENSION PNEUMOTHORAX | HEMOTHORAX |
|---|---|---|---|
| • Shortness of breath<br>• Dyspnea<br>• Tachypnea<br>• Cyanosis<br>• Chest pain<br>• Absent diminished Lung sounds on the affected side | • Shortness of breath<br>• Dyspnea<br>• Cyanosis<br>• Sucking chest wound<br>• Shock<br>• Absent / diminished Lung sounds on affected side | • Shortness of breath<br>• Cyanosis<br>• Shock<br>• Absent / diminished Lung sounds<br>• Tracheal deviation<br>• Hypotension<br>• JVD<br>• Tachycardia<br>• Dyspnea (late sign) | • Shortness of breath<br>• Dyspnea<br>• Cyanosis<br>• Dullness to Percussion sounds<br>• Flat neck veins<br>• Hypotension<br>• Shock<br>• Absent / diminished breath sounds<br>• Tachycardia |

| CARDIAC TAMPONADE | TRAUMATIC ASPHYXIA | FLAIL CHEST |
|---|---|---|
| • Hypotension<br>• Decreasing pulse pressure<br>• Elevated neck veins<br>• Muffled heart tones<br>• Bruising over the sternum<br>• Tachycardia | • Bloodshot, bulging eyes<br>• Blue, bulging tongue<br>• JVD<br>• Cyanotic upper body | • Paradoxical chest wall movement<br>• Asymmetric chest movement Upon inspiration<br>• Dyspnea<br>• Unstable chest segment<br>• Significant chest wall pain |

## KEY POINTS

Thoracic injuries have been called the deadly dozen. The first six are obvious at the primary assessment.

1. Airway obstruction
2. Flail chest
3. Cardiac tamponade
4. Massive hemothorax
5. Open pneumothorax
6. Tension pneumothorax

The second six injuries may be more subtle and not easily found in the field:

7. Traumatic aortic rupture
8. Esophageal injury
9. Myocardial contusion
10. Diaphragmatic tears
11. Tracheal / bronchial tree injury
12. Pulmonary contusion

- A **sucking chest wound** is when the thorax is open to the outside. The occlusive dressing may be anything such as petroleum gauze, plastic, or a defibrillator pad. Tape only 3 sides down so that excess intrathoracic pressure can escape, preventing a tension pneumothorax. May help respirations to place patient on the injured side, allowing unaffected lung to expand easier.
- A **flail chest** is when there are extensive rib fractures present, causing a loose segment of the chest wall resulting in paradoxical and ineffective air movement. Positive pressure breathing via BVM will help push the segment and the normal chest wall out with inhalation and to move inward together with exhalation, getting them working together again. Do not use too much pressure to prevent additional damage or pneumothorax.
- A **penetrating object** must be immobilized by any means possible. If it is very large, cutting may be possible, with care taken not to move it about when making the cut. Place an occlusive and bulky dressing over the entry wound.
- A **tension pneumothorax** is life threatening, look for *HYPOTENSION*, unequal breath sounds, JVD, increasing respiratory distress, and decreasing mental status. The pleura must be decompressed with a needle to provide relief. Decompress between the 2nd and 3rd ribs, midclavicular placing the catheter over the 3rd rib. Alternate site, 5th intercostal space mid axillary or anterior axillary line. Once the catheter is placed, watch closely for re-occlusion. Once the catheter is placed, watch closely for re-occlusion. Repeat if needed to prevent re-occlusion. Decompress with 3.25" 14 ga catheter or Chest Decompression Needle based on patient's size.

ADULT PROTOCOL

# CRUSH INJURY / CRUSH SYNDROME

UNIVERSAL PATIENT CARE PROTOCOL

AIRWAY PROTOCOL

BLEEDING / HEMORRHAGE CONTROL PROCEDURE

Consider SPINAL MOTION RESTRCTION PROCEDURE

Rapid Trauma Assessment

CAPNOGRAPHY PROCEDURE

Consider
Air transport if
delay due to extrication

Throughout care:
Monitor for signs of
**compartment syndrome** such as:
pain disproportionate to exam,
tense swelling,
pain with passive stretch,
muscle weakness, absent pulses,
paresthesia

Document assessment of distal pulses if able
**Early notification for potential surgical intervention**

IV / IO PROCEDURE – Prior to extrication
1000 ml bolus to maintain kidney perfusion
TKO thereafter unless evidence of hypoperfusion
Then additional boluses to maintain MAP > 65
or SBP 90 (100 systolic if >70 years old)
if MAP Unavailable or Radial Pulses

PAIN MANAGEMENT PROTOCOL

DIAGNOSTIC EKG PROCEDURE q 30 mins

IF at any time EKG evidence of
hyperkalemia
Wide Complex QRS or
Peaked T Waves or Bradycardia
*Or any combination of these*
Treat per HYPERKALEMIA PROTOCOL

Consider Tourniquet Procedure
Prior to release - Apply but do not tighten in anticipation of bleeding

Less than 1 Hour to release

Greater than 1 Hour to release

ALBUTEROL
10mg (x4 2.5mg Unit Doses)
ALBUTEROL ONLY – NO IPRATROPIUM

SODIUM BICARBONATE
1mEq / kg
Max 100 mEq / dose q 30 mins

Flush IV then
CALCIUM GLUCONATE
3 Grams IV / IO or
CALCIUM CHLORIDE
1 GRAM IV / IO
May repeat if available and EKG changes reoccur

Reassess including DIAGNOSTIC EKG's

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility **CONTACT** receiving facility
**CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# CRUSH INJURY / CRUSH SYNDROME

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Traumatic crush mechanism<br>• Non-Traumatic swelling of limb | • Pain disproportionate to exam<br>• Tense swelling<br>• Pain with passive stretch<br>• Muscle weakness<br>• Absent pulses<br>• Paresthesia | • Compartment syndrome<br>• Contusions<br>• Crush syndrome<br>• Degloving injury<br>• Fracture(s)<br>• Laceration(s)<br>• Peripheral nerve injury<br>• Tendon injury<br>• Vascular injury<br>• Rhabdomyolysis<br>• Localized allergic reactions<br>• Cellulitis |

**KEY POINTS**

- Care goals include recognizing traumatic crush injury mechanism and minimizing the systemic effects such as rhabdomyolysis, hyperkalemia, acute kidney injury
- Rapid extrication and evacuation to a definitive care facility (trauma center preferred)
- A patient with a crush injury may initially present with very few signs and symptoms. Maintain a high index of suspicion for any patient with a compressive mechanism of injury
- A fatal medical complication of crush syndrome is hyperkalemia. Suspect hyperkalemia if T-waves become peaked, QRS becomes prolonged (greater than 0.12 seconds), absent P wave, prolonged QTc, or sine wave. Continue fluid resuscitation through extrication and transfer to hospital
- Non-traumatic injuries that may cause compartment syndrome include prolonged immobilization, prolonged compression of the torso/limbs, electrical injury, or burns
- Key Documentation Elements include; Time of tourniquet application, neurovascular status of any crushed extremity, EKG findings consistent with hyperkalemia, and amount of IV fluid administered
- Place a tourniquet on any trapped extremities if accessible above the crush area prior to release in preparation of post release bleeding

ADULT PROTOCOL

# DROWNING

UNIVERSAL PATIENT CARE PROTOCOL

Consider SPINAL MOTION RESTRICTION PROCEDURE
Place backboard while still in water if able.

AIRWAY PROTOCOL
Initiate ventilation while patient is still in water if not breathing.

IF DECOMPRESSION SICKNESS
Give oxygen – no positive pressure ventilation unless NOT breathing.

OXYGEN ASAP

CAPNOGRAPHY PROCEDURE

Apply Cardiac Monitor

IF HYPOTHERMIC
Treat per HYPOTHERMIA PROTOCOL

IV / IO PROCEDURE
Normal Saline TKO

Monitor and Reassess

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# DROWNING



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Submersion in water regardless of depth<br>• Possible trauma i.e.; fall, diving board<br>• Duration of immersion<br>• Temperature of water<br>• Salt vs. fresh water | • Period of unconsciousness<br>• Unresponsive<br>• Mental status changes<br>• Decreased or absent vital signs<br>• Vomiting<br>• Coughing | • Trauma<br>• Pre-existing medical problem<br>• Barotrauma (diving)<br>• Decompression sickness |

## KEY POINTS

- Exam: Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neuro
- Drowning due to suffocation from submersion in water.
- 2 causes – breath holding which leads to aspiration of water; & laryngospasm which closes the glottis.
- Both causes lead to profound hypoxia and death.
- Fresh water drowning ventricular fibrillation may be likely.
- Salt water drowning may cause pulmonary edema in time.
- Pulmonary edema can develop within 24 - 48 hours after submersion.
- EMS should be aware that there may be delayed symptoms in some cases.
- Patients WITHOUT vital sign abnormalities may follow standard refusal of care protocols.
- Drowning is a leading cause of death among would-be rescuers.
- Allow appropriately trained and certified rescuers to remove victims from areas of danger.
- With pressure injuries (decompression / barotrauma), consider transport for availability of a hyperbaric chamber.
- All hypothermic / hypothermic / drowning patients should have resuscitation performed until care is transferred, or if there are other signs of obvious death (putrification, traumatic injury unsustainable to life).
- Consider a c-spine injury in all drowning cases.
- Patients with low core temperatures will not respond to ALS drug interventions. Maintain warming procedures and supportive care. Treat per hypothermic arrest protocol.
- DO NOT perform the Heimlich maneuver to remove water from the lungs prior to resuscitation.

ADULT PROTOCOL

# EXTREMITY TRAUMA / AMPUTATION

UNIVERSAL PATIENT CARE PROTOCOL

BLEEDING / HEMORRHAGE CONTROL PROCEDURE

Risk of Exsanguination?
*Internally or Externally*
Upper Extremities Apply Commercial Tourniquet
Lower Extremities 2 Commercial Tourniquets

Consider
Multiple Trauma Protocol
where indicated

OXYGEN

IV / IO PROCEDURE

PAIN MANAGEMENT PROTOCOL
⚠ CAPNOGRAPHY REQUIRED FOR SEDATION / PAIN MANAGEMENT OF TRAUMA PATIENT

If evidence of current / previous uncontrolled hemorrhage, HR > 120 and / or SBP < 90, within 60 mins of injury
Consider TRANEXAMIC ACID (TXA)
2 Grams (2000 mg) IV / IO ***slow push*** over 10 min ***-or-***
2 Grams IV / IO (2000 mg) mixed in 100 ml D5W over 10 mins

If open or suspected open fracture
(Crepitus / angulation with laceration over same site)
CeFAZolin (ANCEF)
2 grams IV / IO in 100 ml D5 / NS over 10 min - No Repeat

- STOP Allergy to cephalosporin antibiotics or penicillin
- STOP Unable to obtain allergy information for patient
- STOP Do not delay any other necessary procedure to administer
- ⚠ Monitor for signs of allergic reaction / anaphylaxis – treat per protocol if identified

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

Amputation?

Clean amputated part with normal saline irrigation

Wrap part in saline soaked sterile dressing and place in plastic bag if able

Place on ice if available – no direct contact to tissue

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# EXTREMITY TRAUMA / AMPUTATION

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Type of injury<br>• Mechanism: crush / penetrating / amputation<br>• Time of injury<br>• Open vs. closed wound / fracture<br>• Wound contamination<br>• Medical history<br>• Medications | • Pain, swelling<br>• Deformity<br>• Altered sensation / motor function<br>• Diminished pulse / capillary refill<br>• Decreased extremity temperature | • Abrasion<br>• Contusion<br>• Laceration<br>• Sprain<br>• Dislocation<br>• Fracture<br>• Amputation |

## KEY POINTS

- Exam: Mental Status, Extremity, Neuro
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.

Extremity Trauma

- DO NOT take the time to splint injured extremities in major trauma patients unless it does not delay the scene time or prevents you from performing more pertinent patient care.
- Splint the extremity if the patient has signs and symptoms of a fracture or dislocation.
- Treat all suspected sprains or strains as fractures until proven otherwise.
- Splint the joint above and below for all suspected fractures.
- Splint the bone above and below for all suspected joint injuries.
- Check and document the patient's MSP's before and after splinting.
- A traction splint with a backboard is the preferred splint to use for femur fractures.

Traumatic Amputation

- Care of the amputated extremity include:
  - Cleanse an amputated extremity with normal saline or sterile water.
  - DO NOT place any amputated tissue directly on ice or cold pack. Instead, place the amputated limb into a plastic bag. Put the bag into a container of cool water with a few ice cubes (if available).
- Contact the receiving hospital with the patient information and include the status of the amputated limb.
- Focus on patient care and not on the amputated extremity.
- Tourniquets should be applied early if there is a risk of exsanguination (bleeding out) from extremity injury.
- Remember to calm and reassure the patient. Do not give the patient or their family member's false hope of re-attachment of the affected limb. A medical team at the receiving hospital makes this decision.
- Delegate someone to do an on-scene search for the amputated part when it cannot be readily found and continue with patient care.

ADULT PROTOCOL

# HEAD TRAUMA

UNIVERSAL PATIENT CARE PROTOCOL
Oxygen for all head trauma

SPINAL MOTION RESTRICTION PROCEDURE

BLEEDING / HEMORRHAGE CONTROL PROCEDURE

Determine and Trend GCS

Consider Other Protocols

Multiple Trauma Protocol
(if Not Isolated Head Trauma)
Altered Level of Consciousness Protocol
Seizure Protocol (if Seizure Activity)

Isolated Uncomplicated Head Trauma?
GCS 15

AIRWAY PROTOCOL
⚠ Do NOT HYPERVENTILATE

IV / IO PROCEDURE
Limit IV fluids due to cerebral edema
To Maintain MAP > 65
or SBP 90 (100 systolic if >70 years old) if MAP Unavailable or Radial Pulses
⚠ Do NOT allow patient to become Hypotensive

Evidence of, or Suspect
Traumatic Brain Injury (TBI)? GCS < 15

AIRWAY PROTOCOL

Do ***NOT*** Allow Patient to Become Hypoxic During ANY Airway Management – 100% Oxygen
Maintain $SpO_2$ > 94% At All Times!
Apply Capnography If Advanced Airway Used

Ventilate to Maintain
**$CO_2$ 35** or 12 Breaths / min

IV / IO PROCEDURE
Normal Saline Bolus to Maintain MAP > 80
or SBP 120 if MAP Unavailable or Radial Pulses
⚠ Do NOT allow patient to become hypotensive

Monitor and Reassess

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HEAD TRAUMA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Time of injury<br>• Mechanism: blunt /penetrating<br>• Loss of consciousness<br>• Bleeding<br>• Medical history<br>• Medications<br>• Evidence of multi-trauma<br>• Helmet use or damage to helmet | • Pain, swelling, bleeding<br>• Altered mental status<br>• Unconscious<br>• Respiratory distress / failure<br>• Vomiting<br>• Significant mechanism of injury | • Skull fracture<br>• Brain injury (concussion, contusion, hemorrhage, or laceration)<br>• Epidural hematoma<br>• Subdural hematoma<br>• Subarachnoid hemorrhage<br>• Spinal injury<br>• Abuse |

**Glasgow Coma Scale**

| INFANT | | ADULT |
|---|---|---|
| *Birth to age 4* | **Eye Opening** | *Age 4 to Adult* |
| 4 Spontaneously | | Spontaneously 4 |
| 3 To speech | | To command 3 |
| 2 To pain | | To pain 2 |
| 1 No response | | No Response 1 |
| | **Best Verbal Response** | |
| 5 Coos, babbles | | Oriented 5 |
| 4 Irritable cries | | Confused 4 |
| 3 Cries to pain | | Inappropriate words 3 |
| 2 Moans, grunts | | Incomprehensible 2 |
| 1 No response | | No response 1 |
| | **Best Motor Response** | |
| 6 Spontaneous | | Obeys commands 6 |
| 5 Localizes pain | | Localizes pain 5 |
| 4 Withdraws from pain | | Withdraws from pain 4 |
| 3 Flexion (decorticate) | | Flexion (decorticate) 3 |
| 2 Extension (decerebrate) | | Extension (decerebrate) 2 |
| 1 No response | | No response 1 |
| ___ = TOTAL | | TOTAL = ___ |

## KEY POINTS

- **Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- If GCS < 12 consider air / rapid transport and if GCS < 9 intubation should be anticipated.
- **GCS ≤ 8? Intubate!**
- DO NOT allow patients to become hypoxic, maintain $SpO_2$ > 94%, abandon intubation attempts if this cannot be maintained. Secure airway by other means.
- Increased intracranial pressure (ICP) may cause **hypertension** and bradycardia (Cushing's Reflex).
- **Hypotension** usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
- Limit IV fluids unless patient is hypotensive (systolic BP < 90) fluid resuscitate if necessary to maintain BP, Do NOT allow patients to become hypotensive.
- **DO NOT** attempt to lower the blood pressure in hypertensive head injured patients with medications such as Nitroglycerine (Nitro-Stat).
- Be alert for c-spine injuries with head trauma.
- Continually reassess the patient, including pupils, LOC, and neurological status.
- Any decrease in GCS suggests a TBI surgical emergency, transport to trauma center
- Capnography is critical! Maintain the $CO_2$ ranges indicated in protocol, 1 point of $CO_2$ change = 3% decrease in cerebral perfusion.
- The most important item to monitor, trend, and document is a change in the level of consciousness / GCS.
- Herniation may occur. Signs are:
  - Cushing's reflex; Bradycardia, hypertension, widening pulse pressure
  - Decreasing level of consciousness progressing towards coma.
  - Dilation of pupils – may be unilateral or bilateral
  - Decerebrate posturing (extension of arms and legs)
  - Decorticate posturing (flexion arms and legs)
- Concussions are periods of confusion or LOC associated with trauma, which may have resolved by the time EMS arrives. A physician ASAP should evaluate any prolonged confusion or mental status abnormality, which does not return to normal within 15 minutes or any documented loss of consciousness.
- Consider **Restraints** if necessary for patient's and / or personnel's protection per the RESTRAINT PROCEDURE.

ADULT PROTOCOL

# MAXILLOFACIAL TRAUMA

UNIVERSAL PATIENT CARE PROTOCOL

Determine type of injury

## Eye

- Remove Contact Lenses (If applicable)
- If burn or foreign body, determine substance. Flush with copious Amounts of normal saline
- If penetrating trauma, secure object (Do not remove)
- Eye Out; Cover with sterile 4 x 4, normal saline and stabilize
- If Non-Penetrating Trauma or Chemical Burns
  CONSIDER TOPICAL PAIN CONTROL
  TETRACAINE
  1 Drop to affected eye
  may repeat 1 drop
  Max 2 Drops
  ⚠ If Tetracaine is used, patient must be evaluated at hospital

## Tongue

- Have suction on and immediately available to maintain airway
- Attempt to control bleeding with direct pressure / gauze if able and will not cause airway obstruction

## Nose

- Have suction on and immediately available to maintain airway
- Sit patient upright and forward. Pinch nostrils. Consider external applied cold pack to bridge of nose
- Traumatic or atraumatic epistaxis not controlled with BLS Measures

  Consider TRANEXAMIC ACID (TXA) Soaked gauze product nostril packing

  Soak in standard concentration TXA
  Have patient blow nose, suction active bleeding, then pack nostril with TXA soaked gauze

  Resume BLS care as above

## Ear

- If foreign body, determine substance
- Attempt to control bleeding with direct pressure / gauze

## Tooth

- If tooth out attempt preservation as soon as possible in; Commercially available tooth preservation kit (if available) or whole milk (if available). Handle by enamel only, do not touch roots
- Bleeding socket from missing teeth not controlled with BLS Measures

  Consider TRANEXAMIC ACID (TXA) Soaked gauze product socket packing

  Soak in standard concentration TXA

  Resume BLS care as above

Consider PAIN MANAGEMENT Protocol

**TRANSPORT to appropriate facility CONTACT receiving facility CONSULT** Medical Control **where indicated** APPROPRIATE transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# MAXILLOFACIAL TRAUMA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Trauma of any type that results in injury to one or both eyes. | • Irritation to eye<br>• Visual disturbances<br>• Obvious penetrating injury<br>• Burn (chemical, thermal)<br>• Loss of vision<br>• Dizziness<br>• Loss of consciousness<br>• Nausea | • Hypertension<br>• Contact lens problem |

## KEY POINTS

- If unsure if something can be flushed with water, contact Medical Command.
- A garden hose can be used to help flush the patient's eye(s) if available. **DO NOT** use a high-pressure hose or at a high force. If needed, irrigate the patient's eyes for approximately 5 -15 minutes.
- Begin irrigating immediately, because irreversible damage can occur in a few minutes.

**TRAUMA**

- Do not allow eye injury to distract you from the basics of trauma care.
- Do not remove any foreign body imbedded in the eye or orbit. Stabilize any large protruding foreign bodies.
- With blunt trauma to the eye, if time permits, examine the globe briefly for gross laceration as the lid may be swollen tightly shut later. Sclera rupture may lie beneath an intact conjunctiva.
- Covering both eyes when only one eye is injured may help to minimize trauma to the injured eye, but in some cases the patient is too anxious to tolerate this.
- Transport patient supine unless other life threats prohibit this from being done. (This is based on physics, the goal of not letting the fluid within the eye drain out of the eye)

**CHEMICAL BURNS**

- When possible determine type of chemical involved first. The eye should be irrigated with copious amounts of water or saline, using IV tubing wide open for a minimum of 15 minutes started as soon as possible. Any delay may result in serious damage to the eye.
- Always obtain name and, if possible, a sample of the contaminant or ask that they be brought to the hospital as soon as possible.

**CONTACT LENSES**

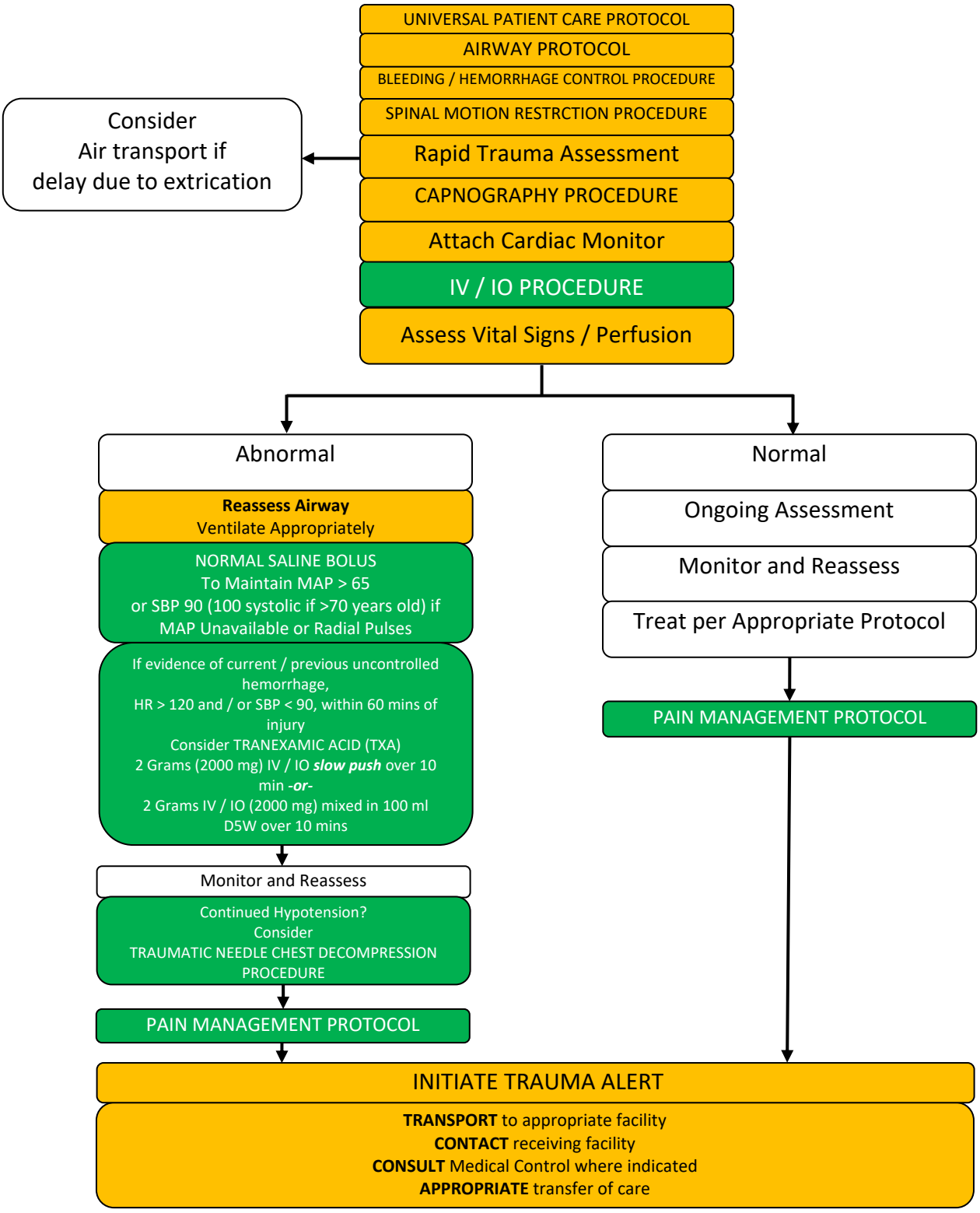
- If possible, contact lenses should be removed from the eye; be sure to transport them to the hospital with the patient. If the lenses cannot be removed, notify the ED personnel as soon as possible.
- If the patient is conscious and alert, it is much safer and easier to have the patient remove their lenses.

**ACUTE, UNILATERAL VISION LOSS**

- When a patient suddenly loses vision in one eye with no pain, there may be a central retinal artery occlusion. Urgent transport and treatment is necessary.
- Patient should be transported flat.

ADULT PROTOCOL

# MULTIPLE TRAUMA




| EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control |
|---|---|---|---|

# MULTIPLE TRAUMA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Time and mechanism of injury<br>• Damage to structure or vehicle<br>• Location in structure or vehicle<br>• Others injured or dead<br>• Speed and details of MVC<br>• Restraints / protective equipment<br>• Past medical history<br>• Medications | • Pain, swelling<br>• Deformity, lesions, bleeding<br>• Altered mental status or unconscious<br>• Hypotension or shock<br>• Arrest | • Flail chest<br>• Tension pneumothorax<br>• Pericardial tamponade<br>• Open chest wound<br>• Hemothorax<br>• Intra-abdominal bleeding<br>• Pelvis / femur fracture<br>• Spine fracture / spinal cord injury<br>• Head injury<br>• Extremity fracture / dislocation<br>• HEENT (airway obstruction)<br>• Hypothermia |

**KEY POINTS**

- Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro
- Mechanism is the most reliable indicator of serious injury.
- In prolonged extrications or serious trauma, consider air transportation for transport times and the ability to give blood.
- Do not overlook the possibility of associated domestic violence or abuse
- Pelvic pain with hypotension or tachycardia should have a pelvic binder placed.

ADULT PROTOCOL

# TRAUMA ARREST

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Time of injury<br>• Mechanism: blunt / penetrating<br>• Loss of consciousness<br>• Bleeding<br>• Medications<br>• Evidence of multi-trauma | • Excessive bleeding<br>• Unresponsive; not breathing<br>• Cardiac arrest<br>• Significant mechanism of injury | • Obvious DOA<br>• Death |

UNIVERSAL PATIENT CARE PROTOCOL

BLEEDING / HEMORRHAGE CONTROL PROCEDURE

SPINAL MOTION RESTRICTION PROTOCOL

AIRWAY PROTOCOL
BEGIN RESUSCITATION

CAPNOGRAPHY PROCEDURE

**BILATERAL**
TRAUMATIC NEEDLE CHEST DECOMPRESSION PROCEDURE

IV / IO PROCEDURE

Apply Cardiac Monitor

Appropriate Protocol based on Signs and Symptoms

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

Consider DOA / Termination of Efforts Protocol for Blunt Trauma Arrest Patients Who Do Not Respond to Treatment or Meet DOA Criteria or Penetrating Trauma Where the Patient Clearly will not Survive

## KEY POINTS

- Except for airway management, salvageable traumatic cardiac arrests are “load and go” situations.
- Resuscitation should not be attempted in trauma arrest patients with:
  1. Spinal transection
  2. Decapitation
  3. Total body burns
  4. Severe blunt trauma patients that are without vital signs
  5. Without pupillary response
  6. Without an organized or shockable cardiac rhythm at the scene
- Patients in cardiac arrest with deep penetrating cranial injuries and patients with penetrating cranial or truncal wounds associated with asystole and a transport time of more than 15 minutes to a definitive care facility are unlikely to benefit from resuscitative efforts.
- Extensive, time-consuming care of trauma victims in the field is usually not warranted. Unless the patient is trapped, they should be enroute to a medical facility within 10 minutes after arrival of the ambulance on the scene.
- Bilateral Needle Decompression is indicated in cases of trauma that involve or may involve the abdomen or chest, it may be considered in other cases.

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# GLASGOW COMA SCALE

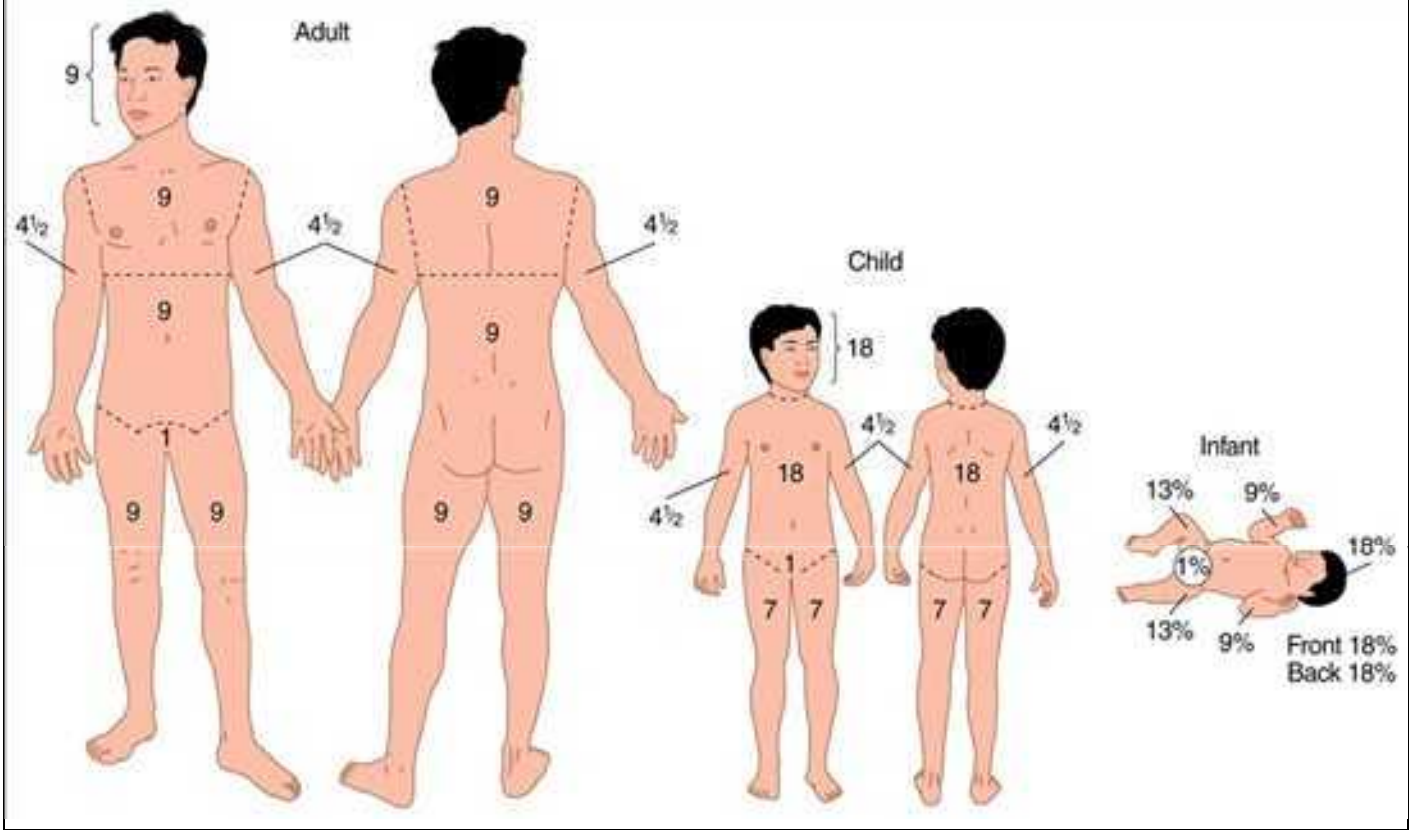
| | | GCS |
|---|---|---|
| EYES | SPONTANEOUSLY | 4 |
| | TO VERBAL COMMAND | 3 |
| | TO PAIN | 2 |
| | NO RESPONSE | 1 |
| | | |
| BEST MOTOR RESPONSE | OBEYS VERBAL COMMAND | 6 |
| | PURPOSEFUL MOVEMENT TO PAIN | 5 |
| | FLEXION - WITHDRAWAL | 4 |
| | FLEXION – ABNORMAL | 3 |
| | EXTENSION | 2 |
| | NO RESPONSE | 1 |
| | | |
| BEST VERBAL RESPONSE | ORIENTED & CONVERSES | 5 |
| | DISORIENTED & CONVERSES | 4 |
| | INAPPROPRIATE WORDS | 3 |
| | INCOMPREHENSIBLE SOUNDS | 2 |
| | NO RESPONSE | 1 |

TRAUMA ASSESSMENT CHARTS

# REVISED TRAUMA SCORE

| | | RTS |
|---|---|---|
| GLASGOW COMA SCALE | 13 – 15 | 4 |
| | 9 – 12 | 3 |
| | 6 – 8 | 2 |
| | 4 – 5 | 1 |
| | 0 – 3 | 0 |
| | | |
| RESPIRATORY RATE | GREATER THAN 29 | 4 |
| | 10 – 29 | 3 |
| | 6 – 9 | 2 |
| | 1 – 5 | 1 |
| | 0 | 0 |
| | | |
| SYSTOLIC BLOOD PRESSURE | GREATER THAN 89 | 4 |
| | 76 – 89 | 3 |
| | 50 – 75 | 2 |
| | 1 – 49 | 1 |
| | 0 | 0 |

# RULE OF NINES




1% is equal to the surface of the palm of the patient's hand. If unsure of %, describe injured area.

## MAJOR BURN CRITERIA

- 2° and 3° burns > 10% surface area
- Burns of the face, hands, feet, or genitalia
- Electrical shock with burn injury
- Burn with inhalation injury any burn with potential functional or cosmetic impairment

# SECTION 7 - PEDIATRIC AIRWAY / BREATHING

Pediatric Airway .....2-7
Pediatric Foreign Body Airway Obstruction (FBAO).....4-7
Pediatric Respiratory Distress – Upper Airway (Croup) .....6-7
Pediatric Respiratory Distress – Lower Airway .....8-7
Pediatric Traumatic Breathing .....10-7

PEDIATRIC PROTOCOL

# AIRWAY

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

Universal Patient Care Protocol

Assess ABC's
Respiratory Rate, Effort, and Adequacy

Adequate → Supplemental OXYGEN

Inadequate

Basic maneuvers FIRST
Open airway
Nasal / Oral Airway
Bag – Valve - Mask

Positive Respirations / Gag Reflex → Oxygenate
Ventilate
Position
Reassess

Apneic / No gag reflex

CAPNOGRAPHY PROCEDURE Required

Pediatric Extraglottic Airway (BIAD)
STOP EMT Pulseless Apneic Patient Only

CONSIDER INTUBATION PROCEDURE
If unable to manage with BVM / extraglottic airway (BIAD)
STOP AEMT Apneic or Pulseless and Apneic Patient Only
⚠ Acceptable to mask bag throughout EMS care if appropriate compliance and oxygenation

Obstruction → Pediatric Foreign Body Airway Obstruction Protocol

Direct Laryngoscopy

Attempt Removal with Magill Forceps

NEEDLE CRICOTHYROTOMY PROCEDURE if Trained
⚠ No Surgical or Cricothyrotomy kit
NEEDLE CRICOTHYROTOMY Only

Continue
Bag – Valve – Mask Ventilations

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

PEDIATRIC PROTOCOL

# AIRWAY

| INDICATIONS | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Apnea<br>• Coughing<br>• Choking<br>• Inability to speak<br>• Unresponsive<br>• Burns<br>• Trauma | • Witnessed aspiration<br>• Sudden episode of choking<br>• Gagging<br>• Audible stridor<br>• Change in skin color<br>• Decreased LOC<br>• Increased or decreased Respiratory rate<br>• Labored breathing<br>• Unproductive cough | • Cardiac arrest<br>• Respiratory arrest<br>• Anaphylaxis<br>• Esophageal obstruction |

Extraglottic airway device / BIAD (Blind Insertion Airway Device)
Examples (not limited to); King Airway, LMA, iGel, Etc.

Differentiate airway obstruction from esophageal obstruction.
If esophageal obstruction, place patient in position of comfort, suction as needed and treat pain.

## MANAGEMENT OF TRACHEOSTOMY PATIENTS

**Tracheostomies come in 2 types**

- Cuffed tracheostomy – has a distal cuff to create seal in patient trachea. Necessary for patients requiring mechanical ventilation. There is a ET tube like pilot balloon to verify cuff patency once placed in the tracheal stoma. Select devices may be filled with saline rather than air, this is device specific. Nearly all will be filled with air.
- Uncuffed tracheostomy – does not have distal cuff and does not seal in the trachea. This type is used for spontaneously breathing patients who require an alternate airway due to upper airway defect. These patients may be able to speak with the use of special tracheostomies or valves.

**Tracheostomies have 2 essential parts**

- Outer cannula – This is the base that secures in the tracheal stoma. If it is cuffed tracheostomy, the cuff is on this section. There are "wings" that allow for attachment of a tie around the patient's neck. Some recently placed devices may be sutured in place.
- Inner cannula – is removeable for cleaning / replacement. Usually clips or is locked in with a quarter turn detent.

**Management of tracheostomy patients**

- Have suction equipment on hand throughout all phases of treatment and transport suction to maintain patency as required.
- If a tracheostomy becomes dislodged and cannot be reinserted, use a ET tube sized to the stoma size.
- If a tracheostomy comes out and can be reinserted or needs changed, utilize a bougie (tube changer) if available to insert into stoma and "railroad" the tracheostomy over the bougie into place.
- Check all cuffed tracheostomy cuffs for patency, add additional air if an air leak can be appreciated around stoma.
- If a tracheostomy patient cannot be bagged effectively, suspect mucous plug. Alternate trachea lavage with saline, suction, and bagging until resolved.
- If a tracheostomy patient presents with increased work of breathing, remove, and inspect inner cannula.
- Pediatric tracheostomies may not have inner cannulas due to their size
- Take an extra tracheostomy kit or inner cannula with you during transport if available at pickup location
- Patients and their care givers are frequently very adept at managing these devices, utilize them as a resource.
- See procedures section for stoma and tracheostomy care procedures

## KEY POINTS

- **$EtCO_2$ measurement is mandatory with all methods of intubation. Document results of $SpO_2$.**
- **Limit intubation attempts to 2 per patient max.**
- **BVM and oral airway is acceptable means of airway control and ventilation during prehospital care.**
- If unable to intubate, continue BVM ventilations, transport rapidly, and **notify receiving hospital early.**
- Provide Spinal Motion Restriction for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic - use oxygen, not a paper bag.
- Continuous pulse oximetry should be utilized in all patients with inadequate respiratory function.
- Consider c-collar to help maintain ETT placement for all intubated patients.

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

PEDIATRIC PROTOCOL

# FOREIGN BODY AIRWAY OBSTRUCTION (FBAO)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

## Infant (0 – 12 months)

Head Tilt / Chin Lift / Jaw Thrust / Airway Maneuvers

Coughing Conscious

OXYGEN
10 – 15 L Infant Mask
as tolerated

Complete Obstruction
Conscious

5 Back Blows / 5 Chest thrusts

Complete Obstruction
Unconscious

Visualize
Finger Sweep
(Only if visualized / attainable)

Consider use of
Laryngoscope / Magill Forceps

Open airway / ventilate
(May reposition and repeat)

Chest Compressions / CPR

If unable to ventilate,
repeat / continue sequence

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

## Child (1 – 8 years)

Head Tilt / Chin Lift / Jaw Thrust / Airway Maneuvers

Coughing Conscious

Encourage patient to cough

OXYGEN
10 – 15 LPM Pediatric Mask
as tolerated

Complete Obstruction
Conscious

Abdominal Thrusts

Complete Obstruction
Unconscious

Visualize
Finger Sweep
(Only if visualized / attainable)

Consider use of
Laryngoscope / Magill Forceps

Open airway / ventilate
(May reposition and repeat)

Chest Compressions / CPR

If unable to ventilate,
repeat / continue sequence

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# FOREIGN BODY AIRWAY OBSTRUCTION (FBAO)



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Coughing<br>• Choking<br>• Inability to speak<br>• Unresponsive | • Witnessed aspiration<br>• Sudden episode of choking<br>• Audible stridor<br>• Change in skin color<br>• Decreased LOC<br>• Increased / decreased Respiratory rate<br>• Labored breathing<br>• Unproductive cough | • Cardiac arrest<br>• Respiratory arrest<br>• Anaphylaxis |

| KEY POINTS |
|---|
| • Infants 0 -12 months DO NOT receive abdominal thrusts. Use chest thrusts.<br>• NEVER perform blind finger sweeps in infants or children.<br>• Attempt to clear the airway should only be made if foreign body aspiration is witnessed or very strongly suspected and there is complete airway obstruction.<br>• Even with a complete airway obstruction, positive-pressure ventilation is often successful. |

PEDIATRIC PROTOCOL

# RESPIRATORY DISTRESS UPPER AIRWAY - CROUP

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

IF WHEEZING GO TO RESPIRATORY DISTRESS LOWER AIRWAY PROTOCOL

Calm Patient
Position Patient in Position of Comfort
Do not Lay Patient Down
Do Not Perform Digital Airway Exam

PULSE OXIMETERY PROCEDURE – Administer $O_2$

CARDIAC MONITOR

These patients present with "Seal Bark Cough" or Stridor. If Patient is wheezing, it is a lower airway etiology and should be treated by the Respiratory Distress Lower Airway Protocol

## Mild Distress

Nebulized Normal Saline throughout transport

## Moderate / Severe Distress - Stridor at Rest

RACEMIC EPINEPHRINE
Unit Dose (2.25% 0.5ml) mixed in 3ml of Normal Saline
Nebulized – No Repeat

STOP NOT for Foreign Body Airway Obstructions

⚠ If Racemic Epinephrine is unavailable, see medication section for aerosol Epinephrine 1mg / ml

methylPREDNISolone
2 mg / kg – IV / IO / IM
No Repeat - Max dose 125 mg

**TRANSPORT to appropriate facility CONTACT receiving facility CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# RESPIRATORY DISTRESS UPPER AIRWAY - CROUP



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL |
|---|---|---|
| • Time of onset<br>• Possibility of foreign body<br>• Medical history<br>• Medications<br>• Fever or respiratory infection<br>• Other sick siblings<br>• History of trauma | • Anxious appearance<br>• Barking cough<br>• Stridor<br>• Gagging<br>• Drooling<br>• Inability to swallow<br>• Increased respiratory effort | • Asthma<br>• Aspiration<br>• Foreign body<br>• Infection<br>• Pneumonia<br>• Epiglottitis<br>• Congenital heart disease<br>• Medication or toxin<br>• Trauma |

## KEY POINTS

- **Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- CONSIDER FOREIGN BODY AIRWAY OBSTRUCTION
- Do not force a child into a position. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control.
- **Croup** typically affects children < 2 years of age. It is viral, possible fever, gradual onset, no drooling is noted.
- **Epiglottitis** is rare and typically affects children > 2 years of age. Patients will appear very sick. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, and drooling is common. Airway manipulation may worsen the condition. DO NOT attempt invasive procedures on the conscious patient who is suspected to have epiglottis.
- DO NOT attempt an invasive airway procedure unless the patient is in respiratory arrest.
- Tracheitis presents in a similar manner to epiglottitis and the patient will also appear very sick.
- **Stridor**, gagging or choking in the breathing patient with respiratory distress may indicate upper airway obstruction.
- **Wheezing** in the breathing patient with respiratory distress indicates lower airway disease, which may come from a variety of causes. The patient with severe lower airway disease may have altered LOC, be unable to talk, may have absent or markedly decreased breath sounds and severe retractions with accessory muscle use.
- If the patient has signs of respiratory failure, begin to assist ventilations with BVM, even when they are breathing.

PEDIATRIC PROTOCOL

# RESPIRATORY DISTRESS LOWER AIRWAY

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

PULSE OXIMETERY PROCEDURE – Administer $O_2$

CAPNOGRAPHY PROCEDURE

CARDIAC MONITOR

Respiratory Failure?

If the patient presents with stridor, or a "seal bark cough", it is a upper airway etiology and should be treated by the Respiratory Distress Upper Airway – Croup Protocol

Patients under 2 years with no history of asthma
CONSIDER BRONCHIOLITIS
Treat with OXYGEN
Bronchodilators ineffective

Yes → Pediatric Airway Protocol

No → Position to Patient Comfort

## Mild

ALBUTEROL
Nebulized Unit Dose 2.5 mg
STOP EMT may administer only with proper training or ONLINE Medical Control

If Repeat Treatment Required

ALBUTEROL / IPRATROPIUM
Nebulized Unit Dose
May Repeat x1 if required
STOP EMT may administer only with proper training or ONLINE Medical Control

## Moderate / Severe

ALBUTEROL / IPRATROPIUM
Nebulized Unit Dose
q 10 min up to 3 doses
STOP EMT may administer only with proper training or ONLINE Medical Control

**If evidence of poor air exchange**
EPINEPHrine
0.01 mg / kg IM of
1 mg / ml Concentration
q 5 min prn - Max dose 0.5 mg

IV PROCEDURE
Attempt only if severe respiratory distress

methylPREDNISolone
2 mg / kg IV / IO / IM / PO
No Repeat - Max Dose 125 mg

Consider
MAGNESIUM SULFATE
50 mg / kg IV / IO - 2 grams Max
IV over 20 mins

**TRANSPORT** to appropriate facility **CONTACT** receiving facility
**CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# RESPIRATORY DISTRESS LOWER AIRWAY



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL |
|---|---|---|
| • Time of onset<br>• Possibility of foreign body<br>• Medical history<br>• Medications<br>• Fever or respiratory infection<br>• Other sick siblings<br>• History of trauma | • Wheezing or stridor<br>• Respiratory retractions<br>• Increased heart rate<br>• Altered level of consciousness<br>• Anxious appearance | • Asthma<br>• Aspiration<br>• Foreign body<br>• Infection<br>• Pneumonia<br>• Croup<br>• Epiglottitis<br>• Congenital heart disease<br>• Medication or toxin<br>• Trauma |

## KEY POINTS

- **Exam: Mental Status, HEENT, Skin, Neck, Heart, Lungs, Abdomen, Extremities, Neuro**
- Do not force a child into a position. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control.
- DO NOT attempt an invasive airway procedure unless the patient is in respiratory arrest.
- For some patients in severe respiratory distress, wheezing may not be heard.
- Use Albuterol and Ipratropium for the known asthmatic in severe respiratory distress.
- Stridor, gagging or choking in the breathing patient with respiratory distress may indicate upper airway obstruction.
- Wheezing in the breathing patient with respiratory distress indicates lower airway disease, which may come from a variety of causes. The patient with severe lower airway disease may have altered LOC, be unable to talk, may have absent or markedly decreased breath sounds and severe retractions with accessory muscle use.
- If the patient has signs of respiratory failure, begin to assist ventilations with BVM, even when they are breathing.

PEDIATRIC PROTOCOL

# TRAUMATIC BREATHING

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL
Evidence of Trauma – Blunt or Penetrating
Abnormal breath sounds, inadequate respiratory rate, unequal symmetry, diminished chest excursion, cyanosis

Identify Treatable Causes

Jaw Thrust Airway Maneuver
Give High Flow Oxygen

**Sucking Chest Wound**
Apply 3-sided Occlusive Dressing or Commercial Chest Seal

**Flail Chest**
Assist with Ventilation – Gentle Positive Pressure

**Penetrating Object**
Immobilize Object
Apply Sterile Saline Dressing

If S&S of Tension Pneumothorax
(No lung sounds on affected side, Hypotension, JVD)
TRAUMATIC NEEDLE CHEST DECOMPRESSION PROCEDURE
⚠ Be Prepared to Repeat *IF* S&S Return

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

**KEY POINTS**

- These injuries involve the airway and are life-threatening.
- Do not become distracted by non-life-threatening injuries that appear terrible.
- A **sucking chest wound** is when the thorax is open to the outside. The occlusive dressing may be anything such as petroleum gauze, plastic, or a defibrillator pad. Tape only 3 sides down so that excess intrathoracic pressure can escape, preventing a tension pneumothorax. It may help respirations to place patient on the injured side, allowing unaffected lung to expand easier.
- A **flail chest** is when there are extensive rib fractures present, causing a loose segment of the chest wall resulting in paradoxical and ineffective air movement. Positive pressure breathing via BVM will help push the segment and the normal chest wall out with inhalation and to move inward together with exhalation, getting them working together again. Do not use too much pressure, as to prevent additional damage or pneumothorax.
- A **penetrating object** must be immobilized by any means possible. If it is very large, cutting may be possible, with care taken to not move it while making the cut. Place an occlusive & bulky dressing over the entry wound.
- A **tension pneumothorax** is life threatening, look for *HYPOTENSION*, unequal breath sounds, JVD, increasing respiratory distress, and decreasing mental status. The pleura must be decompressed with a needle to provide relief. Use the intercostal space between the 2nd and 3rd ribs on the midclavicular line, going in on the top side of the 3rd rib. Alternate site, 5th intercostal space mid axillary or anterior axillary line. Once the catheter is placed, watch closely for re-occlusion. Be prepared to repeat decompression if signs of tension pneumothorax return. Use a 18-14-gauge needle, length based on the patient.

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# SECTION 8 - PEDIATRIC CIRCULATION / SHOCK

Pediatric Shock Guidelines ..... 2-8
Pediatric Anaphylactic Shock / Reaction ..... 4-8
Pediatric Cardiogenic Shock ..... 5-8
Pediatric Hypovolemic Shock ..... 5-8
Pediatric Neurogenic Shock ..... 5-8
Pediatric Septic Shock ..... 5-8

PEDIATRIC PROTOCOL

# SHOCK

| TYPES OF SHOCK | SIGNS AND SYMPTOMS |
|---|---|
| CARDIOGENIC SHOCK | • Hypotension<br>• Difficulty breathing<br>• Cool, clammy skin<br>• Weakness |
| HYPOVOLEMIC SHOCK | • Tachycardia<br>• Weak, thready pulse<br>• Hypotension with narrow pulse pressure<br>• Hypotension or falling systolic BP<br>• Pale skin<br>• Clammy or dry skin<br>• Dyspnea<br>• Altered LOC / coma<br>• Decreased urine output<br>• Restlessness<br>• Irritability<br>• Decreased urine output |
| ANAPHYLACTIC SHOCK (Distributive Shock) | • Hypotension<br>• Severe respiratory distress<br>• Shock<br>• Dyspnea<br>• Wheezing<br>• Hoarseness / stridor<br>• Cyanosis<br>• Facial / airway edema<br>• Urticaria / hives<br>• Warm burning feeling<br>• Itching<br>• Rhinorrhea<br>• Altered LOC / coma<br>• Pulmonary edema |
| NEUROGENIC SHOCK (Distributive Shock) | • Hypotension with a narrow pulse pressure<br>• Evidence of trauma (lacerations, bruising, swelling, deformity)<br>• Normal or bradycardic HR<br>• Compromise in neurological function<br>• Normal or flushed skin color |
| SEPTIC SHOCK (Distributive Shock) | • Hypotension with a narrow pulse pressure<br>• Dyspnea<br>• Febrile<br>• Tachycardia<br>• Signs of infection<br>• History of UTI<br>• Hypovolemia (Fever, Sweating)<br>• Dehydration<br>• Altered LOC / coma |
| OBSTRUCTIVE SHOCK | • Obstruction that interferes with preload / afterload<br>• Commonly caused by tension pneumothorax / pulmonary embolism<br>• Hypotension<br>• Chest pain<br>• Hypoxia<br>• Absent lung sounds (tension pneumothorax)<br>• Present lung sounds (pulmonary embolism) |

PEDIATRIC PROTOCOL

# SHOCK

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Blood loss<br>• Fluid loss<br>• Vomiting<br>• Diarrhea<br>• Fever<br>• Infection | • Restlessness, confusion, weakness<br>• Dizziness<br>• Increased HR, rapid pulse<br>• Decreased BP<br>• Pale, cool, clammy skin<br>• Delayed capillary refill | • Trauma<br>• Infection<br>• Dehydration<br>• Vomiting<br>• Diarrhea<br>• Fever<br>• Congenital heart disease<br>• Medication or toxin |

## ALLERGIC REACTION / ANAPHYLAXIS

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Onset and location<br>• Insect sting or bite<br>• Food allergy / exposure<br>• Medication allergy / exposure<br>• New clothing, soap, detergent<br>• History of reactions<br>• Past medical history<br>• Medication history | • Warm burning feeling<br>• Itching<br>• Rhinorrhea<br>• Hoarseness<br>• Stridor<br>• Wheezing<br>• Respiratory distress<br>• Altered LOC / coma<br>• Cyanosis<br>• Pulmonary edema<br>• Facial / airway edema<br>• Urticaria / hives<br>• Dyspnea | • Urticaria (rash only)<br>• Anaphylaxis (systemic effect)<br>• Shock (vascular effect)<br>• Angioedema (drug induced)<br>• Aspiration / airway obstruction<br>• Vasovagal event<br>• Asthma |

**Do Not Confuse Epinephrine 1 mg / ml and 0.1 mg / ml**

**Fluid Resuscitate IF HYPOTENSIVE to systolic of 70 + 2 x age**

## KEY POINTS

- **Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- Consider all possible causes of shock and treat per appropriate protocol.
- Decreasing heart rate is a sign of impending collapse.
- Most maternal medications pass through breast milk to the infant. Examples: Narcotics, Benzodiazepines.
- Be sure to use the appropriately sized BP cuff.
- Findings in the primary assessment should alert you that the patient is in shock. Pay attention to the patient's mental status, tachycardia, skin color, and capillary refill.
- Shock is not only caused by blood loss. The provider must evaluate for fluid loss from other causes. such as excessive vomiting and / or diarrhea, heat exposure and malnutrition.
- Do not use only the patient's blood pressure in evaluating shock; also look for lower body temperature, poor capillary refill, decreased LOC, increased heart rate and / or poor skin color or turgor.
- Routinely reassess the patient and provide supportive care.

**Addisonian Crisis / Adrenal Crisis**

- Not a field diagnosis. Patient / family / historian should be aware of diagnosis. They are coached to make sure the patient gets IV steroids emergently. May have their own prescribed injectable steroids for EMS to administer. Check for medical alert tags / bracelet.
- Presents with Dehydration and/or severe vomiting and diarrhea stabbing pain in the abdomen, low back, or legs, low blood pressure (shock), low blood sugar, loss of consciousness.
- Emergent steroid administration in addition to other standard resuscitation techniques. (ex. BGL correction and fluid resuscitation). Use patient supplied steroids before EMS supplied if available.

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

PEDIATRIC PROTOCOL

# ANAPHYLACTIC REACTION / SHOCK

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

OXYGEN

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

Apply Cardiac Monitor and Assess Vitals

***DO NOT CONFUSE***

**EPINEPHrine**

| | |
|---|---|
| **1mg / ml (1000 mcg / ml)** | **1:1000 IM Epi** |
| **0.1 mg / ml (100 mcg / ml)** | **1:10,000 Cardiac Epi** |
| **10 mcg / ml** | **Push Dose Epi** |

## Mild

Rash, itching,
**No** difficulty breathing or throat tightening,
B/P – normal limits

diphenhydrAMINE
1 mg / kg
slow IV / IM / IO
No Repeat
Max Dose 50 mg

EMT Consider - If history of severe reaction
EPINEPHrine
**≤ 30 kg (66 lbs)**
0.15 mg IM or
AUTO-INJECTOR JR
**> 30 kg (66 lbs)**
0.3 mg IM or
AUTO-INJECTOR
q 5 min prn
STOP EMT may draw and administer IM only with proper training

Consider - If history of severe reaction
EPINEPHrine
1 mg / ml Concentration
0.01 mg / kg IM
q 5 min prn - Max Dose 0.5 mg
STOP Never Given IV

## Moderate / Severe

Radial Pulses Present
**Rash, itching,**
**Airway compromise,**
**Wheezing, Swelling,**
**GI Symptoms**
Hypotension

EMT EPINEPHrine
**≤ 30 kg (66 lbs)**
0.15 mg IM or
AUTO-INJECTOR JR
**> 30 kg (66 lbs)**
0.3 mg IM or
AUTO-INJECTOR
q 5 min prn
STOP EMT may draw and administer IM only with proper training

EPINEPHrine
1 mg / ml Concentration
0.01 mg / kg IM
q 5 min prn - Max Dose 0.5 mg
STOP Never Given IV

diphenhydrAMINE
1 mg / kg
slow IV / IM / IO
No Repeat - Max Dose 50 mg

ALBUTEROL
Nebulized Unit Dose 2.5 mg
STOP EMT use only with ONLINE Medical Control

IV NORMAL SALINE BOLUS
10 - 20 ml / kg
May Repeat up to 3 times as required

Consider repeat IM EPINEPHrine after 5 min. if no improvement

methylPREDNISolone
2 mg / kg - IV / IO / IM
No Repeat - Max Dose 125 mg

## Impending Arrest
Anaphylactic Shock

**NO Radial Pulses**
**Severe Hypotension**
**Any AGE**
Decreased LOC
Airway compromise

Secure Airway and Ventilate

Double Check

EPINEPHrine
0.01 mg / kg IV / IO
**0.1 mg / ml (100 mcg / ml)**
Concentration
q 5 min prn - Max Dose 0.5 mg

If ONLY AEMT Available
EPINEPHrine
1 mg / ml Concentration
0.01 mg / kg IM
q 5 min prn - Max Dose 0.5 mg

IF ONLY EMT Available
EPINEPHrine
**≤ 30 kg (66 lbs)**
0.15 mg IM or
AUTO-INJECTOR JR
**> 30 kg (66 lbs)**
0.3 mg IM or
AUTO-INJECTOR
q 5 min prn
STOP EMT may draw and administer IM only with proper training

diphenhydrAMINE
1 mg / kg
slow IV / IM / IO
No Repeat - Max Dose 50 mg

IV NORMAL SALINE BOLUS
10 - 20 ml / kg
May Repeat up to 3 times as required

methylPREDNISolone
2 mg / kg - IV / IO / IM
No Repeat - Max Dose 125 mg

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPOVOLEMIC, NEUROGENIC, CARDIOGENIC, AND SEPTIC SHOCK

| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
|---|---|---|---|---|---|---|---|---|
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

***DO NOT CONFUSE***

**EPINEPHrine**

| | |
|---|---|
| **1mg / ml (1000 mcg / ml)** | **1:1000 IM Epi** |
| **0.1 mg / ml (100 mcg / ml)** | **1:10,000 Cardiac Epi** |
| **10 mcg / ml** | **Push Dose Epi** |

UNIVERSAL PATIENT CARE PROTOCOL

AIRWAY PROTOCOL
Monitor Lung Sounds for Fluid Overload

OXYGEN

IV / IO PROCEDURE

Apply Cardiac Monitor and Assess Vitals

CAPNOGRAPHY PROCEDURE

Adrenal / Addisonian Crisis
**History of Condition with dehydration, severe vomiting and diarrhea, loss of consciousness, low blood pressure, and / or stabbing pain in the abdomen, low back, or legs.**
**EMS PERMITTTED TO GIVE PATIENT PRESCRIBED IV STERIODS IF AVAILABLE (Preferred)**
Only if unavailable,
methylPREDISolone
2 mg / kg IV / IM / PO

## Hypovolemic Shock

IV NORMAL SALINE BOLUS
10 - 20 ml / kg
May Repeat up to 3 times as required

BLOOD GLUCOSE PROCEDURE

Treatment per Appropriate Trauma Protocol If Indicated

## Cardiogenic Shock

IV NORMAL SALINE BOLUS
10 ml / kg
max 500 ml

BLOOD GLUCOSE PROCEDURE

Contact Medical Control for the use of vasopressors if failed fluid bolus
EPINEPHrine
PUSH DOSE
Make 10 mcg / ml

1 mcg / kg
Max Dose 10 mcg
2 - 5 min - slow push
Titrate to effect

## Neurogenic Shock

Consider
SPINAL MOTION RESTRICTION PROCEDURE

IV NORMAL SALINE BOLUS
10 - 20 ml / kg
May Repeat up to 3 times as required

BLOOD GLUCOSE PROCEDURE

Contact Medical Control for the use of vasopressors if failed fluid bolus
EPINEPHrine
PUSH DOSE
Make 10 mcg / ml

1 mcg / kg
Max Dose 10 mcg
2 - 5 min - slow push
Titrate to effect

## Septic Shock

IV NORMAL SALINE BOLUS
10 - 20 ml / kg
May Repeat up to 3 times as required

BLOOD GLUCOSE PROCEDURE

Contact Medical Control for the use of vasopressors if failed fluid bolus
EPINEPHrine
PUSH DOSE
Make 10 mcg / ml

1 mcg / kg
Max Dose 10 mcg
2 - 5 min - slow push
Titrate to effect

methylPREDNISolone (SOLU-MEDROL)
2 mg / kg IV / IO / IM / PO
No Repeat - Max Dose 125 mg

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

# HYPOVOLEMIC, NEUROGENIC, CARDIOGENIC, AND SEPTIC SHOCK

## SIRS Checklist

| Clinical Findings | History |
|---|---|
| Temp > 38.3C (100.9F) or < 36C (96.8F)<br>Heart Rate > 90 BPM<br>Respiratory Rate > 20 BPM ***or***<br>Capnography < 32 mmHg<br>Altered Mental Status<br>SBP <90 or MAP <70<br>Need for CPAP | Pneumonia<br>Urinary Tract Infection<br>Cellulitis<br>Septic Arthritis<br>Diarrhea<br>ABD pain<br>Wound Infection<br>Decubitus Ulcer<br>Indwelling Catheter or Device<br>Fever<br>Decreased urine output last 8 hours<br>Prolonged bleeding |

## Severe Sepsis Checklist

Clinical Findings (Present and *NEW* to Patient)

SBP < 90
$SpO_2$ < 90
No Urine Output last 8 Hours
Prolonged bleeding from gums
Lactate ≥ 4

**Push Dose EPINEPHrine Preparation**
**Mix 1 mg EPINEPHrine of 1mg / ml in 100 ml of D5 or Normal Saline**
***This makes 10 mcg / ml concentration***
**Shake bag well to mix**
**Draw from bag and administer**

Label bag and syringe
Administer 1 mcg / kg
Max 10 mcg (1 ml) per dose

# SECTION 9 - PEDIATRIC CARDIAC

Pediatric Asystole / Pulseless Electrical Activity (PEA).....2-9
Pediatric Bradycardia .....4-9
Pediatric Narrow Complex Tachycardia (SVT) .....6-9
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Pediatric Hypothermic Cardiac Arrest .....14-9

PEDIATRIC PROTOCOL

# ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

Continuous CPR

PEDIATRIC AIRWAY PROTOCOL

Apply Cardiac Monitor

CAPNOGRAPHY PROCEDURE

Confirm Asystole / PEA

<u>Identify Possible Causes:</u>
Hypoxemia
Acidosis
Hypovolemia
Tension
Pneumothorax
Hypothermia

IV / IO PROCEDURE

EPINEPHrine
0.01 mg / kg IV / IO of
0.1 mg / ml Concentration
Repeat every 3 - 5 minutes
Max 1 mg per dose
STOP Double Check EPI Concentration

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

GO TO PEDICATRIC POST RESUSCITATION CARDIAC CARE PROTOCOL

NORMAL SALINE IV BOLUS
20 ml / kg
Repeat as needed

BLOOD GLUCOSE PROCEDURE

Glucose < 60

DEXTROSE 10%
5 ml / kg IV / IO max 250ml
⚠ If DEXTROSE 10% Is unavailable, see medication section for DEXTROSE 25% or 50%

Continuous CPR

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Time of arrest<br>• Medical history<br>• Medications<br>• Possibility of foreign body<br>• Hypothermia | • Pulseless<br>• Apneic or agonal Respirations<br>• Cyanosis | • Ventricular fibrillation<br>• Pulseless ventricular tachycardia |

| CONSIDER TREATABLE CAUSES | |
|---|---|
| • Hypovolemia<br>• Tension pneumothorax<br>• Myocardial infarction<br>• Drug overdose<br>• Hypothermia<br>• Acidosis | • Cardiac tamponade<br>• Pulmonary embolism<br>• Tricyclic overdose<br>• Hypoxia<br>• Hypoglycemia<br>• Hyperkalemia |

**Do Not Confuse EPINEPhrine 1 mg / ml and 0.1 mg / ml**

**If Dextrose 25% Not Available, Draw 25 ml of Dextrose 50% out of syringe and dilute with additional 25 ml of normal saline**

**Fluid Resuscitate to systolic of 70 + 2 x age**

| KEY POINTS |
|---|
| • **Exam: Mental Status**<br>• Always confirm asystole in more than one lead.<br>• Cardiac arrest in children is primarily due to lack of an adequate airway, resulting in hypoxia.<br>• If the patient converts to another rhythm or has a return of circulation, refer to the appropriate protocol and treat accordingly.<br>• When assessing for a pulse, palpate the brachial or femoral arteries for infants and the carotid or femoral artery for children.<br>• Continue BLS procedures throughout the resuscitation.<br>• If the patient is intubated, be sure to routinely reassess tube placement.<br>• If the patient has an IO, routinely reassess for patency.<br>• Consider atropine when evidence of increase vagal stimulation is present. |

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

PEDIATRIC PROTOCOL

# BRADYCARDIA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

PEDIATRIC AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

Poor perfusion?
Decreased B/P?
Respiratory Insufficiency?

Yes

No

Monitor and Reassess
Other Protocols as Indicated

Any time: Lost pulses follow Pediatric Asystole / PEA Protocol

≤ 8 Years
If Heart Rate < 60
**Start CPR**

If HR unresolved with O2 / Compressions
EPINEPHrine
0.01 mg / kg IV / IO of
0.1 mg / ml Concentration
Repeat every 3 - 5 minutes
Max 1 mg per dose
STOP Double Check EPI Concentration

CONSIDER ATROPINE
0.02 mg / kg IV / IO
repeat every 3 - 5 minutes
Min dose 0.1 mg
Max dose 0.5 mg child
Max dose 1 mg Adolescent

Consider External Transcutaneous Pacing

Monitor and Reassess
Other Protocols as Indicated

> 8 Years
If Heart Rate < 60

If HR unresolved with O2
EPINEPHrine
0.01 mg / kg IV / IO of
0.1 mg / ml Concentration
Repeat every 3 - 5 minutes
Max 1 mg per dose
STOP Double Check EPI Concentration

CONSIDER ATROPINE
0.02 mg / kg IV / IO
repeat every 3 - 5 minutes
Min dose 0.1 mg
Max dose 0.5 mg child
Max dose 1 mg Adolescent

Consider External Transcutaneous Pacing

Monitor and Reassess
Other Protocols as Indicated

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE**

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

PEDIATRIC PROTOCOL

# BRADYCARDIA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Foreign body exposure<br>• Respiratory distress or arrest<br>• Apnea<br>• Possible toxic or poison exposure<br>• Congenital disease<br>• Medication (maternal or infant) | • Hypoxia<br>• Decreased heart rate<br>• Delayed capillary refill or cyanosis<br>• Mottled, cool skin<br>• Hypotension or arrest<br>• Altered level of consciousness<br>• Poor Perfusion<br>• Shock<br>• Short of breath<br>• Pulmonary fluid | • Respiratory effort<br>• Respiratory obstruction<br>• Foreign body / secretions<br>• Croup / epiglottis<br>• Hypovolemia<br>• Hypothermia<br>• Infection / sepsis<br>• Medication or toxin<br>• Hypoglycemia<br>• Trauma |

**Do Not Confuse EPINEPhrine 1 mg / ml and 0.1 mg / ml**

## KEY POINTS

- Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- Heart Rate < 100 (Neonates)
- Heart Rate < 80 (Infants)
- Heart Rate <60 (Children > 2 years)
- Infant = < 1 year of age
- Most maternal medications pass through breast milk to the infant.
- Most pediatric arrests are due to airway problems.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturers' guidelines.
- Identify and treat possible causes for pediatric bradycardia:
  1. Hypoxia
  2. Hypothermia
  3. Head injury
  4. Heart block
  5. Toxic ingestion / exposure
- Refer to pediatric reference material when unsure about patient weight, age and / or drug dosage.
- The minimum dose of Atropine that should be administered to a pediatric patient is 0.1 mg.
- If the rhythm changes, follow the appropriate protocol.
- Be sure of all medication doses, look it up in reference material.

PEDIATRIC PROTOCOL

# NARROW – COMPLEX TACHYCARDIA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

If rhythm changes, Go to Appropriate Protocol

UNIVERSAL PATIENT CARE PROTOCOL

Cardiac Monitor
Attempt to Identify Cause

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

## Stable (Signs of Perfusion)
HR > 220 infant / HR >180 child

May attempt Vagal Maneuvers

ADENOSINE
0.1 mg / kg IV / IO Rapid - Followed with flush
Max dose 6 mg
Upper extremity venous access

No response
1 –2 minutes

ADENOSINE
0.2 mg / kg IV Rapid - Followed with flush
Max dose 12 mg – No Repeat

IV Normal Saline Bolus 10 - 20 ml / kg
If signs dehydration or hypoperfusion
Repeat as needed

## Unstable (Signs of Hypoperfusion)
HR > 220 infant / HR >180 child

May go directly to Cardioversion
Administer ADENOSINE
If vascular access already in place

Consider Sedation
MIDAZOLAM 0.05 - 0.1 mg / kg IV / IO
q 5 min prn - Max Dose 2.5 mg
**MIDAZOLAM 0.2 mg / kg IM / IN**
q 5 min prn - Max Dose 5 mg
OR
LORazepam 0.05 mg / kg slow IV / IO / IN
q 10 min prn - Max Dose 2 mg

⚠ Capnography Required

⚠ If Midazolam or LORazepam Unavailable, See Medication Section for Diazepam

SYNCHRONIZED CARDIOVERSION
(0.5 – 1 J / kg)

No response
1 –2 minutes

Repeat SYNCHRONIZED CARDIOVERSION as Needed
(1 – 2 J / kg)

IV Normal Saline Bolus 10 - 20 ml / kg
If signs dehydration or hypoperfusion
Repeat as needed

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# NARROW – COMPLEX TACHYCARDIA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Medications or toxic ingestion (Aminophylline, diet pills, thyroid supplements, decongestants, digoxin)<br>• Drugs (nicotine, cocaine)<br>• Congenital heart disease<br>• Respiratory distress<br>• Syncope or near syncope | • HR: Child > 180/bpm<br>Infant > 220/bpm<br>• Pale or cyanosis<br>• Diaphoresis<br>• Tachypnea<br>• Vomiting<br>• Hypotension<br>• Altered level of consciousness<br>• Pulmonary congestion<br>• Syncope | • Heart disease (congenital)<br>• Hypo / hyperthermia<br>• Hypovolemia or anemia<br>• Electrolyte imbalance<br>• Anxiety / pain / emotional stress<br>• Fever / infection / sepsis<br>• Hypoxia<br>• Hypoglycemia<br>• Medication / toxin / drugs (see HX)<br>• Pulmonary embolus<br>• Trauma<br>• Tension pneumothorax |

**Fluid Resuscitate to systolic of 70 + 2 x age**

## KEY POINTS

- **Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Carefully evaluate the rhythm to distinguish Sinus Tachycardia, Supraventricular Tachycardia, and Ventricular Tachycardia
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric pads should be used in children < 10 kg.
- Monitor for respiratory depression and hypotension associated if LORazepam or midazOLAM is used.
- Continuous pulse oximetry is required for all SVT Patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Possible causes of tachycardia; hypoxia, hypovolemia, fear, fever, and pain.
- A complete medical history must be obtained.
- Do not delay cardioversion to gain vascular access for the unstable patient.
- If you are unable to get the monitor to select a low enough joule setting, contact Online Medical Control.
- If the patient is stable, do not cardiovert.
- Record 3-Lead EKG strips during adenosine administration.
- Perform a diagnostic EKG prior to and after Adenosine conversion or cardioversion of SVT.
- If the rhythm changes, follow the appropriate protocol.

PEDIATRIC PROTOCOL

# POST – RESUSCITATION CARDIAC CARE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

Continue Ventilatory Support with 100% OXYGEN

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

DIAGNOSTIC EKG PROCEDURE

Vital Signs

Treat fever with cooling measures

Bradycardia

Hypotension

Electrical Conversion
(NO anti-arrhythmic already given during resuscitation)

Anti-Arrhythmic Conversion

Treat per BRADYCARDIA PROTOCOL

IV NORMAL SALINE BOLUS
20 ml / kg

Contact Medical Control for the use of vasopressors if failed fluid bolus
EPINEPHrine
PUSH DOSE
Make 10 mcg / ml

1 mcg / kg
Max Dose 10 mcg
2 - 5 min - slow push
Titrate to effect

Supportive Care Only
No anti-arrhythmic administered

No Post Arrest Anti-Arrhythmic Administered

If arrest reoccurs, revert to appropriate protocol and / or initial successful treatment

**TRANSPORT** to appropriate PEDIATRIC facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# POST – RESUSCITATION CARDIAC CARE

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Respiratory arrest<br>• Cardiac arrest | • Return of pulse | • Continue to address specific differentials associated with the original dysrhythmia |



| KEY POINTS |
|---|
| • Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neuro<br>• Most patients immediately post resuscitation will require ventilatory assistance.<br>• The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring.<br>• Appropriate post-resuscitation management can best be planned in consultation with Online Medical Control.<br>• This is the period of time between restoration of spontaneous circulation and the transfer of care at the emergency department. The focus is aimed at optimizing oxygenation and perfusion.<br>• Post resuscitation SVT should initially be left alone, but routinely monitor the patient. Follow Pediatric NARROW COMPLEX TACHYCARDIA PROTOCOL or contact Medical Control.<br>• If the patient is profoundly bradycardic, refer to the Pediatric BRADYCARDIA PROTOCOL and treat accordingly.<br>• Only administer oxygen if the patient is hypoxic with a $SpO_2$ of 94 or less. Do not withhold oxygen from patients that are short of breath regardless of $SpO_2$. |

PEDIATRIC PROTOCOL

# VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA

| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
|---|---|---|---|---|---|---|---|---|
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

Initiate Prompt CPR

Apply Cardiac Monitor / AED

Defibrillate 2 J / kg not to exceed adult dose or AED → Confirm V-Fib / Pulseless V-Tach

PEDIATRIC AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

CPR X 5 cycles / 2 minutes

IV / IO PROCEDURE

Defibrillate 4 J / kg not to exceed adult dose or AED

EPINEPHrine
0.01 mg / kg IV / IO
0.1 mg / ml Concentration
Repeat every 3 - 5 minutes
Max dose 1 mg per dose
STOP Double Check EPI Concentration

CPR X 5 cycles / 2 minutes

Defibrillate 4 J / kg not to exceed adult dose or AED

AMIODARONE
5 mg / kg IV / IO – May Repeat up to 3 total doses
Max dose 300 mg
⚠ If Amiodarone Unavailable, See Medication Section for Lidocaine

CPR X 5 cycles / 2 minutes

Defibrillate 4 J / kg not to exceed adult dose or AED
May consider up to 10 J / kg not to exceed adult dose

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

Identify Possible Causes:
Hypoxemia
Acidosis
Hypovolemia
Tension
Pneumothorax
Hypothermia

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

GO TO PEDICATRIC POST RESUSCITATION CARDIAC CARE PROTOCOL

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Time of arrest<br>• Medical history<br>• Medications<br>• Possibility of foreign body<br>• Hypothermia | • Unresponsive<br>• Cardiac arrest | • Respiratory failure<br>• Foreign body<br>• Secretions<br>• Infection (croup, epiglottitis)<br>• Hypovolemia (dehydration)<br>• Congenital heart disease<br>• Trauma<br>• Tension pneumothorax<br>• Hypothermia<br>• Toxin or medication<br>• Hypoglycemia<br>• Acidosis |

**Do Not Confuse EPINEPHrine 1 mg / ml and 0.1 mg / ml**

| KEY POINTS |
|---|
| • **Exam: Mental Status**<br>• Monophasic and Biphasic waveform defibrillators should use the same energy levels noted.<br>• In order to be successful in pediatric arrests, a cause must be identified and corrected.<br>• Airway is the most important intervention. This should be accomplished immediately. Patient survival is often dependent on airway management success.<br>• If the patient converts to another rhythm, follow the appropriate protocol and treat accordingly.<br>• If the patient converts back to ventricular fibrillation or pulseless ventricular tachycardia, defibrillate at the previously used setting.<br>• Defibrillation is the definitive therapy for ventricular fibrillation and pulseless ventricular tachycardia.<br>• Defibrillate 30 - 60 seconds after each medication administration.<br>• The proper administration sequence is CPR (continuous), shock, drug, shock, drug. |

PEDIATRIC PROTOCOL

# WIDE – COMPLEX TACHYCARDIA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

Cardiac Monitor
Attempt to Identify Cause

If rhythm changes, Go to Appropriate Protocol

CAPNOGRAPHY PROCEDURE

IV / IO PROCEDURE

**Stable (Signs of Perfusion)**
HR > 220 infant / HR >180 child

May attempt Vagal Maneuvers

AMIODARONE
5 mg / kg IV / IO
Mix in 100 ml D5 - Over 20 – 60 min
Max dose 300 mg

⚠ If Amiodarone Unavailable, See Medication Section for Lidocaine

No response
1 –2 minutes

IV Normal Saline Bolus 20 ml / kg
If signs dehydration / hypoperfusion
May Repeat up to 3 times as required

**Unstable (Signs of Hypoperfusion)**
HR > 220 infant / HR >180 child

May go directly to Synchronized CARDIOVERSION

Consider Sedation
MIDAZOLAM 0.05 - 0.1 mg / kg IV / IO
q 5 min prn - Max Dose 2.5 mg
**MIDAZOLAM 0.2 mg / kg IM / IN**
q 5 min prn - Max Dose 5 mg
OR
LORazepam 0.05 mg / kg slow IV / IO / IN
q 10 min prn - Max Dose 2 mg

⚠ Capnography Required

⚠ If Midazolam or LORazepam Unavailable, See Medication Section for Diazepam

SYNCHRONIZED CARDIOVERSION
(0.5 – 1 J / kg)

No response
1 –2 minutes

Repeat SYNCHRONIZED CARDIOVERSION as Needed
(1 – 2 J / kg)

IV Normal Saline Bolus 20 ml / kg
If signs dehydration / hypoperfusion
May Repeat up to 3 times as required

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# WIDE – COMPLEX TACHYCARDIA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Medications or toxic ingestion (Aminophylline, diet pills, thyroid supplements, decongestants, digoxin)<br>• Drugs (nicotine, cocaine)<br>• Congenital heart disease<br>• Respiratory distress<br>• Syncope or near syncope | • HR: Child > 180/bpm<br>Infant > 220/bpm<br>• Pale or cyanosis<br>• Diaphoresis<br>• Tachypnea<br>• Vomiting<br>• Hypotension<br>• Altered level of consciousness<br>• Pulmonary congestion<br>• Syncope | • Heart disease (congenital)<br>• Hypo / hyperthermia<br>• Hypovolemia or anemia<br>• Electrolyte imbalance<br>• Anxiety / pain / emotional stress<br>• Fever / infection / sepsis<br>• Hypoxia<br>• Hypoglycemia<br>• Medication / toxin / drugs (see HX)<br>• Pulmonary embolus<br>• Trauma<br>• Tension pneumothorax |

**Fluid Resuscitate to systolic of 70 + 2 x age**

## KEY POINTS

- **Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Carefully evaluate the rhythm to distinguish Sinus Tachycardia, Supraventricular Tachycardia, and Ventricular Tachycardia
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric paddles should be used in children < 10 kg.
- Monitor for respiratory depression and hypotension associated if LORazepam or MIDAZOLAM is used.
- Continuous pulse oximetry is required for all SVT Patients if available.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Possible causes of tachycardia; hypoxia, hypovolemia, fear, and pain.
- A complete medical history must be obtained.
- Do not delay cardioversion to gain vascular access for the unstable patient.
- If you are unable to get the monitor to select a low enough joule setting, contact Online Medical Control.
- If the patient is stable, do not cardiovert.
- Record 3-Lead EKG strips during adenosine administration.
- Perform a diagnostic EKG prior to and after medication conversion or cardioversion of SVT.
- If the rhythm changes, follow the appropriate protocol.

PEDIATRIC PROTOCOL

# HYPOTHERMIC CARDIAC ARREST

UNIVERSAL PATIENT CARE PROTOCOL
Ventilate half standard rate 10-15 breaths / min

**EXPECTED CASE USE FOR THIS PROTOCOL**
Patient is believed to be in cardiac arrest **DUE TO** hypothermia

Begin CPR Immediately
If patient rectal temp is ≥ 30 degrees C (86 degrees F) follow STANDARD CARDIAC ARREST PROTOCOLS

→ Go to Appropriate Protocol

Identify known dialysis patients in asystole, V-Fib or pulseless V-Tach

AT ANY TIME

Return of Spontaneous Circulation (ROSC)

Continue Warming

GO TO POST RESUSCITATION CARDIAC CARE PROTOCOL

If rectal temp is < 30 degrees C (86 degrees F)

Attach Cardiac Monitor
Defibrillator / AED as soon as available

Deliver Shock x 1 if Shockable
Limit to single attempt until warmed
Use highest available Joule setting

IV / IO PROCEDURE

*Warm during arrest*

- Remove wet clothing if applicable, dry and cover patient
- Move to warmed area, increase ambient heat
- Apply heat packs to groin, axilla, and neck
- Consider warmed IV fluids if available

Withold cardioactive medications until temp > ≥ 30 degrees C (86 degrees F)
May give dextrose products

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

**SPECIAL TRANSPORT CONSIDERATIONS**
Consider transport direct to a center capable of emergent ECMO
It is better to transport to a center than can do emergent ECMO even if it is much further away.
All ECPR centers can place patients on ECMO for hypothermia, but some non-ECPR centers can also.
Call medical control to discuss.

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPOTHERMIC CARDIAC ARREST

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Events leading to arrest<br>• Estimated downtime<br>• Past medical history<br>• Medications<br>• Existence of terminal illness<br>• Signs of lividity, rigor mortis<br>• DNR | • Unresponsive<br>• Apneic<br>• Pulseless | • Medical vs. trauma<br>• V-fib vs. pulseless V-tach<br>• Asystole<br>• Pulseless electrical activity (PEA) |

## KEY POINTS

- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe bradycardia.
- Shivering stops below 90° F (32° C).
- Hot packs can be activated and placed in the armpit and groin area if available.
- Care should be taken not to place the packs directly against the patient's skin.
- Consider withholding CPR if patient has organized rhythm. Discuss with Online Medical Control.
- Patients with low core temperatures may not respond to ALS drug interventions. Discuss ACLS drug use with Online Medical Control in severely hypothermic patients.
- Maintain warming procedure and supportive care. Warming procedures includes removing wet clothing, limiting exposure, and covering the patient with warm blankets if available.
- The most common mechanism of death in hypothermia is ventricular fibrillation. If the hypothermia victim is in ventricular fibrillation, CPR should be initiated. If V-FIB is not present, then all treatment and transport decisions should be tempered by the fact that V-FIB can be caused by rough handling, noxious stimuli, or even minor mechanical disturbances, this means that respiratory support with 100% oxygen should be done gently, including intubation, avoiding hyperventilation.
- The heart is most likely to fibrillate between 85 - 88° F (29 - 31° C.) Defibrillate VF / VT x1 if no change, perform CPR and defer repeat defibrillation attempts until patient has been rewarmed.

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# SECTION 10 -PEDIATRIC MEDICAL EMERGENCIES PROTOCOLS

Pediatric Altered Level of Consciousness ..... 2-10
Pediatric Behavioral / Psychiatric Emergencies ..... 4-10
Pediatric Diabetic Emergencies ..... 6-10
Pediatric Hyperkalemia ..... 8-10
Pediatric Hyperthermia / Heat Exposure ..... 10-10
Pediatric Hypothermia / Frostbite ..... 12-10
Pediatric Nausea / Vomiting ..... 14-10
Pediatric Pain Management ..... 16-10
Pediatric Seizure ..... 19-10
Pediatric Syncope / Near Syncope ..... 21-10
Pediatric Toxic Ingestion / Exposure / Overdose ..... 23-10
Pediatric Toxic Ingestion / Exposure / Overdose (Cardio Toxic Medications) ..... 25-10

PEATRIC PROTOCOL

# ALTERED LEVEL OF CONSCIOUSNESS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-37 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

Consider SPINAL MOTION RESTRICTION PROCEDURE

AIRWAY PROTOCOL

DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

OXYGEN / PULSE OXIMETRY PROCEDURE

CAPNOGRAPHY PROCEDURE

BLOOD GLUCOSE PROCEDURE

IV / IO PROCEDURE

Identify Treatable Causes
Treat Per Specific Protocol

- Seizure – Treat per Seizure Protocols
- Hypoxia – Treat per Airway / Breathing Protocols
- Anaphylaxis / Allergic Reaction Protocol
- Sepsis – Treat per Septic Shock Protocol
- Hypotension – Treat per Specific Shock Protocols
- Arrhythmia – Treat per Correct Arrhythmia Protocol
- Psychiatric – Treat per Behavioral Emergencies
- Hypo / Hyperglycemia – Treat per Diabetic Protocol
- Hypo / Hyperthermia – Treat per Specific Protocol
- Stroke CVA / TIA – Treat per Stroke Protocol
- Overdose – Treat per Toxic Ingestion Protocol
- Head Trauma – Treat per Head Trauma Protocol

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# ALTERED LEVEL OF CONSCIOUSNESS



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Known diabetic, medic alert tag<br>• Drugs, drug paraphernalia<br>• Report of illicit drug use or toxic ingestion<br>• Past medical history<br>• Medications<br>• History of trauma | • Unresponsive<br>• Decreased responsiveness<br>• Inadequate respirations<br>• Confusion<br>• Agitation<br>• Decreased mental status<br>• Change in baseline mental status<br>• Hypoglycemia (cool, diaphoretic skin) | • Head trauma<br>• CNS (stroke, tumor, seizure, infection)<br>• Infection<br>• Shock (septic, metabolic, traumatic)<br>• Diabetes (hyper / hypoglycemia)<br>• Toxicologic<br>• Acidosis / alkalosis<br>• Environmental exposure<br>• Pulmonary (Hypoxia)<br>• Electrolyte abnormality<br>• Psychiatric disorder |

## KEY POINTS

- **Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro**
- Be aware of AMS as potential sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Do not let alcohol confuse the clinical picture.
- Low glucose (< 60), normal glucose (60 - 120), high glucose ( > 250).
- Consider restraints if necessary for patient's and / or personnel's protection per the restraint procedure.
- Protect the patient airway and support ABCs.
- Document the patient's Glasgow coma score pre and post treatment.
- Signs and symptoms of narcotic overdose include respiratory depression and altered mental status.
- Naloxone (Narcan) administration may cause the patient to go into acute opiate withdrawal, which includes vomiting, agitation, and / or combative behavior. Always be prepared for combative behavior.
  Naloxone (Narcan) may wear off in as little as 20 minutes causing the patient to become more sedate and possibly hypo ventilate. **Repeat dosing may be necessary**. All A&O 4 patients having received Naloxone (Narcan) should be transported. If patient refuses transport, contact Online Medical Control before release.

**ONLY A FEW CAUSES CAN BE TREATED IN THE FIELD. CARE SHOULD FOCUS ON MAINTAINING AIRWAY AND RAPID TRANSPORT**

PEDIATRIC PROTOCOL

# BEHAVIORAL / PSYCHIATRIC EMERGENCIES

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

**For Use in Psychosis Only**
*NOT For Medical Emergencies Such as Hypoxemia, Sepsis, Seizure, Encephalitis, Hypoglycemia, or Stroke*

If patient is Hyperthermic begin cooling with ice packs in groin and axilla.

SCENE SAFETY
SUMMON LAW ENFORCEMENT

UNIVERSAL PATIENT CARE PROTOCOL

Remove patient from Stressful environment

Verbal techniques
(Reassurance, calm, establish rapport)

BLOOD GLUCOSE PROCEDURE

**Treat Suspected Problems per Appropriate Protocol**
AMS - Overdose - Head Trauma - Hypoglycemia

## Agitation – Not Combative

diphenhydrAMINE
1 mg / kg
slow IV / IM / IO
No Repeat - Max Dose 50 mg

CAPNOGRAPHY PROCEDURE

## Combative – not Violent

Risk to Self or others

RESTRAINT PROCEDURE

MIDAZOLAM
0.05 - 0.1 mg / kg IV / IO
q 5 min prn - Max Dose 2.5 mg
or
0.2 mg / kg IM / IN
q 5 min prn
Max Dose 5 mg
or
LORazepam 0.05 – 0.1 mg / kg slow IV / IO / IN / IM
q 10 min prn - Max Dose 2 mg

CAPNOGRAPHY PROCEDURE Required

## Combative - Violent

***Significant*** Threat to Providers
**Over 50 kg**

RESTRAINT PROCEDURE

KETAMINE
2 mg / kg IM
**USE 100 mg / ml Concentration**
May Repeat 1 mg / kg IM
in 5 Min if NO RESPONSE
Max per dose 250 mg

If Signs of Emergence
After KETAMINE Administer
MIDAZOLAM
0.05 - 0.1 mg / kg IV / IO
q 5 min prn - Max Dose 2.5 mg
or
0.2 mg / kg IM / IN
q 5 min prn
Max Dose 5 mg
or
LORazepam 0.05 – 0.1 mg / kg slow IV / IO / IN / IM
q 10 min prn - Max Dose 2 mg
⚠ Notify receiving Physician Ketamine administered so patient presentation is not misconstrued as other etiology

CAPNOGRAPHY PROCEDURE Required

Constant reassessment of ABC's, personal, and patient safety

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# BEHAVIORAL / PSYCHIATRIC EMERGENCIES

## ALL RESPONDERS SHOULD HAVE A HEIGHTENED AWARENESS OF SCENE SAFETY

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Situational crisis<br>• Psychiatric illness / medications<br>• Injury to self or threats to others<br>• Medic alert tag<br>• Substance abuse / overdose<br>• Diabetes | • Anxiety, agitation, confusion<br>• Affect change, hallucinations<br>• Delusional thoughts, bizarre behavior<br>• Combative violent<br>• Expression of suicidal / homicidal thoughts | • See Altered Mental Status differential diagnosis<br>• Alcohol Intoxication<br>• Toxin / substance abuse<br>• Medication effect / OD<br>• Withdrawal syndromes<br>• Depression<br>• Bipolar (manic-depressive)<br>• Schizophrenia<br>• Anxiety disorders |
| **Agitated – Non-Combative**<br>Patient is experiencing a period of high anxiety seemingly from a psychiatric event not otherwise treatable by EMS who is not a treat to self or others | **Combative – Not Violent**<br>Patient is a treat to self or others and can be controlled and restrained with appropriate help without significant risk to the providers | **Combative – Violent**<br>Patient is in a violent state that puts providers at significant risk despite appropriate help |

**Criteria for Restraint Use:**

- Patient out of control and may cause harm to self or others.
- Necessary force required for patient control without causing harm.
- **Position of patient must not impede airway or breathing.**
- Restraints must not impede circulation.
- Place mask on patient for body secretion protection. May use surgical mask, or Non-rebreather if patient needs oxygen.
- Use supine or lateral positioning ONLY.
- MSP checks are required every 15 min.
- DOCUMENT methods used.
- Medication should be used in conjunction with physical restraint when available.

**Criteria for medication use for combative / violent patients:**

- Patient out of control and may cause harm to self or others.
- Patient is NOT a medical patient (treat underlying causes).
- Medications can be given safely without harm to patient or EMS.
- Use minimum force required for patient control without causing harm.
- **Position of patient must not impede airway or breathing.**
- DOCUMENT methods used.

### RASS (Richmond Agitation Sedation Score)

| | | |
|---|---|---|
| +4 | Combative | Overtly combative, violent, immediate danger to staff |
| +3 | Very Agitated | Pulls or removes tube(s) or catheter(s); aggressive |
| +2 | Agitated | Frequent non-purposeful movement, fights ventilator |
| +1 | Restless | Anxious but movements not aggressive vigorous |
| 0 | Alert and Calm | |
| -1 | Drowsy | Not fully alert, but has sustained awakening (eye-opening/eye contact) to *voice* **(>10 seconds)** |
| -2 | Light Sedation | Briefly awakens with eye contact to *voice* **(<10 seconds)** |
| -3 | Moderate Sedation | Movement or eye opening to *voice* **(but no eye contact)** |
| -4 | Deep Sedation | No response to voice, but movement or eye opening to *physical* stimulation |
| -5 | Unarousable | No response to *voice or physical* stimulation |

| Emergence Symptoms | Extrapyramidal Symptoms (EPS) | Neuroleptic Malignant Syndrome |
|---|---|---|
| Confusion<br>Excitement<br>Irrational Behavior<br>Hallucinations | Involuntary Movements<br>Purposeless Movements<br>Tongue Protrusion - Rapid Eye Blinking<br>Facial Grimacing - Lip Smacking / Puckering | Increased Body Temp > 38C (100.4F)<br>Muscle Rigidity<br>Diaphoresis<br>Altered LOC |

### KEY POINTS

- Exam: Mental Status, Skin, Heart, Lungs, Neuro
- All psychiatric patients must have medical clearance at a hospital ED before transport to a mental health facility.
- Your safety first!!
- Be sure to consider all possible medical / trauma causes for behavior. (Hypoglycemia, overdose, substance abuse, hypoxia, head injury, seizure, etc.)
- Do not irritate the patient with a prolonged exam.
- Do not overlook the possibility of associated domestic violence or child abuse.
- The safety of on scene personnel is the priority. Protect yourself and others by summoning law enforcement to assure everyone's safety and if necessary, to enable you to render care. Do not approach the patient if he / she is armed with a weapon. Once restrained assure that the patient is searched for weapons.
- Consider the medical causes of acute psychosis. Causes may include head trauma, hypoglycemia, acute intoxication, sepsis, CNS insult and hypoxia.
- Suicide ideation or attempts must be transported for evaluation.
- Be alert for rapidly changing behaviors.
- Limit patient stimulation and use de-escalation techniques.
- Handcuffs applied by law enforcement applied to patients **NOT in custody / under arrest** may be switched to soft restraints for transport
- Handcuffs applied by law enforcement to patients **IN custody / under arrest** require a law enforcement officer to remain available to adjust restraints as necessary for the patient's safety. This policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment to establish scene control.
- Consider treatment of agitation / anxiety combativeness for patients requiring restraint procedure.
- Ketamine use in pregnancy is a risk / benefit assessment per case. Consult Medical Control if there are questions.
- Transport to facilities with appropriate police / security

PEDIATRIC PROTOCOL

# DIABETIC EMERGENCIES

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

IV / IO PROCEDURE

BLOOD GLUCOSE PROCEDURE

**Glucose < 60**

ORAL GLUCOSE
7.5 – 18.75 g (1/2 Tube)
Only of alert

May Repeat prn

*OR*

DEXTROSE 10%
5 ml / kg IV / IO max 250 ml

*OR*

If no IV / IO Access
GLUCAGON
< 20 kg 0.5 mg
≥ 20 kg 1 mg
IM
q 15 min prn if no response
Max 2 mg

STOP EMT may administer only with proper training

⚠ Long time to onset of actions

**Glucose > 250**

Check for Hypotension, Tachycardia, Poor Cap Refill

NORMAL SALINE
10 ml / kg Bolus
Over 60 minutes

Recheck Blood Glucose

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# DIABETIC EMERGENCIES



## HYPOGLYCEMIA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Known diabetic, medic alert tag<br>• Past medical history<br>• Medications<br>• Recent BGL | • Altered level of consciousness<br>• Dizziness<br>• Irritability<br>• Diaphoresis<br>• Convulsions<br>• Hunger<br>• Confusion | • ETOH<br>• Toxic overdose<br>• Trauma<br>• Seizure<br>• Syncope<br>• CSN disorder<br>• Stroke<br>• Tumor<br>• Pre-existing condition |

## HYPERGLYCEMIA

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Known diabetic, medic alert tag<br>• Past medical history<br>• Medications<br>• Recent BGL | • Altered level of Consciousness / coma<br>• Abdominal pain<br>• Nausea / vomiting<br>• Dehydration<br>• Frequent thirst and urination<br>• General weakness malaise<br>• Hypovolemic shock<br>• Hyperventilation<br>• Deep / rapid respirations | • ETOH<br>• Toxic overdose<br>• Trauma<br>• Seizure<br>• Syncope<br>• CSN disorder<br>• Stroke<br>• Diabetic ketoacidosis |

**Fluid Resuscitate to systolic of 70 + 2 x age**

### KEY POINTS

**Hyperglycemia:**

- Diabetic Ketoacidosis (DKA) is a complication of diabetes mellitus. It can occur when insulin levels become inadequate to meet the metabolic demands of the body for a prolonged amount of time (onset can be within 12 - 24 hours). Without enough insulin the blood glucose increases, and cellular glucose depletes. The body removes excess blood glucose by dumping it into the urine. Pediatric patients in DKA should be treated as hyperglycemic under the Pediatric Diabetic Emergencies Protocol.
- Patients can have Hyperglycemia without having DKA.

**Hypoglycemia:**

- Always suspect Hypoglycemia in patients with an altered mental status.
- If a blood glucose analysis is not available, a patient with altered mental status and signs and symptoms consistent with hypoglycemia should receive Dextrose, or Glucagon.
    - Dextrose is used to elevate BGL but it will not maintain it. The patient will need to follow up with a meal, if not transported to a hospital.
- If the patient is alert and can swallow; consider administering oral glucose, have patient drink orange juice with sugar or a sugar containing beverage, or have the patient eat a candy bar or meal.
- Check the patient's BGL after the administration of Dextrose, Glucagon, or after any attempt to raise the patient's BGL.

**Miscellaneous:**

- If IV access is successful after Glucagon IM and the patient is still symptomatic, Dextrose should be administered.
- Glucagon unlikely to be useful in malnourished patients.

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

PEDIATRIC PROTOCOL

# HYPERKALEMIA

| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
|---|---|---|---|---|---|---|---|---|
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

Prophylactically apply pacing / defib pads and prepare for decompensation

Pacing may be ineffective until after pharmacologic treatments have been used

Patient has history consistent with hyperkalemia
Available Recent Lab Work
Missed Dialysis
Kidney Failure (Consider Causes - Dehydration, Failure to Thrive)
Burns / Trauma
Uncontrolled Diabetes / Insulin Deficiency
Addison's Disease
Crush Injury / Compartment Syndrome
Medications (K+ Sparing diuretics, ACE inhibitors, Antibiotics, ARB's, NSAIDS, Immunosuppressants)
Excessive Potassium Intake

UNIVERSAL PATIENT CARE PROTOCOL

AIRWAY PROTOCOL
Monitor Lung Sounds for Fluid Overload

OXYGEN

IV / IO PROCEDURE

DIAGNOSTIC EKG PROCEDURE and Assess Vitals

CAPNOGRAPHY PROCEDURE

## EKG CHANGES

Wide Complex QRS or
Peaked T Waves or Bradycardia
*Or any combination of these*
Suspected Hyperkalemia

ALBUTEROL
Serial Albuterol Treatments Only During Entire Transport
10mg (x4 2.5mg Unit Doses)
**ALBUTEROL ONLY – NOT DUONEB**

Flush IV then
CALCIUM GLUCONATE
60 mg / kg - Max 3 grams - Over 10 min
or
CALCIUM CHLORIDE
20 mg / kg IV / IO - Max 1 gram
May repeat either if available and EKG changes reoccur

IV NORMAL SALINE BOLUS
IF SIGNS OF DEHYDRATION AND NO CONTRAINDICATIONS
20 ml / kg
To Maintain MAP > 65
*or SBP 90 if MAP Unavailable or Radial Pulses*

IF EKG WIDE OR BECOMES SINE WAVE

## ONLY IF EKG IS SINE WAVE

TREAT IMMEDIATLY

Flush IV then
CALCIUM GLUCONATE
60 mg / kg - Max 3 grams - Over 10 min
or
CALCIUM CHLORIDE
20 mg / kg IV / IO - Max 1 gram
May repeat either if available and EKG changes reoccur

STOP

DO NOT MIX IN THE SAME LINE AT SAME TIME

Flush IV then
SODIUM BICARBONATE
1 mEq / kg – IV / IO
**May repeat if available and EKG changes reoccur**

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPERKALEMIA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Missed Dialysis<br>• Metabolic acidosis<br>• Addison's disease<br>• Burns<br>• DKA<br>• Dehydration<br>• ACE inhibitor use<br>• Diuretic Use<br>• NSIDS chronic use<br>• Digitalis toxicity<br>• Antibiotic use<br>• ARB use<br>• Kidney failure<br>• Trauma (Crush / Compartment Syndrome)<br>• Immunosuppressant use<br>• Excessive potassium intake | • Peaked T-waves<br>  ○ Narrow and tall<br>  ○ Taller than 5 mm in the limb leads<br>  ○ Taller than 10 mm in the precordial leads<br>• Flattened P-waves<br>  ○ Widening of P-waves prior to their disappearance<br>  ○ The lack of P-waves can result in the appearance of a junctional rhythm<br>• Prolonged PR Interval<br>• Widened QRS complexes<br>• Depressed ST-segment<br>• Sine waves<br>  ○ Broad QRS complex and tall T-wave<br>• AV blocks<br>• Ventricular dysrhythmias<br>  ○ Remember that slower wide rhythms are often common with hyperkalemia—keep this on the list of differentials!<br>• Asystole | • Sinus bradycardia<br>• Wide complex unknown origin rhythms<br>• Bundle branch blocks<br>• Sodium channel blocker OD<br>• Beta Blocker OD<br>• Calcium Channel Blocker OD<br>• STEMI<br>• V-tach |

Stages of hyperkalemia and their potassium lab values:

- Normal potassium levels: 3.5–5.5 mEq/L
- Mild hyperkalemia: 5.5–6.5 mEq/L
- Moderate hyperkalemia: 6.5–8.0 mEq/L
- Severe hyperkalemia: more than 8.0 mEq/L

## KEY POINTS

- A wide, fast, regular rhythm does not always equate to ventricular tachycardia. Remember that hyperkalemia can be a v-tach mimic.
- In cases where we have a great story for hyperkalemia, it is potentially beneficial to start resuscitation with the thought of treating hyperkalemia prior to standard ACLS.
- Certain medications traditionally used to treat ventricular tachycardia, such as amiodarone, can lose effectiveness in the presence of hyperkalemia.
- Calcium, whether chloride or gluconate, stabilizes the cardiac membrane and reduces myocardial irritability.
- Albuterol is a beta-adrenergic agonist that assists with the movement of potassium from the extracellular space into the intracellular space.
- While there is substantial evidence to limit the routine use of sodium bicarbonate in out-of-hospital cardiac arrest and diabetic ketoacidosis, there is benefit in giving it in hyperkalemia.
- Focus less on the numerical value and more on the severity of symptoms based on the change rate of the potassium value.

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

PEDIATRIC PROTOCOL

# HYPERTHERMIA / HEAT EXPOSURE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

Providers may use purpose made continuous core body temperature monitoring devices is already in place or if provided. Regular spot check thermometers are insufficient. If purpose made continuous core body temperature devices unavailable, then use mental status as the indicator to remove from cooling

UNIVERSAL PATIENT CARE PROTOCOL

Document Patient Temperature

Remove Patient from Heat Source

Remove Patient Clothing

Increase Air Flow around patient

CAPNOGRAPHY PROCEDURE

If immersion cooling has been initiated prior to EMS arrival by on scene providers, do not interrupt cooling for assessment or treatment until cooling period has completed per this protocol

HEAT EXAUSTION (NO AMS)

Apply coldest water available or ICE water if possible
Apply ICE PACKS to Patient (Groin, Axilla, and Posterior neck)
Consider Cooling Collar

IV / IO PROCEDURE
IV Normal Saline
Bolus 20 ml / kg
CHILLED SALINE IF AVAILABLE

HEAT STROKE (+AMS)
Immersion Unavailable

Apply coldest water available or ICE water if possible
Apply ICE PACKS to Patient (Groin, Axilla, and Posterior neck)
Consider Cooling Collar

IV / IO PROCEDURE
IF HYPOTENSIVE - IV Normal Saline
Bolus 20 ml / kg
IF NORMOTENSIVE - IV Normal Saline
TKO
CHILLED SALINE IF AVAILABLE

HEAT SROKE (+AMS)
Immersion Available

COLD WATER / ICE IMMERSION AVAILABLE
Or
CAN BE PREPARED IN 5 mins
Use any local assets / supplies to accomplish this
STAYING AND GETTING CORE TEMP DOWN IS IMPERATIVE

Submerge as far up to neck as possible – keep head above water with towel or sheet under arms
Agitate the water
Keep immersed for 10 – 20 mins or return of normal mental status
OR
Core temp ≤ 102F (40C) if purpose made continuous core temp monitoring device available

⚠ If mental status fails to return to normal after 20 mins, look for other causes and / or contact Medical Control

Do not interrupt submersion cooling for vomiting, bowel movement, combativeness, or seizures

IV / IO PROCEDURE
IF HYPOTENSIVE - IV Normal Saline
Bolus 20 ml / kg
IF NORMOTENSIVE - IV Normal Saline
TKO
CHILLED SALINE IF AVAILABLE

Transport with early notification to receiving hospital to begin preparing ice bath / cooling measures as needed

BLOOD GLUCOSE PROCEDURE

Cardiac Monitor / DIAGNOSTIC EKG Procedure

Monitor and Reassess

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPERTHERMIA / HEAT EXPOSURE



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Age<br>• Exposure to increased temperatures and humidity<br>• Past medical history / medications<br>• Extreme exertion<br>• Time and length of exposure<br>• Poor PO intake<br>• Fatigue and / or muscle cramping | • Altered mental status or unconsciousness<br>• Hot, dry, or sweaty skin<br>• Hypotension or shock<br>• Seizures<br>• Nausea | • Fever (infection)<br>• Dehydration<br>• Medications<br>• Hyperthyroidism (storm)<br>• Delirium tremens (DT's)<br>• Heat cramps<br>• Heat exhaustion<br>• Heat stroke<br>• CNS lesions or tumors |

| Heat Exhaustion: Dehydration | Heat Stroke: Cerebral Edema |
|---|---|
| • Muscular / abdominal cramping<br>• General weakness<br>• Diaphoresis<br>• Febrile<br>• Confusion<br>• Dry mouth / thirsty<br>• Tachycardia<br>• BP normal or orthostatic hypotension | • Confusion<br>• Bizarre behavior<br>• Skin hot dry, febrile<br>• Tachycardia<br>• Hypotensive<br>• Seizure<br>• Coma |

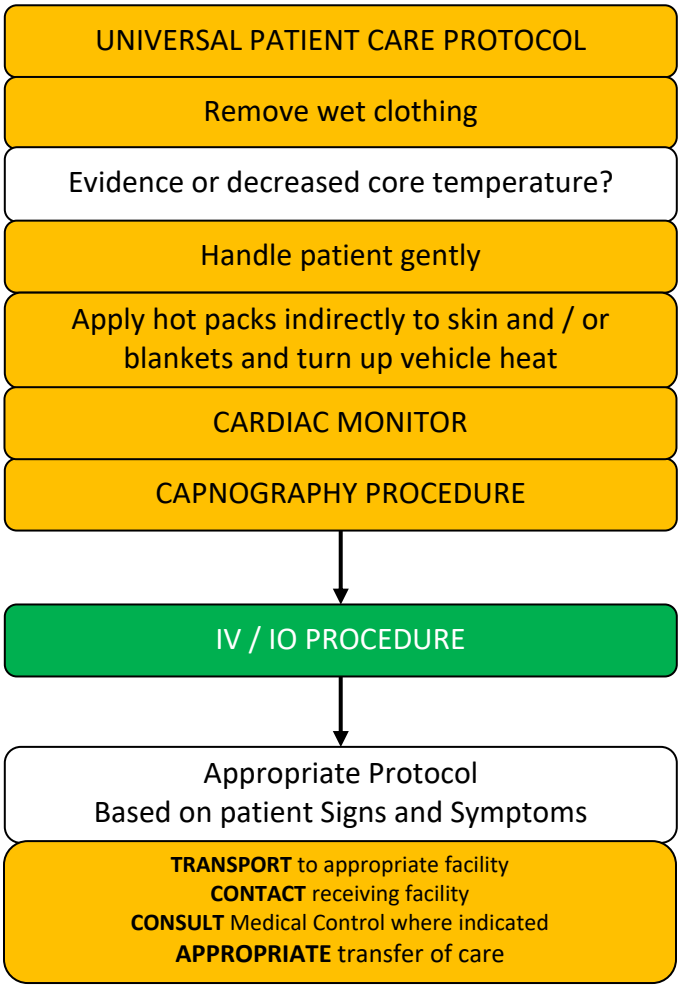
## KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neuro
- Patients at risk for heat emergencies include neonates, infants, geriatric patients, and patients with mental illness. Other contributory factors may include heart medications, diuretics, cold medications, tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, amphetamines, and salicylates may elevate body temperatures.
- Heat exposure can occur either due to increased environmental temperatures or prolonged exercise or a
- combination of both. Environments with temperature > 90° F and humidity > 60% present the most risk.
- Sweating generally disappears as body temperature rises
- **Heat Cramps** consists of benign muscle cramping 2° to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion** consists of dehydration, salt depletion, dizziness, fever, headache, cramping, nausea, and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke** consists of dehydration, tachycardia, hypotension, elevated temperature, and altered mental status. Requires cooling
- On scene cooling by submersion in ice water for heat stroke is imperative. Take time to prepare and submerge patient if suitable tub, ice, and water are available or can be set up in less than the transport time to the hospital or 5 mins. The hospital is unlikely to have immediate availability of an ice bath. Utilize available resources as soon as available to prevent patient deterioration.
- A body bag with ice and water can be used as a makeshift tub if necessary or during transport if additional cooling is required.
- Agitating the water will help with convection and cooling
- Shivering may occur as patient is cooled. Do not discontinue cooling until mental status or target core temperature is achieved.
- Heat stroke occurs when the cooling mechanism of the body (sweating) ceases due to temperature overload and / or electrolyte imbalances. Be alert for cardiac dysrhythmias for the patient with heat stroke.
- In patents with significant hyperthermia (temp > 104° F) begin actively cooling with natural or chemical ice packs applied to the patients' groin, armpits (axilla), and back of neck if submersion is unavailable.
- Use best cooling options available prior to transport when feasible cool patient before transport.

PEDIATRIC PROTOCOL

# HYPOTHERMIA / FROSTBITE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |




EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HYPOTHERMIA / FROSTBITE

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Medications<br>• Exposure to environment even in normal temperatures<br>• Exposure to extreme cold<br>• Extremes of age<br>• Drug use: Alcohol, barbiturates<br>• Infections / sepsis<br>• Length of exposure / wetness | • Cold, clammy<br>• Shivering<br>• Mental status changes<br>• Extremity pain or sensory abnormality<br>• Bradycardia<br>• Hypotension or shock | • Sepsis<br>• Environmental exposure<br>• Hypoglycemia<br>• CNS dysfunction<br>• Stroke<br>• Head injury<br>• Spinal cord injury |

## KEY POINTS

- Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neuro
- Hypothermic / drowning / near drowning patients that appear cold and dead are NOT dead until they are warm and dead, or have other signs of obvious death (putrification, traumatic injury unsustainable to life).
- Defined as core temperature < 95° F (35° C).
- Extremes of age are more susceptible (i.e. young and old).
- Patients with low core temperatures will not respond to ALS drug interventions. Maintain warming procedure and supportive care. Warming procedures includes removing wet clothing, limiting exposure, and covering the patient with warm blankets if available.
- Do not allow patients with frozen extremities to ambulate.
- Superficial frostbite can be treated by using the patient's own body heat.
- Do not attempt to rewarm deep frostbite unless there is an extreme delay in transport, and there is no risk that the affected body part will be refrozen. Contact Medical Command prior to rewarming a deep frostbite injury.
- With temperature less than 88° F (31° C) ventricular fibrillation is common cause of death. Handling patients gently may prevent this. (rarely responds to defibrillation).
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe bradycardia.
- Shivering stops below 90° F (32° C).
- Hot packs can be activated and placed in the armpit and groin area if available.
- Care should be taken not to place the packs directly against the patient's skin.
- Consider withholding CPR if patient has organized rhythm. Discuss with Online Medical Control.
- All hypothermic patients should have resuscitation performed until care is transferred, or if there are other signs of obvious death (putrification, traumatic injury unsustainable to life).
- The most common mechanism of death in hypothermia is ventricular fibrillation. If the hypothermia victim is in ventricular fibrillation, CPR should be initiated. If V fib is not present, then all treatment and transport decisions should be tempered by the fact that V fib can be caused by rough handling, noxious stimuli or even minor mechanical disturbances, this means that respiratory support with 100% oxygen should be done gently, including intubation, avoiding hyperventilation.
- The heart is most likely to fibrillate between 85 - 88° F (29 - 31° C) Defibrillate VF / VT at 2 – 4 j / kg with effective CPR intervals.

PEDIATRIC PROTOCOL

# NAUSEA / VOMITING >1 yr. OLD

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

Administer Oxygen

IV PROCEDURE

Patient has Nausea / Vomiting

ONDANSETRON
0.15 mg / kg IM or IV
over 2 - 4 minutes > 1 Year
-or- 0.15 mg / kg Injectable Liquid PO > 1 Year
q 10 min prn - Max 4 mg
STOP Do not administer if EKG obtained and QT > 500ms (2.5 large EKG boxes)
STOP Advanced EMT only administer if patient age ≥ 4 years old

OR
ONDANSETRON
Orally Disintegrating Tablet
4 mg Oral – q 10 min prn - Max 8 mg
STOP EMT may administer only with proper training or ONLINE Medical Control >12 years old

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# NAUSEA / VOMITING >1 yr. OLD

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Nausea<br>• Vomiting<br>• Medication(s) administration such as narcotic analgesics | • Complaints of nausea and / or vomiting | • Consider AMI / diagnostic EKG<br>• Gastroenteritis<br>• Toxic ingestion / food poisoning<br>• Bowel obstruction<br>• Appendicitis<br>• Gastritis<br>• Cholecystitis (gallbladder)<br>• Hepatitis / cirrhosis<br>• Headaches / migraine<br>• Pregnancy<br>• Hypertensive crisis<br>• Electrolyte imbalances<br>• DKA<br>• Intracranial pressure<br>• Sepsis / infections |



| KEY POINTS |
|---|
| • Position patient to protect airway as appropriate. (Recovery position, sitting up, etc.)<br>• Immediately position entire patient or their head to side if patient begins vomiting then retrieve suction.<br>• Patients with altered LOC and nausea / vomiting need to have airway maintenance prioritized before medication.<br>• Prepare and test suction prior to its need.<br>• Give Ondansetron over at least 2 minutes, slow IV.<br>• Treat patients early, no need to wait for patient to begin vomiting to administer Ondansetron.<br>• Patients receiving medications such as narcotic analgesics may require concurrent administration of Ondansetron to reduce nausea associated with such medications. |

PEDIATRIC PROTOCOL

# PAIN MANAGMENT

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

**PATIENT HAS:**

- Burns
- Intractable Flank Pain
- Intractable Back Pain
- Musculoskeletal and / or Fracture Pain
- Sickle Cell Pain Crisis (Use Supplemental O2)
- Unremitting Abdominal Pain

CARDIAC MONITOR

CAPNOGRAPHY PROCEDURE

fentaNYL
1 mcg / kg IV / IO/ IN / IM up to 50 mcg / dose
REPEAT If no Improvement in 10 – 15 Mins
q 10 min prn – Max 2 doses / up to Max 100 mcg cumulative

⚠ If fentaNYL is unavailable, see medication section for Morphine Sulfate

Monitor Airway, Breathing, Vitals

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

Pain Other Than Listed
Contact Online Medical Control

**NOT FOR**
Altered Mentation,
Traumatic Abdominal Pain, Head Trauma, Hypovolemia

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# PAIN MANAGEMENT

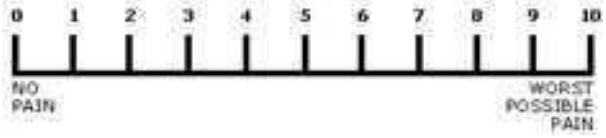


| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Age / onset<br>• Location<br>• Duration<br>• Severity (0 - 10)<br>• Past medical history<br>• Medications<br>• Drug allergies | • Severity (pain scale)<br>• Quality (sharp, dull, etc.)<br>• Radiation<br>• Relation to movement, respiration<br>• Increased with palpation of area | • Per the specific protocol<br>• Musculoskeletal<br>• Visceral (abdominal)<br>• Cardiac<br>• Pleuritic (respiratory)<br>• Neurogenic<br>• Renal (colic) |

## PAIN SCALE

**The Wong-Baker Faces Pain Rating Scale**

Designed for children aged 3 years and older, the Wong-Baker Faces Pain Rating Scale is also helpful for elderly patients who may be cognitively impaired. If offers a visual description for those who don't have the verbal skills to explain how their symptoms make them feel.




To use this scale, your doctor should explain that each face shows how a person in pain is feeling. That is, a person may feel happy because he or she has no pain (hurt), or a person may feel sad because he or she has some or a lot of pain.

**A Numerical Pain Scale**

A numerical pain scale allows you to describe the intensity of your discomfort in numbers ranging from 0 to 10 (or greater, depending on the scale). Rating the intensity of sensation is one way of helping your doctor determine treatment. Numerical pain scales may include words or descriptions to better label your symptoms, from feeling no pain to experiencing excruciating pain. Some researchers believe that this type of combination scale may be most sensitive to gender and ethnic differences in describing pain.

## KEY POINTS

- **Exam: Mental Status, Area of Pain, Neuro**
- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).
- Pain severity (0-10) is a vital sign to be recorded pre and post medication delivery and at disposition.
- Vital signs should be obtained pre, 10 minutes post, and at disposition with all pain medications.
- Contraindications to morphine use include hypotension, head injury, and respiratory distress.
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive pain medications must be observed 15 minutes for drug reaction.
- All patients who receive medication for pain must have continuous ECG monitoring, pulse oximetry, and oxygen administration.
- The patient's vital signs must be routinely reassessed.
- Routine assessments and reassessments must be documented on the run report.
- Have Naloxone (Narcan) on hand if the patient has respiratory depression or hypotension after fentanyl (SUBLIMAZE) administration.
- ***NOT FOR*** Altered Mentation, Traumatic Abdominal Pain, Head Trauma, Hypovolemia, Multiple Trauma

PEDIATRIC PROTOCOL

# SEIZURE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

PEDIATRIC AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

Position on side to prevent aspiration

Febrile?

Yes → COOLING MEASURES

No

BLOOD GLUCOSE PROCEDURE

IV PROCEDURE

Evidence of Shock or Trauma?

Active Seizure? BGL >60

→ BGL <60
Treat per Pediatric Diabetic Emergencies Protocol

Yes

MIDAZOLAM
0.05 - 0.1 mg / kg IV / IO
q 5 min prn - Max Single Dose 2.5 mg
May Repeat Once – Max total dose 5 mg
or
0.2 mg / kg IM / IN
q 5 min prn - Max Dose 5 mg
or
LORazepam 0.05 – 0.1 mg / kg slow IV / IO / IN
q 5 min prn - Max Dose 2 mg

⚠ Capnogrpahy Required

⚠ If Midazolam or LORazepam Unavailable, See Medication Section for DiazePAM

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# SEIZURE

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL |
|---|---|---|
| • Fever<br>• Prior history of seizures<br>• Seizure medications<br>• Reported seizure activity<br>• History of recent head trauma<br>• Congenital abnormality | • Observed seizure activity<br>• Altered mental status<br>• Hot, dry skin or elevated body temperature | • Fever<br>• Infection<br>• Head trauma<br>• Medication or toxin<br>• Hypoxia or respiratory failure<br>• Hypoglycemia<br>• Metabolic abnormality / acidosis<br>• Tumor |

**Categories of Seizures**

| | |
|---|---|
| **Complex = Unconscious** | **Focal = Partial, Localized** |
| **Simple = Conscious** | **Generalized = All Body** |

- **Simple Focal**
- **Simple Generalized**
- **Complex Focal**
- **Complex Generalized**

**KEY POINTS**

- **Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro**
- **Status Epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- **Grand mal seizures** (generalized) are associated with loss of consciousness, incontinence, and tongue trauma.
- **Focal seizures (petit mal)** effect only a part of the body and are not usually associated with a loss of consciousness.
- **Jacksonian seizures** are seizures, which start as a focal seizure and become generalized.
- Be prepared to assist ventilations especially if a benzodiazepine such as LORazepam or MIDAZOLAM is used.
- If evidence or suspicion of trauma, spine should be immobilized.
- If febrile, remove clothing and sponge with room temperature water.
- **In an infant, a seizure may be the only evidence of a closed head injury.**
- Older than 6 years and febrile, it is not considered a febrile seizure.

PEDIATRIC PROTOCOL

# SYNCOPE / NEAR SYNCOPE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

Consider SPINAL MOTION RESTRICTION

AIRWAY PROTOCOL

DIAGNOSTIC EKG PROCEDURE

1ST Contact to EKG and Transmission < 10 Min

OXYGEN / PULSE OXIMETRY PROCEDURE

CAPNOGRAPHY PROCEDURE

BLOOD GLUCOSE PROCEDURE

IV PROCEDURE

Identify Treatable Causes - Treat Per Specific Protocol

**Take cardiac monitor to patient's side. Apply cardiac monitor ASAP once on scene. Maintain monitoring throughout transport including into hospital bed.**

- Seizure – Treat per Seizure Protocol
- Hypoxia – Treat per Airway / Breathing Protocols
- Anaphylaxis / Allergic Reaction
- Sepsis – Treat per Septic Shock Protocol
- Hypotension – Treat per Specific Shock Protocols
- Arrhythmia – Treat per Correct Arrhythmia Protocol
- Psychiatric – Treat per Behavioral Emergencies
- Hypo / Hyperglycemia – Treat per Diabetic Protocol
- Hypo / Hyperthermia – Treat per Specific Protocol
- Stroke CVA / TIA – Treat per Stroke Protocol
- Overdose – Treat per Toxic Ingestion Protocol
- Head Trauma – Treat per Head Trauma Protocol

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | MED CONTROL Consult

# SYNCOPE / NEAR SYNCOPE



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Onset, duration, event recall,<br>• Cardiac (arrythmias, MI, stents, CHF, myocarditis, long QT)<br>• Stroke / TIA<br>• Blood loss (internal, external, GI, rectal)<br>• Volume loss (sweating, vomiting, diarrhea, urination)<br>• Medications (compliance, new, changes, dose, types)<br>• Electrolyte imbalances<br>• Pregnancy or possibility (last menstrual period)<br>• Recent activity, event(s) preceding<br>• Seizure<br>• Fever | • Loss of consciousness / near loss of consciousness<br>• Dizziness / lightheadedness<br>• Palpitations<br>• Bradycardia / tachycardia<br>• Irregular pulse<br>• Hypo / hyperglycemia<br>• Hypotension<br>• Nausea, vomiting, diarrhea<br>• Pale<br>• Neuro deficits<br>• S1Q3T3 EKG pattern<br>• Brugada Syndrome EKG patterns | • Vasovagal (BM, urination, coughing, GI stimulation)<br>• Cardiac (arrythmia, MI, valve disorders)<br>• Drug / medication induced<br>• Orthostatic Hypotension<br>• Pulmonary embolism<br>• Hypoglycemia<br>• Electrolyte imbalance<br>• Dehydration<br>• Hypovolemia<br>• Stroke / TIA<br>• Anaphylaxis<br>• Seizure<br>• Autonomic failure (MS, Parkinson's, DM, age, spinal cord injuries)<br>• Cardiac tamponade<br>• Aortic dissection<br>• Toxicological |

Syncope or Near Syncope in patients of ANY AGE indicates a temporary lack of perfusion to the brain. EMS should have a high index of suspicion and encourage transport for complete assessment despite patient return to baseline. Risk for future complications or death is high in many patients based on cause. Syncope may have many causes, evaluate the patient completely and diligently.

| Brugada EKG Pattern (High Risk Cardiac Death) | Type I | Type II | Type III |
|---|---|---|---|
| J wave amplitude | >= 2mm | >= 2mm | >= 2mm |
| T wave | Negative | Positive or biphasic | Positive |
| ST-T configuration | Coved type | Saddleback | Saddleback |
| ST segment (terminal portion) | Gradually descending | Elevated >= 1mm | Elevated |

| S1Q3T3 EKG Pattern (High Risk for PE) | |
|---|---|
| Lead I | Large S Wave Present |
| Lead III | Q Wave Present |
| Lead III | T Wave Inverted |

## KEY POINTS

- Required Exam: Mental Status, Skin, HEENT, Neck, Heart, Lung, Abdomen, Back, Extremities, Neuro
- Do not write off marginal vitals or findings as "normal". These cases need to be evaluated in depth.
- History of preceding events is crucial to understanding cause. Determine onset, duration, LOC, patient recall of events, speed of recovery, neuro presentations, incontinence.
- Consider family history.
- Consider myocarditis if current or recent viral illness.
- Consider ectopic pregnancy if pregnancy known or suspected.
- CHF are extremely high-risk cases due to potential for arrhythmia.
- Pay attention to diagnostic EKG intervals, U waves, ectopic beats.
- Near syncope does not mean less risk.
- Syncope / near syncope patients should be transported even with identified and EMS treatable causes.

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

PEDIATRIC PROTOCOL

# TOXIC INGESTION / EXPOSURE / OVERDOSE

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

If Suspected Carbon Monoxide (CO) or Cyanide Poisoning see Specific Protocol

UNIVERSAL PATIENT CARE PROTOCOL
AIRWAY PROTOCOL
OXYGEN
IV / IO PROCEDURE
DIAGNOSTIC EKG PROCEDURE and Assess Vitals
BLOOD GLUCOSE PROCEDURE
CAPNOGRAPHY PROCEDURE

Decontaminate and remove clothes if patient is exposed to any dangerous or noxious substances

## Narcotic Overdose AMS / Respiratory Depression

***TAKE PPE PRECAUTIONS***
GLOVES / MASK minimum
Contact / aerosol risk with fentanyl-based substances

ASSURE BLS VENTILATION WITH BVM

Support Hemodynamically
Utilize Shock Protocol

NALOXONE
1 mg IN Atomized
SUMMON ALS IF NO RESPONSE TO IN DOSE

NALOXONE
0.1 mg / kg
Max 2 mg / dose
IV / IM / IN / IO

May repeat every 2 min as necessary if obvious or suspected opiate OD until respiratory improvement or 12 mg Max

If patient is unresponsive to Naloxone, supply is exhausted, or the medication is unavailable, consider Advanced Airway and Support Hemodynamically

## Salicylate (ASA) Overdose *NOT Tylenol (Acetaminophen)*

If Patient is Tachypneic
SODIUM BICARBONATE
1 mEq / kg SLOW
IV / IO

**IF AMS *REGARDLESS OF BGL READING***
DEXTROSE 10%
5 ml / kg IV / IO
Max 250 ml
May repeat prn
⚠ If DEXTROSE 10% Is unavailable, see medication section for DEXTROSE 50%

IF AMS and NORMAL (Bad) or LOW respiratory rate
BVM and ventilatory rate to make Co2 of 30

If candidate for advanced airway
SODIUM BICARBONATE
1 mEq / kg SLOW
IV / IO
Max 50 mEq
Prior to attempt

## Sympathomimetic Overdose *(Stimulants)*

COOLING MEASURES IF FEBRILE

IF PATIENT AGITATED OR HAS CHEST PAIN
MIDAZOLAM
0.05 - 0.1 mg / kg IV / IO
q 5 min prn - Max Dose 2.5mg
or
0.2 mg / kg IM / IN
q 5 min prn - Max Dose 5 mg
or
LORazepam
0.05 – 0.1 mg / kg slow
IV / IO / IN
q 10 min prn - Max Dose 2mg
⚠ If Midazolam or LORazepam Unavailable, See Medication Section for diazePAM

IV NORMAL SALINE BOLUS
20 ml / kg

## Organophosphates / Carbamates

ATROPINE
0.05 mg / kg
Max 1 mg per dose
IV / IO
Repeat every 3 – 5 Minutes or as needed to control secretions
⚠ Given to dry secretions
⚠ No max dose

Consider Advanced Airway Protocol

MIDAZOLAM
0.05 - 0.1 mg / kg IV / IO
q 5 min prn - Max Dose 2.5mg
or
0.2 mg / kg IM / IN
q 5 min prn - Max Dose 5 mg
or
LORazepam
0.05 – 0.1 mg / kg slow
IV / IO / IN
q 10 min prn - Max Dose 2mg
⚠ If Midazolam or LORazepam Unavailable, See Medication Section for diazePAM

IF WHEEZING
Treat with aerosol
ALBUTEROL / IPRATROPIUM
STOP EMT use only with ONLINE Medical Control

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# TOXIC INGESTION / EXPOSURE / OVERDOSE

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Ingestion or suspected ingestion of a potentially toxic substance<br>• Substance ingested, route, quantity<br>• Time of ingestion<br>• Reason (suicidal, accidental, criminal)<br>• Available medications in home<br>• Past medical history, medications | • Mental status changes<br>• Hypo / hypertension<br>• Decreased respiratory rate<br>• Tachycardia, dysrhythmias<br>• Seizures | • Tricyclic antidepressants (TCAs)<br>• Acetaminophen (Tylenol)<br>• Depressants<br>• Stimulants<br>• Anticholinergic<br>• Cardiac medications<br>• Solvents, alcohols, cleaning agents<br>• Insecticides (organophosphates)<br>• Respiratory depression<br>• Other organophosphates<br>• Carbamates |

## KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, and emesis to ED.
- **Tricyclic**: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen**: initially normal or nausea / vomiting. If not detected and treated, causes irreversible liver failure.
- **Depressants**: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils.
- **Stimulants**: increased HR, increased BP, increased temperature, dilated pupils, and seizures.
- **Anticholinergic**s: increased HR, increased temperature, dilated pupils, and mental status changes.
- **Cardiac Medications**: dysrhythmias and mental status changes.
- **Solvents**: nausea, vomiting, and mental status changes.
- **Insecticides**: increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
- Consider restraints if necessary for patient's and / or personnel's protection per the Restraint Procedure.
- If it can be done safely, take whatever container the substance came from to the hospital along with readily obtainable samples of medication unless this results in an unreasonable delay of transport.
- If applicable, DO NOT transport a patient to the hospital until properly decontaminated.
- Naloxone (Narcan) administration may cause the patient to go into acute opiate withdraw, which includes vomiting, agitation, and / or combative behavior. Always be prepared for combative behavior.
- Naloxone (Narcan) goal is to reverse life threating respiratory depression
- Naloxone (Narcan) may wear off in as little as 20 minutes causing the patient to become more sedate and possibly hypoventilate. All A&O 4 patients having received Naloxone (Narcan) should be transported. If patient refuses transport, contact Online Medical Control before release.

**CARBON MONOXIDE POISONING OR CYANIDE POISONING – SEE SPECIFIC PROTOCOL**

POISON CONTROL 1-800-222-1222

Airway / Breathing | Circulation / Shock | Cardiac | Medical | Trauma

PEDIATRIC PROTOCOL

# TOXIC INGESTION / EXPOSURE / OVERDOSE
# CARDIOTOXIC MEDICATIONS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

Always suspect multiple substances and treat for all identified

Therapies listed may need to all be used together in severe cases

UNIVERSAL PATIENT CARE PROTOCOL
AIRWAY PROTOCOL / OXYGEN
IV / IO PROCEDURE
DIAGNOSTIC EKG PROCEDURE and Assess Vitals
Treat Per Presenting EKG Rhythm
BLOOD GLUCOSE PROCEDURE
CAPNOGRAPHY PROCEDURE

Prophylactically apply pacing / defib pads and prepare for decompensation

Bradycardia

Potential Causes
Calcium Channel Blockers
BEAT BLOCKERS
"LOL" Drugs

Reference list on next page

TRANSCUTANEOUS PACING PROCEDURE

CALCIUM CHLORIDE
20 mg / kg IV / IO
Max 1 gram
or
CALCIUM GLUCONATE
60 mg / kg IV / IO
Max 3 grams
Over 10 min
May repeat either if available and EKG changes reoccur

IV NORMAL SALINE BOLUS
20 ml / kg
To Maintain MAP > 65
or SBP 90 if MAP Unavailable or Radial Pulses

Contact Medical Control for the use of vasopressors if failed fluid bolus
EPINEPHrine
PUSH DOSE
Make 10 mcg / ml
1 mcg / kg
Max Dose 10 mcg
2 - 5 min - slow push
Titrate to effect

May CONSIDER ATROPINE
0.02 mg / kg IV / IO
repeat every 3 - 5 minutes
Min dose 0.1 mg
Max dose 0.5 mg child
Max dose 1 mg Adolescent

AVR – R wave final part of QRS
QRS >120ms
(3 small EKG boxes)

Potential Causes
Sodium Channel Blocker / Tricyclic Anti – Depressants

Reference list on next page

SODIUM BICARBONATE
1 mEq / kg SLOW
Max 50 mEq
IV / IO
Until QRS narrows / condition improves
If no improvement, Contact ONLINE MEDICAL CONTROL
May repeat if available and EKG changes reoccur

Prolonged QT

Potential Causes
Potassium Channel Blockers

Reference list on next page

MAGNESIUM SULFATE
25 mg / kg IV / IO
Max 2000 mg
(2 grams) in 100 ml
D5 over 20 min
To reduce risk of Torsades
Does not address the Potassium blockade
Supportive Care
Witnessed episodes of Torsades or QT > 500ms (2.5 large EKG boxes)

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT Medical Control** where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# TOXIC INGESTION / EXPOSURE / OVERDOSE
## CARDIOTOXIC MEDICATIONS

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Ingestion or suspected ingestion of a potentially toxic substance<br>• Substance ingested, route, quantity<br>• Time of ingestion<br>• Reason (suicidal, accidental, criminal)<br>• Available medications in home<br>• Past medical history, medications | • Mental status changes<br>• Hypo / hypertension<br>• Decreased respiratory rate<br>• Tachycardia, dysrhythmias<br>• Seizures | • Tricyclic antidepressants (TCAs)<br>• Acetaminophen (Tylenol)<br>• Depressants<br>• Stimulants<br>• Anticholinergic<br>• Cardiac medications<br>• Solvents, alcohols, cleaning agents<br>• Insecticides (organophosphates)<br>• Respiratory depression<br>• Other organophosphates<br>• Carbamates |

| Common Beta Blockers (Rate Inhibiting) | Common Calcium Channel Blockers (Rate Inhibiting) | | Common Potassium Channel Blockers (QT Prolonging) | Common Sodium Channel Blockers (QRS Widening) | |
|---|---|---|---|---|---|
| Acebutolol | Acalas | Isoptin | Amiodarone | Adapin | Pertofrane |
| Atenolol | Adalat | Lacidipine | Azimilide | Ajmaline | Phenytoin |
| Betapace | Amlodipine | Lacipil | Bretylium | Amitriptyline | Procainamide |
| Betoxolol | Aranidipine | Landel | Clofilium | Anafranil | Propafenone |
| Bisoprolol | Atelec | Lercanidipine | Dofetilide | Benadryl | Protriptyline |
| Brevibloc | Azelnidipine | Madipine | Ibutilide | Calcium | Quinidine |
| Carvedilol | Barnidipine | Manidipine | Nifekalant | Cannabidiol | Saxitoxin |
| Coreg | Baylotensin | Motens | Sematilide | Clomipramine | Sinequn |
| Corgard | Baymycard | Nicardipine | Sotalol | Desipramine | Sparteine |
| Esmolol | Benidipine | Nifedipine | Tedisamil | Diphenhydramine | Surmontil |
| Inderal | Calan | Nilvadipine | Vernakalant | Disopyramide | Tetrodotoxin |
| Innopran XL | Calblock | Nimodipine | | Doxepin | Tocainide |
| Kerlone | Calslot | Nimotop | | Elavil | Tofranil |
| Labetolol | Carden SR | Nisoldipine | | Encainide | Trimipramine |
| Levatol | Cardene | Nitrendipine | | Endep | Vivactil |
| Lopressor | Cardif | Nitrepin | | Flecainide | |
| Metoprolol | Cardizem | Nivadil | | Imipramine | |
| Nadolol | Cilnidipine | Norvasc | | Lamotrigine | |
| Nebivolol | Cinalong | Plendil | | Lidocaine | |
| Pindolol | Clevidipine | Pranidipine | | Ludiomil | |
| Propranolol | Cleviprex | Procardia | | Maprotine | |
| Sectral | Coniel | Procorum | | Mexiletine | |
| Sotalol | Diltiazem | Sapresta | | Moricizine | |
| Tenormin | Efonidipine | Siscard | | Neosaxitoxin | |
| Timolol | Felodipine | Sular | | Norpramin | |
| Trandate | Gallopamil | Syscor | | Nortryptyline | |
| Zabeta | Hypoca | Verapamil | | Pamelor | |

| OTHER QT PROLONGING AGENTS | | | |
|---|---|---|---|
| Haloperidol | Droperidol | Chlorpromazine | Pimozide |
| Citalopram | Escitalopram | Tricyclic Antidepressants | Clarithromycin |
| Erythromycin | Fluoroquinolones | Fluconazole | Itraconazole |
| Voriconazole | Posaconazole | Pentamidine | Methadone |
| Cocaine | Loperamide | Ondansetron | Propofol |
| Arsenic Trioxide | Sunitinib | Vandetanib | |

### KEY POINTS

- Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neuro
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, and emesis to ED.
- **Tricyclic**: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- **Acetaminophen**: initially normal or nausea / vomiting. If not detected and treated, causes irreversible liver failure.
- **Depressants**: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils.
- **Stimulants**: increased HR, increased BP, increased temperature, dilated pupils, and seizures.
- **Anticholinergics**: increased HR, increased temperature, dilated pupils, and mental status changes.
- **Cardiac Medications**: dysrhythmias and mental status changes.
- **Solvents**: nausea, vomiting, and mental status changes.
- **Insecticides**: increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
- Consider restraints if necessary for patient's and / or personnel's protection per the Restraint Procedure.
- If it can be done safely, take whatever container the substance came from to the hospital along with readily obtainable samples of medication unless this results in an unreasonable delay of transport.
- If applicable, DO NOT transport a patient to the hospital until properly decontaminated.

POISON CONTROL 1-800-222-1222

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# SECTION 11 - PEDIATRIC TRAUMA PROTOCOLS


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# TRAUMA EMERGENCIES

## The Golden Period

### GUIDELINES FOR LOAD AND GO TRAUMA TRANSPORTS

### INDICATIONS

- Uncorrectable airway obstruction
- Tension pneumothorax
- Pericardial tamponade
- Penetrating chest wounds with signs of shock
- Hemothorax with signs of shock
- Head trauma with unilaterally dilated pupils
- Head trauma with rapidly deteriorating condition
- Unconsciousness

**KEY POINTS**

- A trauma victim is a pediatric patient if they are less than 16 years old.
- Once the patient is determined to be an actual or potential major trauma / multiple system patient, personnel on scene and / or medical control must quickly determine the appropriate course of action including:
    1. Requesting aeromedical evacuation from scene. See AEROMEDICAL TRANSPORT PROCEDURE.
    2. Ground transportation directly to an appropriate facility.
- Major trauma patients are to be transported to the closest **Trauma Center**.
- Contact the receiving hospital for all major trauma or critical patients.
- Cover open wounds, burns, and eviscerations.
- Except for airway control, initiate ALS enroute when transporting major trauma patients.
- If the EMT is unable to access patient airway and ventilate, transport to the closest facility for airway stabilization.
- The on-scene time for major trauma patients should not exceed 10 minutes without a documented, acceptable reason for the delay.
- All major trauma patients should receive oxygen administration, an IV(s), and cardiac monitoring.
- Provide a documented reason if an intervention could not be performed.

**Mass Casualty Incidents (MCI)**

- Upon arrival at an MCI, the first arriving unit should notify their dispatch of the need to implement the mass casualty plan, call for additional resources, establish a safe staging area, and estimate the total number of victims.
- Each EMS service has a pre-defined coordinating hospital based on their county's mass casualty plan. It is the responsibility of the responding jurisdiction to notify their appropriate coordinating hospital as soon as possible, giving a brief description of the incident and the estimated number of victims. The coordinating hospital will then notify the receiving hospitals of the MCI. The transportation officer should maintain a constant contact with the coordinating hospital until the scene has been cleared of salvageable victims.

**THE GOLDEN PERIOD FOR THE PATIENT BEGINS WHEN THE TRAUMA HAPPENS**
**DO NOT WASTE VALUABLE TIME ON SCENE**

PEDIATRIC PROTOCOL

# TRAUMA GUIDELINES

Emergency medical service personnel shall use the following criteria, consistent with their certification, to evaluate whether an injured person qualifies as an adult trauma victim or pediatric trauma victim, in conjunction with the definition of trauma according to the State of Ohio Trauma Triage Guidelines.

**A Pediatric Trauma Victim is a person < 16 years of age exhibiting one or more of the following physiologic or anatomic conditions**

| **Physiologic conditions** | **Anatomic conditions** |
|---|---|
| • Glasgow Coma Scale < 13;<br>• Loss of consciousness > 5 minutes;<br>• Deterioration in level of consciousness at the scene or during transport;<br>• Failure to localize to pain;<br>• Evidence of poor perfusion, or evidence of respiratory distress or failure. | • Penetrating trauma to the head, neck, or torso;<br>• Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;<br>• Injuries to the head, neck, or torso where the following physical findings are present;<br>• Visible crush injury;<br>• Abdominal tenderness, distention, or seatbelt sign;<br>  ○ Pelvic fracture;<br>  ○ Flail chest;<br>• Injuries to the extremities where the following physical findings are present:<br>  ○ Amputations proximal to the wrist or ankle;<br>  ○ Visible crush injury:<br>  ○ Fractures of two or more proximal long bones;<br>  ○ Evidence of neurovascular compromise.<br>• Signs or symptoms of spinal cord injury;<br>• 2nd or 3rd Degree burns > 10% total BSA, or other significant burns involving the face, feet, hands, genitalia, or airway. |

**Field Trauma Triage Criteria: Mechanism of Injury (MOI) & Special Considerations**

| **Co-Morbid Diseases and Special Considerations** | **Mechanisms of Injury (MOI)** |
|---|---|
| • Age < 5 or > 55<br>• Cardiac disease<br>• Respiratory disease<br>• Diabetes<br>• Immunosuppression<br>• Morbid obesity<br>• Pregnancy<br>• Substance abuse / intoxication<br>• Liver disease<br>• Renal disease<br>• Bleeding disorder / anticoagulation | • High speed MVC<br>• Ejection from vehicle<br>• Vehicle rollover<br>• Death in same passenger compartment<br>• Extrication time > 20 minutes<br>• Falls greater than 10 feet<br>• Vehicle versus bicycle / pedestrian<br>• Pedestrian **struck**, thrown or run over<br>• Motorcycle crash > 20 mph with separation of rider from bike<br>• **Fall from any height, including standing, with signs of traumatic brain injury** |

## KEY POINTS

**Exceptions to Mandatory Transport to a Trauma Center:**

- Emergency Medical Service personnel shall transport a trauma victim directly to an adult or pediatric trauma center that is qualified to provide appropriate adult or pediatric care, unless one or more of the following exceptions apply:

  1. It is medically necessary to transport the victim to another hospital for initial assessment and stabilization before transfer to an adult or pediatric trauma center;
  2. It is unsafe or medically inappropriate to transport the victim directly to an adult or pediatric trauma center due to adverse weather or ground conditions or excessive transport time;
  3. Transporting the victim to an adult or pediatric trauma center would cause a shortage of local emergency medical service resources;
  4. No appropriate adult or pediatric trauma center can receive and provide adult or pediatric trauma care to the trauma victim without undue delay;
  5. Before transport of a patient begins, the patient requests to be taken to a hospital that is not a trauma center or, if the patient is less than eighteen years of age or is not able to communicate, such a request is made by an adult member of the patient's family or a legal representative of the patient.

**Glasgow Coma Scale**

| **INFANT** | **Eye Opening** | **ADULT** |
|---|---|---|
| *Birth to age 4* | | *Age 4 to Adult* |
| 4 Spontaneously | | Spontaneously 4 |
| 3 To speech | | To command 3 |
| 2 To pain | | To pain 2 |
| 1 No response | | No Response 1 |
| | **Best Verbal Response** | |
| 5 Coos, babbles | | Oriented 5 |
| 4 Irritable cries | | Confused 4 |
| 3 Cries to pain | | Inappropriate words 3 |
| 2 Moans, grunts | | Incomprehensible 2 |
| 1 No response | | No response 1 |
| | **Best Motor Response** | |
| 6 Spontaneous | | Obeys commands 6 |
| 5 Localizes pain | | Localizes pain 5 |
| 4 Withdraws from pain | | Withdraws from pain 4 |
| 3 Flexion (decorticate) | | Flexion (decorticate) 3 |
| 2 Extension (decerebrate) | | Extension (decerebrate) 2 |
| 1 No response | | No response 1 |
| ___ = TOTAL | | TOTAL = ___ |

# NOTS PEDIATRIC TRAUMA FIELD TRIAGE

**NOTS Transfer Line:**
**1-216-778-7850**

**Step 1- Measure vital signs and level of consciousness of patient with a traumatic mechanism**

- Glasgow Coma Scale < 13 with traumatic mechanism
- Age specific hypotension and/or
- Requiring airway/ventilator support

**Step 2- Assess anatomy of injury**

- Significant penetrating injuries to the head, neck, torso or extremities proximal the elbow or knee
- Two or more proximal long-bone fractures
- Crushed, degloved, threatened, pulseless or mangled extremity
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis

**Red/Priority 1**
Take to a Pediatric Trauma Center. If transport to a Pediatric Trauma center will add greater than 15 minutes, transport to the nearest trauma center.

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

- Falls
  - 10 ft. or 2-3 times the height of the child
- High-risk auto crash
  - Intrusion: Including roof: > 12 in. occupant site, >18 in. any site
  - Extrication time over 20 minutes
  - Ejection (partial or complete) from automobile
  - Death in same passenger compartment
  - Vehicle telemetry data consistent with high risk of injury
- Auto vs. Pedestrian/Bicyclist thrown, run over or with significant (> 20 mph) impact
- Motorcycle crash > 20 mph
- Other motorized equipment crashes where the patient has the potential of significant injury
- Signs of/suspicion of abuse

**Step 4-Assess special patient or system considerations of trauma patients**

- Anticoagulant and bleeding disorders on prescription blood thinners
- Significant burns (+/- trauma mechanism) or inhalation injury, chemical injury electrical injury or frostbite triage to burn center
- Open fractures regardless
- Pregnancy > 20 weeks gestation
- EMS Provider Judgment- When in doubt transfer to a trauma center

**Yellow/Priority 2**
Transport patient to nearest trauma center within trauma system, need not be the highest level of trauma center

**Step 5- Patients not meeting above criteria**

**Green/Priority 3**
Transport to the closest appropriate emergency department

# ABDOMINAL TRAUMA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |



Pediatric Multiple Trauma Protocol if criteria

UNIVERSAL PATIENT CARE PROTOCOL

PEDIATRIC AIRWAY PROTOCOL

CONSIDER SPINAL MOTION RESTRICTION PROCEDURE

Determine if Load & Go

Control Hemorrhage / Dress Wounds

CAPNOGRAPHY PROCEDURE

Evisceration: Cover, clean saline dressing to loosely stabilize

Penetrating Object: Cover, clean saline dressing – Immobilize object. If too large to transport – attempt to cut with care not to further injure tissue

Penetrating Wounds: Cover, clean saline dressing. Look for exit wound

Blunt Trauma: Assess for change – distention. Note mechanism

IV / IO PROCEDURE
20 ml / kg Normal Saline Bolus to maintain SBP

If evidence of current / previous uncontrolled hemorrhage, sustained HR > 120 and / or SBP < 90 (for age), within 60 mins of injury
Consider TRANEXAMIC ACID (TXA)
15 mg / kg mixed in 100 ml D5W over 10 mins – Max 1 gram

Monitor and Reassess

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

# ABDOMINAL TRAUMA



| MECHANISM | SIGNS & SYMPTOMS |
|---|---|
| • Blunt | • Altered mental status<br>• Shock<br>• Distention<br>• Swelling<br>• Bulging<br>• Nausea and vomiting |
| • Penetrating | • Altered mental status<br>• Bleeding<br>• Tenderness<br>• Pain<br>• Distention<br>• Evisceration<br>• Discoloration<br>• Entrance / exit wounds<br>• Nausea & vomiting |

**Fluid Resuscitate to systolic of 70 + 2 x age**

| KEY POINTS |
|---|
| Trauma to the abdomen is either Blunt or Penetrating. Blunt injuries are harder to detect and diagnose, and have a death rate twice that of penetrating wounds. Key signs and symptoms of blunt trauma include a patient in shock with no obvious injuries. Distention of the abdomen is an indication of internal hemorrhage. Pain may not be a significant factor. Many abdominal trauma injuries are Load & Go cases.<br><br>• Look for both an entrance and exit wound for all penetrating trauma, and treat accordingly.<br>• For all major trauma patients, the on scene time should be less than ten minutes. |

Airway / Breathing

Circulation / Shock

Cardiac

Medical

Trauma

PEDIATRIC PROTOCOL

# BURNS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

CONSIDER SPINAL MOTION RESTRICTION PROCEDURE

PEDIATRIC AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

If Chest, Neck, Face, Airway Involvement – Prepare for Invasive Airway Procedures
Perform Early Intubation

Remove rings, bracelets, and other constricting items

See Rule of 9's chart at the end of this section

## Thermal

If burn < 10% body surface area (using rule of nines)
Cool down wound with NORMAL SALINE and dressings

Cover burn with dry sterile sheet or dressings

IV / IO PROCEDURE
Only if Burns ≥ 20% (KVO Otherwise)
**AGE 0 - 5 - Then 20 drops / min** (Macrodrip set)
not more than 125 ml / hr
**AGE 6 - 13 – Then 40 drops / min** (Macrodrip set)
not more than 250 ml / hr
**AGE 13 + - Then 80 drops / min** (Macrodrip set)
not more than 500 ml / hr

PEDIATRIC PAIN MANAGEMENT PROTOCOL

## Chemical

Eye Injury
Continuous flushing with Normal Saline

Remove clothing and / or expose area

Flush area with NORMAL SALINE for 10 – 15 minutes

IV / IO PROCEDURE

PEDIATRIC PAIN MANAGEMENT PROTOCOL

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# BURNS



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Type of exposure (heat, gas, chemical)<br>• Inhalation injury<br>• Time of injury<br>• Past medical history<br>• Medications<br>• Other trauma<br>• Loss of consciousness<br>• Tetanus / immunization status | • Burns, pain, swelling<br>• Dizziness<br>• Loss of consciousness<br>• Hypotension / shock<br>• Airway compromise / distress<br>• Singed facial or nasal hair<br>• Hoarseness / wheezing | • Superficial (1°) red and painful<br>• Partial thickness (2°) superficial partial thickness, deep partial thickness, blistering<br>• Full thickness (3°) painless and charred or leathery skin<br>• Chemical<br>• Thermal<br>• Electrical<br>• Radiation |

## KEY POINTS

- **Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **Early intubation is required in significant inhalation injuries with airway compromise.**
- Critical Burns: >25% body surface area (BSA); full thickness burns >10% BSA; partial thickness superficial partial thickness, deep partial thickness, and full thickness burns to face, eyes, hand or feet; electrical burns; respiratory burns; deep chemical burns; burns with extremes of age or chronic disease; and burns with associated major traumatic injury. These burns may require hospital admission or transfer to a burn center.
- Potential CO exposure should be treated with 100% oxygen.
- Circumferential burns to extremities are dangerous due to potential vascular compromise partial thickness to soft tissue swelling.
- Burn patients are prone to hypothermia – Never apply ice or cool burns that involve >10% body surface area.
- Do not overlook the possibility of multiple system trauma.
- Do not overlook the possibility of child abuse with children and burn injuries.
- See appendix for rule of nines.

1. **Thermal (dry and moist):**
   a. Stop burning process: i.e. remove patient from heat source, cool skin, remove clothing
   b. If patient starts to shiver or skin is cool, stop cooling process.
   c. Estimate extent (%) and depth of burn (see chart). Determine seriousness (see chart) of burn, contact Medical Control and transport accordingly. Cover burn areas with sterile dressing.
2. **Radiation Burns:**
   a. Treat as thermal burns except when burn is contaminated with radioactive source, then treat as chemical burn.
   b. Wear appropriate protective clothing when dealing with contamination.
   c. Contact HAZ MAT TEAM for assistance in contamination cases.
3. **Chemical Burns:**
   a. Wear appropriate protective clothing and respirators.
   b. Remove patient from contaminated area to decontamination site (NOT SQUAD).
   c. Determine chemicals involved; contact appropriate agency for chemical information.
   d. Remove patient's clothing and flush skin.
   e. Leave contaminated clothes at scene. Cover patient over and under before loading into squad.
   f. Patient should be transported by personnel not involved in decontamination process.
   g. Determine severity (see chart), contact Medical Control and transport accordingly.
   h. Relay type of substance involved to Medical Control.
4. **Electrical Burns:**
   a. Shut down electrical source; do not attempt to remove patient until electricity is CONFIRMED to be shut off.
   b. Assess for visible entrance and exit wounds and treat as thermal burns.
   c. Assess for internal injury, i.e., vascular damage, tissue damage, fractures, and treat accordingly.
   d. Determine severity of burn, contact Online Medical Control and transport accordingly.
5. **Inhalation Burns:**
   a. Always suspect inhalation burns when the patient is found in closed smoky environment and / or exhibits any of the following: burns to face / neck, singed nasal hairs, cough and / or stridor, soot in sputum.
   b. Provide oxygen therapy, contact Online Medical Control and transport.

- Handle patients gently to avoid further damage of the patient's skin**.**
- If the patient is exposed to a chemical, whenever possible, get the name of the chemical, and document it on the patient run report. **DO NOT** transport any hazardous materials with the patient.
- Look for signs of dehydration and shock.
- Initiate early intubation for symptomatic patients with inhalation burns.
- Patients with major burns should be transported to a Regional Burn Center.
- Patients with unstable airway or who are rapidly deteriorating should be transported to the closest appropriate facility.
- Patients with large surface burns lose the ability to regulate their body temperature. Avoid heat loss by covering the patient.

PEDIATRIC PROTOCOL

# CHEST TRAUMA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
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UNIVERSAL PATIENT CARE PROTOCOL

SPINAL MOTION RESTRICTION PROCEDURE

AIRWAY PROTOCOL

HIGH FLOW OXYGEN

CAPNOGRAPHY PROCEDURE

If S&S of Tension Pneumothorax
(No lung sounds on affected side, Hypotension, JVD)
TRAUMATIC NEEDLE CHEST DECOMPRESSION PROCEDURE
⚠ Be Prepared to Repeat *IF* S&S Return

IV / IO PROCEDURE
20 ml / kg Normal Saline Bolus to maintain SBP / Radial Pulses

If evidence of current / previous uncontrolled hemorrhage,
sustained HR > 120 and / or SBP < 90 (for age), within 60 mins of injury
Consider TRANEXAMIC ACID (TXA)
15 mg / kg mixed in 100 ml D5W over 10 mins – Max 1 gram

**Cardiac Tamponade:** Assess for Beck's Triad (Hypotension, + JVD and muffled heart sounds). Paradoxical Pulse (no radial pulse when breathing in) is likely. LOAD AND GO

**Massive Hemothorax:** Shock, then difficulty breathing. No JVD, decreased breath sounds, dull to percussion. LOAD AND GO

**Open Pneumothorax / Sucking Chest Wound:** Occlusive dressing secured on three sides or Commercial Chest Seal, allowing air escape. Prepare for tension pneumothorax. LOAD AND GO

**Flail Chest:** Assist with Ventilation – Gentle Positive Pressure
LOAD AND GO

**Suspected:** Traumatic Aortic Rupture, Tracheal or Bronchial Tree Injury, Myocardial Contusion, Diaphragmatic Tears, Esophageal Injury, Pulmonary Contusion:
Ensure an Airway, Administer Oxygen, LOAD AND GO

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

# CHEST TRAUMA



## SIGNS AND SYMPTOMS

| SIMPLE PNEUMOTHORAX | OPEN PNEUMOTHORAX | TENSION PNEUMOTHORAX | HEMOTHORAX |
|---|---|---|---|
| • Shortness of breath<br>• Dyspnea<br>• Tachypnea<br>• Cyanosis<br>• Chest pain<br>• Absent diminished Lung sounds on the affected side | • Shortness of breath<br>• Dyspnea<br>• Cyanosis<br>• Sucking chest wound<br>• Shock<br>• Absent / diminished Lung sounds on affected side | • Shortness of breath<br>• Cyanosis<br>• Shock<br>• Absent / diminished Lung sounds<br>• Tracheal deviation<br>• Hypotension<br>• JVD<br>• Tachycardia<br>• Dyspnea (late sign) | • Shortness of breath<br>• Dyspnea<br>• Cyanosis<br>• Dullness to Percussion sounds<br>• Flat neck veins<br>• Hypotension<br>• Shock<br>• Absent / diminished breath sounds<br>• Tachycardia |

| CARDIAC TAMPONADE | TRAUMATIC ASPHYXIA | FLAIL CHEST |
|---|---|---|
| • Hypotension<br>• Decreasing pulse pressure<br>• Elevated neck veins<br>• Muffled heart tones<br>• Bruising over the sternum<br>• Tachycardia | • Bloodshot, bulging eyes<br>• Blue, bulging tongue<br>• JVD<br>• Cyanotic upper body | • Paradoxical chest wall movement<br>• Asymmetric chest movement Upon inspiration<br>• Dyspnea<br>• Unstable chest segment<br>• Significant chest wall pain |

**Fluid Resuscitate to systolic of 70 + 2 x age**

## KEY POINTS

Thoracic injuries have been called the deadly dozen. The first six are obvious at the primary assessment.

1. Airway obstruction
2. Flail chest
3. Cardiac tamponade
4. Massive hemothorax
5. Open pneumothorax
6. Tension pneumothorax

The second six injuries may be subtle and not easily found in the field:

7. Traumatic aortic rupture
8. Esophageal injury
9. Myocardial contusion
10. Diaphragmatic tears
11. Tracheal / bronchial tree injury
12. Pulmonary contusion

- A **sucking chest wound** is when the thorax is open to the outside. The occlusive dressing may be anything such as petroleum gauze, plastic, or a defibrillator pad. Tape only 3 sides down so that excess intrathoracic pressure can escape, preventing a tension pneumothorax. May help respirations to place patient on the injured side, allowing unaffected lung to expand easier.
- A **flail chest** is when there are extensive rib fractures present, causing a loose segment of the chest wall resulting in paradoxical and ineffective air movement. Positive pressure breathing via BVM will help push the segment and the normal chest wall out with inhalation and to move inward together with exhalation, getting them working together again. Do not use too much pressure to prevent additional damage or pneumothorax.
- A **penetrating object** must be immobilized by any means possible. If it is very large, cutting may be possible, with care taken not to move it about when making the cut. Place an occlusive and bulky dressing over the entry wound.
- A **tension pneumothorax** is life threatening, look for *HYPOTENSION*, unequal breath sounds, JVD, increasing respiratory distress, and decreasing mental status. The pleura must be decompressed with a needle to provide relief. Decompress between the 2nd and 3rd ribs, midclavicular placing the catheter over the 3rd rib. Alternate site, 5th intercostal space mid axillary or anterior axillary line. Once the catheter is placed, watch closely for re-occlusion. Once the catheter is placed, watch closely for re-occlusion. Repeat if needed to prevent re-occlusion. Use appropriately sized catheter for age.

PEDIATRIC PROTOCOL

# DROWNING

| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
|---|---|---|---|---|---|---|---|---|
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

CONSIDER SPINAL MOTION RESTRICTION PROCEDURE

PEDIATRIC AIRWAY PROTOCOL
Initiate ventilation while patient is still in water if not breathing.
Provide high flow oxygen ASAP.

CAPNOGRAPHY PROCEDURE

IF DECOMPRESSION SICKNESS
Give oxygen – no positive pressure ventilation unless NOT breathing.

Apply Cardiac Monitor

IF HYPOTHERMIC
**Treat per Hypothermia Protocol**

IV / IO PROCEDURE
Normal Saline TKO

Monitor and Reassess

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

# DROWNING

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Submersion in water regardless of depth<br>• Possible trauma i.e.; fall, diving board<br>• Duration of immersion<br>• Temperature of water<br>• Salt vs. fresh water | • Period of unconsciousness<br>• Unresponsive<br>• Mental status changes<br>• Decreased or absent vital signs<br>• Vomiting<br>• Coughing | • Trauma<br>• Pre-existing medical problem<br>• Barotrauma (diving)<br>• Decompression sickness |

## KEY POINTS

- Exam: Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neuro
- Drowning due to suffocation from submersion in water.
- 2 causes – breath holding which leads to aspiration of water; & laryngospasm which closes the glottis.
- Both causes lead to profound hypoxia and death.
- Fresh water drowning ventricular fibrillation may be likely.
- Salt water drowning may cause pulmonary edema in time.
- Pulmonary edema can develop within 24 - 48 hours after submersion.
- EMS should be aware that there may be delayed symptoms in some cases.
- Patients WITHOUT vital sign abnormalities may follow standard refusal of care protocols.
- Drowning is a leading cause of death among would-be rescuers.
- Allow appropriately trained and certified rescuers to remove victims from areas of danger.
- With pressure injuries (decompression / barotrauma), consider transport for availability of a hyperbaric chamber.
- All hypothermic / drowning patients should have resuscitation performed until care is transferred, or if there are other signs of obvious death (putrification, traumatic injury unsustainable to life).
- Consider SPINAL MOTION RESTRICTION in all drowning cases.
- Patients with low core temperatures will not respond to ALS drug interventions. Maintain warming procedures and supportive care.
- DO NOT perform the Heimlich maneuver to remove water from the lungs prior to resuscitation.

PEDIATRIC PROTOCOL

# EXTEMITY TRAUMA / AMPUTATION

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-37 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

BLEEDING / HEMORRHAGE CONTROL PROCEDURE

Risk of Exsanguination?
*Internally or Externally*
Upper Extremities Apply Tourniquet
Lower Extremities 2 Tourniquets if needed

→ Consider Pediatric Multiple Trauma Protocol

OXYGEN

IV / IO PROCEDURE

PEDIATRIC PAIN MANAGEMENT PROTOCOL

If evidence of current / previous uncontrolled hemorrhage, HR > 120 and / or SBP < 90, within 60 mins of injury
Consider TRANEXAMIC ACID (TXA)
15 mg / kg mixed in 100 ml D5W over 10 mins – Max 1 gram

If open or suspected open fracture
(Crepitus / angulation with laceration over same site)
CeFAZolin (ANCEF)
Child 9 – 14 years (30 – 50 kg)
Over 14 or 50 kg use adult dose
1 grams IV / IO in 100 ml D5 / NS over 10 min - No Repeat

- STOP Allergy to cephalosporin antibiotics or penicillin
- STOP Unable to obtain allergy information for patient
- STOP Do not delay any other necessary procedure to administer
- ⚠ Monitor for signs of allergic reaction / anaphylaxis – treat per protocol if identified

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

Amputation?

Clean amputated part with normal saline irrigation

Wrap part in saline soaked sterile dressing and place in plastic bag if able

Place on ice if available – no direct contact to tissue

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# EXTREMITY TRAUMA / AMPUTATION

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Type of injury<br>• Mechanism: crush / penetrating / amputation<br>• Time of injury<br>• Open vs. closed wound / fracture<br>• Wound contamination<br>• Medical history<br>• Medications | • Pain, swelling<br>• Deformity<br>• Altered sensation / motor function<br>• Diminished pulse / capillary refill<br>• Decreased extremity temperature | • Abrasion<br>• Contusion<br>• Laceration<br>• Sprain<br>• Dislocation<br>• Fracture<br>• Amputation |

## KEY POINTS

- Exam: Mental Status, Extremity, Neuro
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.

Extremity Trauma

- DO NOT take the time to splint injured extremities in major trauma patients unless it does not delay the scene time or prevents you from performing more pertinent patient care.
- Splint the extremity if the patient has signs and symptoms of a fracture or dislocation.
- Treat all suspected sprains or strains as fractures until proven otherwise.
- Splint the joint above and below for all suspected fractures.
- Splint the bone above and below for all suspected joint injuries.
- Check and document the patient's MSP's before and after splinting.
- A traction splint with a backboard is the preferred splint to use for femur fractures.

Traumatic Amputation

- Care of the amputated extremity include:
  - Cleanse an amputated extremity with normal saline or sterile water.
  - DO NOT place any amputated tissue directly on ice or cold pack. Instead, place the amputated limb into a plastic bag. Put the bag into a container of cool water with a few ice cubes (if available).
- Contact the receiving hospital with the patient information and include the status of the amputated limb.
- Focus on patient care and not on the amputated extremity.
- Tourniquets should be applied early if there is a risk of exsanguination (bleeding out) from extremity injury.
- Remember to calm and reassure the patient. Do not give the patient or their family member's false hope of re-attachment of the affected limb. A medical team at the receiving hospital makes this decision.
- Delegate someone to do an on-scene search for the amputated part when it cannot be readily found and continue with patient care.
- Use only commercially available tourniquets.

PEDIATRIC PROTOCOL

# HEAD TRAUMA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL
Oxygen for all head trauma

CONSIDER SPINAL MOTION RESTRICTION PROCEDURE

Control Bleeding, Apply Dressing

Determine and **Trend** GCS

Consider Other Protocols
Multiple Trauma Protocol
(if Not Isolated Head Trauma)
Altered Mental Status Protocol
Seizure Protocol (if Seizure Activity)

Isolated Uncomplicated Head Trauma?

PEDIATRIC AIRWAY PROTOCOL
Do Not Hyperventilate

IV / IO PROCEDURE
Limit IV fluids due to cerebral edema
Maintain SBP

Evidence of, or Suspect
Traumatic Brain Injury (TBI)?

PEDIATRIC AIRWAY PROTOCOL

Do ***NOT*** Allow Patient to Become Hypoxic During
ANY Airway Management
Maintain $SpO_2$ > 94% At All Times!
Apply Capnography If Advanced Airway Used

Ventilate to Maintain
**$CO_2$ 35**
Child 25 Breaths / Min
Infant 35 Breaths / Min

IV / IO PROCEDURE
Normal Saline Bolus to maintain SBP

Do NOT allow patient to become hypotensive

Monitor and Reassess

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# HEAD TRAUMA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Time of injury<br>• Mechanism (blunt vs. penetrating)<br>• Loss of consciousness<br>• Bleeding<br>• Past medical history<br>• Medications<br>• Evidence for multi-trauma | • Pain, swelling, bleeding<br>• Altered mental status<br>• Unconscious<br>• Respiratory distress / failure<br>• Vomiting<br>• Major traumatic mechanism of injury<br>• Seizure | • Skull fracture<br>• Brain injury (concussion, contusion, hemorrhage or laceration)<br>• Epidural hematoma<br>• Subdural hematoma<br>• Subarachnoid hemorrhage<br>• Spinal injury<br>• Abuse |

**Fluid Resuscitate to systolic of 70 + 2 x age**

## How Can I Spot a Possible Concussion?

Children and teens who show or report one or more of the signs and symptoms listed below—or simply say they just "don't feel right" after a bump, blow, or jolt to the head or body—may have a concussion or other serious brain injury.

### Signs Observed by Parents or Coaches

- Appears dazed or stunned.
- Forgets an instruction, is confused about an assignment or position, or is unsure of the game, score, or opponent.
- Moves clumsily.
- Answers questions slowly.
- Loses consciousness *(even briefly)*.
- Shows mood, behavior, or personality changes.
- Can't recall events *prior to* or *after* a hit or fall.

### Symptoms Reported by Children and Teens

- Headache or "pressure" in head.
- Nausea or vomiting.
- Balance problems or dizziness, or double or blurry vision.
- Bothered by light or noise.
- Feeling sluggish, hazy, foggy, or groggy.
- Confusion, or concentration or memory problems.
- Just not "feeling right," or "feeling down."

| KEY POINTS |
|---|
| • **Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**<br>• If GCS < 12 consider air / rapid transport and if GCS < 8 intubation should be anticipated.<br>• Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).<br>• Hypotension usually indicates injury or shock unrelated to the head injury.<br>• The most important item to monitor and document is a change in the level of consciousness.<br>• Concussions are periods of confusion or LOC associated with trauma, which may have resolved by the time EMS arrives. A physician should evaluate any prolonged confusion or mental status abnormality, which does not return to normal within 15 minutes or any documented loss of consciousness. |

PEDIATRIC PROTOCOL

# MAXILLOFACIAL / EYE TRAUMA

| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
|---|---|---|---|---|---|---|---|---|
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL

Determine type of injury

## Eye

- Remove contact Lenses (If applicable)
- If burn or foreign body, determine substance. Flush with copious Amounts of normal saline
- If penetrating trauma, secure object (Do not remove)
- Eye out; Cover with sterile 4 x 4, normal saline and stabilize
- If Non-Penetrating Trauma or Chemical Burns
  CONSIDER TOPICAL PAIN CONTROL
  TETRACAINE (PONTOCAINE)
  1 Drop to affected eye
  No Repeat
  ⚠ If Tetracaine is used, patient must be evaluated at hospital

## Tongue

- Have suction on and immediately available to maintain airway
- Attempt to control bleeding with direct pressure / gauze if able and will not cause airway obstruction

## Nose

- Have suction on and immediately available to maintain airway
- Sit patient upright and forward. Pinch nostrils. Consider external applied cold pack to bridge of nose
- Traumatic or atraumatic epistaxis not controlled with BLS Measures

  Consider TRANEXAMIC ACID (TXA) Soaked gauze product nostril packing

  Soak in standard concentration TXA
  Have patient blow nose, suction active bleeding, then pack nostril with TXA soaked gauze

  Resume BLS care as above

## Ear

- If foreign body, determine substance
- Attempt to control bleeding with direct pressure / gauze

## Tooth

- If tooth out attempt preservation as soon as possible in; Commercially available tooth preservation kit (if available) or whole milk (if available). Handle by enamel only, do not touch roots
- Bleeding socket from missing teeth not controlled with BLS Measures

  Consider TRANEXAMIC ACID (TXA) Soaked gauze product socket packing

  Soak in standard concentration TXA

  Resume BLS care as above

**TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# MAXILLOFACIAL / EYE TRAUMA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Trauma of any type that results in injury to one or both eyes. | • Irritation to eye<br>• Visual disturbances<br>• Obvious penetrating injury<br>• Burn (chemical, thermal)<br>• Loss of vision<br>• Dizziness<br>• Loss of consciousness<br>• Nausea | • Hypertension<br>• Contact lens problem |

## KEY POINTS

- If unsure if something can be flushed with water, contact Medical Command.
- A garden hose can be used to help flush the patient's eye(s) if available. **DO NOT** use a high-pressure hose or at a high force. If needed, irrigate the patient's eyes for approximately 5 -15 minutes.
- Begin irrigating immediately, because irreversible damage can occur in a few minutes.

**TRAUMA**

- Do not allow eye injury to distract you from the basics of trauma care.
- Do not remove any foreign body imbedded in the eye or orbit. Stabilize any large protruding foreign bodies.
- With blunt trauma to the eye, if time permits, examine the globe briefly for gross laceration as the lid may be swollen tightly shut later. Sclera rupture may lie beneath an intact conjunctiva.
- Covering both eyes when only one eye is injured may help to minimize trauma to the injured eye, but in some cases the patient is too anxious to tolerate this.
- Transport patient supine unless other life threats prohibit this from being done. (This is based on physics, the goal of not letting the fluid within the eye drain out of the eye)

**CHEMICAL BURNS**

- When possible determine type of chemical involved first. The eye should be irrigated with copious amounts of water or saline, using IV tubing wide open for a minimum of 15 minutes started as soon as possible. Any delay may result in serious damage to the eye.
- Always obtain name and, if possible, a sample of the contaminant or ask that they be brought to the hospital as soon as possible.

**CONTACT LENSES**

- If possible, contact lenses should be removed from the eye; be sure to transport them to the hospital with the patient. If the lenses cannot be removed, notify the ED personnel as soon as possible.
- If the patient is conscious and alert, it is much safer and easier to have the patient remove their lenses.

**ACUTE, UNILATERAL VISION LOSS**

- When a patient suddenly loses vision in one eye with no pain, there may be a central retinal artery occlusion. Urgent transport and treatment is necessary.
- Patient should be transported flat.

PEDIATRIC PROTOCOL

# MULTIPLE TRAUMA

| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
|---|---|---|---|---|---|---|---|---|
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

Consider
Air transport if
delay due to extrication

UNIVERSAL PATIENT CARE PROTOCOL

CONSIDER SPINAL MOTION RESTRICTION PROCEDURE

PEDIATRIC AIRWAY PROTOCOL

Rapid Trauma Assessment

CAPNOGRAPHY PROCEDURE

Attach Cardiac Monitor

IV / IO PROCEDURE

Assess Vital Signs / Perfusion

**Abnormal**

Reassess Airway
Ventilate Appropriately

NORMAL SALINE BOLUS
20 ml / kg - Repeat as Needed

If evidence of current / previous uncontrolled hemorrhage, sustained HR > 120 and / or SBP < 90 (for age), within 60 mins of injury
Consider TRANEXAMIC ACID (TXA)
15 mg / kg mixed in 100 ml D5W over 10 mins – Max 1 gram

Monitor and Reassess

Continued Hypotension?
Consider
TRAUMATIC NEEDLE CHEST DECOMPRESSION PROCEDURE

**Normal**

Ongoing Assessment

Monitor and Reassess

Treat per Appropriate Protocol

PEDIATRIC PAIN PROTOCOL

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# MULTIPLE TRAUMA



| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Time and mechanism of injury<br>• Damage to structure or vehicle<br>• Location in structure or vehicle<br>• Others injured or dead<br>• Speed and details of MVC<br>• Restraints / protective equipment<br>• Car seat<br>• Helmet<br>• Pads<br>• Ejection<br>• Past medical history<br>• Medications | • Pain, swelling<br>• Deformity, lesions, bleeding<br>• Altered mental status<br>• Unconscious<br>• Hypotension or shock<br>• Arrest | **Life Threatening:**<br>• Chest Tension pneumothorax<br>• Flail chest<br>• Pericardial tamponade<br>• Open chest wound<br>• Hemothorax<br>• Intra-abdominal bleeding<br>• Pelvis / femur fracture<br>• Spine fracture / cord injury<br>• Head injury (see Head trauma)<br>• Extremity fracture / dislocation<br>• HEENT (airway obstruction)<br>• Hypothermia |

**A Pediatric Trauma Victim is a person < 16 years of age exhibiting one or more of the following physiologic or anatomic conditions**

| Physiologic conditions | Anatomic conditions |
|---|---|
| • Glasgow Coma Scale < 13;<br>• Loss of consciousness > 5 minutes;<br>• Deterioration in level of consciousness at the scene or during transport;<br>• Failure to localize to pain;<br>• Evidence of poor perfusion, or evidence of respiratory distress or failure. | • Penetrating trauma to the head, neck, or torso;<br>• Significant, penetrating trauma to extremities proximal to the knee or elbow with evidence of neurovascular compromise;<br>• Injuries to the head, neck, or torso where the following physical findings are present;<br>• Visible crush injury;<br>• Abdominal tenderness, distention, or seatbelt sign;<br>  ○ Pelvic fracture;<br>  ○ Flail chest;<br>• Injuries to the extremities where the following physical findings are present:<br>  ○ Amputations proximal to the wrist or ankle;<br>  ○ Visible crush injury:<br>  ○ Fractures of two or more proximal long bones;<br>  ○ Evidence of neurovascular compromise.<br>• Signs or symptoms of spinal cord injury;<br>• 2nd or 3rd Degree burns > 10% total BSA, or other significant burns involving the face, feet, hands, genitalia, or airway. |

**Fluid Resuscitate to systolic of 70 + 2 x age**

| KEY POINTS |
|---|
| • **Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**<br>• Mechanism is the most reliable indicator of serious injury. Examine all restraints / protective equipment for damage.<br>• In prolonged extrications or serious trauma consider air transportation for transport times and the ability to give blood.<br>• Do not overlook the possibility for child abuse.<br>• A trauma victim is a pediatric patient if they are < 16 years old.<br>• Major trauma patients are to be transported to the closest pediatric trauma center.<br>• Contact the receiving hospital for all major trauma or critical patients.<br>• The Proper size equipment is very important to resuscitation care. Refer to length-based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE OR SIMILAR GUIDE) when unsure about patient weight, age and / or drug dosage and when choosing equipment size.<br>• Cover open wounds, burns, eviscerations.<br>• Except for airway control, initiate ALS enroute when transporting major trauma patients.<br>• If unable to access patient airway and ventilate, then transport to the closest facility for airway stabilization.<br>• The on-scene time for major trauma patients should not exceed 10 minutes without documented, acceptable reason for the delay.<br>• When initiating an IV and drawing blood, collect a red top blood tube to assist the receiving hospital with determining the patient's blood type.<br>• All major trauma patients should receive oxygen administration, an IV(s), and cardiac monitoring.<br>• Provide a documented reason if an intervention could not be performed.<br>• Transport to a Pediatric Trauma center when able |

PEDIATRIC PROTOCOL

# TRAUMA ARREST

| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
|---|---|---|---|---|---|---|---|---|
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Time of injury<br>• Mechanism: blunt / penetrating<br>• Loss of consciousness<br>• Bleeding<br>• Medications<br>• Evidence of multi-trauma | • Excessive bleeding<br>• Unresponsive; not breathing<br>• Cardiac arrest<br>• Significant mechanism of injury | • Obvious DOA<br>• Death |

UNIVERSAL PATIENT CARE PROTOCOL

BEGIN RESUSCITATION

CONSIDER SPINAL MOTION RESTRICTION PROCEDURE

PEDIATRIC AIRWAY PROTOCOL

CAPNOGRAPHY PROCEDURE

BILATERAL
TRAUMATIC NEEDLE CHEST DECOMPRESSION

IV / IO PROCEDURE

Apply Cardiac Monitor

Appropriate Protocol based on Signs and Symptoms

INITIATE TRAUMA ALERT

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

Consider
DOA / Termination of Efforts

## KEY POINTS

- Immediately transport traumatic cardiac arrest patients.
- With the exception of airway management, traumatic cardiac arrests are “load and go” situations.
- Resuscitation should not be attempted in cardiac arrest patients with spinal transection, decapitation, or total body burns, nor in patients with obvious, severe blunt trauma patients that are without vital signs, pupillary response, or an organized or shockable cardiac rhythm at the scene. Patients in cardiac arrest with deep penetrating cranial injuries and patients with penetrating cranial or truncal wounds associated with asystole and a transport time of more than 15 minutes to a definitive care facility are unlikely to benefit from resuscitative efforts.
- Extensive, time-consuming care of trauma victims in the field is usually not warranted. Unless the patient is trapped, they should be enroute to a medical facility within 10 minutes after arrival of the ambulance on the scene.

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# GLASGOW COMA SCALE

| | | | |
|---|---|---|---|
| **EYE OPENING** | Spontaneous | Spontaneous | 4 |
| | To voice | To voice | 3 |
| | To pain | To pain | 2 |
| | None | None | 1 |
| **VERBAL RESPONSE** | | | |
| | Oriented | Coos, babbles | 5 |
| | Confused | Irritable cry, inconsolable | 4 |
| | Inappropriate | Cries to pain, | 3 |
| | Garbled speech | Moans to pain | 2 |
| | None | None | 1 |
| **MOTOR RESPONSE** | | | |
| | Obeys commands | Normal movements | 6 |
| | Localizes pain | Withdraws to touch | 5 |
| | Withdraws to pain | Withdraws to pain | 4 |
| | Flexion | Flexion | 3 |
| | Extension | Extension | 2 |
| | Flaccid | Flaccid | 1 |

*** NOTE: MOTOR RESPONSE IS MOST INDICATIVE OF LEVEL OF INJURY**

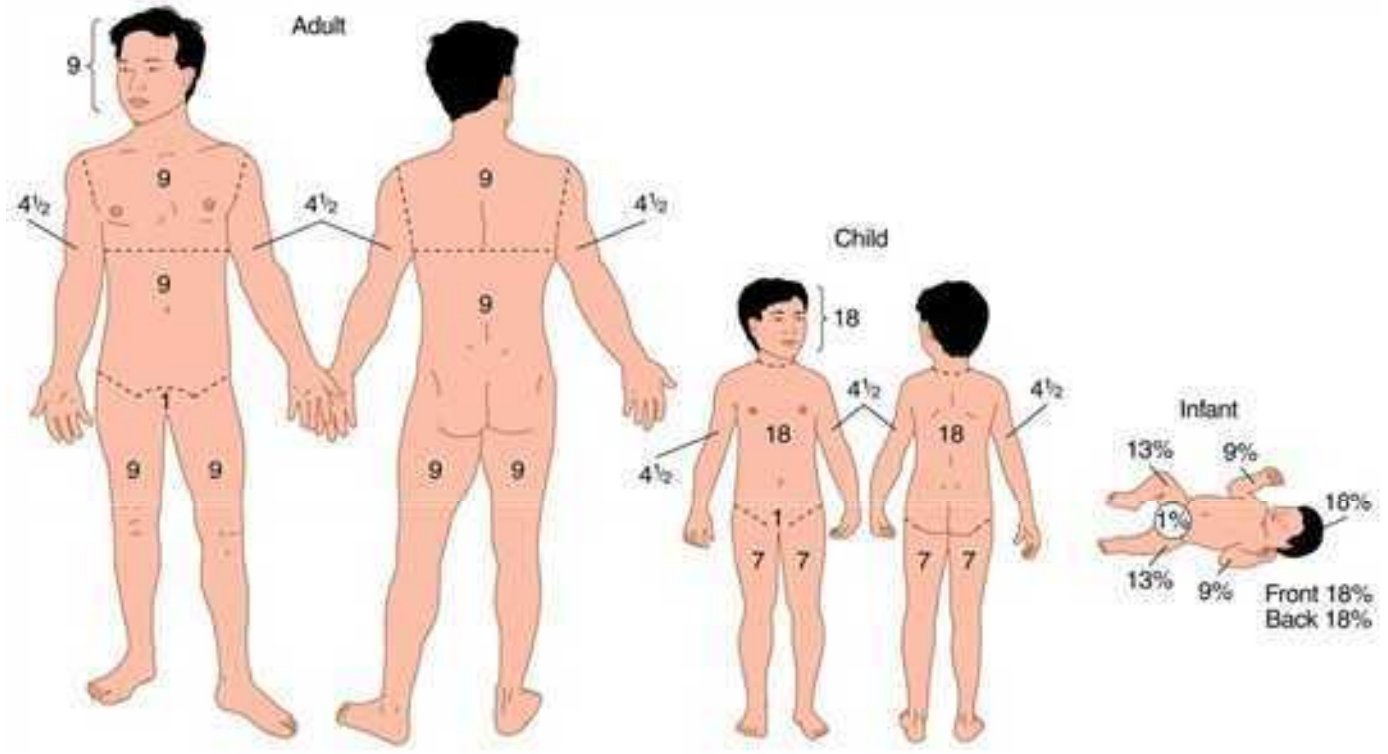
PEDIATRIC PROTOCOL

# NORMAL VITAL SIGNS

| AGE | HEART RATE | RESPIRATIONS | SYSTOLIC BLOOD PRESSURE |
|---|---|---|---|
| Preterm, 1 kg | 120-160 | 30-60 | 36-58 |
| Preterm 1 kg | 120-160 | 30-60 | 42-66 |
| Preterm 2 kg | 120-160 | 30-60 | 50-72 |
| Newborn | 126-160 | 30-60 | 60-70 |
| Up to 1 yo | 100-140 | 30-60 | 70-80 |
| 1-3 yo | 100-140 | 20-40 | 76-90 |
| 4-6 yo | 80-120 | 20-30 | 80-100 |
| 7-9 yo | 80-120 | 16-24 | 84-110 |
| 10-12 yo | 60-100 | 16-20 | 90-120 |
| 13-14 yo | 60-90 | 16-20 | 90-120 |
| 15 + yo | 60-90 | 14-20 | 90-130 |

Blood pressure is a late and unreliable indicator of shock in children

# RULE OF NINES




1% is equal to the surface of the palm of the patient's hand. If unsure of %, describe injured area.

**MAJOR BURN CRITERIA**

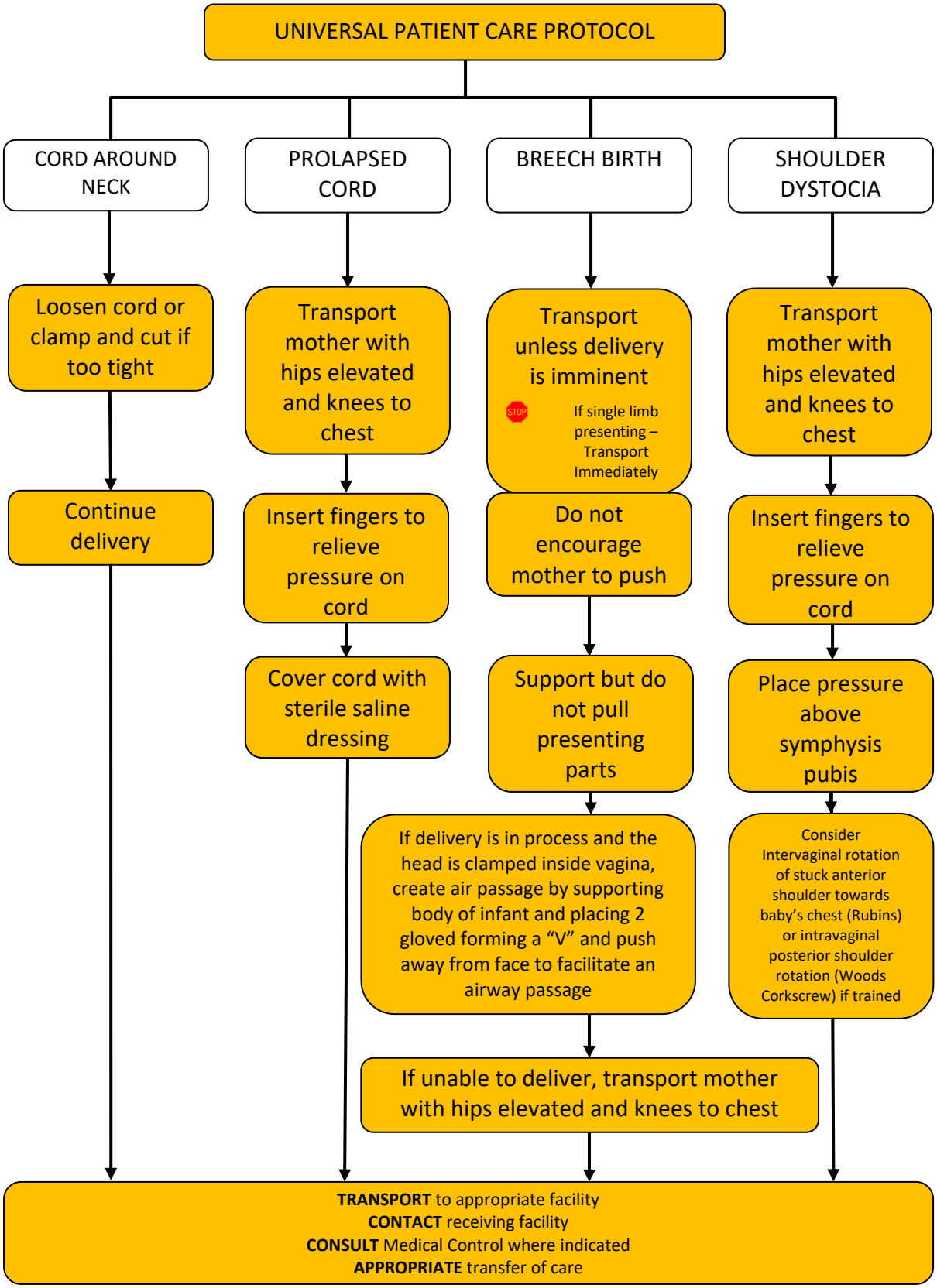
- 2° and 3° burns > 10% surface area
- Burns of the face, hands, feet, or genitalia
- Electrical shock with burn injury
- Burn with inhalation injury any burn with potential functional or cosmetic impairment

# SECTION 12 - OBSTETRICS PROTOCOLS

Abnormal Birth Emergencies.....2-12
Obstetrical HEMORRHAGE Emergencies.....4-12
Obstetrical HYPERTENSIVE Emergencies.....6-12
Uncomplicated / Imminent Delivery.....8-12
Neonatal Resuscitation.....10-12

# ABNORMAL BIRTH EMERGENCIES



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# ABNORMAL BIRTH EMERGENCIES

**CONTACT RECEIVING FACILITY IMMEDIATLEY WHEN ANY ABNORMAL BIRTH PRESENTATION IS DISCOVERED**

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Hypertension meds<br>• Prenatal care<br>• Prior pregnancies / births<br>• Gravida / para<br>• Ultrasound findings in prenatal care | • Frank breech (buttocks presents first)<br>• Footling breech (one foot or both feet presenting)<br>• Transverse lie (fetus is on his / her side with possible arm or leg presenting)<br>• Face first presentation<br>• Prolapsed cord (umbilical cord presents first) | • Miscarriage<br>• Stillbirth |

## KEY POINTS

**General Information**

- DO NOT pull on any presenting body parts.
- These patients will most likely require a c-section, so immediate transport is needed.
- Prolonged, non-progressive labor distresses the fetus and mother. Be sure to reassess mother's vital signs continuously.
- Transport to an appropriate facility with OB services if the patient is pregnant.
- A delivered child should get another PCR as a second patient
- After delivery, drying, and stimulation place baby on mother skin to skin to prevent hypothermia if the newborn does not require resuscitation. Prevent hypothermia in all cases.

**Cord Around Baby's Neck:**

- As baby's head passes out the vaginal opening, feel for the cord. Initially try to slip cord over baby's head; if too tight, clamp cord in two places and cut between clamps.

**Breech Delivery:**

- Footling breech, which is one or both feet delivered first
- Frank breech, which is the buttocks first presentation
  - When the feet or buttocks first become visible, there is normally time to transport patient to nearest facility.
  - If upper thighs or the buttock have come out of the vagina, delivery is imminent.
  - If the child's body has delivered and the head appears caught in the vagina, the EMT must support the child's body and insert two fingers into the vagina along the child's neck until the chin is located. At this point, the two fingers should be placed between the chin and the vaginal canal and then advanced past the mouth and nose.
  - After achieving this position, a passage for air must be created by pushing the vaginal canal away from the child's face. This air passage must be maintained until the child is completely delivered.

**Excessive Bleeding Pre-Delivery:**

- If bleeding is excessive during this time and delivery is imminent, in addition to normal delivery procedures, the EMT should use the HYPOVOLEMIC SHOCK PROTOCOL.
- If delivery is not imminent, patient should be transported on her left side and shock protocol followed.

**Excessive Bleeding Post-Delivery:**

- If bleeding appears to be excessive, start IV of saline.
- If placenta has been delivered, massage uterus and put baby to mother's breast.
- Follow HYPOVOLEMIC SHOCK PROTOCOL.

**Prolapsed Cord:**

- When the umbilical cord passes through the vagina and is exposed, the EMT should check cord for a pulse.
- The patient should be transported with hips elevated or in the knee chest position and a moist dressing around cord.
- If umbilical cord is seen or felt in the vagina, insert two fingers to elevate presenting part away from cord, distribute pressure evenly when occiput presents.
- DO NOT attempt to push the cord back. High flow oxygen and transport IMMEDIATELY.

**Shoulder Dystocia:**

- Following delivery of the head the shoulder(s) become "stuck" behind the symphysis pubis or sacrum of the mother.
- Occurs in approximately 1% of births.

# OBSTETRICAL HEMORRHAGE EMERGENCIES

## *Pre and Post-Partum*

OBSTETRICAL

Can occur at the same time as OB Hypertension See OB HYPERTENSIVE EMERGENCIES

UNIVERSAL PATIENT CARE PROTOCOL

IV / IO PROCEDURE

Capnography Procedure

**Bleeding AFTER BIRTH**
Postpartum Hemorrhage
**Up to 12 weeks postpartum**

NORMAL SALINE BOLUS
To Maintain MAP > 65
or SBP 90 if MAP Unavailable or Radial Pulses

External Uterine Massage

OXYTOCIN
10 Units IM – No Repeat
⚠ Do NOT give between multiple births
⚠ Permissible to give PRIOR to placental delivery

If evidence of current / previous uncontrolled hemorrhage, HR > 120 and / or SBP < 90, Consider TRANEXAMIC ACID (TXA)
**1 Grams (1000 mg)** IV / IO *slow push* over 10 min *-or-*
**1 Grams IV / IO (1000 mg)** mixed in 100 ml D5W over 10 mins
⚠ May repeat in 30 mins if bleeding continues

⚠
THIS IS DIFFERENT FROM TRAUMA DOSING
Evidence based dosing for this patient population

**Bleeding DURING PREGNANCY**
1st Trimester – Miscarriage, Ectopic Pregnancy
2nd & 3rd Trimester – Placenta Previa / Abruptio Placenta

Pad, do not pack bleeding, save, and bring with patient

NORMAL SALINE BOLUS
To Maintain MAP > 65
or SBP 90 if MAP Unavailable or Radial Pulses

QUIET ***RAPID*** **TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care **Transport to Hospital with OB CAPABILITIES**

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# OBSTETRICAL HEMORRHAGE EMERGENCIES

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Hypertension meds<br>• Prenatal care<br>• Prior pregnancies / births<br>• Gravida (pregnancies) / para (live births) | • Vaginal bleeding<br>• Abdominal pain<br>• Seizures<br>• Hypertension<br>• Severe headache<br>• Visual changes<br>• Edema of hands and face | • Pre-eclampsia / eclampsia<br>• Placenta previa<br>• Placenta abruptio<br>• Spontaneous abortion |

## KEY POINTS

- Exam: Mental Status, Abdomen, Heart, Lungs, Neuro

**General Information**

- Any woman of child bearing age with syncope should be considered an ectopic pregnancy until proven otherwise.
- May place patient in a left lateral position to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour.
- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation and fetal monitoring.
- Pad do not **DO NOT** apply packing into the vagina. Save any expelled material and bring to hospital.
- Be alert for fluid overload when administering fluids.
- Consider starting a second IV if the patient is experiencing excessive vaginal bleeding or hypotension maintain BP 90 systolic,
- Transport to an appropriate OB facility
- A delivered child should get another PCR as a second patient

**Abortion / Miscarriage**

- The patient may be complaining of cramping, nausea, and vomiting.
- Be sure to gather any expelled tissue and transport it to the receiving facility.
- If patient is < 16 weeks, may go to any hospital. If > 16 weeks, or unknown, transport to sub-specialty obstetrical hospital.
- Signs of infection may not be present if the abortion/miscarriage was recent.
- An abortion is any pregnancy that fails to survive over 20 weeks. When it occurs naturally, it is commonly called a ”miscarriage”.

**Abruptio Placenta**

- Usually occurs after 20 weeks.
- Dark red vaginal bleeding.
- May only experience internal bleeding.
- May complain of a “tearing” abdominal pain.

**Ectopic Pregnancy**

- The patient may have missed a menstrual period or had a positive pregnancy test.
- Acute unilateral lower abdominal pain that may radiate to the shoulder.
- Any female of childbearing age complaining of abdominal pain is considered to have an ectopic pregnancy until proven otherwise.
- If > 16 weeks, transport to a sub-specialty obstetric hospital.

**Pelvic Inflammatory Disease**

- Be tactful when questioning the patient to prevent embarrassment.
- Diffuse back pain.
- Possibly lower abdominal pain.
- Pain during intercourse.
- Nausea, vomiting, or fever.
- Vaginal discharge.
- May walk with an altered gait do to abdominal pain.

**Placenta Previa**

- Usually occurs during the last trimester.
- Painless.
- Bright red vaginal bleeding.

**Postpartum Hemorrhage**

- Post-partum blood loss greater than 300 - 500 ml.
- Bright red vaginal bleeding.
- Be alert for shock and hypotension.

**Uterine Inversion**

- The uterine tissue presents from the vaginal canal. Cover with sterile saline dressing.
- Be alert for vaginal bleeding and shock.

**Uterine Rupture**

- Often caused by prolonged, obstructed, or non-progressive labor.
- Severe abdominal pain.

**Vaginal Bleeding**

- If the patient is experiencing vaginal bleeding, DO NOT pack the vagina, pad on outside only.
- If shock or hypotension, go to the nearest hospital with OB capability. If no shock or hypotension and gestational age > 16 weeks and <35 weeks, transport to a sub-specialty obstetric hospital.

# OBSTETRICAL HYPERTENSIVE EMERGENCIES

## *Pre and Post-Partum*



Can occur at the same time as OB Hemorrhage See OB HEMORRHAGE EMERGENCIES

UNIVERSAL PATIENT CARE PROTOCOL

IV / IO PROCEDURE

Capnography Procedure

**Pre-Eclampsia or Post-partum hypertension < 6 weeks**
**SBP ≥ 140 and / or DBP ≥ 90** with Edema, Headache, Visual Disturbances, or Epigastric Discomfort

→ MAGNESIUM SULFATE
4 grams
IV / IO over 20 minutes may repeat 2 grams if unresolved or re-occurrence over 5 min

**Pre-Eclampsia or Post-partum hypertension < 6 weeks**
**SBP ≥ 160 and / or DBP ≥ 110**

*REGARDLESS OF SYMPTOMS*

→ MAGNESIUM SULFATE
4 grams
IV / IO over 20 minutes may repeat 2 grams if unresolved or re-occurrence over 5 min

→ LABETALOL
20 mg slow IV
If no improvement in 5 min then
40 mg slow IV
⚠ DO NOT CONFUSE WITH METOPROLOL

**Eclampsia**
Patent Actively Seizing

→ MAGNESIUM SULFATE
4 grams
IV / IO over 20 minutes may repeat 2 grams if unresolved or re-occurrence over 5 min

→ ONLY IF MAGNESIUM FAILS AND ALL IS USED

MIDAZOLAM
2.5 mg IV / IO or 5 mg IM / IN
OR
LORazepam
1 – 2 mg IV / IO / IM / IN
⚠ If Midazolam or LORazepam Unavailable, See Medication Section for diazePAM

→ If SBP is > 160 and / or DBP > 110 *also give*
LABETALOL
20 mg slow IV
If no improvement in 5 min then
40 mg slow IV
⚠ DO NOT CONFUSE WITH METOPROLOL

QUIET ***RAPID*** **TRANSPORT** to appropriate facility **CONTACT** receiving facility **CONSULT** Medical Control where indicated **APPROPRIATE** transfer of care **Transport to Hospital with OB CAPABILITIES**

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# OBSTETRICAL HYPERTENSIVE EMERGENCIES

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Past medical history<br>• Hypertension meds<br>• Prenatal care<br>• Prior pregnancies / births<br>• Gravida (pregnancies) / para (live births) | • Vaginal bleeding<br>• Abdominal pain<br>• Seizures<br>• Hypertension<br>• Severe headache<br>• Visual changes<br>• Edema of hands and face | • Pre-eclampsia / eclampsia<br>• Placenta previa<br>• Placenta abruptio<br>• Spontaneous abortion |

## KEY POINTS

- Exam: Mental Status, Abdomen, Heart, Lungs, Neuro

**General Information**

- Any woman of child bearing age with syncope should be considered an ectopic pregnancy until proven otherwise.
- May place patient in a left lateral position to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of pads used per hour.
- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation and fetal monitoring.
- Pad do not **DO NOT** apply packing into the vagina. Save any expelled material and bring to hospital.
- Be alert for fluid overload when administering fluids.
- Consider starting a second IV if the patient is experiencing excessive vaginal bleeding or hypotension maintain BP 90 systolic,
- Transport to an appropriate OB facility
- A delivered child should get another PCR as a second patient

**Pre-Eclampsia / Eclampsia**

- Severe headache, vision changes, or RUQ pain may indicate pre-eclampsia.
- In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic and greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- In cases of pre-eclampsia or post-partum hypertension, the labetalol is a priority. However, do not delay magnesium while obtaining orders for labetalol.

**Uterine Rupture**

- Often caused by prolonged, obstructed, or non-progressive labor.
- Severe abdominal pain.

**Vaginal Bleeding**

- If the patient is experiencing vaginal bleeding, DO NOT pack the vagina, pad on outside only.
- If shock or hypotension, go to the nearest hospital with OB capability. If no shock or hypotension and gestational age > 16 weeks and <35 weeks, transport to a sub-specialty obstetric hospital.

# UNCOMPLICATED DELIVERY

OBSTETRICAL

Contact Receiving Facility to Notify of Delivery

Observed Head Crowning

UNIVERSAL PATIENT CARE PROTOCOL

Prepare Patient for Delivery
Set-Up Equipment

IV PROCEDURE (if time) Not in AC
Normal Saline at KVO

**Delivery of Head**
Firm, gentle pressure with flat of hand to slow expulsion
Allow head to rotate normally, check for cord around neck, wipe face free of debris
Suction mouth and nose with bulb syringe

**Delivery of Body**
Place one palm over each ear with next contraction **gently** move downward until upper shoulder appears
Then lift gently to ease out lower shoulder
Support the head and neck with one hand and buttocks with other

**Newborn and Cord**
Keep newborn at level of vaginal opening
Keep warm and dry
After 10 seconds, clamp cord in two places with sterile equipment at least 6 - 8" from newborn
Cut between clamps

Allow placenta to deliver itself but do not delay transport while waiting
Take placenta to hospital with patient
**DO NOT PULL-ON CORD TO DELIVER PLACENTA!**
**Perform APGAR Score 1 min and 5 min post delivery**
Place baby on mother skin to skin for warmth unless resuscitation required – prevent hypothermia in all cases

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care
**Transport to Hospital with OB Facilities**

OXYTOCIN
10 Units IM
After Delivery –
No Repeat
For all deliveries regardless off bleeding

⚠ Do not give between multiple births

⚠ Wait until placental delivery unless hemorrhage, treat per OB Emergencies

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# UNCOMPLICATED DELIVERY

**CONTACT RECEIVING FACILITY IMMEDIATLEY WHEN DELIVERY IS IMMINENT**

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Due date<br>• Time contractions started / how often<br>• Rupture of membranes<br>• Time / amount of any vaginal bleeding<br>• Sensation of fetal activity<br>• Past medical and delivery history<br>• Medications | • Spasmodic pain<br>• Vaginal discharge or bleeding<br>• Crowning or urge to push<br>• Meconium<br>• Left lateral position<br>• Inspect perineum (No digital vaginal exam) | • Abnormal presentation<br>• Buttock<br>• Foot<br>• Hand<br>• Prolapsed cord<br>• Placenta previa<br>• Abruptio placenta |

## APGAR SCORING

| SIGN | 0 | 1 | 2 |
|---|---|---|---|
| **COLOR** | Blue / Pale | Pink Body, Blue Extremities | Completely Pink |
| **HEART RATE** | Absent | Below 100 | Above 100 |
| **IRRITABILITY (Response to Stimulation)** | No Response | Grimace | Cries |
| **MUSCLE TONE** | Limp | Flexion of Extremities | Active Motion |
| **RESPIRATORY EFFORT** | Absent | Slow and Regular | Strong Cry |

**KEY POINTS**

- Exam (of Mother): Mental Status, Heart, Lungs, Abdomen, Neuro
- Document all times (delivery, contraction frequency, and length).
- If maternal seizures occur, refer to the OBSTETRICAL EMERGENCIES PROTOCOL.
- After delivery, massaging the uterus (lower abdomen) will promote uterine contraction and help to control post-partum bleeding.
- Some bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
- Prepare to deliver on scene (protecting the patient's privacy). If delivery becomes imminent while enroute, stop the squad and prepare for delivery.
- Newborns are very slippery, so be careful not to drop the baby.
- There is no need to wait on scene to deliver the placenta.
- If possible, transport between deliveries if the mother is expecting twins.
- Allow the placenta to deliver, but DO NOT delay transport while waiting.
- DO NOT PULL ON THE UMBILICAL CORD WHILE PLACENTA IS DELIVERING.
- A delivered child should get another PCR as a second patient
- After delivery, drying, and stimulation place baby on mother skin to skin to prevent hypothermia if the newborn does not require resuscitation. Prevent hypothermia in all cases.
- Transport to a hospital with OB services
- If < 35 weeks or unknown gestational age, transport to sub-specialty OB hospital.

# NEONATAL RESUSCITATION

| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
|---|---|---|---|---|---|---|---|---|
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

UNIVERSAL PATIENT CARE PROTOCOL (For Mother)

Dry Infant and Keep Warm

Maintain body heat of infant during and post resuscitation

BVM 30 seconds at 40 – 60 Breaths per minute with ROOM AIR IF NOT BREATHING
Suction only if airway appears obstructed

Stimulate infant and note APGAR Score at 1 Min and 5 Min

Newborn Oxygen Saturation

| Time | Saturation |
|---|---|
| 1 Min | 60-65% |
| 2 Min | 65-70% |
| 3 Min | 70-75% |
| 4 Min | 75-80% |
| 5 Min | 80-85% |
| 10 Min | 85-95% |

Attempt to maintain these

Respirations Present?

No

Yes

Assess Heart Rate

HR < 100

BVM 30 seconds at 40 – 60 Breaths per minute with ROOM AIR

HR > 100

Reassess Heart Rate

HR < 60

HR 60 - 100

HR > 100

EFFECTIVE VENTILATIONS NEONATAL AIRWAY PROTOCOL

EFFECTIVE VENTILATIONS NEONATAL AIRWAY PROTOCOL

Monitor and Reassess

< 80

Begin CPR 3:1 Ratio

Reassess Heart Rate

IV / IO / PROCEDURE

HR 80 - 100

HR > 100

EPINEPHrine
0.02 mg / kg IV / IO or
0.1 mg / kg ETT
of
0.1 mg / ml Concentration
Repeat every 3 - 5 minutes
Double Check EPI Concentration

IV / IO / PROCEDURE

OXYGEN
Blow - By

CONSIDER
NORMAL SALINE BOLUS
10 ml / kg

Dextrose 10%
2 ml / kg IV / IO
If Glucose < 45 prn

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONSULT** Medical Control where indicated
**APPROPRIATE** transfer of care

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# NEONATAL RESUSCITATION

| HISTORY | SIGNS AND SYMPTOMS | DIFFERENTIAL DIAGNOSIS |
|---|---|---|
| • Due date and gestational age<br>• Multiple gestation (twins etc.)<br>• Meconium<br>• Delivery difficulties<br>• Congenital disease<br>• Medications (maternal)<br>• Maternal risk factors substance abuse smoking | • Respiratory distress<br>• Peripheral cyanosis or mottling (normal)<br>• Central cyanosis (abnormal)<br>• Altered level of responsiveness<br>• Bradycardia | • Airway failure<br>• Secretions<br>• Respiratory drive<br>• Infection<br>• Maternal medication effect<br>• Hypovolemia<br>• Hypoglycemia<br>• Congenital heart disease<br>• Hypothermia |

## KEY POINTS

- **Exam: Mental Status, Skin, HEENT, Neck, Chest, Heart, Abdomen, Extremities, Neuro**
- Newborn arrest is not a cardiac arrest, it is a respiratory arrest.
- Effective ventilation is key to successful resuscitation.
- Effective ventilation can be determined by; Chest rise, Bilateral breath sounds, and Increasing heart rate.
- Term baby resuscitation should begin with room air.
- If preterm baby, resuscitate with oxygen, but reservoir removed from BVM.
- Hypothermia is a common complication of home and field deliveries. Keep the baby warm and dry.
- Consider hypoglycemia in infant. If the BGL is less than 45 mg / dl then administer Dextrose 10%.
- Document 1 and 5-minute APGAR scores, but do not use it to guide your resuscitation steps.
- If the patient is in distress, consider causes such as; hypovolemia. Administer a 10 ml / kg fluid bolus of normal saline.
- If drying and suction has not provided enough stimulation, try rubbing the infant's back or flicking their feet. If the infant still has poor respiratory effort, poor tone, or central cyanosis, consider them to be distressed, most distressed infants will respond quickly to BVM.
- Use caution not to allow newborns to slip from grasp.
- Gestation less than 20 weeks are not viable and considered stillbirth. Fundus at the umbilicus or greater. Greater than 20 weeks and deceased are corners cases.
- After delivery, drying, and stimulation place baby on mother skin to skin to prevent hypothermia if the newborn does not require resuscitation. Prevent hypothermia in all cases.

## APGAR SCORING

| SIGN | 0 | 1 | 2 |
|---|---|---|---|
| **COLOR** | Blue / Pale | Pink Body, Blue Extremities | Completely Pink |
| **HEART RATE** | Absent | Below 100 | Above 100 |
| **IRRITABILITY (Response to Stimulation)** | No Response | Grimace | Cries |
| **MUSCLE TONE** | Limp | Flexion of Extremities | Active Motion |
| **RESPIRATORY EFFORT** | Absent | Slow and Regular | Strong Cry |

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# APPENDIX #1: MEDICATIONS

## Medication Reference


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Pharmacology Review ..... 3-13
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## Standard Use Medications


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Albuterol and Ipratropium ..... 8-13
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FentaNYL ..... 19-13
Glucagon ..... 20-13
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## Pediatric Weight Based Dosing


Pediatric Drug Administration Charts ..... 64-13 thru 68-13

# Medication Supply / Availability

**Medical Director / EMS agency rights:**
These medications represent the medications approved by the protocol advisory board for inclusion in the EMS protocol. Each individual Medical Director reserves the right to choose not to supply or use medication included in the protocol at his / her discretion. The Medical Director also reserves the right to decide which (or all) agent to supply if multiple medications are listed for an application.

In situations where medications are not provided by the EMS agency or Medical Director, the EMS provider is NOT IN VIOLATION of protocol if they cannot provide a listed medication.

**Medication Availability:**
Medication shortages are an ongoing reality. Although, where available, this document lists available alternate medications, the alternate medications are not necessarily intended to be carried routinely. These agents are intended to be added to the drug box in the event of a shortage of the primary listed agent.

It is the individual Medical Directors and the individual agencies responsibility to communicate shortages and substitutions with the staff. It is the individual providers' responsibility to review the protocols and dosing for substituted medications.

**MEDICATION INFORMATION**

# PHARMACOLOGY REVIEW

**I. ACTIONS OF MEDICATIONS**

1. Local effects
2. Systemic effects

**II. EFFECTS DEPENDS UPON**

1. Age of patient
2. Condition of patient
3. Dosage
4. Route of administration

**III. ROUTE OF ADMINISTRATION**

1. Intravenous (IV)
    - Most rapidly effective
    - Most dangerous
    - Give SLOWLY through an established IV line (FOR MOST MEDICATIONS)
2. Intramuscular (IM)
    - Takes longer to act
    - Longer duration of action (Oil vs. water-based medications duration varies)
    - Deltoid or gluteus maximus site
    - Absorption VERY dependent on blood flow
3. Subcutaneous (SQ)
    - Slower and more prolonged absorption
    - Under skin of upper arms, thigh, abdomen
4. Inhalation
    - Bronchodilators
    - Steroids (Patients may be prescribed)
5. Endotracheal (Only administer through ET as a last resort with no better options)
    - EPINEPHrine, Atropine, Lidocaine, Naloxone
    - Medication dose must be twice the IV dose
6. Sublingual (SL)
    - Rapid absorption
    - Patient must be well hydrated for good absorption
7. Oral
    - Slow rate of absorption
8. Rectal (PR)
    - Rapid but unpredictable absorption
9. Intranasal (IN)
    - Must use specific device to aerosolize medication
10. Intraosseous (IO)
    - IO is only to be used only if IV is unobtainable in an unconscious patient
    - Nearly as fast as IV route

**IV. RATES OF ABSORPTION**

1."Directly related to route of administration"
    - IV (Fastest)
    - IO (Intraosseous)
    - Inhalation
    - ET (Endotracheal)
    - IM (Intramuscular)
    - SL (Sublingual)
    - IN (intranasal)
    - PR (Rectal)
    - SQ (Subcutaneous)
    - Oral (Slowest)

**V. ELIMINATION**

1. Many methods
2. Usually metabolized by the liver
3. Eliminated by the kidneys, lungs, skin

**VI. TERMS**

1. Indications – Conditions medications are used for
2. Contraindications – Conditions which make medication use improper
3. Depressants - Lessens / decreases activity
4. Stimulants - Increases activity
5. Physiologic action - Action from therapeutic concentrations of a medication
6. Therapeutic action - Beneficial action expected from a desired concentration of a medication
7. Untoward reaction - Unwanted side effect
8. Irritation - Damage to tissue
9. Antagonism - Opposition between physiologic action
10. Cumulative action - Increased action after repeated administration of medications
11. Tolerance - Decreased effects after repeated doses
12. Synergism - Combined effects greater than sum of individual effects
13. Potentiation - Enhancement of one medication by another
14. Habituation – Becoming abnormally tolerant to and dependent on something that is habit-forming
15. Idiosyncrasy - Abnormal response to a medication
16. Hypersensitivity - Exaggerated response or allergy to a specific agent

**VII. AUTONOMIC NERVOUS SYSTEM**

1. Parasympathetic - Controls vegetative functions “rest and digest”
2. Sympathetic - "flight or fight"

**VIII. PARASYMPATHETIC NERVOUS SYSTEM**

1. Mainly mediated by vagus nerve
2. Acetylcholine is transmitter (cholinergic)
3. Atropine is an acetylcholine blocker

**IX. SYMPATHETIC NERVOUS SYSTEM**

1. Mediated by Nerves from Sympathetic Chain
2. Norepinephrine and EPINEPHrine are the transmitters

**X. SYMPATHETIC RECEPTORS**

Alpha (a) - Vasoconstriction
Beta (b) – Heart rate / Contractility

**XI. COMMON SYMPATHETIC AGENTS**

Isoproterenol - pure BETA
Epinephrine – ALPHA and BETA
Dobutamine - predominately BETA
Norepinephrine - predominately ALPHA
DOPAmine - BETA at low dose range, ALPHA at high dose range
Phenylephrine - pure ALPHA

**XII. SYMPATHETIC BLOCKERS**

Propranolol (Inderal) - BETA blocker

**XIII. MEDICATION ADMINISTRATION**

Appropriate:

1. Medication selection based on protocol
2. Visually examine medication for particulates or discoloration and that the medication has not expired
3. Contraindications are reviewed prior to administration
4. Route is determined by protocol
5. Dose selection based on protocol
6. Dilution is per protocol
7. Rate is per protocol

**MEDICATION INFORMATION**

# PREGANCY CLASSES

## Category A

Controlled studies in women do not demonstrate a risk to the fetus. The possibility of fetal harm appears remote.

## Category B

Either animal studies have not demonstrated a fetal risk but there are no controlled studies in pregnant women, or animal studies have shown an adverse effect that was not confirmed in controlled studies in women.

## Category C

Either studies in animals have revealed adverse effects on the fetus and there are no controlled studies in women, or studies in women and animals are not available. Drugs in category C should only be taken if the benefit justifies the fetal risk.

## Category D

There is positive evidence of human fetal risk (birth defects, etc.), but the benefits from use in pregnant women may be acceptable despite the risk.

## Category X

Studies in animals or human beings have demonstrated fetal abnormalities or there is evidence of fetal risk based on human experience, and the risk of the use of the drug in pregnant women clearly outweighs any possible benefit. Drugs in category x should not be taken by pregnant women for any reason.

## Category N

Not classified

| MEDICATIONS |
|---|
| **ADENOSINE** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Slows conduction time and can interrupt re-entrant pathways through the AV node<br>2. Slows the sinus rate |
| **INDICATIONS** | 1. Supra ventricular tachycardia (SVT)<br>2. Monomorphic, regular wide complex arrhythmias |
| **CONTRAINDICATIONS** | 1. Atrial fibrillation<br>2. Atrial flutter<br>3. Polymorphic, irregular, or unstable ventricular tachycardia<br>4. Heart blocks<br>5. Known WPW |
| **PRECAUTIONS** | Inform the patient of likely side effects prior to medication administration |
| **SIDE EFFECTS** | 1. Facial flushing<br>2. Shortness of breath / dyspnea<br>3. Chest discomfort<br>4. Brief period of sinus arrest<br>5. Headache<br>6. Dizziness<br>7. Hypotension |
| **USUALLY SUPPLIED** | 6 mg / 2ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **SVT Initial Dose:**<br>6 mg rapid IV PUSH (over 1-3 sec.) immediately followed with a 20 ml normal saline flush<br>**SVT Repeat Dose:** (If no response is observed after 1 minute)<br>12 mg rapid IV PUSH (over 1-3 sec.) immediately followed with a 20 ml normal saline flush. – No additional Repeat<br>**Suspected Narrow Complex Presenting as Wide Complex Regular Initial Dose:**<br>6 mg rapid IV PUSH (over 1-3 sec.) immediately followed with a 20 ml normal saline flush<br>**Suspected Narrow Complex Presenting as Wide Complex Repeat Dose:**<br>(If no response is observed after 1 minute)<br>12 mg rapid IV PUSH (over 1-3 sec.) immediately followed with a 20 ml normal saline flush. – No additional Repeat |
| | |
| **PEDIATRIC DOSAGE** | **SVT Initial Dose:**<br>0.1 mg / kg rapid IV PUSH followed with a 10 ml normal saline flush (Max single dose 6 mg)<br>**SVT Repeat Dose:**<br>If no response is observed after 1 - 2 min., administer 0.2 mg / kg rapid IV PUSH followed with a 10 ml normal saline flush<br>(Max single dose 12 mg) – No additional Repeat |

**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • Adenosine has a short half-life, and should be administered rapidly followed by a rapid IV flush<br>• Reassess after each medication administration and refer to the appropriate protocol and treat accordingly<br>• Perform a diagnostic EKG prior to the administration of adenosine and after the rhythm converts<br>• Record EKG during administration |

| MEDICATIONS |
|---|
| **ALBUTEROL** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Relaxes bronchial smooth muscles<br>2. Reduces airway resistance<br>3. Relieves bronchospasm |
| **INDICATIONS** | 1. Asthma exacerbation<br>2. COPD exacerbation<br>3. Pulmonary edema with wheezing<br>4. Hyperkalemia |
| **CONTRAINDICATIONS** | Known hypersensitivity |
| **PRECAUTIONS** | 1. Use caution when administering to pregnant women<br>2. Patients with cardiac history<br>3. Patients with seizure disorders |
| **SIDE EFFECTS** | 1. Headache<br>2. Drowsiness<br>3. Dizziness<br>4. Restlessness<br>5. Nausea / Vomiting<br>6. Tachycardia<br>7. Palpitations<br>8. Hyper / hypotension<br>9. Tremors<br>10. PVCs |
| **SUPPLIED** | Single unit dose 2.5 mg in 3 ml of nebulizer solution |
| **ADULT DOSAGE** | **Respiratory Distress / Asthma / COPD:**<br>(As part of a mixed Albuterol/Ipratropium treatment)<br>2.5 mg in 3 ml unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **Congestive Heart Failure with wheezing:**<br>(As part of a mixed Albuterol/Ipratropium treatment)<br>2.5 mg in 3 ml unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **Anaphylaxis:** (As part of a mixed Albuterol/Ipratropium treatment)<br>2.5 mg in 3 ml unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **EMT may administer only with proper training or ONLINE Medical Control** |
| | **Hyperkalemia:**<br>2.5 mg in 3 ml unit dose via nebulizer and 6 - 8 lpm oxygen<br>10 mg normal staring dose (4 unit doses) Albuterol ONLY no Ipratropium |
| **PEDIATRIC DOSAGE** | **Respiratory Distress Lower Airway:**<br>Mild - 2.5 mg in 3 ml unit dose via nebulizer and 6 – 8 lpm oxygen first Dose – Add Ipratropium with subsequent doses<br>Moderate / Distress Severe Distress - 2.5 mg in 3 ml unit dose via nebulizer and 6 – 8 lpm oxygen – Add Ipratropium |
| | **Anaphylaxis:**<br>2.5 mg in 3 ml unit dose via nebulizer and 6 - 8 lpm oxygen |
| | **EMT may administer only with proper training or ONLINE Medical Control** |
| | **Hyperkalemia:**<br>2.5 mg in 3 ml unit dose via nebulizer and 6 - 8 lpm oxygen<br>10 mg normal staring dose (4 unit doses) Albuterol ONLY no Ipratropium |

| MEDICATIONS |
|---|
| **ALBUTEROL and IPRATROPIUM** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Relax bronchial smooth muscles<br>2. Reduces airway resistance<br>3. Relieves bronchospasm<br>4. Dries bronchial secretions |
| **INDICATIONS** | 1. Asthma exacerbation<br>2. COPD exacerbation<br>3. Pulmonary edema with wheezing |
| **CONTRAINDICATIONS** | Known hypersensitivity |
| **PRECAUTIONS** | 1. Use caution when administering to pregnant women<br>2. Patients with cardiac history<br>3. Patients with seizure disorders<br>4. **Not intended for use with hyperkalemia, use albuterol alone.** |
| **SIDE EFFECTS** | 1. Headache<br>2. Drowsiness<br>3. Dizziness<br>4. Restlessness<br>5. Nausea / Vomiting<br>6. Tachycardia<br>7. Palpitations<br>8. Hyper / hypotension<br>9. Tremors<br>10. PVCs<br>11. Dry nose, Mouth |
| **SUPPLIED** | 2.5 mg Albuterol and 0.5 mg Ipratropium in single unit dose |
| **ADULT DOSAGE** | **Respiratory Distress / Asthma / COPD:**<br>Single unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **Congestive Heart Failure with wheezing:**<br>Single unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **Anaphylaxis:**<br>Single unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **EMT may administer only with proper training or ONLINE Medical Control** |
| | |
| **PEDIATRIC DOSAGE** | **Respiratory Distress Lower Airway:**<br>Mild Distress - Second and third doses use Albuterol / Ipratropium Unit dose via nebulizer and 6 – 8 lpm oxygen. First Dose – Use Albuterol Only. q 10 min max 3 doses<br>Moderate / Severe Distress - Albuterol/Ipratropium Unit dose via nebulizer and 6 – 8 lpm oxygen. q 10 min max 3 doses |
| | **EMT may administer only with proper training or ONLINE Medical Control** |
| **KEY POINTS** | • May repeat treatments as required |

| MEDICATIONS |
|---|
| **AMIODARONE** |

| | |
|---|---|
| **PREGNANCY CLASS** | X – ***USE LIDOCAINE instead*** |
| **ACTIONS** | Prolongs the refractory period and action potential duration |
| **INDICATIONS** | 1. Ventricular fibrillation<br>2. Pulseless ventricular tachycardia<br>3. Wide complex tachycardia with a pulse |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. If lidocaine was previously used, **Do Not** use amiodarone<br>3. Second / third degree AV blocks |
| **SIDE EFFECTS** | 1. Hypotension<br>2. Prolonged QT interval |
| **SUPPLIED** | 150 mg / 3 ml vial<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **PULSELESS - Ventricular Fibrillation / Ventricular Tachycardia:**<br>300 mg IV Push<br>(May be repeated one time at 150 mg IV push in 3 - 5 minutes if no change) |
| | **PULSE PRODUCING - Wide Complex Tachycardia:**<br>150 mg diluted in 100 ml of D5 over 10 minutes<br>**If pregnant use Lidocaine** |
| | |
| **PEDIATRIC DOSAGE** | **PULSELESS - Ventricular Fibrillation / Ventricular Tachycardia:**<br>5 mg / kg IV / IO Push – May repeat up to 3 doses<br>If the rhythm converts to a perfusing rhythm, then administer 2.5 mg / kg IV / IO mixed in 100 ml D5 over 20 - 60 minutes<br>Max 300 mg |
| | **PULSE PRODUCING - Wide Complex Tachycardia:**<br>5 mg / kg mixed in 100 ml D5 IV / IO over 20 - 60 minutes<br>Max 300 mg |
| | **See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • Amiodarone is the preferred antiarrhythmic medication to treat life threating PULSELESS ventricular arrhythmias<br>• Avoid excessive movement and shaking of the medication<br>• Do not administer concurrently with other medications that prolong QT interval<br>• Ideally mixed in 100 ml bag of D5 or normal saline for administration to patients with perfusing rhythms. |

| MEDICATIONS |
|---|
| **ASPIRIN** |

| | |
|---|---|
| **PREGNANCY CLASS** | D |
| **ACTIONS** | Blocks platelet aggregation |
| **INDICATIONS** | 1. Chest pain suggestive of a MI<br>2. 12-Lead EKG indicating a possible MI<br>3. Patients with Acute coronary symptoms |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Active ulcer disease<br>3. Signs of stroke<br>4. Withold in cases of suspected trauma<br>5. Withhold in cases of ripping / tearing chest pain |
| **PRECAUTIONS** | 1. GI bleeds |
| **SIDE EFFECTS** | 1. Heartburn<br>2. Nausea and vomiting |
| **SUPPLIED** | 81 mg chewable tablet |
| **ADULT DOSAGE** | **Acute Coronary Symptoms:**<br>324 mg (4 tablets) |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in the pre-hospital setting |
| **KEY POINTS** | • If patient has already taken ASA in the last 24 hours, give ASA to equal 324 mg total |

| MEDICATIONS |
|---|
| **ATROPINE SULFATE** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Blocks acetylcholine (parasympathetic nervous system)<br>2. Increases conduction through the SA node by blocking vagal activity |
| **INDICATIONS** | 1. Symptomatic sinus bradycardia<br>2. Organophosphate poisoning<br>3. Nerve agent exposure |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Second degree AV Blocks (Mobitz type II)<br>3. Third degree AV Blocks |
| **PRECAUTIONS** | 1. May increase myocardial oxygen demand – use caution if possible acute MI<br>2. May trigger tachydysrhythmias<br>3. Avoid in hypothermic bradycardia |
| **SIDE EFFECTS** | 1. Dry mouth<br>2. Blurred vision<br>3. Flushed skin<br>4. Headache<br>5. Tachycardia<br>6. Pupillary dilation |
| **SUPPLIED** | 1 mg / 10 ml |
| **ADULT DOSAGE** | **Bradycardia:**<br>1 mg IV / IO every 3 - 5 minutes<br>(max dose 3 mg) |
| | **Organophosphate Poisoning:**<br>1 mg IV repeat every 3 - 5 minutes until resolution of symptoms<br>*No max dose. Extremely large doses will likely be required* |
| | **Beta Blocker OD:**<br>1 mg IV / IO every 3 - 5 minutes<br>(max dose 3 mg) |
| | |
| **PEDIATRIC DOSAGE** | **Bradycardia:**<br>0.02 mg / kg IV / IO repeated in 5 minutes one time<br>Minimum dose is 0.1 mg<br>Max dose 0.5 mg<br>EPINEPHrine is used first in peds bradycardia |
| | Useful in pediatrics only if evidence of vagal stimulation, use EPINEPHrine first in pediatric bradycardia |
| | **Organophosphate Poisoning:**<br>0.05 mg / kg IV Max 1 mg per dose<br>Repeat every 3 - 5 minutes until resolution of symptoms.<br>*No max dose. Extremely large doses will likely be required.* |

**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

MEDICATIONS

# CALCIUM CHLORIDE / CALCIUM GLUCONATE

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Raises serum calcium levels, increases cardiac contractility |
| **INDICATIONS** | 1. Calcium channel blocker OD<br>2. Dialysis patient in cardiac arrest<br>3. Hypocalcemia<br>4. Hyperkalemia<br>5. Hypermagnesemia |
| **CONTRAINDICATIONS** | None in the emergency setting |
| **PRECAUTIONS** | 1. Do not infuse with SODIUM BICARBONATE – will cause precipitates – FLUSH LINES BEFORE ADMIN<br>2. PUSH SLOW 2 minutes<br>3. Extravasation may cause tissue necrosis |
| **SIDE EFFECTS** | 1. Hypotension<br>2. Nausea<br>3. Tissue necrosis at injection site<br>4. Flushing / Hot flashes<br>5. Arrhythmias |
| **SUPPLIED** | 1000 mg / 10 ml – Both Calcium Chloride and Calcium Gluconate |
| **ADULT DOSAGE** | **Dialysis Patients in Cardiac Arrest:**<br>3 Grams ***Calcium Gluconate*** IV / IO Slow -or-<br>1 Gram IV / IO Slow ***Calcium Chloride***<br>May repeat if available and first dose ineffective |
| | **Calcium Channel Blocker OD:**<br>3 Grams ***Calcium Gluconate*** IV / IO Slow -or-<br>1 Gram IV / IO Slow ***Calcium Chloride***<br>May repeat either if available and EKG changes reoccur |
| | **Hyperkalemia / Peaked T Waves / Sine Wave EKG:**<br>3 Grams ***Calcium Gluconate*** IV / IO Slow -or-<br>1 Gram IV / IO Slow ***Calcium Chloride***<br>May repeat either if available and EKG changes reoccur |
| | |
| **PEDIATRIC DOSAGE** | **Calcium Channel Blocker OD:**<br>20 mg / kg IV / IO ***Calcium Chloride*** over 10 min<br>Max dose 1 Gram<br>60 mg / kg IV / IO ***Calcium Gluconate*** over 10 min<br>Max dose 3 Grams<br>May repeat either if available and EKG changes reoccur |

**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| MEDICATIONS |
|---|
| **CeFAZolin** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | 1. Cephalosporin Antibiotic |
| **INDICATIONS** | 1. Open or suspected open fracture of extremities |
| **CONTRAINDICATIONS** | 1. Allergies to penicillin<br>2. Unable to determine allergy to penicillin |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Monitor for potential anaphylaxis / allergic reaction |
| **USUALLY SUPPLIED** | 1 Gram vials for reconstitution with Sterile Water<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | 2 gram IV / IO – over 50 kg<br>In 100 ml D5 or Normal Saline over 10 mins<br>No repeat |
| | |
| **PEDIATRIC DOSAGE** | Open Fracture<br>1 gram IV / IO if over 9 years old and between 30 and 50 kg<br>In 100 ml D5 or Normal Saline over 10 mins<br>No repeat<br>Over 50 kg use the adult dosing |
| **KEY POINTS** | • Do not delay other necessary trauma care to administer<br>• Crepitus or angulation with a laceration over the site is considered an open fracture.<br>• Early administration of antibiotics on open fractures help reduce post-surgical infection rates. |

| MEDICATIONS |
|---|
| **DEXTROSE 5%, 10%, AND 50%** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Restores blood sugar |
| **INDICATIONS** | 1. Treatment of altered mental status due to hypoglycemia<br>2. Adult BGL less than 70 mg / dl or signs and symptoms of hypoglycemia<br>3. Coma with associated hypoglycemia<br>4. Delirium tremens with associated hypoglycemia<br>5. Seizure or status epilepticus with associated hypoglycemia<br>6. Cardiac arrest with associated hypoglycemia |
| **CONTRAINDICATIONS** | 1. Known hyperglycemia<br>2. Intracranial / intraspinal hemorrhage |
| **PRECAUTIONS** | 1. Use with caution with stroke or head injury patients<br>2. A blood glucose level should be determined prior to and post dextrose administration |
| **SIDE EFFECTS** | 1. Extravasation of Dextrose may cause necrosis<br>2. Hyperglycemia |
| **SUPPLIED** | **5%** IV bags 5 grams / 100 ml FOR MIXING DRIP MEDICAIONS ONLY<br>**10%** IV bags 10 grams / 100 ml (250 ml = 25 g of dextrose)<br>**50%** Prefilled syringes or vials containing 50 ml of Dextrose 50%<br>(50 ml = 25 g of dextrose) |
| **ADULT DOSAGE** | **Diabetic Emergencies / Hypoglycemia:**<br>If glucose < 40 / 25 g (250 ml of 10% or 50 ml of 50%)<br>IV / IO - may repeat as required<br>If glucose 40 – 70 / 12.5 g (125 ml of 10% or 25 ml of 50%)<br>IV / IO - may repeat as required<br>**Salicylate Overdose (Aspirin) with AMS:**<br>*Regardless of BGL* – 12.5 g (125 ml of 10% or 25 ml of 50% |
| | |
| **PEDIATRIC DOSAGE** | **Diabetic Emergencies / Hypoglycemia:**<br>**PEDIATRICS Dextrose 10% (D10)**<br>5 ml / kg IV / IO - may repeat as required max 250 ml / dose<br>**NEONATE Dextrose 10% (D10)**<br>Dextrose 10% (D10)<br>2 ml / kg IV / IO – may repeat as required |

**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • 5% Dextrose is used as a base solution for mixing specific drips in the field<br>• Dextrose should not be routinely given through IO, use other methods first. Use as a last resort in peri-arrest arrest patients only.<br>• Extravasation of Dextrose can cause tissue necrosis<br>• Attempt to use a large vein to administer Dextrose<br>• Precede Dextrose with Thiamine 100 mg IV / IM if the patient is suspected of chronic alcoholism or malnourishment (Adult patients) |

| MEDICATIONS |
|---|
| **diazePAM** |

| | |
|---|---|
| **PREGNANCY CLASS** | D |
| **ACTIONS** | 1. Sedative<br>2. Anticonvulsant<br>3. Amnestic (induces amnesia) |
| **INDICATIONS** | 1. Status epilepticus<br>2. Sedation prior to transcutaneous pacing, synchronized cardioversion, and painful procedures in the conscious patient<br>3. Cocaine induced acute coronary syndromes<br>4. Agitated or combative patients |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Altered mental status of unknown origin<br>3. Head injury without seizure<br>4. Respiratory insufficiency |
| **PRECAUTIONS** | 1. May cause respiratory depression, **respiratory effort must be continuously monitored with Capnography**<br>2. Should be used with caution with hypotensive patients and patients with altered mental status<br>3. diazePAM (VALIUM) potentiates alcohol or other CNS depressants |
| **SIDE EFFECTS** | 1. Respiratory depression<br>2. Hypotension<br>3. Lightheadedness<br>4. Confusion<br>5. Slurred speech<br>6. Amnesia |
| **SUPPLIED** | 5 mg / ml |
| **ADULT DOSAGE** | **Seizure (Status Epilepticus):**<br>2.5 - 5 mg IV / IO may repeat to max dose 10 mg |
| | **Procedural Sedation (Transcutaneous Pacing and Cardioversion):**<br>2.5 - 5 mg IV / IO may repeat prn to max dose 10 mg |
| | **Sympathomimetic Overdose:**<br>2.5 - 5 mg IV / IO may repeat prn to max dose 10 mg |
| | **Airway Management:**<br>2.5 - 5 mg IV / IO may repeat prn to max dose 10 mg |
| | **Combative Psych Patient:**<br>2.5 - 5 mg IV / IO may repeat prn to max dose 10 mg |
| | |
| **PEDIATRIC DOSAGE** | **Seizure (Status Epilepticus):**<br>0.15-0.2 mg / kg slow IV / IO max dose of 5mg<br>May assist with patients rectal Diastat if prescribed |
| | **Procedural Sedation (Transcutaneous Pacing and Cardioversion):**<br>0.05 - 0.1 mg / kg slow IV / IO max dose of 5mg |

**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| MEDICATIONS |
|---|
| **diphenhydrAMINE** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | Antihistamine |
| **INDICATIONS** | 1. Allergic reactions<br>2. Adjunctive treatment to EPINEPHrine in anaphylaxis<br>3. Medication induced extrapyramidal symptoms (EPS) |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Acute asthma |
| **PRECAUTIONS** | 1. Carefully monitor patient while waiting for medication to take effect (effect of medication begins 15 minutes after administration)<br>2. May cause CNS depression<br>3. Use caution in patients with history of asthma<br>4. Use caution in patients with history or cardiovascular disease |
| **SIDE EFFECTS** | 1. Sedation<br>2. Dries secretions<br>3. May exacerbate asthma<br>4. Blurred vision<br>5. Headache<br>6. Hypotension<br>7. Tachycardia<br>8. Thickening of bronchial secretions |
| **SUPPLIED** | 50mg / 1ml |
| **ADULT DOSAGE** | **Allergic Reaction or Anaphylactic Shock:**<br>Mild reaction - 25 – 50 mg slow IV / IO or IM<br>Moderate / Severe Reaction or Shock - 50 mg slow IV / IO or IM<br>**Extrapyramidal Symptoms or Akathisia (Medication Induced Restlessness / Panic):**<br>25 mg – 50 mg IV / IM<br>DO NOT mix in the same syringe as Haloperidol (Haldol)<br>**Motion Sickness / Kinetosis:**<br>25 mg – 50 mg IV / IM |
| | |
| **PEDIATRIC DOSAGE** | **Allergic Reaction or Anaphylactic Shock:**<br>1 mg/kg slow IV / IO or IM<br>Max dose 50 mg<br>**Behavioral / Psychiatric Emergencies - Agitation**<br>1 mg / kg slow IV / IO or IM<br>Max dose 50 mg<br>**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • Use in anaphylaxis only after EPINEPHrine (Adrenaline) and stabilization of cardiorespiratory symptoms |

| MEDICATIONS |
|---|
| **DroPERidol** |

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|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Treatment of acute psychosis or agitation patients |
| **INDICATIONS** | Aggressive, violent, or severely agitated patients in the setting of psychosis or alcohol intoxication |
| **CONTRAINDICATIONS** | 1. Dementia related psychosis<br>2. Known hypersensitivity<br>3. Parkinson's disease<br>4. CNS depression<br>5. Severe cardiac disease<br>6. Hepatic disease<br>7. Prolonged QT interval on EKG |
| **PRECAUTIONS** | 1. *Identify and address treatable medical emergencies Such as Hypoxemia, Sepsis, Seizure, Encephalitis, Hypoglycemia or Stroke.*<br>2. Elderly patients – half dose<br>3. Renal impairment<br>4. Respiratory diseases<br>5. Seizure disorders |
| **SIDE EFFECTS** | 1. Sedation<br>2. Extrapyramidal symptoms (EPS) / dystonic reactions<br>3. Orthostatic Hypotension |
| **SUPPLIED** | 2.5 mg / 1 ml – 2 ml vial |
| **ADULT DOSAGE** | **Combative Psych Patient:**<br>5 mg IM ONLY – No Repeat<br>Over age 65 - 2.5 mg IM ONLY – No Repeat |
| | **Alcohol Related Emergencies**<br>5 mg IM ONLY – No Repeat<br>Over age 65- 2.5 mg IM ONLY – No Repeat |
| | |
| **PEDIATRIC DOSAGE** | Not Indicated in the pre-hospital setting |
| **KEY POINTS** | • If administration causes extrapyramidal symptoms (EPS) give diphenhydrAMINE 25 mg – 50 mg IV / IM<br>• EPS symptoms are: Involuntary purposeless movements of body, usually of the face such as grimacing, tongue protrusion, lip smacking, lip puckering, or eye blinking.<br>• DO NOT mix DroPERidol and diphenhydrAMINE in the same syringe.<br>• Not for procedural sedation |

## MEDICATIONS

# EPINEPHrine

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|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Alpha and beta-adrenergic agonist<br>2. Bronchodilation<br>3. Increase heart rate and automaticity<br>4. Increases cardiac contractility<br>5. Increases myocardial conduction velocity<br>6. Increases blood pressure |
| **INDICATIONS** | 1. Cardiac arrest<br>2. Anaphylactic reaction<br>3. Anaphylactic shock<br>4. Respiratory distress |
| **CONTRAINDICATIONS** | Known hypersensitivity |
| **PRECAUTIONS** | Blood pressure, pulse, and ECG must be routinely monitored for all patients receiving EPINEPHrine |
| **SIDE EFFECTS** | 1. Palpitations<br>2. Anxiety<br>3. Headache<br>4. Trembling<br>5. Nausea / vomiting |
| **SUPPLIED** | 1 mg / 10 ml – 0.1 mg / ml (100mcg / ml)<br>1 mg / 1ml (1000 mcg / ml)<br>Autoinjector Adult 0.3 mg EPINEPHrine >30kg (66 lbs)<br>Autoinjector Jr. Peds 0.15 mg EPINEPHrine <30kg (66 lbs) |
| **ADULT DOSAGE** | **Cardiac Arrest:**<br>1 mg of EPINEPHrine 100 mcg / ml IV / IO every 3 - 5 minutes |
| | **Anaphylactic Reaction:** – EMT may draw and administer with proper training<br>0.3 - 0.5 mg of EPINEPHrine 1mg / ml IM<br>**EPINEPHRINE AUTO-INJECTOR (0.3 mg) >30kg (66 lbs).** |
| | **Stridor: (If Racemic EPINEPHrine Not Available)**<br>5 mg of EPINEPHrine 1 mg / ml Nebulized Undiluted Dose |
| | **Respiratory Distress: (Unresponsive to Albuterol)**<br>0.3 - 0.5 mg of EPINEPHrine 1mg / ml IM |
| | **Anaphylactic Shock: (Impending Arrest)**<br>1 ml per minute of EPINEPHrine 0.1 mg / ml (100 mcg / ml) IV / IO until resolution of blood pressure.<br>Max dose 500 mcg (0.5 mg) |
| | **Cardiogenic, Neurogenic, Septic Shock, Post Resuscitation, Bradycardia – PUSH DOSE EPI**<br>Make 10 mcg / ml - 10 mcg (1 ml) every prn - slow push titrate to effect, may increase up to 50mcg / dose if needed to maintain MAP > 65 or SBP 90 / Radial Pulses if MAP Unavailable |
| | |
| **PEDIATRIC DOSAGE** | **Cardiac Arrest:**<br>0.01 mg / kg of EPINEPHrine 0.1 mg / ml - IV / IO every 3 - 5 minutes. Max 1mg per dose |
| | **Anaphylactic Reaction:** – ***EMT may draw and administer with proper training 0.15 mg <66 lbs. 0.3 >66 lbs.***<br>**EPINEPHRINE AUTO-INJECTOR JR (0.15 mg) <66 lbs. use Adult (0.3 mg) >66lbs**<br>**AEMT / Paramedic** 0.01 mg / kg of EPINEPHrine 1mg / ml IM - Max dose 0.5 mg |
| | **Stridor: (If Racemic EPINEPHrine Not Available)**<br><10 kg 3 ml of EPINEPHrine 1 mg / ml nebulized<br>>10 kg 5 ml of EPINEPHrine 1 mg / ml nebulized |
| | **Respiratory Distress: (Unresponsive to Albuterol)**<br>0.01 mg / kg of EPINEPHrine 1mg / ml IM - Max dose 0.5 mg |
| | **Anaphylactic Shock: (Impending Arrest)**<br>0.01 mg / kg of 0.1 mg / ml (100 mcg / ml) IV / IO until resolution of blood pressure –<br>Max dose 500 mcg (0.5 mg) |
| | **Cardiogenic, Neurogenic, Septic Shock, Post Resuscitation – PUSH DOSE EPI**<br>Make 10 mcg / ml – 1 mcg / kg every 2-5 mins – Max dose 10 mcg - slow push titrate to effect |
| | **See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | **Do Not Confuse Epi 1 mg / ml IM and 0.1 mg / ml (100 mcg / ml) IV** |
| **PUSH DOSE EPI PREPERATION** | Mix 1 mg EPINEPHrine (Adrenaline) of 1mg / ml in 100 ml of D5 or Normal Saline<br>*This makes 10 mcg / ml concentration* - Shake bag well to mix - Draw from bag and administer |
| **PUSH DOSE EPI KEY POINTS** | • Label the IV bag once mixed to prevent misuse<br>• Use filter needle when drawing from ampoules, discard filter needle and use new needle while injecting |

| MEDICATIONS |
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| **fentaNYL** |

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|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Inhibits pain pathways altering perception and response to pain |
| **INDICATIONS** | 1. Severe pain management<br>2. ACS / STEMI<br>3. Abdominal Pain<br>4. Isolated trauma |
| **CONTRAINDICATIONS** | 1. Hypersensitivity<br>2. Uncontrolled hemorrhage<br>3. Shock |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Respiratory depression<br>2. Bradycardia<br>3. Muscle rigidity |
| **SUPPLIED** | 100 mcg / 2 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Acute Coronary Symptoms:**<br>25 – 100 mcg IV / IO / IM / IN<br>May repeat q10 min – Max 200 mcg |
| | **Pain Management:**<br>25 – 100 mcg IV / IO / IM / IN<br>May repeat q10 min – Max 200 mcg |
| | **Abdominal Pain:**<br>25 – 100 mcg IV / IO / IM / IN<br>May repeat q10 min – Max 200 mcg |
| | **CPR Induced Awareness:**<br>100 mcg IV / IO / IM / IN<br>May repeat fentanyl prn |
| | **Analgesia For Drug Assisted Airway or RSI:**<br>25 mcg bolus to pain tolerance prn max 200 mcg |
| | |
| **PEDIATRIC DOSAGE** | **Pain Management:**<br>1 mcg / kg IV / IO / IM / IN may repeat in 10 mins<br>Max 50 mcg IV / IO / IM – 100 mcg IN |
| | **See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • Likelihood of side effects increases with rapid administration<br>• Narcotic naive patients may need lower dosing regimen<br>• Preferred analgesic for trauma / ACS<br>• Must be given slowly IV |

| MEDICATIONS |
|---|
| **GLUCAGON** |

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|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | 1. Causes breakdown of glycogen to glucose increasing blood glucose level |
| **INDICATIONS** | 1. Correction of hypoglycemia when vascular access is not able to be established and oral glucose is contraindicated |
| **CONTRAINDICATIONS** | Known hypersensitivity |
| **PRECAUTIONS** | 1. Glucagon is only effective in patients with enough stores of glycogen (glycogen stored in liver)<br>2. Glucagon can be administered on scene, but do not wait for it to take affect |
| **SIDE EFFECTS** | 1. Nausea and vomiting<br>2. Hyperglycemia |
| **SUPPLIED** | Vials of 1mg Glucagon with 1ml of diluting solution |
| **ADULT DOSAGE** | **Hypoglycemia without Vascular Access:**<br>1 mg IM<br>STOP **EMT may administer only with proper training** |
| | |
| **PEDIATRIC DOSAGE** | **Hypoglycemia Without Vascular Access:**<br>< 20kg 0.5 mg IM<br>≥ 20kg 1 mg IM<br>STOP **EMT may administer only with proper training** |
| **KEY POINTS** | • Response is usually noticed in 5 - 20 minutes. If response is delayed, dose may be repeated<br>• If IV is established after Glucagon (Glucagen) is given and patient is still hypoglycemic, administer Dextrose |

| MEDICATIONS |
|---|
| **HALOPERIDOL** |

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|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Treatment of acute psychosis or agitation patients |
| **INDICATIONS** | Aggressive, violent, or severely agitated patients in the setting of psychosis or alcohol intoxication |
| **CONTRAINDICATIONS** | 1. Dementia related psychosis<br>2. Known hypersensitivity<br>3. Parkinson's disease<br>4. CNS depression<br>5. Severe cardiac disease<br>6. Hepatic disease<br>7. Prolonged QT interval on EKG |
| **PRECAUTIONS** | 1. *Identify and address treatable medical emergencies such as Hypoxemia, Sepsis, Seizure, Encephalitis, Hypoglycemia or Stroke.*<br>2. Elderly patients – half dose<br>3. Renal impairment<br>4. Respiratory diseases<br>5. Seizure disorders |
| **SIDE EFFECTS** | 1. Sedation<br>2. Extrapyramidal symptoms (EPS) / dystonic reactions<br>3. Orthostatic Hypotension |
| **SUPPLIED** | 5 mg / 1 ml |
| **ADULT DOSAGE** | **Combative Psych Patient:**<br>5 mg IM ONLY – No Repeat<br>Over age 65 - 2.5 mg IM ONLY – No Repeat |
| | **Alcohol Related Emergencies**<br>5 mg IM ONLY – No Repeat<br>Over age 65- 2.5 mg IM ONLY – No Repeat |
| | |
| **PEDIATRIC DOSAGE** | Not Indicated in the pre-hospital setting |
| **KEY POINTS** | • If administration causes extrapyramidal symptoms (EPS) give diphenhydrAMINE 25 mg – 50 mg IV / IM<br>• EPS symptoms are: Involuntary purposeless movements of body, usually of the face such as grimacing, tongue protrusion, lip smacking, lip puckering, or eye blinking.<br>• DO NOT mix Haloperidol and diphenhydrAMINE in the same syringe.<br>• Not for procedural sedation |

| MEDICATIONS |
|---|
| **HEPARIN** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Anticoagulant |
| **INDICATIONS** | 1. STEMI |
| **CONTRAINDICATIONS** | 1. Hypersensitivity<br>2. Active bleeding<br>3. Trauma<br>4. Hypertension<br>5. Aortic dissection<br>6. Pregnancy<br>7. Surgery within last 14 days<br>8. Symptoms of CVA<br>9. Withold in trauma cases of suspected trauma |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Bleeding |
| **SUPPLIED** | 5000 units / 1 ml \| 4000 units = 0.8 ml<br>1000 units / 1 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Confirmed STEMI:**<br>60 units / kg IV / IO<br>Max dose 4000 units |
| | |
| | Greater than 76 kg or 147 lbs. = 4000 U dose |
| **PEDIATRIC DOSAGE** | Not recommended in the pre-hospital setting |

| MEDICATIONS |
|---|
| **HYDROmorphone** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Inhibits pain pathways altering perception and response to pain |
| **INDICATIONS** | 1. Moderate to severe pain management<br>2. Burns<br>3. Intractable flank pain<br>4. Intractable back pain<br>5. Musculoskeletal and / or fracture pain<br>6. Sickle cell pain crisis (USE SUPPLEMENTAL O2)<br>7. Unremitting abdominal pain (NOT OF OB ORIGIN)<br>8. Chest Pain |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Head injury or head trauma<br>3. Hypotension<br>4. Respiratory depression<br>5. Acute or severe asthma or COPD<br>6. Labor pain<br>7. Shock |
| **PRECAUTIONS** | 1. Liver failure, renal failure, or patients more than 65 years should receive half dose, titrated to their pain tolerance<br>2. If the patient responds with respiratory depression administer Naloxone (Narcan) to reverse the effects<br>3. All patients must have supplemental oxygen saturation monitoring.<br>4. Use caution if patient is hypersensitive to sulfites<br>5. Use caution if patient is hypersensitive to latex<br>6. May cause CNS depression<br>7. Use caution in patients with hypersensitivity to other narcotics<br>8. Push over 2 mins |
| **SIDE EFFECTS** | 1. Respiratory depression<br>2. Altered LOC<br>3. Bradycardia<br>4. Nausea and vomiting<br>5. Constricted pupils |
| **SUPPLIED** | 1 mg / 1 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Pain Management:**<br>0.5 mg – 1 mg IV / IM<br>Over 65 years, liver failure, renal failure, or debilitated patients:<br>Titrated to pain tolerance, up to 0.5 mg IV / IM<br>May repeat 10 min - Max 2 mg |
| | **Abdominal Pain:**<br>0.5 mg – 1 mg IV / IM<br>Over 65 years, liver failure, renal failure, or debilitated patients:<br>Titrated to pain tolerance, up to 0.5 mg IV / IM<br>May repeat 10 min - Max 2 mg |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in the pre-hospital setting |
| **KEYPOINTS** | • Likelihood of side effects increases with rapid administration<br>• Narcotic naive patients may need lower dosing regiment<br>• Preferred analgesic for intractable / unremitting pain |

| MEDICATIONS |
|---|
| **IPRATROPIUM BROMIDE** |

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|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | 1. Blocks action of acetylcholine at receptor sites on bronchial smooth muscle<br>2. Dries bronchial secretions |
| **INDICATIONS** | Treatment of bronchospasm in patients with COPD as an adjunct to albuterol |
| **CONTRAINDICATIONS** | Known hypersensitivity |
| **SIDE EFFECTS** | 1. Dry nose, mouth<br>2. Paradoxical bronchospasm<br>3. Nausea<br>4. Chest pain<br>5. Palpitations<br>6. Headache<br>7. Dizziness |
| **SUPPLIED** | Single unit dose 0.5 mg in 2.5 ml of nebulizer solution |
| **ADULT DOSAGE** | **Respiratory Distress / Asthma / COPD:**<br>(As part of a mixed Albuterol / Ipratropium treatment)<br>Single unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **Congestive Heart Failure with wheezing:**<br>(As part of a mixed Albuterol / Ipratropium treatment)<br>Single unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **Anaphylaxis:**<br>(As part of a mixed Albuterol / Ipratropium treatment)<br>Single unit dose via nebulizer and 6 - 8 lpm oxygen<br>May repeat prn |
| | **EMT may administer only with proper training or ONLINE Medical Control** |
| | |
| **PEDIATRIC DOSAGE** | **Respiratory Distress Lower Airway:**<br>Mild Moderate Distress - Second and third doses use Albuterol / Ipratropium Unit dose via nebulizer and 6 – 8 lpm oxygen, First Dose – Use Albuterol Only q 10 min max 3 doses<br>Severe Distress – Albuterol / Ipratropium Unit dose via nebulizer and 6 – 8 lpm oxygen q 10 min max 3 doses |
| | **EMT may administer only with proper training or ONLINE Medical Control** |
| **KEY POINTS** | • Mix with Albuterol for administration<br>• Used with Albuterol when Albuterol / Ipratropium unavailable or not supplied |

| MEDICATIONS |
|---|
| **KETAMINE** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | Sedation, analgesia, and anesthesia |
| **INDICATIONS** | 1. Induction of anesthesia for RSI<br>2. Medication assisted airway maintenance<br>3. Tranquilization of the violent patient<br>4. Pain Management |
| **CONTRAINDICATIONS** | 1. Known Hypersensitivity |
| **PRECAUTIONS** | 1. May interact with other medications and alcohol, bradypnea or apnea can result<br>2. Use in setting with providers capable of intubation<br>3. All dissociative doses must have capnography monitored |
| **SIDE EFFECTS** | 1. Hallucinations / Vivid dreams<br>2. Hypertension<br>3. Tachycardia<br>4. Increased Cardiac Output<br>5. Salivation<br>6. Tonic-clonic Movements<br>7. Increased Cardiac Output<br>8. Myocardial Depression |
| **SUPPLIED** | 500 mg / 5 ml (100 mg / ml) or 200 mg / 20ml (10mg / ml)<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION<br>**Creation of 10 mg / ml concentration from 100 mg / ml concentration -**<br>**Use 10 ml syringe with 9 ml of saline and then draw 1 ml of 100 mg / ml and mix in syringe -**<br>**Yield is 10 mg / ml – Overdraw air in syringe while mixing to assure proper dilution** |
| **ADULT DOSAGE** | **Adult Advanced Airway Placement:**<br>1 mg / kg IV / IO – May Repeat in 2 min – Usual dose 100 mg - Max 200 mg |
| | **Induction for RSI (For Departments Who Provide RSI)**<br>1 mg / kg IV / IO – May Repeat in 2 min – Usual dose 100 mg - Max 200 mg |
| | **Violent / Acute Psychosis Patient:**<br>250 mg IM Only of the 100mg/ml concentration (2.5 ml),<br>May repeat 250 IM Only in 5 mins if no response |
| | **Pain Management – MUST USE 10 mg / ml Concentration – See Above**<br>10 mg IV / IO / IM / IN<br>May repeat q 10 min – max 30 mg |
| | **CPR Induced Awareness:**<br>100 mg IV / IO / IM / IN<br>May repeat prn |
| | **Refractory Seizures:**<br>100 mg IV / IO - diluted in 100 ml D5 or NS wide open -or-<br>100 mg UNDILUTED – IM<br>Consider repeat if no change q 5 min |
| | |
| **PEDIATRIC DOSAGE** | **Violent / Acute Psychosis Patient:**<br>Over 50 kg<br>2 mg / kg IM of the 100 mg / ml concentration<br>May repeat 1 mg / kg in 5 minutes if no response<br>Max Per dose 250 mg |
| **KEY POINTS** | • To prevent emergence reactions (Confusion, excitement, irrational behavior, hallucinations) after administration of dissociative doses of Ketamine, administer a Benzodiazepine such as LORazepam or Midazolam<br>• If dissociative doses (any dosing other than pain dosing) of Ketamine given, make sure verbal hand off is with the receiving *Physician* and includes this information so patient presentation is not confused with other medical etiology.<br>• Blood pressure may elevate after injection but usually returns to pre-administration values within 15 mins.<br>• Ketamine use in pregnancy is a risk / benefit assessment per case. Consult Medical Control if there are questions |

| MEDICATIONS |
|---|
| **KETOROLAC** |

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|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Non-Steroidal Anti-Inflammatory Analgesic<br>2. Antipyretic |
| **INDICATIONS** | 1. Kidney stones / Flank pain<br>2. Moderate pain |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity to NSAIDS / Aspirin<br>2. >65 years old<br>3. Bleeding (GI, Cerebrovascular)<br>4. Obvious pregnancy / nursing mothers<br>5. Asthmatics with sensitivity to NSAIDS |
| **SIDE EFFECTS** | 1. Edema<br>2. Hypertension<br>3. Rash<br>4. Nausea<br>5. Dizziness |
| **SUPPLIED** | 30 mg / 1 ml |
| **ADULT DOSAGE** | **Moderate Pain / Kidney Stones:**<br>15 mg IV / IO – No Repeat<br>30 mg IM – No Repeat |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in the pre-hospital setting |

| MEDICATIONS |
|---|
| **LABETALOL** |

**ATTENTION**

**2 Beta Blockers in Protocol**

**THIS IS USED FOR ECLAMPSIA, PRE-ECLAMPSIA, AND POST-PARTUM HYPERTENSION**

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Reduces blood pressure by decreasing peripheral vascular resistance |
| **INDICATIONS** | 1. Correction of hypertension associated with stroke<br>2. Correction of blood pressure associated with OB emergencies |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity to Labetalol or beta blockers<br>2. Bradycardia<br>3. Heart blocks<br>4. Shock<br>5. Sick sinus syndrome<br>6. Heart failure |
| **PRECAUTIONS** | 1. Asthma / bronchospastic diseases<br>2. Impaired liver functions<br>3. Elderly<br>4. Thyroid disorders<br>5. Hypotension may occur<br>6. Conduction disturbances in cardiac conduction may occur |
| **SIDE EFFECTS** | 1. Hypotension<br>2. Bradycardia<br>3. Dizziness<br>4. Fatigue<br>5. Arrhythmias |
| **SUPPLIED** | 20 mg / 4 ml vial or Carpuject or 100 mg / 20ml - vial |
| **ADULT DOSAGE** | **Pre-Eclampsia, Eclampsia, or Post-partum Hypertension**<br>If SBP >160 and / or DBP 110 with symptoms<br>20 mg IV slow – if no improvement in 5 min then.<br>40 mg IV slow |
| | **Stroke with hypertension – WHERE PARTICPATING**<br>If SBP > 220 or DBP > 120 verified by 2 readings, in 2 locations, 1 manual<br>10 mg IV slow – if no improvement in 10 min then;<br>20 mg IV slow |
| **PEDIATRIC DOSAGE** | Not recommended in the pre-hospital setting |
| **KEY POINTS** | • Check blood pressures in both arms, with at least one BP being a manual BP<br>• Monitor cardiac and pulmonary status during administration |

## MEDICATIONS

# LIDOCAINE

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | 1. Anesthetizes the intraosseous space during fluid administration to increase pain tolerance<br>2. Suppresses ventricular ectopy |
| **INDICATIONS** | 1. Anesthetization of intraosseous space prior to or during IO administration of fluids<br>2. Antiarrhythmic for ventricular arrhythmias in the absence of Amiodarone<br>3. Antiarrhythmic for ventricular arrhythmias in place of Amiodarone for pregnant patients |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity to Lidocaine or caine family<br>2. AV blocks<br>3. Idioventricular escape rhythms<br>4. Accelerated idioventricular rhythm<br>5. Sinus bradycardia or arrest or block<br>6. Hypotension<br>7. Shock |
| **SIDE EFFECTS** | 1. Dizziness<br>2. Numbness<br>3. Drowsiness<br>4. Confusion<br>5. Seizure<br>6. Respiratory depression |
| **PRECAUTIONS** | 1. Do NOT use Lidocaine if Amiodarone already used<br>2. Use half dose if patient is over 70 years old or has a history of liver failure or CHF |
| **SUPPLIED** | 100 mg / 5 ml |
| **ADULT DOSAGE** | **Anesthetization of Intraosseous Space:**<br>Up to 40 mg IO push - slow to allow Anesthetization of the IO space<br>**Ventricular Fibrillation or Ventricular Tachycardia without a Pulse**<br>1 - 1.5 mg / kg IV / IO First Dose<br>0.5 – 0.75 mg / kg IV / IO Second Dose if needed (max dose 3 mg / kg)<br>**Wide Complex Tachycardia with a Pulse**<br>1 - 1.5 mg / kg IV / IO First Dose<br>0.5 – 0.75 mg / kg IV / IO Second Dose if needed (max dose 3 mg / kg) |
| | |
| **PEDIATRIC DOSAGE** | **Anesthetization of Intraosseous Space:**<br>0.5 mg / kg IO push - slow to allow Anesthetization of the IO space<br>Max 40 mg<br>**Ventricular Fibrillation or Ventricular Tachycardia without a Pulse**<br>1 mg / kg IV / IO First Dose<br>0.5 mg / kg IV / IO Second Dose if needed (max dose 3 mg / kg)<br>If Conversion to a non-bradycardic perfusing rhythm occurs, then use Lidocaine (Xylocaine) give 0.5 mg / kg IV / IO every 10 mins to maintain x 2.<br>**Wide Complex Tachycardia with a Pulse**<br>1 mg / kg IV / IO First Dose<br>0.5 mg / kg IV / IO Second Dose if needed (max dose 3 mg / kg)<br>If Conversion to a non-bradycardic perfusing rhythm occurs, then use Lidocaine (Xylocaine) give 0.5 mg / kg IV / IO every 10 mins to maintain x 2.<br>**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

## MEDICATIONS

# LORazepam

| | |
|---|---|
| **PREGNANCY CLASS** | D |
| **ACTIONS** | 1. Sedative<br>2. Anticonvulsant<br>3. Amnestic (induces amnesia) |
| **INDICATIONS** | 1. Status epilepticus<br>2. Sedation prior to transcutaneous pacing, synchronized cardioversion, and painful procedures in the conscious patient<br>3. Stimulant overdose<br>4. Agitated or combative patients |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Altered mental status of unknown origin<br>3. Head injury without seizure<br>4. Respiratory insufficiency |
| **PRECAUTIONS** | 1. May cause respiratory depression, **respiratory effort must be continuously monitored with Capnography**<br>2. Should be used with caution with hypotensive patients and patients with altered mental status<br>3. LORazepam potentiates alcohol or other CNS depressants |
| **SIDE EFFECTS** | 1. Respiratory depression<br>2. Hypotension<br>3. Lightheadedness<br>4. Confusion<br>5. Slurred speech<br>6. Amnesia |
| **SUPPLIED** | 2 mg / 1 ml |
| **ADULT DOSAGE** | **Status Epilepticus:**<br>1 – 4 mg IM / IV / IO / IN per dose - ***May repeat q 5 min prn*** - max dose 4 mg |
| | **Procedural Sedation (Transcutaneous Pacing and Cardioversion):**<br>1 – 2 mg IM / IV / IO / IN - May repeat q 10 min prn - max dose 4 mg |
| | **Sympathomimetic Overdose:**<br>1 – 2 mg IM / IV / IO / IN - May repeat q 10 min prn - max dose 4 mg |
| | **Airway Management:**<br>1 – 2 mg IM / IV / IO / IN - May repeat q 10 min prn - max dose 4 mg |
| | **Combative Psych Patient:**<br>1 – 2 mg IM / IV / IO / IN - May repeat q 10 min prn - max dose 4 mg |
| | **Alcohol Related Emergencies – Combative / Withdrawal:**<br>1 – 2 mg IM / IV / IO / IN - May repeat q 10 min prn - max dose 4 mg |
| | **CPR Induced Awareness:**<br>1 – 2 mg IM / IV / IO / IN - May repeat prn |
| | |
| **PEDIATRIC DOSAGE** | **Status Epilepticus:**<br>0.05 – 0.1 mg / kg IM / IV / IO / IN per dose<br>***May repeat q 5 min prn*** - max dose 2 mg |
| | **Procedural Sedation (Transcutaneous Pacing and Cardioversion):**<br>0.05 mg / kg slow IM / IV / IO / IN<br>May repeat q 10 min prn - max dose 2 mg |
| | **Combative Psych Patient:**<br>0.05 – 0.1 mg / kg slow IM / IV / IO / IN<br>May repeat q 10 min prn - max dose 2 mg |

**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| MEDICATIONS |
|---|
| **MAGNESIUM SULFATE** |

| | |
|---|---|
| **PREGNANCY CLASS** | A |
| **ACTIONS** | 1. Central Nervous System Depressant<br>2. Anticonvulsant<br>3. Antiarrhythmic<br>4. Bronchodilation |
| **INDICATIONS** | 1. Ventricular fibrillation / pulseless ventricular tachycardia in patients who are malnourished or chronic alcoholics<br>2. Treatment of seizures in eclampsia patients<br>3. Torsades de pointes active an prophylaxis<br>4. Asthma / COPD refractory to sympathomimetic |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Shock<br>3. Heart blocks |
| **PRECAUTIONS** | 1. Hypotension<br>2. Renal impairment |
| **SIDE EFFECTS** | 1. Respiratory depression<br>2. Flushing<br>3. Drowsiness |
| **SUPPLIED** | 2 grams / 50 ml premixed bag<br>1 gram / 2 ml vial 50% solution (Dilute before use in 100ml D5 or saline)<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Cardiac Arrest / Torsades:**<br>2 g IV / IO over 1 -2 minutes |
| | **Torsades with Pulse:**<br>2 g IV / IO Over 20 minutes - May Repeat if Necessary to Max 4 Grams in 1 Hour |
| | **Eclampsia:**<br>4 g IV / IO over 20 minutes may repeat 2 grams if unresolved or re-occurrence over 5 min |
| | **Pre-Eclampsia / Post-Partum Hypertension:**<br>4 g IV / IO over 20 minutes may repeat 2 grams if unresolved or re-occurrence over 5 min |
| | **Respiratory Distress / Bronchoconstriction with minimal relief from sympathomimetics**<br>2 Grams IV / IO over 20 minutes |
| | **Prolonged QT – Torsades Prophylaxis for these cases**<br>2 Grams IV / IO over 20 minutes |
| | |
| **PEDIATRIC DOSAGE** | **Pediatric Lower Airway:**<br>50 mg / kg IV / IO over 20 minutes<br>No Repeat – max dose 2 grams |
| | **Prolonged QT – Torsades Prophylaxis for these cases**<br>25 mg / kg in 100 ml D5 IV / IO over 20 minutes (Max 2000 mg) |
| **KEY POINTS** | • Check deep tendon reflexes (DTR's) after administration (if trained)<br>• Monitor EKG, vital signs, and respiratory effort during administration<br>• Vials can be added to D5 or normal saline for mixing drips |

| MEDICATIONS |
|---|
| **methylPREDNISolone** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Reduces inflammation in lower airways |
| **INDICATIONS** | 1. Anaphylaxis<br>2. Asthma<br>3. COPD<br>4. Croup<br>5. Stridor<br>6. Pediatric Sepsis<br>7. Addisonian / Adrenal crisis when no better agent available |
| **CONTRAINDICATIONS** | None in the emergency setting |
| **PRECAUTIONS** | 1. Use with caution in diabetics, hyperglycemia<br>2. Use with caution in recent MI |
| **SIDE EFFECTS** | 1. Hyperglycemia<br>2. Increased susceptibility to infection<br>3. GI bleeding |
| **SUPPLIED** | 125 mg / 2 ml Act-o-Vial |
| **ADULT DOSAGE** | **Anaphylaxis:**<br>125 mg IV / IO / IM – No Repeat |
| | **Respiratory Distress / Asthma / COPD / Stridor:**<br>125 mg IV / IO / IM / PO – No Repeat |
| | |
| **PEDIATRIC DOSAGE** | **Anaphylaxis:**<br>2 mg / kg IV / IO / IM - No Repeat - Max dose 125 mg |
| | **Pediatric Upper Airway (Stridor / Croup):**<br>2 mg / kg IV / IO / IM - No Repeat - Max dose 125 mg |
| | **Pediatric Lower Airway (Wheezing):**<br>2 mg / kg IV / IO / IM / PO - No Repeat - Max dose 125 mg |
| | **Pediatric Sepsis:**<br>2 mg / kg IV / IO / IM / PO - No Repeat - Max dose 125 mg |
| | **See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • methylPREDNISolone will need to be mixed just prior to administration. Fluid will initially be cloudy, but will change quickly to clear<br>• Can be given IM if no vascular access, but not ideal.<br>• Be cautious with pediatric dosing, as the amounts may be very small. Use a 1 ml syringe for accuracy |

| MEDICATIONS |
|---|
| **METOCLOPRAMIDE** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | 1. Prevents nausea and vomiting by antagonizing central and peripheral dopamine receptors |
| **INDICATIONS** | 1. Nausea and vomiting |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Under influence of depressants (including alcohol) with CNS depression<br>3. Coma<br>4. History of epilepsy<br>5. GI obstruction, perforation, or hemorrhage<br>6. QT Interval greater than 500 ms (2.5 large EKG boxes) |
| **PRECAUTIONS** | 1. Pregnancy<br>2. May prolong QT interval when used with other QT prolonging agents<br>3. Kidney Disease<br>4. Over age 65 |
| **SIDE EFFECTS** | 1. Drowsiness<br>2. Impaired mental and physical ability<br>3. **Akathisia (Feeling of restlessness / panicked / need to move or pace)**<br>3. Extrapyramidal Symptoms (EPS) |
| **SUPPLIED** | 10 mg / 2 ml single dose vial |
| **ADULT DOSAGE** | **Anti-Emetic**<br>10 mg IV – No Repeat |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in prehospital setting |
| **KEY POINTS** | • **If administration causes akathisia or extrapyramidal symptoms (EPS) give diphenhydrAMINE 25 mg – 50 mg IV / IM**<br>EPS symptoms are: Involuntary purposeless movements of body, usually of the face such as grimacing, tongue protrusion, lip smacking, lip puckering, or eye blinking.<br>• Metoclopramide may be administered after pain medications if the patient does not have an altered mental status after the administration of pain medications.<br>• Metoclopramide will potentiate the effects of analgesics. |

| MEDICATIONS |
|---|
| **METOPROLOL** |

**ATTENTION**

**2 Beta Blockers in Protocol**

**THIS IS USED FOR NARROW COMPLEX TACHYCARDIA**

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Reduces heart rate and BP by blocking B1 receptors |
| **INDICATIONS** | Rate control in tachyarrhythmias that will not convert with other medications |
| **CONTRAINDICATIONS** | 1. Asthma<br>2. CHF<br>3. Heart blocks<br>4. Bradycardia<br>5. Shock<br>6. Cocaine / Sympathomimetic abuse / use |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Bradycardia<br>2. Heart blocks<br>3. CHF<br>4. Bronchospasm<br>5. Hypotension |
| **SUPPLIED** | 5 mg / 5 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Narrow Complex Tachycardia:**<br>5 mg IV / IO over 1 min<br>Discuss repeat doses with Medical Direction |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in the pre-hospital setting |

## MEDICATIONS

# MIDAZOLAM

| | |
|---|---|
| **PREGNANCY CLASS** | D |
| **ACTIONS** | Hypnotic and sedative effects |
| **INDICATIONS** | 1. Status epilepticus<br>2. Sedation prior to transcutaneous pacing, synchronized cardioversion, and painful procedures in the conscious patient<br>3. Stimulant overdose<br>4. Agitated or combative patients |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity to the drug<br>2. Hypotension<br>3. Respiratory Depression<br>4. Head injury without seizure<br>5. Allergy to Benzodiazepines |
| **PRECAUTIONS** | 1. May cause respiratory depression, **respirations must be continuously monitored with Capnography**<br>2. Use lower initial doses in elderly or debilitated patients<br>3. Avoid rapid injection |
| **SIDE EFFECTS** | 1. Drowsiness<br>2. Hypotension<br>3. Amnesia<br>4. Respiratory Depression<br>5. CNS Depression<br>6. Nausea / Vomiting |
| **SUPPLIED** | 5 mg / 1 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Status Epilepticus - With Vascular Access:**<br>2.5 mg IV - May Repeat q 5 min prn - Max 10 mg<br>**Status Epilepticus - Without Vascular Access:**<br>5 mg IM / IN Atomized – 1/2 dose up each nostril - May Repeat q 5 min prn - Max 10 mg<br>**Procedural Sedation (Cardioversion, Pacing) With Vascular Access:**<br>2.5 mg IV (1 minute prior to procedure) - May Repeat q 5 min prn - Max 10 mg<br>**Procedural Sedation (Cardioversion, Pacing) No Vascular Access:**<br>5 mg IM / IN Atomized – 1/2 dose up each nostril - May Repeat q 5 min prn - Max 10 mg<br>**Airway Management – With Vascular Access:**<br>2.5 mg IV (1 minute prior to procedure) - May Repeat q 5 min prn - Max 10 mg<br>**Airway Management – No Vascular Access:**<br>5 mg IM / IN Atomized – 1/2 dose up each nostril - May Repeat q 5 min prn - Max 10 mg<br>**Alcohol Related Emergencies – Combative / Withdrawal – With Vascular Access**<br>2.5 mg IV (1 minute prior to procedure) - May Repeat q 5 min prn - Max 10 mg<br>**Alcohol Related Emergencies – Combative / Withdrawal – No Vascular Access**<br>5 mg IM / IN Atomized – 1/2 dose up each nostril - May Repeat q 5 min prn - Max 10 mg<br>**Combative Psych Patient – With Vascular Access**<br>2.5 mg IV (1 minute prior to procedure) - May Repeat q 5 min prn - Max 10 mg<br>**Combative Psych Patient – NO Vascular Access**<br>5 mg IM / IN Atomized – 1/2 dose up each nostril - May Repeat q 5 min prn - Max 10 mg<br>**Sympathomimetic Overdose – With Vascular Access**<br>2.5 mg IV (1 minute prior to procedure) - May Repeat q 5 min prn - Max 10 mg<br>**Sympathomimetic Overdose – NO Vascular Access**<br>5 mg IM / IN Atomized – 1/2 dose up each nostril - May Repeat q 5 min prn - Max 10 mg<br>**CPR Induced Awareness:**<br>2.5 mg IV May repeat prn |
| **PEDIATRIC DOSAGE** | **Status Epilepticus - With Vascular Access:**<br>0.1 mg / kg IV / IO - May Repeat q 5 min prn - max single dose 2.5 mg – may repeat once – max total dose 5 mg<br>**Status Epilepticus - NO Vascular Access:**<br>0.2 mg / kg IN / IM - (1/2 dose up each nostril) - May Repeat q 5 min prn - Max Dose 5 mg<br>**Procedural Sedation (Cardioversion, Pacing) With Vascular Access:**<br>0.05 - 0.1 mg / kg IV / IO - May Repeat q 5 min prn - max dose 2.5 mg<br>**Procedural Sedation (Cardioversion, Pacing) No Vascular Access:**<br>0.2 mg / kg IN / IM - (1/2 dose up each nostril) - May Repeat q 5 min prn - Max Dose 5 mg<br>**Combative Psych Patient – With Vascular Access**<br>0.05 - 0.1 mg / kg IV / IO - May Repeat q 5 min prn - Max Dose 2.5 mg<br>**Combative Psych Patient – NO Vascular Access:**<br>0.2 mg / kg IN / IM - (1/2 dose up each nostril) - May Repeat q 5 min prn - Max Dose 5 mg<br>**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |
| **KEY POINTS** | • Monitor respiratory status continuously |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in |

| MEDICATIONS |
|---|
| **MORPHINE SULFATE** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Inhibits pain pathways altering perception and response to pain<br>2. Mild vasodilatation |
| **INDICATIONS** | 1. Cardiac chest discomfort and acute MI<br>2. Pain Management |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Respiratory depression<br>3. Head injury or head trauma<br>4. Hypotension<br>5. Multi-system trauma patients |
| **PRECAUTIONS** | 1. May cause respiratory depression and / or hypotension<br>2. Routinely monitor the patient's respiratory effort / $SpO_2$<br>3. Morphine may mask pain, so conduct a complete assessment prior to administration<br>4. Administer slowly and titrate to pain |
| **SIDE EFFECTS** | 1. Respiratory depression<br>2. Altered LOC<br>3. Hypotension<br>4. Bradycardia<br>5. Nausea and vomiting<br>6. Constricted pupils |
| **SUPPLIED** | 10 mg / 1 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Cardiac Chest Discomfort and Acute MI:**<br>2.5 - 5 mg IV / IM<br>May Repeat q 10 mins prn - Max Dose 10 mg |
| | **Pain Management:**<br>2.5 - 5 mg IV / IM<br>May Repeat q 10 mins prn- Max Dose 10 mg |
| | |
| **PEDIATRIC DOSAGE** | **Severe Pain Management:**<br>0.05 - 0.1 mg / kg IV / IM<br>May Repeat q 10 mins Max Dose 4 mg |

**See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • Rapid administration increases likelihood of side effects<br>• Elderly may be more susceptible to respiratory depression effects |

| MEDICATIONS |
|---|
| **NALOXONE** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Blocks opiates from acting on opiate receptors |
| **INDICATIONS** | 1. Respiratory depression due to opioids |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity |
| **PRECAUTIONS** | 1. Assist ventilations prior to and while waiting for Naloxone to work<br>2. Should be used and titrated to desired respiratory effect, and not intended to restore full consciousness<br>3. Naloxone may induce acute withdrawal in patients who are opiate dependent. Be prepared for a potentially combative patient<br>4. The effects of Naloxone do not usually last as long as the effects of opiates, therefore subsequent doses may need to be administered<br>5. Withdrawal may cause pain, hypertension, agitation, irritability, and diaphoresis |
| **SIDE EFFECTS** | Narcotic withdrawal |
| **SUPPLIED** | 2 mg / 2 ml prefilled syringe or 4 mg / 0.1 ml unit dose nasal spray |
| **ADULT DOSAGE** | **Opiate Overdose:**<br>2 - 4 mg IV / IM may be repeated as needed to maintain respiratory effort – May Repeat q 2 mins prn - Max 12 mg |
| | **Opiate Overdose:**<br>2 - 4mg IN Atomized – If IN dose ineffective, summon ALS to administer subsequent doses IV / IO – May Repeat 2 mins - Max 12 mg |
| | |
| **PEDIATRIC DOSAGE** | **Opiate Overdose:**<br>0.1 mg / kg IV / IM - Max 2 mg per dose - May be repeated as needed to maintain respiratory effort<br>May Repeat q 2 mins prn - Max 12 mg |
| | **Opiate Overdose:**<br>1 mg IN Atomized – If IN dose ineffective, summon ALS to administer subsequent doses IV / IO – May Repeat 2 mins - Max 12 mg |
| | **See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • Not for use during cardiac arrest, for respiratory arrest / failure only<br>• If sufficient dose is not available to resolve breathing, ventilate and consider advanced airway intervention |

| MEDICATIONS |
|---|
| **NITROGLYCERIN** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Vasodilatation<br>2. Coronary artery dilation<br>3. Decreases myocardial oxygen demand<br>4. Decreases vascular resistance |
| **INDICATIONS** | 1. Suspected ischemic chest pain / AMI<br>2. Hypertensive emergency with signs and symptoms of ACS<br>3. Pulmonary edema |
| **CONTRAINDICATIONS** | 1. Hypotension<br>2. Known hypersensitivity<br>3. Use of Viagra or similar erectile dysfunction or pulmonary hypertension medications within 48 hours<br>4. Withhold in cases of suspected trauma |
| **PRECAUTIONS** | 1. Use caution in patients with inferior wall MI or right ventricular involvement (Elevation in leads II, III, AVF or V4R)<br>2. Avoid use in patients with increased intracranial pressure or glaucoma<br>3. If the patient becomes hypotensive after nitroglycerine administration, then place the patient in a semi-reclined position with legs elevated and give IV normal saline bolus |
| **SIDE EFFECTS** | 1. Hypotension<br>2. Throbbing headache<br>3. Lightheadedness / dizziness<br>4. Syncope |
| **SUPPLIED** | 0.4 mg SL tablet or spray |
| **ADULT DOSAGE** | **Cardiac Chest Discomfort / AMI:**<br>0.4 mg (400 mcg) SL (may be repeated up to 3 doses total)<br>STOP **EMT CONTACT ONLINE MEDICAL CONTROL**<br>**Pulmonary Edema / CHF:**<br>0.4 mg (400 mcg) SL |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in prehospital setting |
| **KEY POINTS** | • May repeat up to 3 doses if B/P systolic > 110 with IV or 120 without IV<br>• Assure that patient does not chew or swallow tablets |

| MEDICATIONS |
|---|
| **OLANZapine ODT** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Dopamine and Serotonin Antagonist |
| **INDICATIONS** | 1. Acute Agitation (Not combative or Violent) with psychosis |
| **CONTRAINDICATIONS** | 1. Hypersensitivity to the drug or any component of the formulation |
| **PRECAUTIONS** | 1. Elderly patients<br>2. Prolonged QT interval<br>3. Not approved for use in dementia related psychosis |
| **SIDE EFFECTS** | 1. Sedation<br>2. Extrapyramidal Symptoms (EPS)<br>3. Orthostasis |
| **SUPPLIED** | 10 mg ODT (oral disintegrating tablet) |
| **ADULT DOSAGE** | Behavioral Emergencies (Agitation)<br>10mg ODT x1 tablet – No Repeat |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in prehospital setting |
| **KEY POINTS** | • Remove from foil blister by peeling back (do not push tablet through the foil)<br>• Place tablet in mouth immediately upon removal<br>• Tablet dissolves rapidly in saliva and may be swallowed with or without liquid<br>• If administration causes extrapyramidal symptoms (EPS) give diphenhydrAMINE 25 mg – 50 mg IV / IM<br>• EPS symptoms are: Involuntary purposeless movements of body, usually of the face such as grimacing, tongue protrusion, lip smacking, lip puckering, or eye blinking.<br>• Do not co-administer with benzodiazepines. |

| MEDICATIONS |
|---|
| **ONDANSETRON** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | 1. Prevents nausea and vomiting by blocking serotonin peripherally and centrally in the small intestines |
| **INDICATIONS** | 1. Nausea and vomiting<br>2. Chemotherapy and radiation induced nausea and vomiting |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Severe liver disease<br>3. QT Interval greater than 500 ms (2.5 large EKG boxes) |
| **PRECAUTIONS** | 1. Pregnancy<br>2. May prolong QT interval when used with another QT prolonging agent |
| **SIDE EFFECTS** | 1. Constipation, diarrhea<br>2. Increased liver enzymes<br>3. Headache<br>4. Fatigue and malaise |
| **SUPPLIED** | 4 mg / 2 ml single dose vial and 4 mg oral disintegrating tablets (ODT) |
| **ADULT DOSAGE** | **Anti-Emetic**<br>4 mg IM or IV<br>May repeat in 10 minutes prn – Max 8 Mg |
| | **Anti-Emetic ODT**<br>4 mg Oral disintegrating tablets (ODT)<br>May repeat in 10 minutes prn – Max 8 Mg |
| | |
| **PEDIATRIC DOSAGE** | **Anti-Emetic**<br>0.15 mg / kg IM or IV -or- 0.15 mg / kg PO (injectable liquid) > 1 year old<br>May Repeat in 10 minutes prn – Max 4 mg<br>**Advanced EMT only administer if patient age ≥ 4 years old** |
| | **Anti-Emetic ODT**<br>if > 40 kg / 12 Years, then 4 mg Oral disintegrating tablets (ODT) no repeat |
| | **See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • Remove ODT tablet from foil blister by peeling back (do not push tablet through the foil)<br>• Place the ODT tablet in mouth immediately upon removal<br>• The ODT Tablet dissolves rapidly in saliva and may be swallowed with or without liquid |

| MEDICATIONS |
|---|
| **ORAL GLUCOSE** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | Raises blood glucose level |
| **INDICATIONS** | Treatment of hypoglycemia |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity to corn products<br>2. Unconscious patients |
| **PRECAUTIONS** | 1. Patient must be alert and able to sufficiently swallow<br>2. Monitor patient for difficulty swallowing or choking due to the thick consistency of agent |
| **SUPPLIED** | Squeeze tube containing 24 grams of flavored oral dextrose gel |
| **ADULT DOSAGE** | One complete tube (15 g – 37.5 g) by mouth |
| | |
| **PEDIATRIC DOSAGE** | Half a tube by mouth (7.5-18.75 g – Approximately) by mouth |
| **KEY POINTS** | **The patient must be alert and can swallow!** |

| MEDICATIONS |
|---|
| **OXYGEN ($O_2$)** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | 1. Increases oxygen content of blood<br>2. Improves tissue oxygenation<br>3. Decreases energy expended for respirations |
| **INDICATIONS** | 1. Cardiac chest discomfort / ACS with $SpO_2$ < 94<br>2. Suspected stroke<br>3. Hypoxemia<br>4. Cardiopulmonary emergencies<br>5. Trauma<br>6. Shortness of breath / dyspnea<br>7. Sedative drug administration<br>8. Unknown oxyhemoglobin saturation |
| **CONTRAINDICATIONS** | None in the prehospital setting |
| **PRECAUTIONS** | Be aware for respiratory depression in COPD patients on prolonged high flow oxygen |
| **SIDE EFFECTS** | High concentrations of oxygen may reduce the respiratory drive in some COPD patients; these patients should be carefully monitored |
| **SUPPLIED** | As a compressed gas in cylinders of varying sizes |
| **ADULT DOSAGE** | 12 - 15 lpm via NRB mask or 2 - 6 lpm via nasal cannula, 6 - 8 lpm via small volume nebulizer, unless otherwise indicated |
| | |
| **PEDIATRIC DOSAGE** | 12 - 15 lpm via NRB mask or 2 - 6 lpm via nasal cannula, or 6 - 8 lpm via unit dose nebulizer, unless otherwise indicated |
| **KEY POINTS** | • Never withhold oxygen to those who need it |

| MEDICATIONS |
|---|
| **OXYTOCIN** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Induce uterine contractions<br>2. Control postpartum bleeding and hemorrhage |
| **INDICATIONS** | 1. Post-partum hemorrhage<br>2. Prophylaxis for post-partum hemorrhage / bleeding |
| **CONTRAINDICATIONS** | 1. Hypersensitivity / allergy to the drug or drug class<br>2. Patient has not delivered the fetus |
| **SIDE EFFECTS** | 1. Nausea / Vomiting<br>2. Cardiac arrythmia<br>3. Anaphylaxis |
| **SUPPLIED** | 10 units / 1 ml vial |
| **ADULT DOSAGE** | **Obstetrical Emergencies / Postpartum hemorrhage:**<br>10 units IM after delivery - No Repeat |
| | **Uncomplicated Delivery:**<br>10 units IM after delivery – No Repeat |
| | |
| **PEDIATRIC DOSAGE** | NO indication for use in pediatrics |
| **KEY POINTS** | • Assure all deliveries complete prior to administration<br>• May give prior to placental delivery if there is hemorrhage<br>• Give after placental delivery in normal deliveries |

| MEDICATIONS |
|---|
| **RACEMIC EPINEPHrine** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | 1. Reduces subglottic edema via vasoconstriction<br>2. Bronchodilation |
| **INDICATIONS** | 1. Stridor<br>2. Croup |
| **CONTRAINDICATIONS** | Known hypersensitivity |
| **PRECAUTIONS** | Patient may have a rebound worsening after effects wear off |
| **SIDE EFFECTS** | 1. Tachycardia<br>2. Hypertension |
| **SUPPLIED** | Single unit dose 0.5 ml 2.25%<br>Must be diluted with 3 ml normal saline |
| **ADULT DOSAGE** | **Stridor:**<br>Single unit dose (0.5 ml) nebulized, diluted in 3 ml normal saline<br>No repeat |
| | |
| **PEDIATRIC DOSAGE** | **Stridor at rest:**<br>Single unit dose (0.5 ml) nebulized, diluted in 3 ml normal saline<br>No repeat |
| **KEY POINTS** | |

| MEDICATIONS |
|---|
| **SODIUM BICARBONATE** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Alkalinizing agent<br>Decreases absorption of certain drug in the kidneys |
| **INDICATIONS** | 1. Used in cardiac arrest for known dialysis patients<br>2. Tricyclic overdoses |
| **CONTRAINDICATIONS** | Known hypersensitivity |
| **PRECAUTIONS** | 1. Should be administered after airway is secured<br>2. Heart failure |
| **SIDE EFFECTS** | 1. Hyperosmolarity<br>2. Alkalosis |
| **SUPPLIED** | Prefilled syringes 8.4% 50ml |
| **ADULT DOSAGE** | **Cardiac Arrest / Known Dialysis Patient:**<br>1 meq / kg IV / IO – Max 200 meq<br>May repeat if available and EKG changes reoccur |
| | **Wide QRS / Sodium Channel Blocker OD / Tricyclic Overdose:**<br>1 meq / kg IV / IO – Max 200 meq<br>May repeat if available and EKG changes reoccur |
| | **Hyperkalemia / Sine Wave EKG:**<br>1 meq / kg IV / IO – Max 200 meq<br>May repeat if available and EKG changes reoccur |
| | **Salicylate (Aspirin) Overdose:**<br>1 meq / kg IV / IO – Max 200 meq<br>May repeat if available and EKG changes reoccur |
| | **Crush Injury After 2 hours Entrapped:**<br>**1 meq / kg IV / IO – Max 100 meq / doses repeat every 30 min during care**<br>**May repeat if available and EKG changes reoccur** |
| | |
| **PEDIATRIC DOSAGE** | **Wide QRS / Sodium Channel Blocker OD / Tricyclic Overdose:**<br>1 mEq / kg IV / IO Max 50 meq / Dose<br>May repeat if available and EKG changes reoccur |
| | **See PEDIATRIC DRUG ADMINISTRATION CHART for weight-based administration** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3-5 kg | 6-7 kg | 8-9 kg | 10-11 kg | 12-14 kg | 15-18 kg | 19-23 kg | 24-29 kg | 30-36 kg |
| 6-11 lbs | 13-15 lbs | 18-20 lbs | 22-24 lbs | 26-31 lbs | 33-40 lbs | 42-51 lbs | 53-64 lbs | 66-81 lbs |
| 18-24 in | 24-26 in | 26-29 in | 29-33 in | 33-38 in | 38-43 in | 43-48 in | 48-52 in | 52-57 in |

| | |
|---|---|
| **KEY POINTS** | • Tricyclic anti-depressants include (but not limited to): Amitriptyline, Nortriptyline, Elavil, Amoxapine, Clomipramine, Desipramine, Doxepin, Imipramine, Nortriptyline, Protriptyline, and Trimipramine<br>• Administer until QRS complex narrows to less than 0.12 and the patient condition improves<br>• Carefully flush IV lines after administration<br>• Extravasation may cause tissue resistance<br>• Will cause transient increase in capnography |

| MEDICATIONS |
|---|
| **TETRACAINE** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | Topical local anesthetic ophthalmic solution |
| **INDICATIONS** | Ocular irritation / pain with NO PENETRATING TRAUMA |
| **CONTRAINDICATIONS** | 1. Hypersensitivity<br>2. Allergy to caine family (Novocain, Lidocaine, Etc.)<br>3. Penetrating eye injury |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Burning sensation<br>2. Redness<br>3. Tearing |
| **SUPPLIED** | 0.5% 4 ml dropper |
| **ADULT DOSAGE** | Non-Penetrating Eye Trauma / Irritants<br>1 – 2 drops in affected eye – No repeat |
| | |
| **PEDIATRIC DOSAGE** | Non-Penetrating Eye Trauma / Irritants<br>1 drop in affected eye – No Repeat |
| **KEY POINTS** | • Keep dropper sterile<br>• Single patient use packaging<br>• Patients receiving Tetracaine must be transported |

| MEDICATIONS |
|---|
| **THIAMINE** |

| | |
|---|---|
| **PREGNANCY CLASS** | A |
| **ACTIONS** | Allows the normal breakdown of glucose |
| **INDICATIONS** | Suspected thiamine deficiency in malnourished or alcoholic patients prior to giving dextrose |
| **CONTRAINDICATIONS** | Known hypersensitivity |
| **PRECAUTIONS** | Rare anaphylactic reactions |
| **SIDE EFFECTS** | 1. Known hypersensitivity<br>2. Restlessness<br>3. Anaphylactic reaction<br>4. Nausea<br>5. Weakness |
| **SUPPLIED** | 100 mg / 1 ml vial |
| **ADULT DOSAGE** | **Hypoglycemic Chronic Alcoholic / Malnourished Patient:**<br>100 mg IV or IM prior to dextrose – No repeat |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in the pre-hospital setting |

| MEDICATIONS |
|---|
| **TICAGRELOR** |

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | P2Y platelet inhibitor |
| **INDICATIONS** | 1. Confirmed STEMI |
| **CONTRAINDICATIONS** | 1. Bleeding<br>2. Intracranial hemorrhage<br>3. Hepatic impairment<br>4. Age greater than 80 years<br>5. Withhold in cases of suspected trauma |
| **PRECAUTIONS** | Use with caution in patients with other prescribed direct acting anti-platelet medications |
| **SIDE EFFECTS** | 1. Bleeding<br>2. Dyspnea |
| **SUPPLIED** | 90 mg tablets |
| **ADULT DOSAGE** | |
| | **Confirmed STEMI :**<br>180 mg PO (2 – 90 mg Tablets) chew and swallow – No Repeat |
| | |
| **PEDIATRIC DOSAGE** | Not recommended in the pre-hospital setting |

| MEDICATIONS |
|---|
| **TRANEXAMIC ACID (TXA)** |

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | Preserves the framework of existing clot structure, preventing clot breakdown. |
| **INDICATIONS** | • Evidence of current or previous uncontrolled hemorrhage<br>• Hemorrhagic shock from recent Trauma (< 1 hour)<br>• Sustained tachycardia (>120 bpm) and / or hypotension (systolic < 90mmHg or hypotensive for age, see resuscitation chart)<br>• TXA must be given within 60 minutes from time of injury<br>• Post-partum hemorrhage with signs of shock |
| **CONTRAINDICATIONS** | • Hypersensitivity to medication<br>• Suspected CVA, MI, or PE |
| **PRECAUTIONS** | • TXA should not be administered in non-hemorrhagic shock.<br>• TXA should only be administered within 60 minutes of the injury |
| **SIDE EFFECTS** | • Anaphylaxis<br>• Thrombosis<br>• Hypotension (with rapid infusion, such as rate of greater than 100 mg/min)<br>• Nausea, vomiting, diarrhea<br>• Visual disturbances (blurred vision, changes in color vision) |
| **SUPPLIED** | 1 Gram (1000mg) / 10 ml Vial or Ampule<br>1 Gram (1000mg) / 100 ml premixed infusion |
| **ADULT DOSAGE** | **Adult Trauma with Uncontrolled Bleeding and Hemodynamic Instability:**<br>Mix 2 gm (2000mg) in 100 ml of D5 or normal saline and administer over 10 minutes<br>10 drops / ml drip set (2qtts/sec)<br>15 drops / ml drip set (3gtts/sec) |
| | **Post-Partum Hemorrhage / Vaginal Bleeding:**<br>Mix 1 gm (2000mg) in 100 ml of D5 or normal saline and administer over 10 minutes<br>10 drops / ml drip set (2qtts/sec)<br>15 drops / ml drip set (3gtts/sec)<br>**May repeat in 30 mins if bleeding continues** |
| | **Epistaxis or Bleeding Tooth Socket:**<br>Soak gauze product with TXA – insert in nostril / socket – continue pressure |
| | **Other Non-Traumatic Bleeding with Shock**<br>Mix 1-2gm (1000 - 2000mg) in 100 ml of D5 or normal saline and administer over 10 minutes<br>10 drops / ml drip set (2qtts/sec)<br>15 drops / ml drip set (3gtts/sec) |
| | |
| **PEDIATRIC DOSAGE** | **Pediatric Trauma with Uncontrolled Bleeding and Hemodynamic Instability:**<br>15 mg / kg mixed in 100 ml bag of D5 or normal saline – Max 1000 mg<br>Administer over 10 mins |
| | **Epistaxis or Bleeding Tooth Socket:**<br>Soak gauze product with TXA – insert in nostril / socket – continue pressure |

SPECIAL USE MEDICATIONS
Only for HAZMAT Situations

# BENZALKONIUM CHLORIDE

| | |
|---|---|
| **PREGNANCY CLASS** | N |
| **ACTIONS** | Quaternary Ammonium Compound which relieves pain and slows the passage of the fluoride ion into deeper tissues and into the bloodstream |
| **INDICATIONS** | Immerse burns from Hydrogen Fluoride or Hydrofluoric Acid in in an iced, aqueous solution 0.13% benzalkonium chloride. If immersion is not possible, then apply towels soaked in the same solution and re-soak every 2-4 minutes |
| **CONTRAINDICATIONS** | 1. Documented Hypersensitivity |
| **PRECAUTIONS** | 7. For external use only. Topical use only, not for internal use.<br>8. Avoid contact with eyes<br>9. Ice should be cubed rather than crushed to avoid hypothermia |
| **SIDE EFFECTS** | 1. Swelling, redness, skin irritation.<br>2. Itching and hives<br>3. Wheezing and chest tightness |
| **SUPPLIED** | 0.13% solution, chilled with ice if available |
| **ADULT DOSAGE** | |
| **PEDIATRIC DOSAGE** | |
| **KEY POINTS** | |

SPECIAL USE MEDICATIONS
Only for HAZMAT Situations

# Calcium Gluconate Eye Irrigation Solution (1%)

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Used in emergency response to hydrofluoric acid (HF) exposure or contact to the eyes. Calcium gluconate combines with hydrofluoric acid to neutralize the powerful fluoride ion and relieve pain. |
| **INDICATIONS** | Hydrofluoric Acid exposure to the eyes |
| **CONTRAINDICATIONS** | 1. Documented Hypersensitivity |
| **PRECAUTIONS** | 1. For eye irrigation only.<br>2. Not for intravenous injection. |
| **SIDE EFFECTS** | 1. Swelling, redness, irritation. |
| **SUPPLIED** | 1% solution (premixed 50 cc of 10% solution in 500 ml of Normal Saline) |
| **ADULT DOSAGE** | |
| **PEDIATRIC DOSAGE** | |
| **KEY POINTS** | |

SPECIAL USE MEDICATIONS
Only for HAZMAT Situations

# Calcium Gluconate Gel (2.5%)

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Used in emergency response to hydrofluoric acid (HF) exposure or contact to the body. Calcium gluconate combines with hydrofluoric acid to neutralize the powerful fluoride ion and relieve pain. |
| **INDICATIONS** | Calcium gluconate gel is indicated as an integral part in responding to Hydrofluoric Acid exposure to the body, mitigating or preventing the related pain and potential tissue burns and bone damage. |
| **CONTRAINDICATIONS** | 1. Hypersensitivity |
| **PRECAUTIONS** | 1. For external use only. Topical use only, not for internal use.<br>2. Avoid contact with eyes |
| **SIDE EFFECTS** | 1. Swelling, redness, skin irritation. |
| **SUPPLIED** | 30 cc tube of 2.5% Calcium Gluconate in water soluble jelly |
| **ADULT DOSAGE** | Topical application |
| **PEDIATRIC DOSAGE** | Topical application |
| **KEY POINTS** | • Store between 15-30°C (59-86°F).<br>• Use directly from tube, one tube per application, then safely discard.<br>• Ensure adequate ventilation at all times. |

SPECIAL USE MEDICATIONS
Only for HAZMAT Situations

# Calcium Gluconate Solution (10%)

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Used in emergency response to exposure of hydrofluoric acid (HF). Calcium gluconate combines with hydrofluoric acid to neutralize the powerful fluoride ion and relieve pain. |
| **INDICATIONS** | Exposure to Hydrofluoric Acid |
| **CONTRAINDICATIONS** | 1. Hypersensitivity |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | |
| **SUPPLIED** | 10% solution 10 ml vial, 100 mg/ml (1 gm/10 ml) |
| **ADULT DOSAGE** | 0.1 to 0.2 mL/kg - Up to 10 ml SLOW IV (repeat doses may be required) |
| **PEDIATRIC DOSAGE** | 0.1 to 0.2 mL/kg - Up to 10 ml SLOW IV (repeat doses may be required) |
| **KEY POINTS** | |

SPECIAL USE MEDICATIONS
Only for HAZMAT Situations

# Calcium Gluconate Solution for Nebulizer (2.5%)

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Used in emergency response to inhalation exposure of hydrofluoric acid (HF). Calcium gluconate combines with hydrofluoric acid to neutralize the powerful fluoride ion and relieve pain. |
| **INDICATIONS** | Inhalation exposure to Hydrofluoric Acid vapors |
| **CONTRAINDICATIONS** | 1. Hypersensitivity |
| **PRECAUTIONS** | 1. For nebulization only.<br>2. Not for intravenous injection. |
| **SIDE EFFECTS** | |
| **SUPPLIED** | 2.5% solution in Normal Saline |
| **ADULT DOSAGE** | |
| **PEDIATRIC DOSAGE** | |
| **KEY POINTS** | |

SPECIAL USE MEDICATIONS
Only for BIOLOGICAL EMERGENCY RESPONSE

# CIPROFLOXACIN

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Antimicrobial |
| **INDICATIONS** | 1. Anthrax exposure<br>2. Other microorganism exposure deemed public health threat |
| **CONTRAINDICATIONS** | 1. Hypersensitivity<br>2. Allergy |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Nausea / Vomiting |
| **SUPPLIED** | 100, 250, 500 mg tablets or 200 mg in 100 ml / 400 mg in 200 ml IV bags<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Anthrax / Microorganism Exposure:**<br>500 mg PO or 400 mg IV / IO |

**SPECIAL USE MEDICATIONS**
**ONLY FOR USE IF TICAGRELOR Unavailable**

# CLOPIDOGREL

| | |
|---|---|
| **PREGNANCY CLASS** | B |
| **ACTIONS** | Platelet aggregate inhibitor |
| **INDICATIONS** | 1. Confirmed STEMI where Ticagrelor is unavailable |
| **CONTRAINDICATIONS** | 1. Bleeding<br>2. Intracranial hemorrhage<br>3. Hepatic impairment |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Chest pain<br>2. Weakness<br>3. Bleeding |
| **SUPPLIED** | 300 mg tablet |
| **ADULT DOSAGE** | **Confirmed STEMI with NO TICAGRELOR Available:**<br>600 mg PO |

SPECIAL USE MEDICATIONS
Only for BIOLOGICAL EMERGENCY RESPONSE

# DOXYCYCLINE

| | |
|---|---|
| **PREGNANCY CLASS** | D |
| **ACTIONS** | Antibiotic |
| **INDICATIONS** | 1. Anthrax<br>2. Plague |
| **CONTRAINDICATIONS** | 1. Allergy<br>2. Pregnancy<br>3. Pediatrics |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | Diarrhea |
| **SUPPLIED** | 100 mg Tablet or Capsule |
| **ADULT DOSAGE** | **Anthrax / Plague Exposure:**<br>100 mg PO |

SPECIAL USE MEDICATIONS
Only for NERVE AGENT EMERGENCY RESPONSE

# DuoDote (Atropine and Pralidoxime Chloride)
# VALIUM Auto Injector

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | **DuoDote**<br>• Blocks nerve agents effects and relieves airway constriction and secretions in the lungs and gastrointestinal tract.<br>• Acts to restore normal functions at the nerve ending by removing the nerve agent and reactivating natural function<br>**Valium:**<br>• Given to treat seizures caused by exposure to nerve agents (buddy treatment) – SUPPLEMENT TO DUODOTE |
| **INDICATIONS** | Suspected or confirmed nerve agent exposure or organophosphate poisoning |
| **CONTRAINDICATIONS** | Both medications in the kit should be used with caution (but not withheld) in patients with preexisting cardiac disease, HTN, or CVA history |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Chest pain<br>2. Exacerbation of angina<br>3. Myocardial infarction<br>4. Blurred vision<br>5. Headache<br>6. Drowsiness<br>7. Nausea<br>8. Tachycardia<br>9. Hypertension<br>10. Hyperventilation |
| **SUPPLIED** | DUODOTE - Each auto injector contains ***BOTH:***<br>Atropine 2.1 mg and Pralidoxime 600 mg<br>Valium auto injector contains 10 mg |
| **ADULT DOSAGE** | **For Nerve Agent Exposure (SLUDGE symptoms):**<br>Up to 3 auto injectors may be used for one patient based on signs<br>(1 - 2 kits for self-treatment - up to 3 for buddy treatment with severe symptoms) |
| | **For Seizures Associated with Nerve Agent Exposure:**<br>1 Valium auto injector (buddy administration) |
| | |
| **PEDIATRIC DOSAGE** | DuoDotes are not authorized for the use of children under 41 kg (90 lbs) |

SPECIAL USE MEDICATIONS
ONLY FOR DEPARTMENTS PERMITTED TO PERFORM RSI

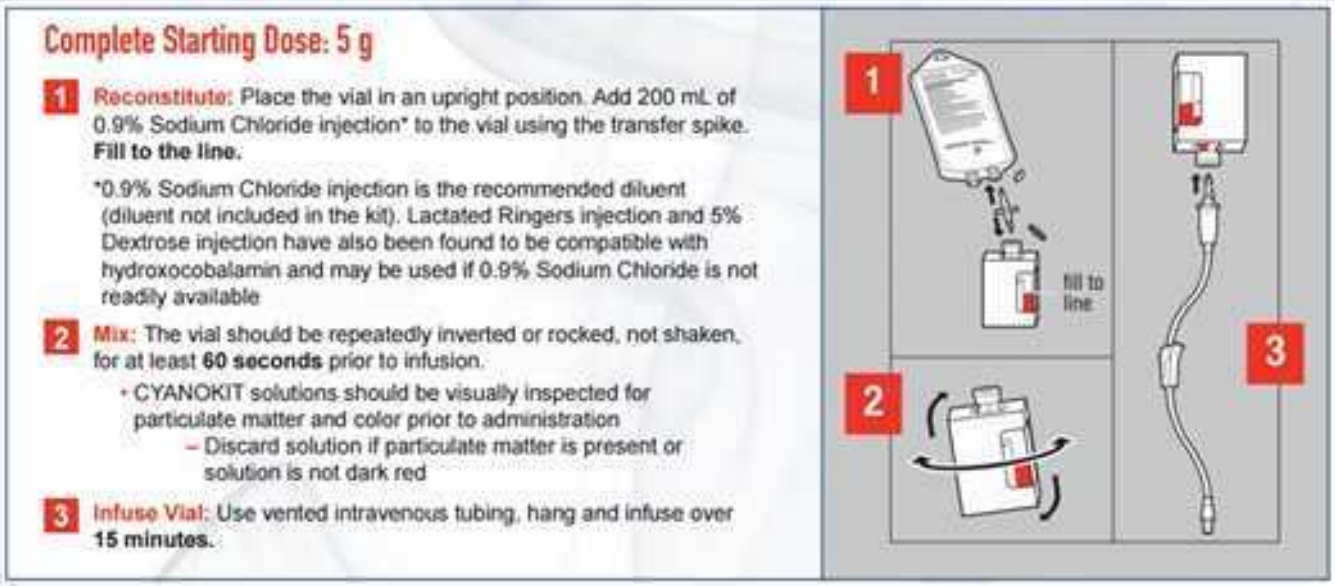
# ETOMIDATE

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Hypnotic sedative |
| **INDICATIONS** | Induction of anesthesia during RSI |
| **CONTRAINDICATIONS** | Hypersensitivity |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | Skeletal muscle movements |
| **SUPPLIED** | 20 mg / 10 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Induction For RSI:**<br>0.3 mg / kg IV / IO - Usual dose 20 mg |

SPECIAL USE MEDICATIONS
Only for CYANIDE EXPOSURE RESPONSE – Where available

# HYDROXOCOBALAMIN

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Cyanide antidote – binds to cyanide ions for excretion |
| **INDICATIONS** | Known or suspected cyanide poisoning with<br>1. Cardiac or Respiratory Arrest<br>2. Seizures<br>3. Hypotension (MAP <65)<br>4. Minimally responsive or unconscious |
| **CONTRAINDICATIONS** | None in the emergency setting – assure airway, breathing, and circulatory support are in place prior to administration. |
| **PRECAUTIONS** | 1. Use caution if other cyanide antidotes are used simultaneously with Hydroxocobalamin (Cyanokit), use separate IV lines<br>2. Do not use if there is particulate matter in the vial after reconstitution or the solution is not dark red |
| **SIDE EFFECTS** | 1. Possible allergic reaction<br>2. Eye irritation, redness, swelling<br>3. Abdominal pain, nausea, vomiting, diarrhea<br>4. Chest discomfort<br>5. Dizziness, restlessness<br>6. Dyspnea, tight throat<br>7. Skin flushing, urticaria |
| **SUPPLIED** | (1) 5 g vials for reconstitution – rock and invert for 30 seconds per vial |
| **ADULT DOSAGE** | **Cyanide Exposure:**<br>5 g over 15 minutes |
| **KEY POINTS** | • A second dose of 5 g may be considered depending on patient response and severity of exposure.<br>• Discard unused medication after 6 hours<br>• Reconstitute with normal saline (0.9% sodium chloride)<br>• May have drug interactions, administer all other medications via a separate IV line |



SPECIAL USE MEDICATIONS
For PAIN MANAGEMENT where SUPPLIED AND SUPPORTED by EMS DEPARTMENT

# NITROUS OXIDE / OXYGEN

| | |
|---|---|
| **PREGNANCY CLASS** | N |
| **ACTIONS** | 1. Nitrous oxide / oxygen is a mixture of 50% nitrous oxide and 50% oxygen<br>2. When inhaled, nitrous oxide/oxygen depresses the central Nervous system, causing sedation and analgesia<br>3. Nitrous Oxide: oxygen is self-administered<br>4. Provides rapid, easily reversible relief of pain |
| **INDICATIONS** | 1. Burns<br>2. Kidney stones<br>3. Musculoskeletal trauma<br>4. Fractures |
| **CONTRAINDICATIONS** | 1. Known hypersensitivity<br>2. Decreased level of consciousness or unable to follow instructions<br>3. History of drug or alcohol ingestion<br>4. History of COPD, emphysema, or any condition that may compromise respiratory efforts including chest trauma, CHF, respiratory tract burns, or other trauma<br>5. Bowel obstruction or traumatic abdominal injury<br>6. Maxillofacial injuries or head injuries<br>7. Obstetric patient not in the process of delivery<br>8. Pediatric patient < 12 years or < 75 pounds<br>9. Intoxication<br>10. Psychiatric problems<br>11. Respiratory distress<br>12. Increased intracranial pressure<br>13. Decompression sickness |
| **SUPPLIED** | Supplied as Nitronox, a set containing oxygen and a nitrous oxide cylinder joined by a valve that regulates flow to provide a 50:50 mixture of the two gasses. The mixture is piped to a demand valve apparatus. |
| **SIDE EFFECTS** | Dizziness, apnea, cyanosis, nausea, vomiting. Ambulance crew may experience giddiness if the vehicle is not properly vented |
| **ADULT DOSAGE** | **Extremity Trauma:**<br>Instruct the patient to inhale deeply though a patient-held demand valve and mask or mouthpiece. Have patient inhale gas until pain relief or patient spontaneously is unable to hold mask. |
| | |
| **PEDIATRIC DOSAGE** | Not indicated in the pre-hospital setting |
| **KEY POINTS** | • Self-administered by mask: a good seal around mouth and nose is important; the gas is breathed deeply and may give relief after about two minutes; the patient should stop when relief is obtained<br>• The paramedic should not hold the face mask in place for the patient |

SPECIAL USE MEDICATIONS
ONLY FOR DEPARTMENTS PERMITTED TO PERFORM RSI

# ROCURONIUM

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Intermediate duration nondepolarizing neuromuscular blocking agent |
| **INDICATIONS** | Facilitate endotracheal intubation |
| **CONTRAINDICATIONS** | 1. Hypersensitivity to Rocuronium or other nondepolarizing neuromuscular blocking agents |
| **PRECAUTIONS** | Paralysis may be prolonged in cases with electrolyte abnormalities, neuromuscular diseases, liver disease, and acidosis |
| **SIDE EFFECTS** | 1. Nausea<br>2. Vomiting<br>3. Swelling or Discomfort at The Injection Site<br>4. Sleepiness or Lightheadedness<br>5. Mild Itching or Skin Rash<br>6. High or Low Blood Pressure (Hypertension or Hypotension) |
| **SUPPLIED** | 100 mg / 10 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Muscle Relaxant for RSI:**<br>1 mg / kg - Usual dose 100 mg |

SPECIAL USE MEDICATIONS
ONLY FOR DEPARTMENTS PERMITTED TO PERFORM RSI

# SUCCINYLCHOLINE

| | |
|---|---|
| **PREGNANCY CLASS** | C |
| **ACTIONS** | Depolarizing neuromuscular blocking agent |
| **INDICATIONS** | Facilitate endotracheal intubation |
| **CONTRAINDICATIONS** | 2. History of malignant hyperthermia<br>3. Skeletal muscle myopathies<br>4. Known or suspected hyperkalemia<br>5. Renal failure<br>6. Burns >24 hours old |
| **PRECAUTIONS** | |
| **SIDE EFFECTS** | 1. Apnea<br>2. Arrhythmias<br>3. Increased intraocular pressure<br>4. Muscle fasciculations |
| **SUPPLIED** | 200 mg / 10 ml<br>VERIFY ACTUAL CONCENTRATION ON HAND BEFORE ADMINISTRATION |
| **ADULT DOSAGE** | **Muscle Relaxant for RSI:**<br>1 – 1.5 mg / kg - Usual dose 100 mg |

**SPECIAL USE MEDICATIONS**

**For CONFIRMED STEMI ONLY where SUPPLIED AND SUPPORTED due to TRANSPORT TIMES TO PCI CENTERS**

# TENECTEPLASE

| | | |
|---|---|---|
| **PREGNANCY CLASS** | C | |
| **ACTIONS** | Thrombolytic agent | |
| **INDICATIONS** | 1. Confirmed STEMI where transport times to PCI are >60 min | |
| **CONTRAINDICATIONS** | 1. Active bleeding<br>2. CVA History<br>3. Trauma within 2 months<br>4. Surgery within 2 months<br>5. Uncontrolled hypertension | |
| **PRECAUTIONS** | 1. Cerebrovascular disease<br>2. Recent gastrointestinal or genitourinary bleeding<br>3. Recent trauma<br>4. Hypertension: systolic BP ≥180 mm Hg and/or diastolic BP ≥110 mm Hg<br>5. High likelihood of left heart thrombus, e.g., mitral stenosis with atrial fibrillation<br>6. Acute pericarditis<br>7. Subacute bacterial endocarditis<br>8. Hemostatic defects, including those secondary to severe hepatic or renal disease<br>9. Severe hepatic dysfunction<br>10. Pregnancy<br>11. Diabetic hemorrhagic retinopathy or other hemorrhagic ophthalmic conditions<br>12. Septic thrombophlebitis or occluded AV cannula at seriously infected site<br>13. Advanced age (see PRECAUTIONS: Geriatric Use)<br>14. Patients currently receiving oral anticoagulants, e.g., warfarin sodium<br>15. Recent administration of GP IIb/IIIa inhibitors<br>16. Any other condition in which bleeding constitutes a significant hazard or would be particularly difficult to manage because of its location | |
| **SIDE EFFECTS** | 1. Bleeding<br>2. CVA | |
| **SUPPLIED** | 50 mg vial with 10 ml sterile water for Reconstitution | |
| **ADULT DOSAGE** | **Confirmed STEMI:** | |
| | <60 kg | 30 mg IV (6 ml) |
| | 60 kg – 70 kg | 35 mg IV (7 ml) |
| | 70 kg – 80 kg | 40 mg IV (8 ml) |
| | 80 kg – 90 kg | 45 mg IV (9ml) |
| | ≥ 90 kg | 50 mg IV (10ml) |

# PEDIATRIC WEIGHT BASED DOSING CHARTS

| GRAY | CONCENTRATION | ROUTES | 3 KG | 4 KG | 5 KG | RESUSCITATION |
|---|---|---|---|---|---|---|
| | | | | | | ET Tube |
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 0.3 mg (0.1 ml) | 0.4 mg (0.13 ml) | 0.5 mg (0.17 ml) | 3.0 Cuffed |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 0.6 mg (0.2 ml) | 0.8 mg (0.27 ml) | 1.0 mg (0.33 ml) | ET Depth |
| Amiodarone | 150 mg / 3 ml | IV / IO | 15 mg (0.3 ml) | 20 mg (0.4 ml) | 25 mg (0.5 ml) | 9 – 10 cm |
| Atropine | 1 mg / 10 ml | IV / IO | 0.1 mg (1 ml) | 0.1 mg (1 ml) | 0.1 mg (1 ml) | Blade |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 60 mg (0.6 ml) | 80 mg (0.8 ml) | 100 mg (1 ml) | 1 |
| Calcium Gluconate | 100 mg / ml | IV / IO | 180 mg (1.8ml) | 240 mg (2.4ml) | 300 (3 ml) | King |
| Dextrose 10% (Made from D50) | 1 G / 10 ml | IV / IO | 0.6 G (6 ml) | 0.8 G (8 ml) | 1 G (10 ml) | 0 (Clear) |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 0.6 G (6 ml) | 0.8 G (8 ml) | 1 G (10 ml) | iGel / LMA |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 3 mg (0.06 ml) | 4 mg (0.08 ml) | 5 mg (0.1 ml) | 1 Pink / 1 |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.03 mg (0.03 ml) | 0.04 mg (0.04 ml) | 0.05 mg (0.05 ml) | OPA |
| EPINEPHrine 0.1 mg / ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.03 mg (0.3 ml) | 0.04 mg (0.4 ml) | 0.05 mg (0.5 ml) | 50 mm / 0 / Blue |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 3 mcg (0.06 ml) | 4 mcg (0.08 ml) | 5 mcg (0.1 ml) | NPA |
| Lidocaine for IO | 20 mg / ml | IO | 1.5 mg (0.075 ml) | 2 mg (0.1 ml) | 2.5 mg (0.125 ml) | 14 Fr. |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 3 mg (0.15 ml) | 4 mg (0.2ml) | 5 mg (0.25 ml) | IV Caths |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 1.5 mg (0.075 ml) | 2 mg (0.1 ml) | 2.5 mg (0.125 ml) | 22 – 24 |
| LORazepam | 2 mg / ml | IV / IO | 0.15 mg (0.075 ml) | 0.2 mg (0.1 ml) | 0.25 mg (0.125 ml) | Defib Energy |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 6 mg (0.1 ml) | 8 mg (0.125 ml) | 10 mg (0.15 ml) | 8 then 20 up to 50 |
| Midazolam | 5 mg / ml | IV / IO | 0.3 mg (0.06 ml) | 0.4 mg (0.08 ml) | 0.5 mg (0.1 ml) | Cardiovert |
| Midazolam | 5 mg / ml | IN / IM | 0.6 mg (0.12 ml) | 0.8 mg (0.16 ml) | 1 mg (0.2 ml) | 4 then 8 |
| Morphine | 10 mg / ml | IV / IO | 0.3 mg (0.03 ml) | 0.4 mg (0.04 ml) | 0.5 mg (0.5 ml) | Bolus |
| Naloxone | 2 mg / 2ml | IV / IO / IN | 0.3 mg (0.3 ml) | 0.4 mg (0.4 ml) | 0.5 mg (0.5 ml) | 80 ml |
| Ondansetron | | | | | | Hypotension<60 |

| PINK | CONCENTRATION | ROUTES | 6 - 7 KG (6.5 kg avg.) | RESUSCITATION |
|---|---|---|---|---|
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 0.65 mg (0.22 ml) | ET Tube |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 1.3 mg (0.43 ml) | 3.0 Cuffed |
| Amiodarone | 150 mg / 3 ml | IV / IO | 32 mg (0.64 ml) | ET Depth |
| Atropine | 1 mg / 10 ml | IV / IO | 0.13 mg (1.3 ml) | 10-10.5 cm to lip |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 130 mg (1.3 ml) | Laryngoscope Blade |
| Calcium Gluconate | 100 mg / ml | IV / IO | 390 mg (3.9 ml) | 1 |
| Dextrose 10% (Made from D50) | 1 G / 10 ml | IV / IO | 1.3 G (13 ml) | King |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 1.3 G (13 ml) | 1 (White) |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 6.5 mg (0.13 ml) | iGEL / LMA |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.065 mg (0.065 ml) | 1.5 Blue / 1.5 |
| EPINEPHrine 0.1 mg /ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.065 mg (0.65 ml) | OPA |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 6.5 mcg ( 0.13 ml) | 50 mm / 0 / Blue |
| Lidocaine for IO | 20 mg / ml | IO | 3.25 mg (0.16 ml) | NPA |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 6.5 mg (0.32 ml) | 14 Fr. |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 3.25 mg (0.16 ml) | IV Caths |
| LORazepam | 2 mg / ml | IV / IO | 0.325 mg (0.1625 ml) | 22 – 24 |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 13 mg (0.21 ml) | Defib Energy |
| Midazolam | 5 mg / ml | IV / IO | 0.65 mg (0.13 ml) | 15 then 30 up to 65 |
| Midazolam | 5 mg / ml | IN / IM | 1.3 mg (0.26 ml) | Cardiovert |
| Morphine | 10 mg / ml | IV / IO | 0.65 mg (0.065 ml) | 7 then 15 |
| Naloxone (Narcan) | 2 mg / 2ml | IV / IO / IN | 0.65 mg (0.65 ml) | Bolus |
| Ondansetron | | | | 130 ml |
| Sodium Bicarbonate 8.4% | 1 mEq / ml | IV / IO | 6.5 mEq (6.5 ml) | Hypotensive if < 70 SBP |

| RED | CONCENTRATION | ROUTES | 8 - 9 kg (8.5 kg average) | RESUSCITATION |
|---|---|---|---|---|
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 0.85 mg (0.28 ml) | ET Tube |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 1.7 mg (0.57 ml) | 3.5 Cuffed |
| Amiodarone | 150 mg / 3 ml | IV / IO | 42 mg (0.84 ml) | ET Depth |
| Atropine | 1 mg / 10 ml | IV / IO | 0.17 mg (1.7 ml) | 10.5-11 cm to lip |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 170 mg (1.7 ml) | Laryngoscope Blade |
| Calcium Gluconate | 100 mg / ml | IV / IO | 510 mg (5.1 ml) | 1 |
| Dextrose 25% (Made from D50) | 12.5 G / 50 ml | IV / IO | 4.25 G (17 ml) | King |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 4.25 (42.5 ml) | 1 (White) |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 8.5 mg (0.17 ml) | LMA |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.085 mg (0.085 ml) | 1.5 Blue / 1.5 |
| EPINEPHrine 0.1 mg / ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.085 mg (0.85 ml) | OPA |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 8.5 mcg (0.17 ml) | 50 mm / 0 / Blue |
| Lidocaine for IO | 20 mg / ml | IO | 4.25 mg (0.21 ml) | NPA |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 8.5 mg (0.42 ml) | 16 Fr. |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 4.25 mg (0.21 ml) | IV Caths |
| LORazepam | 2 mg / ml | IV / IO | 0.425 mg (0.2125 ml) | 22 - 24 |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 17 mg (0.27 ml) | Defib Energy |
| Midazolam | 5 mg / ml | IV / IO | 0.85 mg (0.17 ml) | 20 then 50 up to 85 |
| Midazolam | 5 mg / ml | IN / IM | 1.7 mg (0.34 ml) | Cardiovert |
| Morphine | 10 mg / ml | IV / IO | 0.85 mg (0.085 ml) | 9 then 20 |
| Naloxone | 2 mg / 2ml | IV / IO / IN | 0.85 mg (0.85 ml) | Bolus |
| Ondansetron | | | | 170 ml |
| Sodium Bicarbonate 8.4% | 1 mEq / ml | IV / IO | 8.5 mEq (8.5 ml) | Hypotensive if < 70 SBP |

| PURPLE | CONCENTRATION | ROUTES | 10 - 11 kg (10.5 kg average) | RESUSCITATION |
|---|---|---|---|---|
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 1 mg (0.33 ml) | ET Tube |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 2 mg (0.66 ml) | 3.5 Cuffed |
| Amiodarone | 150 mg / 3 ml | IV / IO | 52 mg (1.04 ml) | ET Depth |
| Atropine | 1 mg / 10 ml | IV / IO | 0.21 mg (2.1 ml) | 11-12 cm to lip |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 210 mg (2.1 ml) | Laryngoscope Blade |
| Calcium Gluconate | 100 mg / ml | IV / IO | 630 mg (6.3 ml) | 1 |
| Dextrose 25% (Made from D50) | 12.5 G / 50 ml | IV / IO | 5.25 G (21 ml) | King |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 5.25 G (52.5) | 1 (White) |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 10.5 mg (0.21 ml) | iGEL / LMA |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.10 mg (0.1 ml) | 2 Gray / 2 |
| EPINEPHrine 0.1 mg / ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.1 mg (1 ml) | OPA |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 10.5 mcg (0.21 ml) | 60 mm / 1 / Black |
| Lidocaine for IO | 20 mg / ml | IO | 5.25 mg (0.26 ml) | NPA |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 10.5 mg (0.52 ml) | 18 Fr. |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 5.25 mg (0.26 ml) | IV Caths |
| LORazepam | 2 mg / ml | IV / IO | 0.525 mg (0.2625 ml) | 20 - 24 |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 21 mg (0.34 ml) | Defib Energy |
| Midazolam | 5 mg / ml | IV / IO | 1.05 mg (0.21 ml) | 20 then 50 up to 100 |
| Midazolam | 5 mg / ml | IN / IM | 2.1 mg (0.42 ml) | Cardiovert |
| Morphine | 10 mg / ml | IV / IO | 1.05 mg (0.105 ml) | 10 then 20 |
| Naloxone | 2 mg / 2ml | IV / IO / IN | 1.05 mg (1.05 ml) | Bolus |
| Ondansetron | 4 mg / 2 ml | IV / IO / PO | 1.58 mg (0.8 ml) | 200 ml |
| Sodium Bicarbonate 8.4% | 1 mEq / ml | IV / IO | 10.5 mEq (10.5 ml) | Hypotensive if < 74 SBP |

| YELLOW | CONCENTRATION | ROUTES | 12 - 14 kg (13 kg average) | RESUSCITATION |
|---|---|---|---|---|
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 1.3 mg (0.43 ml) | ET Tube |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 2.6 mg (0.87 ml) | 4.0 Cuffed |
| Amiodarone | 150 mg / 3 ml | IV / IO | 65 mg (1.3 ml) | ET Depth |
| Atropine | 1 mg / 10 ml | IV / IO | 0.26 mg (2.6 ml) | 12.5-13.5 cm to lip |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 260 mg (2.6 ml) | Laryngoscope Blade |
| Calcium Gluconate | 100 mg / ml | IV / IO | 780 mg (7.8ml) | 2 |
| Dextrose 25% (Made from D50) | 12.5 G / 50 ml | IV / IO | 6.5 G (26 ml) | King |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 6.5 G (65 ml) | 2 (Green) |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 13 mg (0.21 ml) | iGEL / LMA |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.13 mg (0.13 ml) | 2 Gray / 2 |
| EPINEPHrine 0.1 mg / ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.13 mg (1.3 ml) | OPA |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 13 mcg (0.26 ml) | 60 mm / 1 / Black |
| Lidocaine for IO | 20 mg / ml | IO | 6.5 mg (0.325 ml) | NPA |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 13 mg (0.65 ml) | 20 Fr. |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 6.5 mg (0.325 ml) | IV Caths |
| LORazepam | 2 mg / ml | IV / IO | 0.65 mg (0.325 ml) | 20 - 22 |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 26 mg (0.42 ml) | Defib Energy |
| Midazolam | 5 mg / ml | IV / IO | 1.3 mg (0.26 ml) | 30 then 70 up to 130 |
| Midazolam | 5 mg / ml | IN / IM | 2.6 mg (0.52 ml) | Cardiovert |
| Morphine | 10 mg / ml | IV / IO | 1.3 mg (0.13 ml) | 15 then 30 |
| Naloxone | 2 mg / 2ml | IV / IO / IN | 1.3 mg (1.3 ml) | Bolus |
| Ondansetron | 4 mg / 2 ml | IV / IO / PO | 1.95 mg (.975 ml) | 250 ml |
| Sodium Bicarbonate 8.4% | 1 mEq /ml | IV / IO | 13 mEq (13 ml) | Hypotensive if < 78 SBP |

| WHITE | CONCENTRATION | ROUTES | 15 - 18 kg (16.5 kg average) | RESUSCITATION |
|---|---|---|---|---|
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 1.65 mg (0.55 ml) | ET Tube |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 3.3 mg (1.1 ml) | 4.5 Cuffed |
| Amiodarone | 150 mg / 3 ml | IV / IO | 82.5 mg (1.65 ml) | ET Depth |
| Atropine | 1 mg / 10 ml | IV / IO | 0.33 mg (3.3 ml) | 14-15 cm to lip |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 330 mg (3.3 ml) | Laryngoscope Blade |
| Calcium Gluconate | 100 mg / ml | IV / IO | 990 mg (9.9ml) | 2 |
| Dextrose 25% (Made from D50) | 12.5 G / 50 ml | IV / IO | 8.5 G (34 ml) | King |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 8.25 G (82.5 ml) | 2 (Green) |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 16.5 mg (0.33 ml) | iGEL / LMA |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.16 mg (0.16 ml) | 2 Gray / 2 |
| EPINEPHrine 0.1 mg / ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.165 mg (1.65 ml) | OPA |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 16.5 mcg (0.33ml) | 60 mm / 1 / Black |
| Lidocaine for IO | 20 mg / ml | IO | 8.25 mg (0.41 ml) | NPA |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 16.5 mg (0.82 ml) | 22 Fr. |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 8.25 mg (0.41 ml) | IV Caths |
| LORazepam (Ativan) | 2 mg / ml | IV / IO | 0.825 mg (0.42 ml) | 20 - 22 |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 33 mg (0.53 ml) | Defib Energy |
| Midazolam | 5 mg / ml | IV / IO | 1.65 mg (0.33 ml) | 50 then 70 up to 165 |
| Midazolam | 5 mg / ml | IN / IM | 3.3 mg (0.66 ml) | Cardiovert |
| Morphine | 10 mg / ml | IV / IO | 1.65 mg (0.165 ml) | 20 then 50 |
| Naloxone | 2 mg / 2ml | IV / IO / IN | 1.65 mg (1.65 ml) | Bolus |
| Ondansetron | 4 mg / 2 ml | IV / IO / PO | 2.48 mg (1.24 ml) | 250 ml |
| Sodium Bicarbonate 8.4% | 1 mEq/ml | IV / IO | 16.5 mEq (16.5 ml) | Hypotensive if < 82 SBP |

| BLUE | CONCENTRATION | ROUTES | 19 - 23 kg (21 kg average) | RESUSCITATION |
|---|---|---|---|---|
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 2.1 mg (0.7 ml) | ET Tube |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 4.2 mg (1.4 ml) | 5.0 Cuffed |
| Amiodarone | 150 mg / 3 ml | IV / IO | 105 mg (2.1 ml) | ET Depth |
| Atropine | 1 mg / 10 ml | IV / IO | 0.42 mg (4.2 ml) | 15.5-16.5 cm to lip |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 420 mg (4.2 ml) | Laryngoscope Blade |
| Calcium Gluconate | 100 mg / ml | IV / IO | 1.26 G (12.6 ml) | 2 |
| Dextrose 25% (Made from D50) | 12.5 G / 50 ml | IV / IO | 10.5 G (42 ml) | King |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 10.5 G (105 ml) | 2 (Green) |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 21 mg (0.42 ml) | iGEL / LMA |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.21 mg (0.21 ml) | 2 Gray / 2.5 |
| EPINEPHrine 0.1 mg / ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.21 mg (2.1 ml) | OPA |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 21 mcg (0.42 ml) | 70 mm / 2 / White |
| Lidocaine for IO | 20 mg / ml | IO | 10.5 mg (0.525 ml) | NPA |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 21 mg (1.05 ml) | 24 Fr. |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 10.5 mg (0.525 ml) | IV Caths |
| LORazepam | 2 mg / ml | IV / IO | 1.05 mg (0.525 ml) | 18 - 20 |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 42 mg (0.675 ml) | Defib Energy |
| Midazolam | 5 mg / ml | IV / IO | 2 mg (0.4 ml) | 50 then 100 up to 200 |
| Midazolam | 5 mg / ml | IN / IM | 4.2 mg (0.84 ml) | Cardiovert |
| Morphine | 10 mg / ml | IV / IO | 2.1 mg (0.21 ml) | 30 then 50 |
| Naloxone | 2 mg / 2ml | IV / IO / IN | 2 mg (2 ml) | Bolus |
| Ondansetron | 4 mg / 2 ml | IV / IO / PO | 3.15 mg (1.58 ml) | 250 ml |
| Sodium Bicarbonate 8.4% | 1 mEq / ml | IV / IO | 21 mEq (21 ml) | Hypotensive if < 86 SBP |

| ORANGE | CONCENTRATION | ROUTES | 24 - 29 kg (26.5 kg average) | RESUSCITATION |
|---|---|---|---|---|
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 2.65 mg (0.9 ml) | ET Tube |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 5.3 mg (1.8 ml) | 5.5 Cuffed |
| Amiodarone | 150 mg / 3 ml | IV / IO | 132.5 mg (2.65 ml) | ET Depth |
| Atropine | 1 mg / 10 ml | IV / IO | 0.5 mg (5 ml) | 17-18 cm to lip |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 530 mg (5.3 ml) | Laryngoscope Blade |
| Calcium Gluconate | 100 mg / ml | IV / IO | 1.59 G (15.9 ml) | 2 |
| Dextrose 25% (Made from D50) | 12.5 G / 50 ml | IV / IO | 12.5 G (50 ml) | King |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 13.25 G (132.5 ml) | 2.5 (Orange) |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 26.5 mg (0.54 ml) | iGEL / LMA |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.27 mg (0.27 ml) | 2.5 White / 2.5 |
| EPINEPHrine 0.1 mg / ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.27 mg (2.7 ml) | OPA |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 26.5 mcg (0.53 ml) | 80 mm / 3 / Green |
| Lidocaine for IO | 20 mg / ml | IO | 13.25 (0.66 ml) | NPA |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 26.5 (1.32 ml) | 26 Fr. |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 13.25 (0.66 ml) | IV Caths |
| LORazepam | 2 mg / ml | IV / IO | 1.325 mg (0.66 ml) | 18 - 20 |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 53 mg (0.85 ml) | Defib Energy |
| Midazolam | 5 mg / ml | IV / IO | 2 mg (0.4 ml) | 70 then 120 up to 265 |
| Midazolam | 5 mg / ml | IN / IM | 5 mg (1 ml) | Cardiovert |
| Morphine | 10 mg / ml | IV / IO | 2.65 mg (0.265 ml) | 30 then 70 |
| Naloxone | 2 mg / 2ml | IV / IO / IN | 2 mg (2 ml) | Bolus |
| Ondansetron | 4 mg / 2 ml | IV / IO / PO | 4 mg (2 ml) | 250 ml |
| Sodium Bicarbonate 8.4% | 1 mEq / ml | IV / IO | 26.5 mEq (26.5 ml) | Hypotensive if < 90 SBP |

| GREEN | CONCENTRATION | ROUTES | 30 - 36 kg (33 kg average) | RESUSCITATION |
|---|---|---|---|---|
| Adenosine (1st dose) | 6 mg / 2 ml | IV / IO | 3.3 mg (1.1 ml) | ET Tube |
| Adenosine (2nd dose) | 6 mg / 2 ml | IV / IO | 6.6 mg (2.2 ml) | 6.0 Cuffed |
| Amiodarone | 150 mg / 3 ml | IV / IO | 165 mg (3.3 ml) | ET Depth |
| Atropine | 1 mg / 10 ml | IV / IO | 0.5 mg (5 ml) | 18.5-19.5 cm to lip |
| Calcium Chloride | 1 G / 10 ml | IV / IO | 660 mg (6.6 ml) | Laryngoscope Blade |
| Calcium Gluconate | 100 mg / ml | IV / IO | 1.98 G (19.8 ml) | 3 |
| Dextrose 25% (Made from D50) | 12.5 G / 50 ml | IV / IO | 12.5 G (50 ml) | King |
| Dextrose 10% | 10 grams / 100 ml | IV / IO | 16.5 G (165 ml) | 2.5 (Orange) |
| DiphenhydrAMINE | 50 mg / ml | IV / IO / IM | 33 mg (0.66 ml) | iGEL / LMA |
| EPINEPHrine 1 mg / ml (1:1,000) | 1 mg / ml | IM | 0.33 mg (0.33 ml) | 3 Yellow / 3.0 |
| EPINEPHrine 0.1 mg / ml (1:10,000) | 0.1 mg / ml | IV / IO | 0.33 mg (3.3 ml) | OPA |
| FentaNYL | 100 mcg / 2 ml | IN / IV / IM | 33 mcg (0.66 ml) | 80 mm / 3 / Green |
| Lidocaine for IO | 20 mg / ml | IO | 16.5 mg (0.825 ml) | NPA |
| Lidocaine for Cardiac 1st | 20 mg / ml | IV / IO | 33 mg (1.65 ml) | 28 Fr. |
| Lidocaine for Cardiac 2nd | 20 mg / ml | IV / IO | 16.5 mg (0.825 ml) | IV Caths |
| LORazepam | 2 mg / ml | IV / IO | 1.65 mg (0.825 ml) | 16 - 20 |
| MethylPREDNISolone | 125 mg / 2 ml | IV / IO | 66 mg (1.06 ml) | Defib Energy |
| Midazolam | 5 mg / ml | IV / IO | 2 mg (0.4 ml) | 70 then 150 up to 330 |
| Midazolam | 5 mg / ml | IN / IM | 5 mg (1 ml) | Cardiovert |
| Morphine | 10 mg / ml | IV / IO | 3.3 mg (0.33 ml) | 50 then 70 |
| Naloxone | 2 mg / 2ml | IV / IO / IN | 2 mg (2 ml) | Bolus |
| Ondansetron | 4 mg / 2 ml | IV / IO / PO | 4 mg (2 ml) | 250 ml |
| Sodium Bicarbonate 8.4% | 1 mEq / ml | IV / IO | 33 mEq (33 ml) | Hypotensive if < 90 SBP |

# APPENDIX #2: MEDICAL PROCEDURES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# Equipment and Procedure Disclaimer Statement

The devices and equipment illustrated in this section represent devices commonly in use in the region at the time of this writing. Inclusion of any item in this document does not represent any specific endorsement by any regional Hospital or system.

The individual Medical Director and the supported EMS agency have the right to choose which equipment and devices fit their needs. It is incumbent upon the Medical Director and the supported EMS agency to provide all required training for devices and equipment provided or utilized.

# ADULT PATIENT ASSESSMENT

**INDICATIONS**

- Any MEDICAL patient 18 years or older, any TRAUMA patient 16 years or older.

**PROCEDURE**

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

**KEY POINTS**

**Dealing with the family:**

- **REMAIN CALM**. Show efficiency and competence, even if you do not really feel it.
- Show a caring a concerned manner for both the family and the patient. If you have negative feelings about the situation (for example if it is an injury because of neglect or abuse), try not to let them show. This will only increase hostility between yourself and the family.
- Honestly inform them of what you are doing and what you think is wrong with the patient.
- Reassurance is important for the family as well. Involve them in the care (for example, holding the oxygen or talking to the patient to calm them). This will help develop some trust between you and the family.

# PEDIATRIC PATIENT ASSESSMENT

## INDICATIONS

- Any MEDICAL patient less than 18 years old, or any TRAUMA patient less than 16 years old

## PROCEDURE

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

## KEY POINTS

- Illness and injuries in children can cause significant anxiety for prehospital personnel as well as panic in the patient, family, and bystanders. It is important for the EMT to remain calm and take control of the patient and situation.

**Dealing with the child:**

- Tell them what is happening. It is important to remember to communicate with the child.
- Relate and speak one their developmental level.
- Be honest with them. Do not say, “This won’t hurt”, if it will. Explain actions.
- Try to enlist their cooperation, if possible.
- Do not separate child from the parent unless they are ill enough to require significant interventions like airway positioning and ventilation.
- Reassure the child frequently.

**Dealing with the family:**

- **REMAIN CALM**. Show efficiency and competence, even if you do not really feel it.
- Show a caring a concerned manner for both the family and the patient. If you have negative feelings about the situation (for example if it is an injury because of neglect or abuse), try not to let them show. This will only increase hostility between yourself and the family.
- Honestly inform them of what you are doing and what you think is wrong with the patient.
- Reassurance is important for the family as well. Involve them in the care (for example, holding the oxygen or talking to the patient to calm them). This will help develop some trust between you and the family.

# AEROSOL / INHALER TREATMENTS

## AEROSOL TREATMENT

| INDICTATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Patients experiencing bronchospasm | • Shortness of breath<br>• Wheezing<br>• History of COPD / asthma<br>• Unable to complete full sentences<br>• Accessory muscle use<br>• Nasal flaring<br>• Fatigue | • Allergy to medication |

## PROCEDURE

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed medication into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 6 - 8 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece if no mask.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of his / her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
8. Document the treatment, dose, and route on the patient care report (PCR).

| KEY POINTS |
|---|
| • **Use mouthpiece if patient can hold nebulizer effectively.**<br>• **Use nebulizer mask if patient is unable to hold nebulizer effectively.** |

## PERSONAL INHALER TREATMENT – EMT DOES NOT NEED MEDICAL CONTROL

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Patients experiencing bronchospasm | • Shortness of breath<br>• Wheezing<br>• Patient has own prescribed inhaler | • Medication is not prescribed to patient<br>• Medication has expired<br>• Patient has received maximum dose |

## PROCEDURE

1. Make sure that personal inhaler is at room temperature or warmer.
2. Follow the instructions for either gentle or vigorous shaking.
3. Instruct patient to seal lips around opening of inhaler, using spacer if present.
4. Instruct patient to inhale deeply while depressing the inhaler.
5. Instruct patient to hold breathe if possible.
6. Follow the Respiratory Distress protocol.

# BAG VALVE MASK VENTILATION

| INDICTATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Respiratory failure<br>• Respiratory / Cardiac arrest | • Apnea<br>• Low Spo2<br>• Increasing or absent capnography | • Intolerance of manual ventilation |

**Gather and Prepare Equipment**

Self-inflating bag resuscitator sized to patient

- less than 1 yr—infant with manometer
- 1 yr to 5 yr—child with manometer
- Greater than 5 yr—Adult

**Procedure**

1. 2 Providers should be utilized whenever possible, one holding mask with both hands and one providing ventilation
2. Attach to oxygen source and set flow rate (typically 15 LPM)
3. Properly size mask to patient face
4. Position patient head / neck to optimize chest rise and fall, reassess and tune throughout ventilation period
5. Place a properly sized mask on the face starting with the nose and rolling the mask evenly onto the face
6. Place both hands on either side of the mask with the thumbs parallel alongside the 22 mm connector
7. Place the fingers along both sides of the jaw and perform a jaw thrust while simultaneously pressing down with evenly distributed pressure on the mask
8. About 90% of the effort should be focused on opening the airway and lifting the face up into the mask.
9. Squeeze the bag gently at the desired rate – titrate based on Spo2 and Capnography if available
10. Both should monitor capnography, manometer pressures, resistance in the bag, and rise and fall of the chest with each breath
11. Bag-mask ventilation requires continual attention to airway position, mask seal, tidal volume, inspiratory time, and inspiratory pressures

**PEEP**

- Where / when available utilize a PEEP valve attached to the exhalation valve
- PEEP is set on PEEP valves by turning the cap clockwise and lining the edge of the cap with graduations on the side of the valve
- 5CmH20 is the normal starting point for all ventilated patients
- Patients that have low Spo2 despite high concentration oxygen and 5 CmH2O of PEEP, add PEEP 5 CmH20 at a time and observe for increases in Spo2 to a max of 20 CmH2O
- PEEP is the same as CPAP pressure is the same as Bilevel (BiPAP) EPAP pressures

| KEY POINTS |
|---|
| • Improper rate and ventilation volumes can lead to gastric insufflation and aspiration<br>• Squeeze BVM just enough to observe chest rise<br>• Consider advanced airways for prolonged ventilation |

| AIRWAY / BREATHING |
|---|
| **CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) DEVICE** |

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Breathing patient whose condition is not improving with oxygen therapy<br>• Respiratory distress or failure, due to pulmonary edema, CHF, or COPD<br>• Patients 16 years of age or older<br>• Carbon Monoxide poisoning >10%<br>• Flail segment without hypotension / shock | • Dyspnea and tachypnea > 25<br>• Chest pain<br>• Hypertension<br>• Tachycardia<br>• Anxiety<br>• Altered LOC<br>• Rales and wheezes<br>• Frothy sputum (severe cases)<br>• Accessory muscle use<br>• Retractions<br>• $SpO_2$ < 94% | • Respiratory arrest / compromise<br>• Agonal respirations<br>• Unconscious<br>• Shock (cardiac insufficiency)<br>• Pneumothorax - (with no chest tube)<br>• Penetrating chest trauma<br>• Persistent nausea and vomiting<br>• Facial anomalies, facial trauma<br>• Known blebs<br>• Unable to follow commands<br>• B/P < 90 systolic |

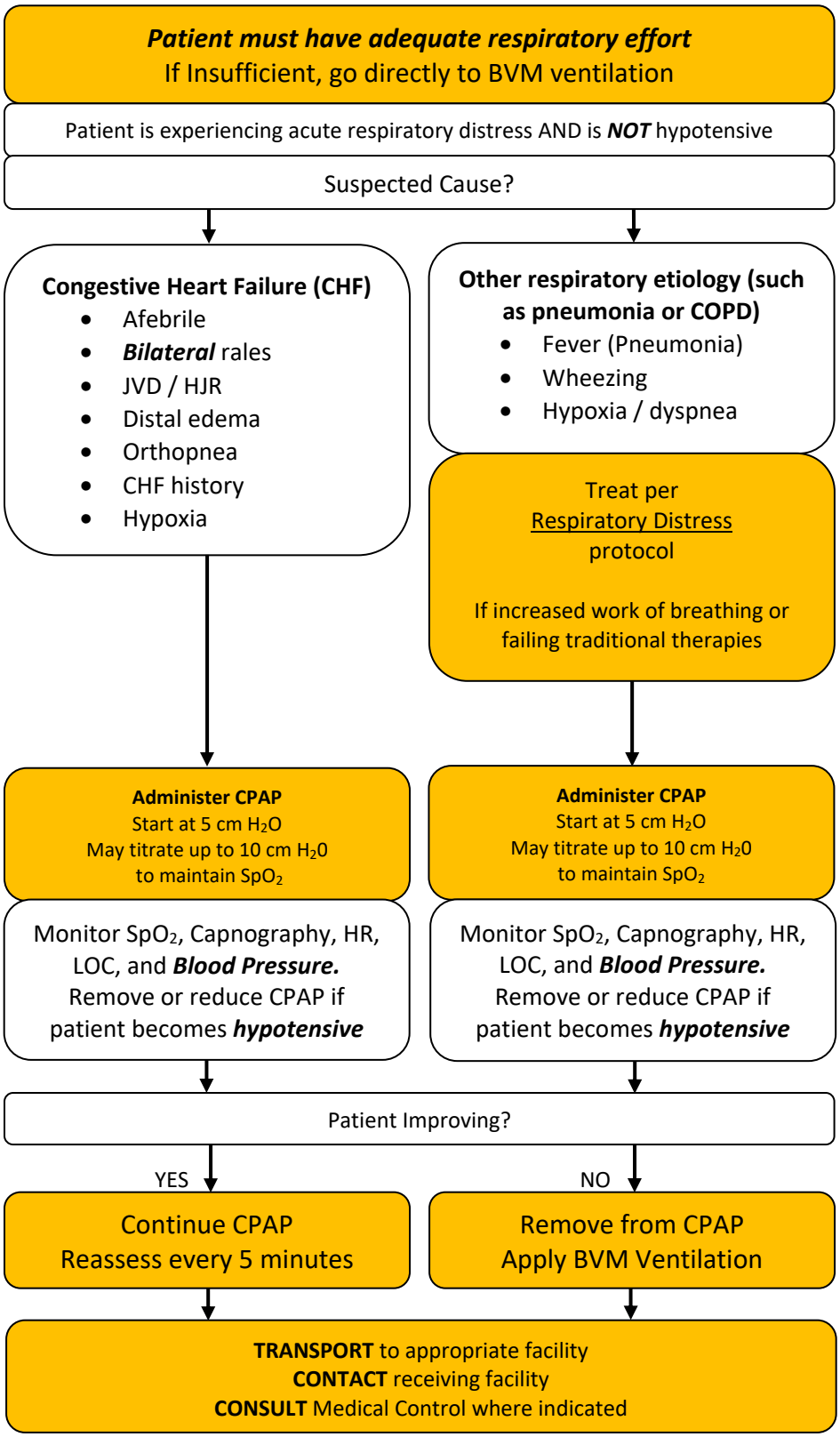
## PROCEDURE

1. Assure there is a patent airway and patient breathing are life sustaining.
2. Administer 100% oxygen via appropriate delivery system.
3. Perform appropriate patient assessment, including obtaining vital signs, $SpO_2$ reading and cardiac rhythm.
4. Verbally instruct the CPAP procedure to the patient.
5. Apply CPAP device, starting at 5 cm H20.
6. Slowly titrate the pressure up to patient response. 10 cm H2O maximum.
7. Continuously reassess the patient, obtaining vital signs every 5 minutes.
8. Monitor continuous $SpO_2$ and capnography.
9. Follow the appropriate set of standing orders for your specific device for continued treatment.
10. Contact medical control as soon as possible to allow for prompt availability of hospital CPAP equipment and respiratory personnel.

| KEY POINTS |
|---|
| • The use of CPAP has long been recognized as an effective treatment for patients suffering from exacerbation of congestive heart failure.<br>• Utilize aerosol treatments in-line as defined in protocol.<br>• The use of CPAP for the treatment of patients who might otherwise receive endotracheal intubation holds several benefits:<br>1. CPAP is a less invasive procedure with lesser risk of infection. This eliminates the possibility for adverse reactions following the administration of any antibiotics given for infection.<br>2. CPAP eliminates the necessity of weaning the patient off an ET tube and ventilator.<br>3. CPAP used prehospitally reduces the need to intubate patients in the hospital.<br>4. CPAP allows the alert patient to have a continued dialogue with his / her caregivers. This allows for the exchange of additional medical history. It also allows for the patient to be involved in the decision-making process for his / her care.<br>5. CPAP should be used as a last resort only in asthmatic patents. Prepare to intubate and ventilate.<br>• Certain types of CPAP devices may only produce lower <50% Fio2, consider augmentation with nasal oxygen |

**For circumstances in which the patient does not improve or continues to deteriorate despite CPAP and / or medication therapy, terminate CPAP administration and perform BVM ventilation and endotracheal intubation if necessary.**

# CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) DEVICE




**KEY POINTS**

- **CPAP Indications:** Hypoxemia and SOB secondary to CHF or other causes **not responding to $O_2$ therapy**
- **CPAP Contraindications:** BP < 90 systolic, respiratory arrest, agonal respirations, unconscious, shock, pneumothorax, penetrating chest trauma, persistent nausea and vomiting, facial anomalies, facial trauma, known blebs, unable to follow commands, apnea, hypercarbia, and airway compromise.
- **Patient must be adequately and spontaneous breathing**

# CRICOTHYROTOMY - NEEDLE (Only if Trained)

| INDICATIONS | SIGNS AND SYMPTOMS | COMPLICATIONS |
|---|---|---|
| • Management of an obstructed airway when standard airway procedures cannot be accomplished or have failed.<br>• Unable to intubate by another route.<br>• Cervical spine injuries<br>• Maxilla facial trauma<br>• Laryngeal trauma / edema | Airway obstruction from:<br>• Edema from infection, caustic ingestion, allergic reaction, and / or inhalation injuries<br>• Foreign body<br>• Mass lesion | • Post procedure bleeding<br>• Cellulitis of neck<br>• Subcutaneous emphysema<br>• Voice change<br>• Feeling of lump in throat<br>• Persistent stoma<br>• Obstructive problems<br>• Misplacement |

PARAMEDIC Intervention

**This procedure buys TIME only. It is not a definitive airway. It will provide OXYGENATION only, not appropriate VENTILATION.**

**PROCEDURE**

1. If time permits, prep with appropriate antiseptic solution.
2. Have suction supplies available and ready.
3. Locate the cricothyroid membrane utilizing anatomical landmarks (in the midline between thyroid cartilage and cricoid cartilage).
4. Secure larynx laterally between thumb and forefinger.
5. Relocates the cricothyroid membrane.
6. Using a syringe attached to a short 10 to 14-gauge catheter-over-needle device if needed, insert the needle through the cricothyroid membrane at a 45 to 60-degree angle caudally (towards feet).
7. Confirm entry of needle in trachea by aspirating air through the syringe.
8. If air is present, change the angle of insertion to 60 degrees.
9. Advance the catheter to the level of the hub.
10. Carefully remove the needle and syringe.
11. Secure the cannula to patient.
12. Attach the cannula to a 15 mm adapter. (3.0 – 3.5 pediatric ET tube adapter)
13. Attach a BVM to the airway adapter and begin oxygenation.
14. Make certain ample time is used not only for inspiration but expiration as well.
15. If unable to obtain an adequate airway, resume basic airway management and transport the patient as soon as possible.
16. **Regardless of success or failure of needle cricothyrotomy, notify the receiving hospital at the earliest possible time of a surgical airway emergency.**
17. Document procedure on the patient care record (PCR).

**KEY POINTS**

- Use needle cricothyrotomy as a bridge to more invasive surgical airways. (Tracheotomy, surgical cricothyrotomy)
- If placement is required due to foreign body obstruction, removal attempts should continue after performing needle cricothyrotomy procedure.
- Use procedure early to prevent ongoing hypoxia if foreign body is not easily removed.
- QuickTrach device provides a better airway and ventilation if device is available, and provider has undergone specific training for that device. See Cricothyrotomy / QuickTrach Procedure.

AIRWAY / BREATHING

# CRICOTHYROTOMY – KIT (Only if trained)

| INDICATIONS | SIGNS AND SYMPTOMS | COMPLICATIONS |
|---|---|---|
| • Management of an obstructed airway when standard airway procedures cannot be accomplished or have failed<br>• Unable to intubate by another route<br>• Cervical spine injuries<br>• Maxilla facial trauma<br>• Laryngeal trauma / edema | Airway obstruction from:<br>• Edema from infection, caustic ingestion, allergic reaction, and / or inhalation injuries<br>• Foreign body<br>• Mass lesion | • Post procedure bleeding<br>• Cellulitis of neck<br>• Subcutaneous emphysema<br>• Voice change<br>• Feeling of lump in throat<br>• Persistent stoma<br>• Obstructive problems<br>• Misplacement |

PARAMEDIC Intervention

**This procedure will provide OXYGENATION and life sustaining VENTILATION in an emergency.**

**PROCEDURE**

1. If time permits, prep with appropriate antiseptic solution.
2. Have suction supplies available and ready.
3. Locate the cricothyroid membrane utilizing anatomical landmarks.
4. Secure larynx laterally between thumb and forefinger.
5. Relocate the cricothyroid membrane (in the midline between thyroid cartilage and cricoid cartilage).
6. Using the syringe and the finder needle supplied in the QuickTrach kit, insert the needle through the cricothyroid membrane at a 45 to 60-degree angle caudally (toward the feet).
7. Confirm entry of needle in trachea by aspirating air through the syringe.
8. If air is present, change the angle of insertion to 60 degrees.
9. Advance the device to the level of the stop guide.
10. Remove the stop guide and slide the plastic cannula along the needle into the trachea until the flange rest against the neck.
11. Carefully remove the needle and syringe.
12. Secure the cannula with the provided anchoring device.
13. Attach the connecting tube to the 15mm connection.
14. Attach a BVM to the connecting tube.
15. Confirm placement by auscultation and observing patient for adequate chest rise. Make certain ample time is used not only for inspiration but expiration as well.
16. If unable to obtain an adequate airway, resume basic airway management and transport the patient as soon as possible.
17. **Regardless of success or failure of the placement of QuickTrach, notify the receiving hospital at the earliest possible time of a surgical airway emergency.**
18. Document procedure on the patient care record (PCR).

**KEY POINTS**

**Guidelines for Sizing**

- Adult (4.0 mm) QuickTrach: Any patient greater than 100 pounds (45kg) and greater than 8 years in age.
- Use a scalpel to make a *VERTICLE MIDLINE* incision over the cricothyroid membrane if the landmarks are difficult to identify. Once identified, use the QuickTrach as noted above.

MEDICAL PROCEDURES

# SURGICAL CRICOTHYROTOMY (Only if trained)

**REQUIRES PRIOR MEDICAL DIRECTOR AUTHORIZATION AND TRAINING**

| INDICATIONS | SIGNS AND SYMPTOMS | COMPLICATIONS |
|---|---|---|
| • Management of an obstructed airway when standard airway procedures cannot be accomplished or have failed.<br>• Unable to intubate by another route.<br>• Cervical spine injuries<br>• Maxilla facial trauma<br>• Laryngeal trauma / edema | Airway obstruction from:<br>• Edema from infection, caustic ingestion, allergic reaction, and / or inhalation injuries<br>• Foreign body<br>• Mass lesion | • Post procedure bleeding<br>• Cellulitis of neck<br>• Subcutaneous emphysema<br>• Voice change<br>• Feeling of lump in throat<br>• Persistent stoma<br>• Obstructive problems<br>• Misplacement |

PARAMEDIC Intervention

**CONTRAINDICATIONS:**

- Ability to oxygenate and ventilate using less invasive measures
- Age less than 12 years old

**PROCEDURE:**

Position the patient supine and extend the neck as needed to improve anatomic view.

1. Prep neck with antiseptic
2. Using your non-dominant hand, stabilize the larynx and locate the following landmarks: thyroid cartilage (Adam's apple) and cricoid cartilage. The cricothyroid membrane lies between these cartilages.
3. Make an approximately a 3cm vertical incision 0.5cm deep through the skin and fascia, over the cricothyroid membrane. With finger, dissect the tissue and locate the cricothyroid membrane.
4. Make approximately a 1.5cm horizontal incision through the cricothyroid membrane.
5. With your finger, bluntly dilate the opening through the cricothyroid membrane.
6. Insert the bougie curved tip first through the incision and angled towards the patient's feet.
7. Advance the bougie into the trachea feeling for "clicks" of tracheal rings and until "hang-up" when it cannot be advanced any further. This confirms tracheal position.
8. Advance a 6.0 mm endotracheal tube (ensure all air aspirated out of cuff) over the bougie and into the trachea.
9. Remove bougie while stabilizing ETT ensuring it does not become dislodged
10. Inflate the cuff with 5 – 10ml of air.
11. Confirm appropriate proper placement by symmetrical chest-wall rise, auscultation of equal breath sounds over the chest and a lack of epigastric sounds with ventilations using bag-valve-mask, condensation in the ETT, and quantitative waveform capnography.
12. Reassess tube placement frequently, especially after movement of the patient.
13. Ongoing monitoring of ETT placement and ventilation status using waveform capnography is required for all patients.
14. **Regardless of success or failure of needle cricothyrotomy, notify the receiving hospital at the earliest possible time of a surgical airway emergency.**
15. Document procedure on the patient care record (PCR).

**KEY POINTS**

- Be prepared for a spray of blood while cutting through the cricothyroid membrane. Eye and face protection required.
- More definitive airway than percutaneous catheter airways
- May begin with needle cricothyrotomy and transition to surgical cricothyrotomy
- Traditional commercial tube securing devices unlikely to work to secure ET tube. Do not let go of tube until secured with best option available.

| AIRWAY / BREATHING | | |
|---|---|---|
| **END TIDAL $CO_2$ - CAPOGRAPHY PROCEDURE** | | |
| **INDICATIONS** | **SIGNS AND SYMPTOMS** | **CONTRAINDICATIONS** |
| • The End-Tidal $CO_2$ shall be measured on all intubated patients, or with placements of King Airway / LMA | • Cardiac Arrest / Shock<br>• Intubated Patients<br>• Respiratory Failure<br>• COPD<br>• Hyper / Hypoventilation / Seizures<br>• Sedated Patients | This device is not to be used for:<br>• Detection of mainstem bronchial intubation |

Capnography vs. Capnometry

Capnography comprises the continuous analysis and recording of carbon dioxide concentrations ($CO_2$) in respiratory gases. Although the terms capnography and capnometry are sometimes considered synonymous, capnometry suggests measurement (i.e., analysis alone) without a continuous waveform.

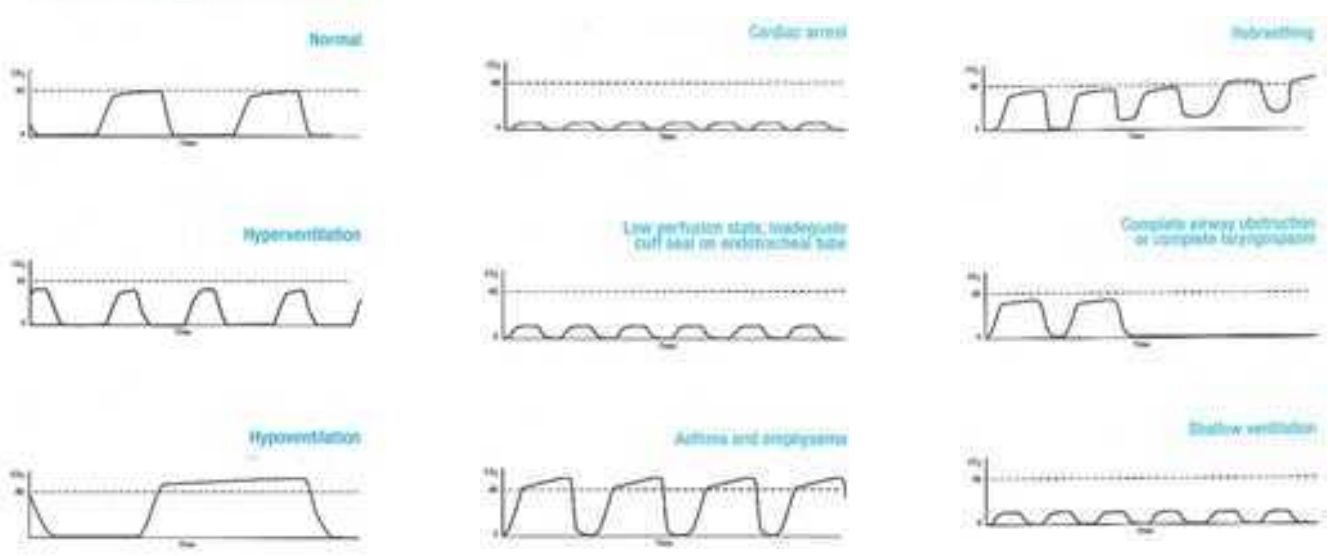
### PROCEDURE – Capnography (Intubated Patient)

***Capnography is required for all patients requiring ventilation through an advanced airway (anything with a 15mm connector).***

a. Turn on recording instrumentation (usually part of a cardiac monitor in the pre-hospital setting)
b. Place $CO_2$ Sampling device in between ventilation device (BVM / Ventilator) and the ET / BIAD
c. Attach sampling device to recording instrumentation and ventilate to a $CO_2$ of 35 – 45
d. If ResQPOD is used, place ResQPOD directly on tube, followed by intubated $CO_2$ sampling device, then BVM.

### PROCEDURE – Capnography (Non-Intubated, spontaneously breathing patient)

1. Turn on recording instrumentation (usually part of a cardiac monitor in the pre-hospital setting)
2. Place the sampling cannula on the patient
3. Attach sampling device to recording instrumentation record results and treat per results

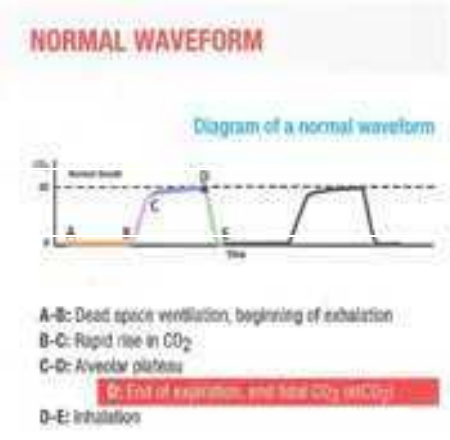


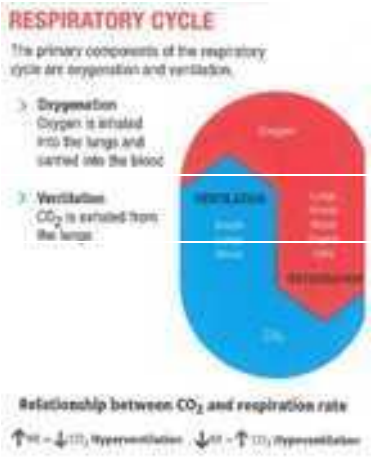

General Response to abnormal Co2 Values
(Normal Range 35-45)
*This does not cover every situation. A fundamental understanding that the Co2 value is the sum of the patient's metabolism + perfusion + ventilation is necessary to properly conclude what is happening with the patient*

If the value is high, increase ventilation rate if able and not a result of a chronic respiratory condition

If value is low and you are ventilating the patient, consider slowing rate to prevent hyperventilation. If that does not change the value, it may be due to perfusion or metabolic abnormalities, identify and correct.

If a patient is spontaneously breathing fast and has a low Co2, this is likely compensation for acidosis. Identify underlying cause, but do not attempt to change spontaneous breathing rate



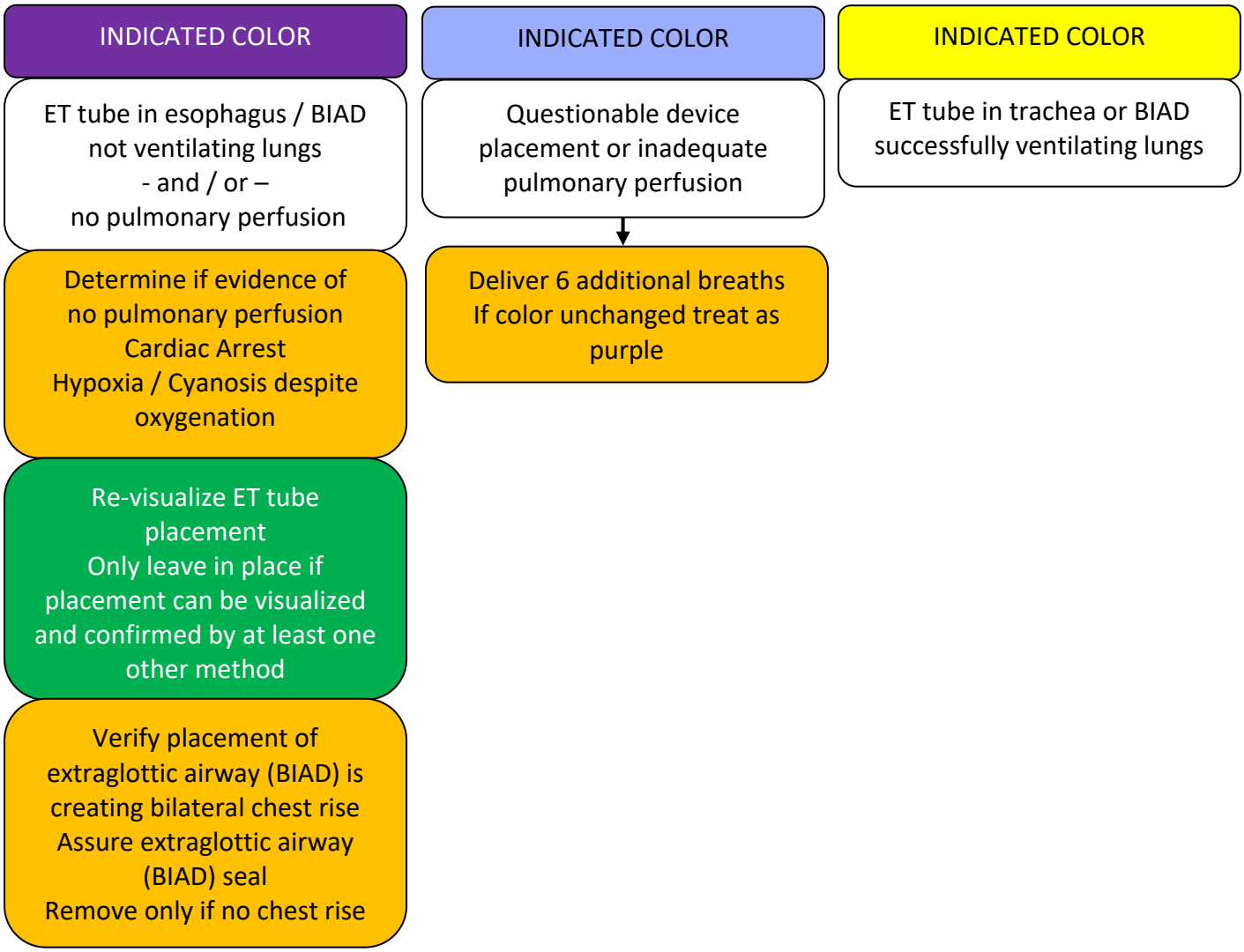
| KEY POINTS |
|---|
| **END TIDAL $CO_2$ PROCEDURE - COLORIMETRIC** |

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • *Backup to Capnography* | • *Intubated Patients* | *This device is not to be used for:*<br>• *Detection of hypercarbia*<br>• *Detect mainstem bronchial intubation*<br>• *Not for continuous monitoring, use capnography* |

***Does not meet Ohio's Requirement for Waveform $EtCO_2$ monitoring with advanced airways***

**PROCEDURE – Colorimetric $CO_2$ monitoring**

1. Remove the $CO_2$ detector from package or activate detector.
2. Attach the $CO_2$ detector to a King or endotracheal tube.
3. Ventilate patient and note color change on the $CO_2$ detector.
4. Compare color of indicator on full end-expiration to color chart on product dome. SEE ALGORITHM BELOW.
5. The $CO_2$ detector shall remain in place with the airway and monitored throughout the prehospital care and transport. Any loss of $CO_2$ detection or color change is to be documented and monitored as procedures are done to verify or correct the airway problem.
6. Tube placement should be verified frequently and with each patient move or change in the $CO_2$ detector.
7. If initial intubation attempts fail, the $CO_2$ detector can be used for re-intubation on the same patient provided the indicator color still matches the "CHECK" color standard on product dome.
8. Document the procedure and the results on the patient care report (PCR).



**MEDICAL PROCEDURES**

# iGel / LMA (BIAD)

**INDICATIONS**

- Emergent airway management of pulseless and apneic patients (EMT Provider)
- Emergent salvage airway management of apneic patients (AEMT and PARAMEDIC Provider)

**CONTRAINDICATIONS**

- Responsive patients with an intact gag reflex.
- Patients who have ingested caustic substances.

**PROCEDURE**
**Lubricate device prior to insertion**
**LMA – Along back of airway head, not on the cuff**
**iGel – On both the back of the airway head and the cuff**

1. Grasp the lubricated device firmly along the tube. Position the device so that the cuff outlet is facing towards the chin of the patient.
2. The patient should be in the sniffing position with head extended and neck flexed.
3. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
4. Glide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.

**Do not apply excessive force on the device during insertion. It is not necessary to insert fingers or thumbs into the patient's mouth during the process of inserting the device. If there is early resistance during insertion a 'jaw thrust' 'Insertion with deep rotation' or triple maneuver is recommended.**

5. At this point the tip of the airway should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework. Inflate LMA with indicated amount of air volume. iGel requires no inflation.
6. Secure the device - iGel - The incisors should be resting on the integral bite-block. Secure in place with tape or commercial tube securement device. LMA – Secure in place with commercial tube securement device.

**To avoid the possibility of the device moving up out of position prior to being secured in place, it is essential that as soon as insertion has been successfully completed, the device is held in the correct position until and whilst the device is secured in place.**

LMA

iGEL

| Code | Description | Size | Weight | Box Qty |
|---|---|---|---|---|
| 8200000 | i-gel, large adult, supraglottic airway | 5 | 90+kg | 25 |
| 8204000 | i-gel, medium adult, supraglottic airway | 4 | 50-90kg | 25 |
| 8203000 | i-gel, small adult, supraglottic airway | 3 | 30-60kg | 25 |
| 8225000 | i-gel, large paediatric, supraglottic airway | 2.5 | 20-35kg | 10 |
| 8202000 | i-gel, small paediatric, supraglottic airway | 2 | 10-25kg | 10 |
| 8215000 | i-gel, infant, supraglottic airway | 1.5 | 5-12kg | 10 |
| 8201000 | i-gel, neonate, supraglottic airway | 1 | 2-5kg | 10 |

## AIRWAY / BREATHING

# INTUBATION - ENDOTRACHEAL

| INDICATIONS | SIGNS AND SYMPTOMS | PRECATUTIONS |
|---|---|---|
| • A patient without a gag reflex, is apneic, or is demonstrating inadequate respiratory effort<br>• Any patient medicated for rapid sequence intubation | • Unstable airway<br>• Respiratory arrest<br>• Cardiac arrest<br>• GCS less than 8 without a treatable cause (for example, hypoglycemia) | • Patient intolerance is only a relative contraindication to this procedure |

PARAMEDIC Intervention

AEMT Intervention

## PROCEDURE

1. Cervical immobilization should be applied to the patient when indicated by mechanism of injury or when it is deemed necessary.
2. Prepare all equipment and have suction ready.
3. Hyperoxygenate the patient (one breath every three seconds) for at least one minute before attempting endotracheal intubation, if possible.
4. Suction the pharynx as needed.
5. Open the patient's airway and holding the laryngoscope in the left hand, insert the blade into the right side of the mouth and sweep the tongue to the left.
6. Use the blade to lift the tongue and epiglottis (either directly with the straight blade or indirectly with the curved blade).
7. Once the glottic opening is visualized, slip the tube through the cords, and continue to visualize until the cuff is past the cords.
8. No more than 30 seconds may be used per attempt.
    a. Re-ventilation for at least 30 seconds after each attempt.
    b. Some situations such as copious vomiting or bleeding may require suction attempts longer than 30 seconds. These are the exception, not the norm.
9. Remove the stylet if used.
10. Inflate the cuff of the endotracheal tube with just enough air to seal the airway. Reassess during transport.
11. Attach the bag-valve device to the ET tube and ventilate the patient.
12. Assess for tube placement:
    a. Watched tube pass through cords.
    b. Waveform Capnography
    c. Confirmation of lung sounds in the apices and bases bilaterally.
    d. Absence of epigastric sounds.
    e. Chest rises with ventilation.
    f. Good compliance with bag-valve ventilation
    g. Patent color improves.
    h. $SpO_2$ improves. (If distal perfusion is present to create a reading)

If at any time placement cannot be confirmed or obtained, the ETT shall be removed, an alternate airway placed, and the patient shall be ventilated. **If there is any doubt about proper placement, the tube shall be removed.**

13. If proper placement is confirmed, the cm markings on the tube at the level of the teeth shall be noted and secure the tube with a commercial tube holder.
14. Document ETT size, time, result, and placement location by the centimeter marks either at the patient's teeth or lips on the patient care report (PCR). Document all devices used to confirm initial tube placement. Also, document breath sounds before and after each movement of the patient.
15. Routinely reassess for proper tube placement. The initial tube placement and all reassessments must be documented.

## KEY POINTS

- It is essential to have complete and detailed documentation concerning the placement of the endotracheal tube. The documentation MUST include: Methods used, success / failure, pre-oxygenation, suction, $SpO_2$, $CO_2$, medications used, visualization, tube size, lip line, all confirmation techniques, securement of tube, and repeat assessments of placement.
- Placement - direct visualization of the tube passing through the vocal cords.
- Applying c-collar may assist in minimizing ETT movement after placement.
- It is the responsibility of the practitioner to be familiar with the proper technique of using the different laryngoscope blades.
- Tube placement must be confirmed; after it was initially placed, after every movement, any significant change in patient status, and prior to entering the emergency department.
- Continually monitor the patient's $SpO_2$, $EtCO_2$, ease of ventilation, heart rate, and presence of JVD.
- A complication of endotracheal intubation and / or manual ventilation is a pneumothorax and tension pneumothorax. Refer to the chest decompression procedure if this occurs.
- Only functioning paramedics and AEMT may intubate. AEMT'S may only intubate patients who are apneic.
- Intubation does NOT have to be attempted if their airway can be effectively managed with BVM ventilations.
- Have tube placement confirmed immediately upon entering the ER by a Physician prior to moving patient to ER bed.
- High ET cuff pressures may potentiate tissue necrosis in the trachea. Use just enough air in the cuff to seal the airway.

## BOUGIE ASSISTED INTUBATION

1. Prepare patient as described above for standard orotracheal intubation.
2. Use laryngoscope to lift mandible and displace tongue as normal.
3. Use the gum rubber bougie with the bent end up in place of an ETT.
4. Pass the bougie through the cords, this works as a place keeper to an ETT can be slide over the Bougie and into the trachea.
5. Pass a generously lubricated tube over the Bougie and into the trachea. Do not use force to advance the tube past the vocal cords.
6. Pull the Bougie out once the tube has been passed to the desired depth, inflate the ETT cuff, and verify tube placement using all standard methods.

## VIDEO LARYNGOSCOPY - OTHER DEVICES

Video laryngoscopes are permitted to be substituted for standard laryngoscopes during intubation procedures. The user must have previous training specific to the make and model of laryngoscope being used and have and must have a standard laryngoscope set available in the event of device failure. Manufacturer's recommendations must be followed on use, sizing, disposal or cleaning, indications, and contraindications for the device. A BIAD device must still be available if unable to pass an endotracheal tube with either video or standard laryngoscopy.

If the device has the ability to record the intubation process, it should be recorded and attached to the ePCR when the technology permits.

## PEDIATRIC TUBE SIZING

Use cuffed ET tubes. The cuffed tube will be approximately ½ size smaller than traditional uncuffed tubes, to accommodate for the cuff size. If the tube seals the airway without air in the cuff, it needs not be inflated. If there is an air leak, inflate with only as much air is required to seal the airway. Refer to the Pediatric Medication Administration Charts for tube sizing.

| KEY POINTS |
| --- |
| • All the above tube sizes are still dependent on the child's size rather than consideration of age. |

## TUBE REMOVAL

If the patient begins to breathe spontaneously and effectively and is resisting the presence of the tube, removal of the tube may be necessary. The following procedures will be followed:

1. Explain procedure to victim.
2. Prepare suction equipment with large-bore catheter and suction secretions from endotracheal tube, mouth, and pharynx.
3. The lungs should be completely inflated so that the patient will initially cough or exhale as the tube is taken from the larynx. This is accomplished in 2 ways:
    a. The patient is asked to take the deepest breath they possibly can, and, at the very peak of the inspiratory effort, the cuff is deflated, and the tube removed rapidly; or
    b. Positive pressure is administered with a hand-held ventilator and, at the end of deep inspiration, the cuff is deflated, and the tube rapidly removed.
4. Prepare to suction secretions and gastric content if vomiting occurs.
5. Appropriate oxygen is then administered.
6. The patient's airway is immediately evaluated for signs of obstruction, stridor or difficulty breathing. The patient should be encouraged to take deep breaths and to cough.

# KING AIRWAY DEVICE (BIAD)

**INDICATIONS**

- Emergent airway management of pulseless and apneic patients (EMT Provider)
- Emergent salvage airway management of apneic patients (AEMT and PARAMEDIC Provider)

**CONTRAINDICATIONS**

- Responsive patients with an intact gag reflex.
- Patients with known esophageal disease. (varices)
- Patients who have ingested caustic substances.

**PROCEDURE**

1. Hold the King Airway at the connector, using the dominant hand.
2. With non-dominant hand, hold mouth open and apply chin lift.
3. Using a lateral approach, introduce device into corner of mouth.
4. Advance tip behind the base of the tongue, while rotating tube back to midline so that the blue orientation line faces the chin of the patient.
5. Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.
6. Attach the syringe and inflate the cuffs to the appropriate volume:
    - SIZE 2 = 25-35 ml (LT or LTS-D)
    - SIZE 2.5 = 30-40 ml (LT or LTS-D)
    - SIZE 3 = 40-55 ml (LT or LTS-D)
    - SIZE 4 = 50-70 ml (LT or LTS-D)
    - SIZE 5 = 60-80 ml (LT or LTS-D)
7. Attach a bag-valve device to the connector. While gently bagging the patient to assess ventilation, gently withdraw the tube until ventilation is easy and free flowing (large tidal volume with minimal airway pressure).
8. Adjust cuff inflation, if necessary, to obtain a seal of the airway.
9. After placement, perform standard checks for breath sounds and utilize an appropriate carbon dioxide detection device, as required by protocol.

**REMOVAL OF DEVICE (if indicated):**

1. Confirm need for removal of the device.
2. Suction above cuffs in the oral cavity.
3. FULLY deflate both cuffs before removal of the device. (may require multiple attempts of air removal with syringe to fully evacuate air)
4. Remove the device when protective reflexes have returned.

**KEY POINTS**

1. The key to insertion is to get the distal tip of KING around the corner in the posterior pharynx, under the base of the tongue. Experience has indicated that a lateral approach, in conjunction with a chin lift, facilitates placement of the KING. Alternatively, a laryngoscope or tongue depressor can be used to lift the tongue anteriorly to allow easy advancement of the KING into position.
2. Insertion can also be accomplished via a midline approach by applying a chin lift and sliding the distal tip along the palate and into position in the hypopharynx. In this instance, head extension may also be helpful.
3. As the KING is advanced around the corner in the posterior pharynx, it is important that the tip of the device is maintained at the midline. If the tip is placed or deflected laterally, it may enter the piriform fossa and the tube will appear to bounce back upon full insertion and release. Keeping the tip at the midline assures that the distal tip is placed properly in the hypopharynx / upper esophagus.
4. Depth of insertion is key to providing a patent airway. Ventilatory openings of the KING must align with the laryngeal inlet for adequate oxygenation / ventilation to occur. Accordingly, the insertion depth should be adjusted to maximize ventilation. Experience has indicated that initially placing the KING deeper (proximal opening of gastric access lumen aligned with teeth or gums), inflating the cuffs, and withdrawing until ventilation is optimized results in the best depth of insertion for the following reasons:
    - It ensures that the distal tip has not been placed laterally in the piriform fossa (see item #3 above).
    - With a deeper initial insertion, only withdrawal of the tube is required to realize a patent airway. A shallow insertion will require deflation of the cuffs to advance the tube deeper.
    - As the KING is withdrawn, the initial ventilation opening exposed to or aligned with the laryngeal inlet is the proximal opening. Since the proximal opening is closest to and is partially surrounded by the proximal cuff, airway obstruction is less likely, especially when spontaneous ventilation is employed.
    - Withdrawal of the KING with the balloons inflated results in a retraction of tissue away from the laryngeal inlet, thereby encouraging a patent airway.
5. Ensure that the cuffs are not over-inflated. If a cuff pressure gauge is not available, inflate cuffs with the minimum volume necessary to seal the airway at the peak ventilatory pressure employed. (just seal volume)
6. Removal of the KING is well tolerated until the return of protective reflexes. For later removal, it may be helpful to remove some air from the cuffs to reduce the stimulus during wake-up.
7. King Airway Kit Includes:
    - King Airway
    - 60-80 cc Syringe
    - Lubricant
    - Instructions for use

## DO NOT GIVE MEDICATIONS DOWN THE KING AIRWAY

| Color | Tube Size | Patient Size | Weight | Cuff Volume |
|---|---|---|---|---|
| Transparent | 0 | See Weight | < 5 kg | 10 ml Verify on Tube |
| White | 1 | See Weight | 5-12 kg | 20 ml Verify on Tube |
| Green | 2 | 35-40 Inches | 12-25 kg | 25-35 ml Verify on Tube |
| Orange | 2.5 | 41-51 Inches | 25-35 kg | 30-40 ml Verify on Tube |
| Yellow | 3 | 4-5 Feet | NA | 40-55 ml Verify on Tube |
| Red | 4 | 5-6 Feet | NA | 50-80 ml Verify on Tube |
| Purple | 5 | >6 Feet | NA | 60-90 ml Verify on Tube |

# OG TUBE PLACEMENT

| INDICTATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Gastric insufflation from mechanical ventilation of a patient without an advanced airway | • Difficulty bagging<br>• Distended abdomen<br>• Emesis | • Caustic ingestion or esophageal disease |

**PURPOSE:**

This policy outlines the use and placement of orogastric tubes (OG)

**POLICY**

OG tubes may be placed after an advanced airway has been secured. Clinicians trained in their use according to manufacturer's guidelines, the following procedure, and as approved by the Operational Medical Director are authorized to place an OG tube. OG tube placement is permitted by Paramedics only.

**DEFINITION:**

Prehospital resuscitation efforts using mouth-to-mouth or bag-valve-mask ventilation may cause gastric distention. Gastric distention compromises oxygenation and ventilation and increases the risk of aspiration, decreases venous return, and increases intra-abdominal pressure which all hinder adequate resuscitation. Gastric distention can be easily reduced with the use of an OG tube.

An OG tube is a dual-lumen tube that is passed through the mouth, down through the oropharynx and esophagus into the stomach. The tube has cm markings allowing clinicians to easily determine tube depth during placement. The large lumen allows for easy suction of gastric contents and decompression while the smaller vent lumen allows for atmospheric air to equalize the vacuum pressure in the stomach preventing the tube from adhering to and damaging the stomach lining.

**INDICATIONS:**

Patients orotracheally intubated or a BIAD Airway is in place.

**OG TUBE DEPTH MEASUREMENT**

1. Hold end of OG tube (the end with the eyelet) over the patient's xiphoid process.
2. Extend the OG tube up the chest to the patient's earlobe.
3. Hold OG tube at the patient's earlobe and extend it over the cheek to the patient's lips.
4. Note the OG tube's cm markings at the lips. Mark tube with a marker, or with a piece of tape.

**PROCEDURE: BIAD**

1. Identify the appropriate size OG tube and the correct depth.
2. Lubricate the OG tube tip with a water-soluble gel.
3. Insert the OG tube into the proximal gastric access lumen.
4. Advance OG tube to the pre-determined depth.
5. Secure OG tube to BIAD with tape.
6. Attached OG tube to suction and suction until no return of stomach contents.
7. Turn off suction, leave the OG tube in place.
8. If the OG tube is disconnected from the suction tubing, connect the clear tube to the blue air vent lumen using the plastic male adapter.

**PROCEDURE: Endotracheal Tube (ETT)**

1. Identify the appropriate size OG tube and the correct depth.
2. Curl OG tube tip with a slight curvature.
3. Lubricate the OG tube tip with a water-soluble gel.
4. Insert OG tube behind the ETT, toward the roof of the mouth, and down the midline of the oropharynx.
5. Advance to the pre-determined depth.
6. If resistance is met, stop advancement and adjust direction slightly before reattempting.
7. Confirm placement by: a. Aspirate gastric contents with a Toomey syringe, and,
b. With the Toomey syringe, inject 30ml air into the OG tube while auscultating over the stomach area listening for a "swoosh" sound. i. Pediatrics: 10ml of air
8. Secure OG tube to ETT with tape.
9. Attached OG tube to suction and suction until no return of stomach contents.
10. Turn off suction, leave the OG tube in place.
11. If the OG tube is disconnected from the suction tubing, connect the clear tube to the blue air vent lumen using the plastic male adapter.

## KEY POINTS

- 1. Do not apply continuous suction. After stomach contents have been removed, turn off suction.
- 2. There is no need to inject air to confirm the OG tube placement when using the King LTS-D Airway / iGel They have a lumen channel with direct access into the esophagus.
- 3. Document use in electronic Patient Care Report (ePCR).

AIRWAY / BREATHING

# PULSE OXIMETERY

| INDICATIONS | SIGNS AND SYMPTOMS | PRECAUTIONS |
|---|---|---|
| • Patients with suspected hypoxemia.<br>• All cases of respiratory distress<br>• For the treatment of primary respiratory or cardiac disease<br>• All cases of altered or depressed level of consciousness<br>• Drug overdoses<br>• Any patient requiring intubation or BVM support<br>• Major trauma<br>• Smoke Inhalation (may not be accurate due to CO)<br>• Any patient on home oxygen, home ventilator, or BiPAP | • Dyspnea<br>• Tachypnea<br>• Tachycardia<br>• Bradycardia (late sign in adults)<br>• Altered mental status<br>• Pallor, cyanosis<br>• Diaphoresis<br>• Prolonged capillary refill<br>• Accessory muscle use<br>• Abnormal breath sounds | • Poor perfusion; must be applied with good perfusion<br>• Patients with history of anemia<br>• Patients with suspected high carboxyhemoglobin / methemoglobin (CO poisoning, smoke inhalation, heavy cigarette smokers) |

**PROCEDURE**

1. Turn the machine on and allow for self-tests.
2. Apply probe to patient's finger or any other digit as recommended by the device manufacturer.
3. Allow machine to register saturation level.
4. Record time and initial saturation percent on room air if possible on the patient care report (PCR).
5. Verify pulse rate on machine with actual pulse of the patient.
6. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
7. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
8. In general, normal saturation is 97 - 99%. Below 94%, suspect a respiratory compromise.
9. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
10. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain.
11. Factors which may reduce the reliability of the pulse oximetry reading include:
    - Poor peripheral circulation. (blood volume, hypotension, hypothermia)
    - Excessive pulse oximeter sensor motion.
    - Fingernail polish. (may be removed with acetone pad or sensor turned 90 degrees)
    - Carbon monoxide bound to hemoglobin.
    - Irregular heart rhythms. (atrial fibrillation, SVT, etc.)
    - Jaundice.
    - High ambient light. (washes out the sensors light)

**All patients who require vital signs to be taken should have oxygen saturation measured and recorded as part of the vital signs.**

**Measure oxygen saturation before applying oxygen and repeat the measurement after oxygen has been applied. Do not delay oxygen administration in patients experiencing severe respiratory distress.**

| TREATMENT GUIDELINES | | |
|---|---|---|
| **$SpO_2$ READING** | **INTERPRETATION** | **ACTION** |
| ≥94% | Ideal Range | No supplemental oxygen is needed if no distress noted |
| 93% TO 90% | Mild to Moderate Hypoxemia | Check airway start oxygen therapy via nasal cannula @ 2 - 6 lpm |
| 90% TO 85% | Severe Hypoxemia | Check airway start aggressive oxygen therapy, high flow oxygen via nonrebreather mask @ 15 lpm. Consider bag valve mask ventilation with 100% oxygen if the patient does not have adequate ventilations. Consider CPAP if indicated. |
| 85% OR LESS | Respiratory Failure | Prepare to intubate or assist ventilations with 100% oxygen and bag valve mask |

## KEY POINTS

- 100% oxygen should be administered to all patients despite a good $SpO_2$ if they are hypoxic.
- Make sure that all dirt and nail polish or any obstructive covering is removed to prevent the unit from giving a false reading.
- Attempt to obtain a room air reading and a reading with supplemental oxygen.
- DO NOT read while BP being taken. May give false readings.
- Oxygen saturation measurements must routinely be recorded as part of the run report. Include those measurements taken as part of routine vital signs and those measurements taken before and after oxygen administration.
- Although the pulse oximeter displays the heart rate, the unit should not be used in place of a physical assessment of the heart rate.
- Oxygen saturation readings may be inaccurate in any situation where the flow of blood through the finger is impaired, such as:
    - Hypotension or shock with poor peripheral perfusion
    - Peripheral vascular disease
    - Extremity injury with restriction of peripheral perfusion
    - Cold extremities
- Oxygen saturation readings may be incorrectly high in situations such as carbon monoxide poisoning.
- Many patients with COPD have chronic low oxygen readings and may lose their respiratory drive if administered prolonged high oxygen therapy. Routinely assess pulse oximetry as well as respiratory drive when administering oxygen to these patients. Do not withhold oxygen from any patient that requires it.
- The room air pulse oximetry reading is NOT required if the patient has been placed on supplemental oxygen prior to EMS arrival.
- Pulse oximetry is NOT and indicator of myocardial or cerebral perfusion.

| AIRWAY / BREATHING |
|---|
| **STOMA and TRACHEOSTOMY CARE PROCEDURE** |
| **TRACHEOSTOMY SUCTIONING** |

**PURPOSE**

Tracheostomy suctioning may be required to maintain a patent airway in patients who present with respiratory distress secondary to tracheostomy tube occlusion or obstruction.

| INDICATIONS | ADVERSE EFFECTS/COMPLICATIONS | CONTRAINDICATIONS |
|---|---|---|
| •Increased secretions from the Tracheostomy site or a mucous plug<br>•Hypoxia, cyanosis, or decreased oxygen saturation levels<br>•Increased work of breathing<br>•Altered mental status secondary to hypoxia<br>•Dislodged /obstructed tracheostomy | •Bleeding at tracheal stoma site<br>•Dislodgment of tracheostomy tube<br>•Exaggerated cough reflex with introduction of saline<br>•Increased hypoxia/respiratory distress<br>•Infection | • NONE |

**PROCEDURE**

1. Position patient with the head and neck hyperextended to expose the tracheostomy site.
2. Pre-oxygenate patient at the tracheostomy site:
   (a) NRB mask if patient has adequate effective spontaneous respirations
   (b) manual resuscitator bag if ventilator-dependent or there are ineffective spontaneous respirations
3. Select appropriately sized suction catheter.
4. Insert suction catheter:
   (a) Measure from the tracheostomy site to the sternal notch OR Insert until there is a cough reflex.
5. Apply suction ONLY as the catheter is withdrawn, rotating the catheter in a twisting motion between thumb and finger.
6. Suction for maximum of 10 seconds.
7. Re-oxygenate and reevaluate patient.
8. Repeat suction procedure as needed (for thick secretions instill 3–5 cc sterile saline/water prior to repeat suctioning). Usually suctioning will fix the trach problem. If it does not, try suctioning again because mucous plugging is a very common cause of trach failure.
9. If there is suspicion that the trach is the cause of cardiac arrest and/or for difficult tracheostomy/laryngectomy management transport to nearest emergency department

| AIRWAY / BREATHING |
|---|
| **STOMA and TRACHEOSTOMY CARE PROCEDURE** |
| **TRACHEOSTOMY TUBE REPLACEMENT** |

**PURPOSE**

Changing a tracheostomy tube may be required to reestablish a patent airway in patients who present with respiratory distress secondary to tracheostomy tube occlusion or obstruction that has not been relieved through suctioning.

| INDICATIONS | ADVERSE EFFECTS/COMPLICATIONS | CONTRAINDICATIONS |
|---|---|---|
| •Inability to ventilate with manual resuscitator bag<br>•Ineffective spontaneous ventilations (poor chest rise, decreased breath sounds bilaterally)<br>•Hypoxia, cyanosis, or decreased O2 saturation levels, not relieved by suctioning<br>•Increased work of breathing<br>•Altered mental status secondary to hypoxia | •Inability to reinsert a tracheostomy tube<br>•Edema or bleeding at stoma site<br>•Inability to maintain adequate chest rise and fall with assisted ventilations due to air leak around uncuffed tracheostomy tube<br>•False tracheostomy para-tracheal intubation (avoid forced tracheostomy tube re-placement or ETT intubation) | •NONE<br>but tracheostomy tube replacement and/or ETT should be attempted as a last resort after multiple attempts at suctioning and oxygenation have failed |

**PROCEDURE**

**1.** Position patient with the head and neck hyperextended to expose the tracheostomy site.

**2.** Explain procedure to patient/family.

**3.** To exchange the tracheostomy tube:

(a) If a double cannula tracheostomy tube is in place, attempt to change inner cannula first and reassess the patient to see if the obstruction is relieved. If the patient continues to have respiratory distress, and diligent suctioning was unsuccessful, then change the entire tracheostomy tube. If cuffed, deflate using a 10 mL syringe.

(b) Insert Bougie through existing trach tube to maintain tract.

(c) Remove the tracheostomy tube, outward and backward towards the chest.

(d) Lubricate the new tracheostomy tube with lubricating jelly or saline/water.

(e) Insert new tracheostomy tube into stoma, inward and downward towards the lungs. STOP IF YOU MEET RESISTANCE.

(f) If cuffed tracheostomy tube is used, once the tube has been inserted, inflate the cuff with an appropriate amount of air to avoid air leak around the tube (1–3 mL for pediatric tubes and 5–10 mL for adult tubes).

(g) Reassess the patient. Oxygenate as needed.

(h) With good chest rise and fall and improved skin color, secure the tracheostomy tube with ties or Velcro at the back of the neck, so only one fingertip fits between the neck and the ties.

**4.** If ALS, you may attempt to insert a same size or 1/2 smaller sized endotracheal tube into the stoma.

In the event that the stoma size is unknown start with a size 6 mm ETT. If cuffed endotracheal tube is used, inflate the cuff with an appropriate amount of air to avoid air leak around the tube (1–3 mL for pediatric tubes and 5–10 mL for adult tubes). Advance cuffed ETT just until you lose sight of the cuff.

(b) If ALS and unable to insert the endotracheal tube into the stoma, AND the patient certainly has not had a laryngectomy, you may attempt to intubate orally and apply an occlusive dressing over the stoma site.

**5.** If you meet resistance inserting the tracheostomy tube, **do NOT force the tube into the stoma**. Assess the patient.

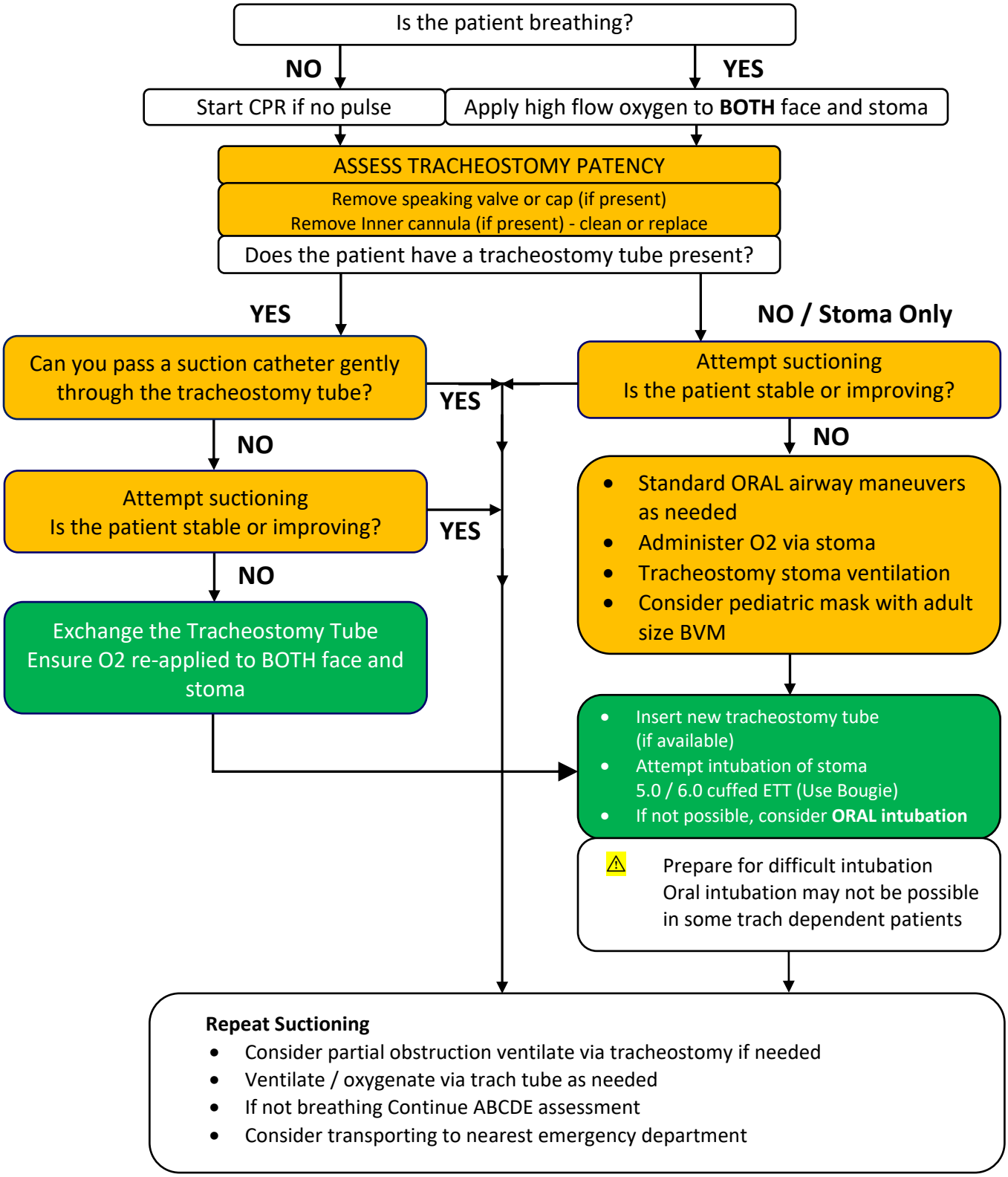
**6**. If you continue to have problems, STOP, consult Online Medical Control, and continue BVM ventilations orally, or manual resuscitator bag to tracheostomy site, while en-route to the nearest emergency department.

(a) If all attempts at exchanging a tracheostomy tube have failed, you may need to ventilate through the stoma using an infant size mask with an appropriate size manual resuscitator bag.

| **KEY POINTS** |
| --- |
| • Attempting to reinsert a dislodged tracheostomy tube or intubating a stoma may cause a false channel in the subcutaneous tissue anterior to the trachea. Compression of the trachea may result. **Do not use force!** |
| • Document ETT size, time, results (success) and placement location by the centimeter marks in the ePCR. Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient. It is required that the airway be monitored continuously through waveform capnography (ALS providers) and pulse oximetry. A digital copy of the $ETCO_2$ MUST be attached to the ePCR. |
| • Manually secure the tracheostomy tube while beginning to ventilate the patient using a manual resuscitator bag |
| • The tracheostomy outer cannula has a 15 mm fitting on the end that will attach to a manual resuscitator bag just like an ET tube. |
| • Attempt to re-place the tracheostomy tube (if possible) before attempting to secure the airways via ETT. |
| • Advance cuffed ETT just until you lose sight of the cuff. Secure the ETT and promptly monitor the $ETCO_2$. |
| • Oral intubation may not be possible in some tracheostomy dependent patients, depending on |

# STOMA and TRACHEOSTOMY CARE PROCEDURE

## Tracheostomy Patient Management Protocol




| EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control |
|---|---|---|---|

# SUCTIONING

| INDICATIONS | SIGNS AND SYMPTOMS | PRECAUTIONS |
|---|---|---|
| • Any patient who is having trouble maintaining an airway and fluid is noted in the oropharynx, endotracheal tube, or tracheotomy<br>• Tracheal suctioning should also be performed when rhonchi is heard in the intubated patient or tracheotomy patients | • Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, tracheostomy tube, or a cricothyrotomy tube | • The patient must be well oxygenated before attempting this procedure |

## PROCEDURES

### ORAL SUCTIONING

1. Body substance isolation procedures must be used.
2. Assess the need for suctioning.
3. Oxygenate the patient for 30 seconds prior to suctioning.
4. Select an appropriate size suction catheter.
    a. A soft flexible suction catheter or a “whistle tip” can be used if only fluids need to be removed.
    b. A yankauer or “tonsil tip” should be used for thick fluids, small particles, or large volumes.
5. Prepare a cup of sterile water or saline to flush the catheter after suctioning and in between attempts.
6. Quickly insert the catheter into the patient’s mouth until it is at the desired depth.
7. Apply suction and withdraw the catheter. Suction no more than 15 seconds per attempt.
8. Immediately after each suction attempt, oxygenate the patient for thirty seconds with 100% oxygen.
9. Repeat this procedure as needed until the airway is clear.

### TRACHEAL SUCTIONING (Trach tube or endotracheal tube)

1. Body substance isolation procedures must be used.
2. Assess the need for suctioning.
3. Oxygenate the patient prior to suctioning.
4. Select an appropriate size suction catheter.
    a. A soft flexible suction catheter or a “whistle tip” should be used.
    b. A yankauer or “tonsil tip” should NOT be used.
5. Prepare a cup of sterile water or saline to flush the catheter after suctioning and in between attempts.
6. While maintaining aseptic technique, quickly insert the catheter into the endotracheal or tracheal tube until it is at the desired depth.
7. Apply suction and withdraw the catheter using a gentle rotating motion. Suction no more than 15 seconds per attempt.
8. Immediately after each suction attempt, oxygenate the patient for thirty seconds with 100% oxygen.
9. Repeat this procedure as needed until the airway is clear.

| KEY POINTS |
| --- |
| • **General**<br>• To maintain aseptic technique, keep the distal end of the catheter in the wrapper when not being used.<br>• If the suction catheter needs to be set down between suction attempts, place it back inside its wrapper.<br>• Patients who require assisted ventilations should be hyperventilated before and after every suction attempt.<br>• DO NOT suction for more than 15 seconds per attempt.<br>• DO NOT insert farther than the desired depth.<br>• If a back boarded patient vomits, turn the board on its side and then suction.<br><br>• **Oral Suctioning**<br>• If using a soft flexible suction catheter, determine the length by holding it against the patient's face. Measure from the edge of the patient's mouth to the tip of the ear lobe.<br>• Patients with clenched teeth may need to be suctioned via the naso-tracheal route. Use a soft suction catheter only.<br><br>• **Tracheal Suctioning**<br>• Even though endotracheal tubes isolate the trachea, if there is fluid present in the lower airway, oxygenation will be reduced.<br>• There are many patients at home with tracheotomy tubes. These tubes tend to become obstructed because the patient cannot cough normally. EMS is often called when these tubes become obstructed.<br>• This procedure should be performed with aseptic technique. Use an unopened sterile catheter for every patient.<br>• Use the largest sized suction catheter that will fit down the endotracheal tube.<br>• Estimate the length by looking at the distance between the end of the tube and the sternal notch. This approximates the level of the carina.<br>• If tracheal secretions are extremely thick and unable to be removed, administer 2 - 3 ml of saline followed by 2 BVM ventilations and then perform suctioning. |

# TRANSPORT VENTILATION DEVICES

**Inclusion: This procedure applies to CONTROL only resuscitative ventilators for use during cardiac arrest**

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Transport of an intubated or tracheostomy patient | • Pt. currently breathing with ventilation device | • Insufficient training |

**PROCEDURE**

1. Confirm the placement of tube as per airway protocol.
2. Ensure adequate oxygen delivery to the ventilator device.
3. Pre - oxygenate the patient as much as possible with BVM.
4. Remove BVM and attach ventilation device.
5. Per instructions of device, set initial respiration values, respiratory rate, and volume.
6. Assess breath sounds. Allow for adequate expiratory time. Adjust ventilator setting as clinically indicated.
7. If any worsening of patient condition, decrease in oxygen saturation, or any question regarding the function of the ventilator, remove and resume bag-valve ventilations.
8. Document time, complications, and patient response on the patient care report (PCR).

**IF THERE IS EVER ANY QUESTION ABOUT WHETHER OR NOT THE DEVICES IS VENTIALTING CORRECTLY, REMOVE IT AND VENTILATE MANUALLY**

**USERS MUST RECEIVE TRAINING REGARDING THEIR SPECIFIC VENT DEVICE**

| KEY POINTS |
|---|
| • Transportation ventilators may be used on patients according to the manufacturer's directions.<br>• It must be noted that this is a short-term adjunct, which must be always monitored to prevent tube displacement. If the patient begins to show any signs of further deterioration, the entire airway must be re-evaluated, and a bag-valve-mask should be used until the airway can be successfully stabilized. |

# NEEDLE CHEST DECOMPRESSION OF TENSION PNEUMOTHORAX

| INDICATIONS | SIGNS AND SYMPTOMS | PRECAUTIONS |
|---|---|---|
| • Chest Trauma and signs of pneumothorax (based on physical exam or ultrasound) with 2/3 following signs | • Hypotension<br>• Difficulty Bagging<br>• Hypoxia despite supplemental O2 | • Insufficient training |

PARAMEDIC Intervention

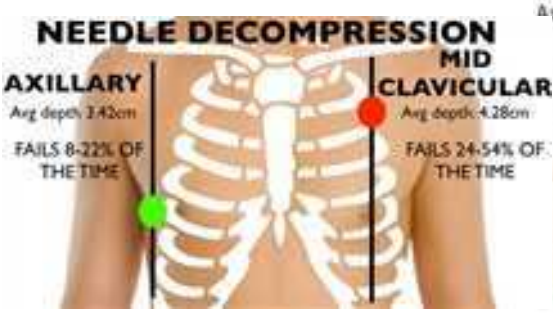
AEMT Intervention

## PROCEDURE

1. Confirm presence of a tension pneumothorax or identify strong clinical evidence in a rapid deteriorating patient in the setting of major trauma. Consider in the setting of traumatic arrest.
2. Locate the insertion site at the second intercostal space at the midclavicular line on the affected side of the chest. Alternate sites include, the mid axillary or anterior axillary line.
3. Prep the insertion site. Use sterile gloves and fully utilize aseptic procedure possible under the circumstances.
4. Remove rear cap of IV catheter.
5. Insert the 3 – 3.25 inch, 12 - 14-gauge IV catheter (1 inch, 18-gauge IV catheter in patients less than 8 years) by directing the needle just over the top of the rib to avoid intercostal nerves and vessels which are located on the inferior rib borders.
6. Advance the catheter 1 - 2 inches (3/4 - 1 inch in patients less than 8 years) through the chest wall. Tension should be felt until the needle enters the pleural space. A pop or give may also be felt. Do not advance the needle any further.

> In a tension pneumothorax, air under pressure should be released when the needle enters the pleural cavity. This will be heard as a rush of air through an open catheter-over-the-needle. If you are using a syringe attached to the catheter-over-the-needle you should be able to withdraw air by pulling out on the barrel of the syringe.

7. Withdraw the needle and advance the catheter until flush with the skin. Listen for a gush or hiss of air which confirms placement and diagnosis. This is frequently missed due to ambient noise.
8. Dispose of the needle properly and **never reinsert into the catheter**.
9. Once the presence of a tension pneumothorax has been confirmed:
    a. Remove the needle, leaving the catheter in place.
    b. Tape the catheter in place.
10. Secure the catheter and rapidly transport the patient providing appropriate airway assistance.
11. Be prepared to re-needle the chest next to original site if catheter kinks or becomes occluded.



**KEY POINTS**

- A tension pneumothorax is almost exclusively a traumatic event. Spontaneous tension pneumothorax is exceedingly rare, and medical control should be consulted in these cases
- Simple pnemothroax can become a tension pneumothorax after the application of positive pressure (CPAP, BVM, Advanced Airway Placement).
- Cover all penetrating chest trauma with an occlusive dressing taped on three sides.
- In some cases of penetrating chest trauma, placing an occlusive dressing on the wound will convert an open pneumothorax to a closed tension pneumothorax. In these cases, treatment consists of removing the dressing and converting the wound back to an open pneumothorax. This may be the only treatment needed.
- DO NOT perform a chest decompression, if the patient is not in significant respiratory distress and is otherwise stable.
- **Major trauma victims should have catheter-over-the-needles placed on the affected side of the chest, if all the following are present:**
    1. **Obvious chest trauma**
    2. **Difficulty bagging, and absent breath sounds on one / both sides**
    3. **Hypotensive or pulseless**
- Needle decompression is a temporary lifesaving procedure only. Patients requiring decompression will require chest tube placement for long term maintenance.
- Catheters may kink or become occluded, always be prepared to re-needle the chest next to the original site.
- **BE ALERT FOR SIGNS OF CONTINUEING OR RECURRING TENSION PNEUMOTHORAX.**

# VIDEO LARYNGOSCOPY

**Clinical Indications:**
Airway management where endotracheal intubation is indicated
An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort or has been pre-treated with pharmacological agents to facilitate intubation
Foreign Body Airway Obstruction which cannot be visualized with a standard laryngoscope blade in a patient with no gag reflex.

**Procedure:**
1. Prepare, position, and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube and have suction ready.
3. Select the appropriate size laryngoscope blade based on the size of the ETT being used.
5. Attach the camera head to the laryngoscope blade. The camera will automatically turn on.
6. Ensure that the ETT does not have a stylet and lubricate the ETT with surgical lubricant before placing it into the lateral channel of the laryngoscope blade. (If using channeled blade)
7. Align the tip of the ETT with the end of the lateral channel being careful not to obstruct the view with the distal balloon.
8.Hold the laryngoscope camera by placing the thumb on the front of the blade just below where the camera attaches. Place the index and middle finger on the back of the blade. This is the three-finger finesse technique.
9. Insert the laryngoscope blade into the midline of the patient's mouth, being careful not to insert the blade too deeply.
10. Insert the blade until the epiglottis is visualized. The blade may then be placed in the vallecula (Macintosh Style) or under the epiglottis (Miller Style).
11. Gently lift up on the laryngoscope blade to expose the vocal cords.
12. Move the laryngoscope blade to align the vocal cords in the center of the visual field. Fluids in the oropharynx can distort or obscure the visual field of the camera. Suction as needed to clear the camera view
13.Gently advance the ETT through the lateral channel of the blade through the vocal cords (channeled blade) or introduce the endotracheal tube from the side (non-channeled) and continue to advance the ETT to the appropriate depth.
14. Maintain ETT securely in position and inflate the distal balloon with 7–10ml of air.
15. Maintain ETT securely in position and remove the ETT from the lateral channel by pushing the ETT to the right corner of the mouth. Remove the blade following the midline.
16. Confirm ETT placement by auscultating for bilaterally equal breath sounds and the absence of breath sounds over the epigastrium and End-Tidal capnography waveform. If placement cannot be confirmed, then remove the ETT and ventilate the patient with a bag-valve mask.
15. Monitor the airway with continuous waveform capnography and pulse oximetry record readings on scene, enroute, to the hospital, and at the hospital (before and after transfer to the hospital bed).
16.Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.
18. All recordings shall be saved to the appropriate location as designated by the Quality Assurance (QA) Coordinator and/or their designee.

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

# Automatic CPR Device (LUCAS)

**PURPOSE**

This procedure describes the appropriate methods to apply, operate, and discontinue the LUCAS CPR device in patients > 12 years of age requiring mechanical chest compression related to cardiac arrest.

**INDICATIONS**

1. The LUCAS may be used in patients 12 years of age and older who have suffered cardiac arrest, where manual CPR would otherwise be used.

Do not delay chest compression to apply mechanical CPR devices

**CONTRAINDICATIONS**

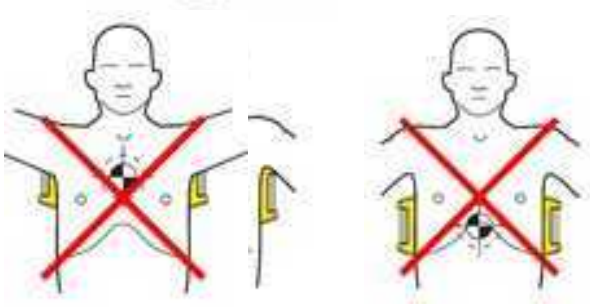
1. Patients < 12 years of age.
2. Patients who do not fit within the device.
    a. Patients who are too large and with whom you cannot press the pressure pad down 2 inches.
    b. Patients who are too small and with whom you cannot pull the pressure pad down to touch the sternum

**PLACEMENT**

1. All therapies related to the management of cardiac arrest should be continued as currently defined in protocol
2. Initiate typical resuscitative measures
    a. Early defibrillation should be considered and provided as indicated based on clinical presentation.
    b. Manual chest compressions should be initiated ***immediately*** while the LUCAS device is being placed on the patient.
    c. **Limit interruptions in chest compressions to 10 seconds or less.**
    d. **Do not delay manual CPR for the LUCAS. Continue manual CPR until the device can be placed.**
3. While resuscitative measures are initiated, the LUCAS device should be removed from it carrying device and placed on the patient in the following manner.

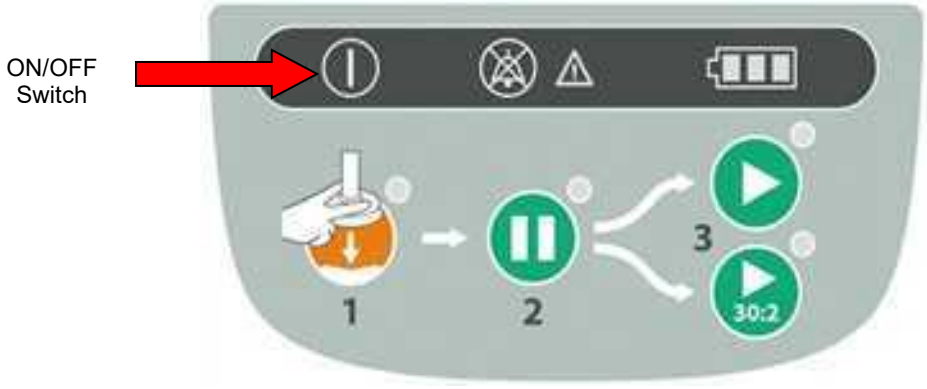
**Backplate Placement**

- The backplate should be centered on the nipple line and the top of the backplate should be located just below the patient's armpits. Placement should occur during a scheduled discontinuation of compressions [e.g., after five cycles of 30:2 or two minutes of uninterrupted compressions]).



**Position the Compressor**

- Turn the LUCAS Device on (the device will perform a 3 second self-test).




- Remove the LUCAS device from it carrying case using the handles provided on each side.

- With the index finger of each hand, pull the trigger to ensure the device is set to engage the backplate. Once this is complete, you may remove your index finger from the trigger loop.
- **Approach the patient from the side opposite the person performing manual chest compressions.**
- Attach the claw hook to the backplate on the side of the patient opposite that where compressions are being provided.
- Place the LUCAS device across the patient, between the staff member's arms who is performing manual CPR.
- At this point the staff member performing manual CPR stops and assists attaching the claw hook to the backplate on their side.
- Pull up once to make sure that the parts are securely attached.

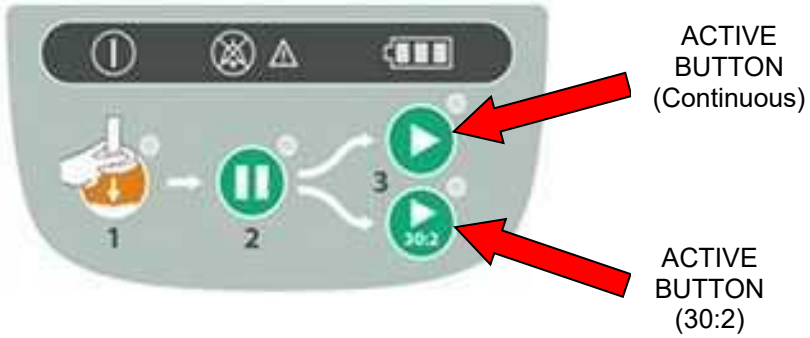
**Adjust the Height of the Compression Arm**

- Use two fingers (V pattern) to make sure that the lower edge of the Suction Cup is immediately above the end of the sternum. If necessary, move the device by pulling the support legs to adjust the position
- Press the Adjust Mode Button on the control pad labeled #1 (This will allow you to easily adjust the height of the compression arm).

- To adjust the start position of the compression arm, manually push down the SUCTION CUP with two fingers onto the chest (without compressing the patient's chest)
- Once the position of the compression arm is satisfactory, push the green PAUSE button labeled #2 (This will lock the arm in this position), then remove your fingers from the SUCTION CUP.
- If the position is incorrect, press the ADJUST MODE BUTTON and repeat the steps.

**Start Compressions**

- If the patient is not intubated and you will be providing compression to ventilation ratio of 30:2 push ACTIVE (30:2) button to start
- If the patient is intubated and you will be providing continuous compressions push ACTIVE (continuous) button



**Patient Adjuncts**

- Place the neck roll behind the patient's head and attach the straps to the LUCAS device.
    - This will prevent the LUCAS from migrating toward the patient's feet.
- Place the patients arms in the straps provided.

**USING THE LUCAS DURING RESUSCIATION**

**Defibrillation**

- Defibrillation can and should be performed with the LUCAS device in place and in operation
- One may apply the defibrillation electrodes either before or after the LUCAS device has been put in position
    - The defibrillation pads and wires should not be underneath the suction cup
    - If the electrodes are already in an incorrect position when the LUCAS is placed, you must apply new electrodes
- Defibrillation should be performed according to the EMS protocols and following the instructions of the defibrillator manufacturer.
- If the rhythm strip cannot be assessed during compressions, one may stop the compressions for analysis by pushing the PAUSE BUTTON (The duration of interruption of compressions should be kept as short as possible and should not be > 10 seconds. There is no need to interrupt chest compressions other than to analyze the rhythm).
- Once the rhythm is determined to require defibrillation, the appropriate ACTIVE BUTTON should be pushed to resume compressions while the defibrillator is charging and then the defibrillator should be discharged.

**Pulse Checks / Return of Spontaneous Circulation (ROSC)**

- Pulse checks should occur intermittently while compressions are occurring
- If the patient moves or is obviously responsive, the LUCAS Device should be paused, and the patient evaluated.
- If there is a change in rhythm, but no obvious indication of responsiveness or ROSC, a pulse check while compressions are occurring should be undertaken. If the palpated pulse is asynchronous, one may consider pausing the LUCAS Device. If the pulse remains, reassess the patient. If the pulse disappears, one should immediately restart the LUCAS Device.

**Disruption or Malfunction of Lucas Device**

- **If disruption or malfunction of the LUCAS device occurs, immediately revert to Manual CPR.**

**Care of the LUCAS Device after use**

- Remove the Suction cup and the Stabilization Strap (if used, remove the Patient Straps).
- Clean all surfaces and straps with a cloth and warm water with an appropriate disinfectant agent
- Replace the used Battery with a fully charged Battery.
- Remount (or replace) the Suction Cup and straps
- Repack the device into the carrying bag
- Make sure that the Charging Cord is plugged into the LUCAS Device.

# Automated CPR Device (AutoPulse)

**INDICATIONS**:

The AutoPulse is intended to be used as an adjunct to manual CPR, on adult patients only, in cases of clinical death as defined by a lack of spontaneous breathing and pulse. The AutoPulse must be used only in cases that manual CPR would normally be initiated. Personnel certified in manual CPR must always be present during AutoPulse operation.

**CONTRAINDICATIONS**:

- Patients with traumatic injury (wounds resulting from sudden physical injury or violence)
- Patients under the age of 18.
- Patient's parameters that are not within the AutoPulse's Operating Parameters.

Do not delay chest compression to apply mechanical CPR devices

**KEY POINTS**:

- The AutoPulse takes time to deploy. It is essential that providers begin manual CPR as soon as cardiac arrest is recognized and continue until the AutoPulse is deployed.
- If there is an error that causes the AutoPulse to stop performing CPR, if the band cannot be closed around the patient, or if the AutoPulse fails to start CPR, continue the resuscitation with manual CPR. Do not attempt to resolve the error until after patient care is complete.
- If the AutoPulse is stored in the Quick Case, the patient may be extricated using the carrying device built into the case. Otherwise, the AutoPulse must be secured to another approved extrication device to move the patient.
- Use of the AutoPulse does not change AHA recommendations for CPR. Use a ratio of 30 compressions to 2 ventilations on patients without an advanced airway and switch the AutoPulse to continuous compressions if an advanced airway is in place.
- Remove the AutoPulse from the patient by undoing the Velcro fastener, not by cutting the Life Band. Cutting the Life Band may cause an error that cannot be fixed in the field.

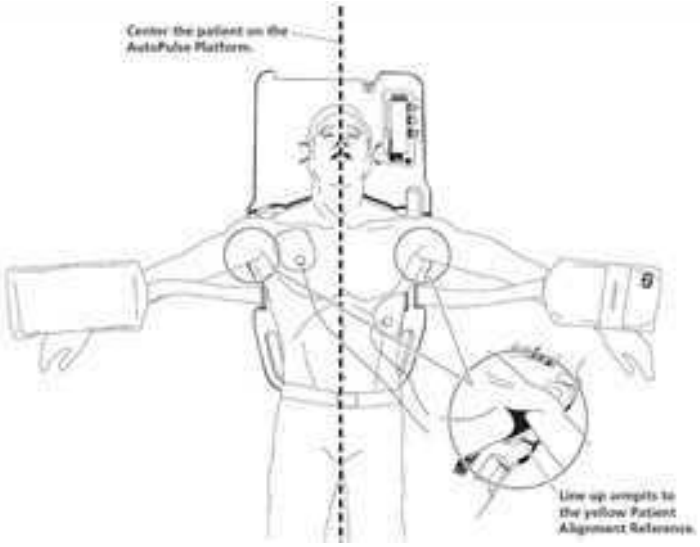
## AutoPulse Operating Parameters:

| Patient Parameter | Auto Pulse Specification |
|---|---|
| Patient chest circumference permitted | 29.9 to 51.2 in (76 to 130cm) |
| Patient chest width permitted | 9.8 to 15 in. (25 to 38cm) |
| Maximum patient weight permitted | 300lbs (136kg) |

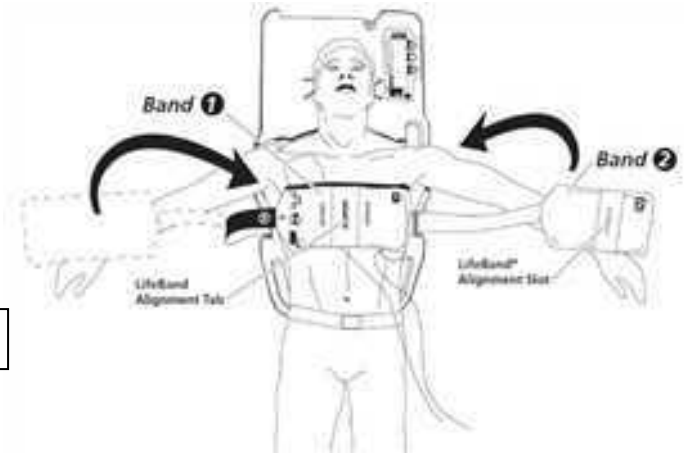
## Deploying the AutoPulse System:

1. Power up the Auto Pulse. The ON/OFF button is located on the top ("head") edge of the Auto Pulse Platform.
2. The Auto Pulse illuminates the green Power light-emitting diode (LED) on the User Control Panel and performs self-tests. **Note:** Make sure that no User Advisory, Fault or System Error messages display.
3. Sit the patient up and make a single cut down the back of the patient's clothing.
4. Slide the Auto Pulse Platform into position behind the sitting patient and lay the patient down onto the platform. Placing the Auto Pulse to the patient's side and "log rolling" him or her onto the platform is an acceptable alternative.
5. Grasp the Clothing by the sleeves and pull down toward the ankles to remove all the clothing from both the front and back torso. The anterior pad(s) may be placed at this time.

6. Position the patient so that he/she is centered laterally (from left to right) and that the armpits are aligned with the Auto Pulse using the yellow line positioning guides on the platform (see diagram at right).




7. Close the Life Band around the patient's chest. To properly align the two sides of the Life Band:
   a) Place band on top of patient's chest
   b) Locate mating slot of band over the alignment tab
   c) Press the bands together to engage and secure the Velcro fastener
   d) Lift the Life Band to its fullest, ensuring that the side bands are at a 90-degree angle to the platform, that they are not twisted and that there are no obstructions.
   e) Center the Life Band on the patient's chest, placing it such that its center is over the area upon which manual compressions are conducted.




**Note:** If the bands cannot be closed, use manual CPR.

## Starting Chest Compressions:

1. Make sure that the yellow upper edge of the Life Band is aligned with the patient's armpits and is directly over the yellow line on the Auto Pulse Platform. Also make sure that there are no obstructions, such as clothing, straps, or equipment, with the bands.
2. Press and release the Start / Continue button once. The Auto Pulse Automatically adjusts the bands to the patient's chest.

**Warning:** Do not touch the patient or the Life Band while the Auto Pulse Platform is analyzing the patient's size.

3. The Auto Pulse will pause for 3 seconds to allow you to verify that the patient is properly aligned and that the Life Band has taken up any slack in the bands. **Note:** If the patient is not properly aligned, press Stop / Cancel button, realign the patient, and begin compressions again with step 1.
4. After the 2 second verify patient alignment pause is complete, compressions will automatically begin. You may press the Start / Continue button to immediately initiate compressions ahead of the time.

**Warning:** If the Stop / Cancel button is not pressed within 3 seconds, compressions will automatically begin. Press the Stop/Cancel button to immediately stop the compressions.

**Compression Modes:**

- **30:2** – The AutoPulse will perform 30 compressions and then pause for 3 seconds to permit the user to ventilate the patient before automatically resuming compressions. The AutoPulse will be set to start in 30:2 mode and should be used in this mode whenever an advanced airway is not in place.
- **Continuous** – The AutoPulse will continually perform ventilations until the stop button is pressed. An audio

cue tone for ventilation will sound 8 times per minute. Switch to this mode if an advanced airway is placed.

- The current compression mode is displayed in the left upper corner of the screen. The words above the gray Menu / Mode switch button indicate the alternate mode the AutoPulse will switch to. Pressing the Menu / Mode switch once will indicate that you want to change compression modes. Press the Menu / Mode switch twice in rapid secession to confirm your compression change.

5. To access the patient or to pause the Auto Pulse for any reason, press the Stop / Cancel button. The Auto Pulse Platform releases the tension on the Life Band, allowing the user to pull the bands to the maximum extended position.
6. After either successful resuscitation or termination of activities, press the Stop / Cancel button followed by the On/Off button. The Stop / Cancel button action will cease the compression cycles and relax the Life Band.The On / Off button action will power down the Auto Pulse.
7. Open the Velcro fastener and lift or log roll off the patient from the Auto Pulse Platform, as necessary.

## Patient Alignment and Securing for Transport:

**Warning:** The Auto Pulse is ***NOT*** intended for carrying or transporting a patient. The Auto Pulse should be secured to the top of a backboard or other equipment used to carry or transport the patient, if necessary. During Transport, Regular Checks of the patient's alignment should be performed.

1. Attach the Shoulder Restraint to keep the patient properly aligned on the Auto Pulse Platform.
2. The head Immobilizer assists in keeping the patient's head from moving, especially when combined with cervical collar. A cloth may also be placed under the patients head.

## Removing the LifeBand:

**Note: DO NOT** cut the LifeBand before removing it from the AutoPulse. Cutting the LifeBand may cause the AutoPulse to report a fault and will require specific steps to clear the fault.

1. Place the AutoPulse platform with the surface facing down on a smooth, flat surface.
2. Flip up the hinged belt guards of the LifeBand cover plate to disengage the LifeBand from the rollers. You will hear the guards "snap." This is normal.
3. Using both hands, pinch together the locking tabs of the LifeBand cover plate and firmly pull the plate straight up and away from the AutoPulse.
4. Remove the LifeBand from the AutoPulse by grasping the LifeBand chest band with the thumb and indexfinger of both hands, on either side if the LifeBand clip. Push the guide plate, using both middle fingers. Keeping the guide plate pushed in, pull up on the band to remove the clip from the shaft.

## Removing a LifeBand that is cut or not in the home position:

**Warning:** The chest band must be completely unwound from the driveshaft before it is removed. When the chest band is completely unwound, the seam is visible and the driveshaft rests in the home position. Removing the band clip when the driveshaft is not in at its home position will result in a permanent User Advisory (45) that the user will not be able to clear. The LifeBand should only be removed from the driveshaft **ONLY** from its home position. If the chest bands have been cut it is quite possible that the chest band is still wound onto the driveshaft. Care should be taken to ensure that the bands are fully extended before the cover plate is opened and the band clip is removed.

1. Once the cover plate is removed, take hold of the chest band on either side of the driveshaft, and pull both bands outward.
2. The chest bands should now be fully extended. The seam securing the band clip should easily be seen and the driveshaft is centered. The LifeBand may now be removed using the removal procedures.

# PERIPHERAL INTRAVASCULAR ACCESS (IV)

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Any patient where intravenous access is indicated (significant trauma or mechanism, emergent or potentially emergent medical condition) | • Dehydration<br>• Hypovolemia<br>• Need for drug therapy | • Hypersensitivity to IV catheter |

**PROCEDURES**

EMS may use a PICC line after cleaning the port and flushing the line

PARAMEDIC Intervention

AEMT Intervention

1. Universal precautions. Gloves.
2. Prepare equipment.
3. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
4. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
5. Place a tourniquet around the patient's extremity to restrict venous flow only.
6. Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
7. Prep the skin with an antiseptic solution.
8. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the blood flashback is visualized in the catheter.
9. Advance the catheter into the vein. **Never** reinsert the needle through the catheter.
10. Dispose of the needle into the proper container without recapping.
11. Draw blood samples when appropriate.
12. Remove the tourniquet and connect the IV tubing or saline lock.
13. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.
14. Secure IV using appropriate measures to insure stability of the line.
15. Check for signs of infiltration.
16. Adjust flow rate.
17. Document the procedure, time, and result on the patient care report (PCR).

Attempt to draw lab work on all patients when the IV is started, unless the draw will compromise the access site, or the patient is in extremis.
Label all blood draws with patient name and DOB

**KEY POINTS**

- IVs will be started by the Advanced EMT and / or the Paramedic as allowed by each patient care protocol.
- IV placement must not delay transport of any critical patient involved in trauma.
- Generally, no more than two (2) attempts or more than two minutes should be spent attempting an IV. If unable to initiate IV-line, transport patient and notify hospital IV was not able to be started.
- IVs may be started on patients of any age providing there are adequate veins and patient's condition warrants an IV.
- Use 1000 ml bags of normal saline for trauma patients and 500 - 1000 ml bags of normal saline for medical patients.
- Any prehospital fluids or medications approved for IV use may be given through intraosseous access.
- All IV rates should be at KVO (minimal rate to keep vein open) unless administering fluid bolus.
- Extreme care should be made to discard of all IV sharps in the appropriate sharps container immediately after cannulation. No sharps should be found on patient / sheets after transport to the hospital.
- Any venous catheter which has already been accessed prior to EMS arrival may be used.
- Upper extremity IV sites are preferable to lower extremity sites.
- Lower extremity IV sites are relatively contraindicated in patients with vascular disease or diabetes.
- In post-mastectomy patients, avoid IV, blood draw, injection, or blood pressure in arm on affected side.
- Use IV catheters appropriately sized for the patient and their condition.

**PROCEDURE FOR STARTING SALINE LOCK**

1. Prepare equipment: Flush saline lock with saline (approx. 1 ml) leave saline syringe attached device.
2. Apply tourniquet.
3. Cleanse site with alcohol.
4. Use appropriately sized catheter for all saline locks. Perform venipuncture.
5. Attach IV tubing and push remaining saline through tubing and catheter. Remove syringe.
6. Secure IV using appropriate measures to insure stability of the line.
7. Check for signs of infiltration.

| **KEY POINTS** |
|---|
| • Saline lock is preferred for patients who do not need immediate IV medication or fluids.<br>• Saline locks can be used whenever a patient requires an IV primarily for medication administration, or for any patient where the IV would be run at a TKO rate.<br>• A saline lock should not be used with a 14 -16 gauge IV unless attached to IV tubing and a bag or normal saline.<br>• Extreme care should be made to discard of all IV sharps in the appropriate sharps container immediately after cannulation. No sharps should be found on patient or in sheets after transport to the hospital.<br>• External jugular. (> 8 years of age).<br><br>Blood Draws<br>• Blood specimen drawing should be performed whenever the patient has a medical condition requiring an IV.<br>• Blood draws are not required if the IV site may become compromised, trauma, or the patient's condition dictates otherwise.<br>• Blood tubes should be labeled with the patient's name and initialized by the drawer of the specimen and placed in a biohazard bag.<br>• If the tube does not draw a vacuum, discard tube, and try another of the same color.<br>• Tube should be rotated upright, not shaken, when mixing additives and blood. |

CIRCULATION / SHOCK

# EXTERNAL JUGULAR INTRAVASCULAR (IV)

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • External jugular vein cannulation is indicated in a critically ill patient > 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable. Intraosseous access should be the preferred access route and attempted first<br>• External jugular cannulation can be attempted initially in life threatening events where no obvious other peripheral site is noted | • Dehydration<br>• Hypovolemia<br>• Need for drug therapy | • Only (1) attempt per pt. |

PARAMEDIC Intervention

AEMT Intervention

**PROCEDURE**

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Position yourself at the patient's head.
4. Locate external jugular vein.
5. Select IV catheter.
6. Prep the site as per peripheral IV site.
7. Align the catheter with the vein and aim toward the same side shoulder.
8. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
9. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
10. Secure IV using appropriate measures to insure stability of the line.
11. Check for signs of infiltration.
12. Adjust flow rate.
13. Document the procedure, time, and result on the patient care report (PCR).

**ONLY (1) ATTEMPT SHOULD BE MADE DURING EXTERNAL JUGULAR IV**
**DO NOT ATTEMPT AN IV ON THE OTHER SIDE OF THE NECK**

| KEY POINTS |
|---|
| • Hypotensive patients may not produce a good "flash" from their EJ vein.<br>• May use a syringe to aspirate blood on the back of the IV catheter to help establish patency.<br>• Flow a bolus of saline through EJ IV catheter to assure solid patency prior to administering medications through the line, especially dextrose or vasopressors. |

# INTRAOSSEOUS INFUSION

PARAMEDIC Intervention

AEMT Intervention

## ADULT INTRAOSSEOUS INFUSION:

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Life threatening illness or injury in an adult where traditional vascular access has failed or is unlikely | • Altered level of consciousness<br>• Arrhythmias<br>• Burns<br>• Cardiac / respiratory arrest<br>• Dehydration<br>• Head Injury<br>• Hypotension<br>• Seizures<br>• Traumatic Injuries / shock<br>• Other medical conditions when immediate vascular access is required | • Gross infection, osteomyelitis, or cellulitis at the intended site (use the other leg if possible)<br>• Fracture at or above the intended site<br>• Previous unsuccessful IO attempt in same extremity<br>**PRECAUTIONS**<br>• Will not work, potentially damaging, in extremities with joint replacement. Attempt to determine before placement. Look for scars. |

**PROCEDURE: EZ IO Adult Device: (For providers trained in technique)**

1. Select site:
2. ***Humoral head*, outer aspect (use the 45 mm yellow needle) *OR Tibia* medial to the tibial tuberosity on flat plane of tibia (use 25mm blue or 45 mm yellow).**
3. Locate the anatomical site and prep with betadine and / or alcohol.
4. Load the needle onto the driver.
5. Firmly stabilize the leg near (not under) the insertion site.
6. Firmly press the needle against the site at a $90^0$ angle and operate the driver. Use firm, gentle pressure.
7. As the needle reaches the bone, stop and be sure that the 5 mm marking on the needle is visible; if it is, continue to operate the driver.
8. When a sudden decrease in resistance is felt and the flange of the needle rests against the skin, remove the driver and remove the stylet from the catheter.
9. Do not attempt to aspirate bone marrow. (may clog needle and tubing)
10. Use a syringe to infuse 0.9% normal saline.
11. If no S/S of infiltration are found, attach the IV line, and infuse fluids and medications as normal. (IV bag will need to be under pressure)
12. Secure the needle and dress the site.
13. Manage IO pain with LIDOCAINE through the IO 20 – 40 mg. Allow to dwell in IO space. Approved for AEMT

**Consider use of 45 mm length IO needle for patients with excessive tissue over the insertion site. *Use the 45 mm needle for all humeral head insertions – see humeral head IO procedure.***

**PROCEDURE: Adult IO Manual Placement:**

1. Expose the lower leg.
2. Identify the tibial tubercle (bony prominence below the kneecap) on the proximal tibia.
3. The insertion location will be 1 - 2 cm (2 finger widths) below this and medially.
4. Prep the site as per peripheral IV site.
5. Insert needle at 90-degree angle to the skin surface, approximately one to two finger breadths distal to the tibial tuberosity. With a straight steady push and / or rotary motion, push needle through subcutaneous tissue and bone until a drop or pop is felt.
6. Remove the trocar and attach the IV.
7. Once the needle has reached the bone marrow, saline should be injected via syringe to clear the needle.
8. Observe for signs of subcutaneous infiltration.
9. The needle should feel firm in position and stand upright without support.
10. Stabilize and secure the needle.
11. Infusion via this route is the same as venous access without limit to rate of administration, drugs pushed or fluid type infused, pressure infuser may be necessary to facilitate flow.
12. Document the procedure, time, and result (success) on the patient care report (PCR).
13. Manage IO pain with LIDOCAINE through the IO 20 – 40 mg. Allow to dwell in IO space. Approved for AEMT

**PEDIATRIC INTRAOSSEOUS INFUSION:**

PARAMEDIC Intervention

AEMT Intervention

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Life threatening illness or injury in a child where traditional vascular access has failed or is unlikely | • Unresponsive<br>• Cardiopulmonary arrest<br>• Decompensated shock | • Gross infection, osteomyelitis, or cellulitis at the intended site (use the other leg if possible)<br>• Fracture at or above the intended site<br>• Previous unsuccessful IO attempt in same extremity |

**PROCEDURE: May use manual IO Device or EZ IO Pediatric Device**

1. Select site.
2. Identify the tibial tubercle (bony prominence below the kneecap) on the proximal tibia or the humeral head. The insertion location will be 1-2 cm (2 finger widths) below this and medially.
3. Prep the site as per peripheral IV site.
4. Stabilize leg / shoulder as needed.
5. Needle insertion varies between 70- and 90-degree angle to the skin surface, approximately one to two finger breadths distal to the tibial tuberosity. With a straight steady push and / or rotary motion, push needle through subcutaneous tissue and bone until a drop or pop is felt.
6. Remove the trocar and attach the IV.
7. Once the needle has reached the bone marrow, saline should be injected via syringe to clear needle
8. Observe for signs of subcutaneous infiltration.
9. The needle should feel firm in position and stand upright without support.
10. Stabilize and secure the needle.
11. Infusion via this route is the same as venous access without limit to rate of administration, drugs pushed or fluid type infused, pressure infuser may be necessary to facilitate flow.
12. Document the procedure, time, and result on the patient care report (PCR).
13. Manage IO pain with LIDOCAINE through the IO 0.5 mg / kg, not to exceed 40 mg. Allow to dwell in IO space. Approved for AEMT

| KEY POINTS |
|---|
| • An IO can administer any medication or fluid that can be administered by an IV.<br>• Consider using a three-way stopcock, and a syringe with the IV tubing. Use the “pull-push” method to infuse fluid for small bolus in infants / children.<br>• A blood pressure cuff or pressure infuser may have to be used to apply pressure to the IV bag to maintain an adequate flow rate.<br>• An IO may be attempted prior to attempting an IV if the patient is in cardiac arrest or is in decompensated shock and requires immediate access.<br>• If attempt unsuccessful remove needle and apply pressure to site for 5 minutes.<br>• Intraosseous infusions of fluids may cause subcutaneous infiltration, osteomyelitis, or subcutaneous infections if not placed properly. |

# INTRAOSSEOUS INFUSION – Humeral Head

| | |
|---|---|
| | Adult or Pediatric<br>Place the patient's hand over the abdomen (elbow adducted and humerus internally rotated)<br>Place your palm on the patient's shoulder anteriorly<br>• The area that feels like a "ball" under your palm is the general target area<br>• You should be able to feel this ball, even on obese patients, by pushing deeply |
| | Place the ulnar aspect of one hand vertically over the axilla<br>Place the ulnar aspect of the opposite hand along the midline of the upper arm laterally. |
| | Place your thumbs together over the arm.<br>• This identifies the vertical line of insertion on the proximal humerus |
| | Palpate deeply as you climb up the humerus to the surgical neck.<br>• It will feel like a golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck<br>• The insertion site is on the most prominent aspect of the greater tubercle, 1 to 2 cm above the surgical neck |
| | **Insertion:**<br>• Prepare the site by using antiseptic solution of your choice<br>• Use a clean, "no touch" technique<br>• Remove the needle cap<br>• Point the needle set tip at a 45-degree angle to the anterior plane and posteromedial<br>• Push the needle tip through the skin until the tip rests against the bone<br>• The 5mm mark must be visible above the skin for confirmation of adequate needle length<br>• Gently drill into the humerus 2cm or until the hub reaches the skin in an adult.<br>  ○ The hub of the needle set should be perpendicular to the skin<br>• Hold the hub in place and pull the driver straight off<br>• Continue to hold the hub while twisting the stylet off the hub with counterclockwise rotations<br>  ○ The needle should feel firmly seated in the bone (1st confirmation of placement)<br>• Place the stylet in a sharps container<br>• Place the EZ-Stabilizer™ dressing over the hub<br>• Attach a primed EZ-Connect® extension set to the hub, firmly secure by twisting clockwise<br>• Pull the tabs off the EZ-Stabilizer dressing to expose the adhesive, apply to the skin<br>• Aspirate for blood/bone marrow (2nd confirmation of placement)<br>• Secure the arm in place across the abdomen |

# ResQGARD Impedance Threshold Device

The ResQGARD is an impedance threshold device (ITD) that provides therapeutic resistance to inspiration in spontaneously breathing patients. During inspiration, a negative pressure (created from expansion of the thorax) draws air into the lungs. When inspiratory impedance is added to the ventilation circuit, it enhances the negative pressure (vacuum) in the chest, which pulls more blood back to the heart, resulting in increased preload and thus, enhanced cardiac output on the subsequent cardiac contraction.

**Indications for Use:**
Spontaneously breathing patients who are experiencing symptoms of low blood circulation (e.g. diaphoresis, tachycardia, weak radial pulses, cold, clammy skin, tachypnea) or hypotension (e.g. < 90 mm Hg [adults]; per age & weight and as directed by a physician [children]), which can be secondary to a variety of causes such as; Anaphylaxis, Blood loss (traumatic or medical etiology) or blood donation, Burns, Dehydration, Dialysis, Drug overdose, Heat shock, Orthostatic intolerance, Pregnancy, Sepsis / toxins, and Spinal shock.

2. Permissive Hypotension: in cases (e.g., hemorrhage due to a trauma-related injury) in which a lower-than-normal blood pressure (BP) is desired to assist in the blood-clotting process, the ResQGARD may still be a reasonable therapy to help maintain "permissive hypotension."

**Contraindications:**
1. Flail chest
2. Shortness of breath or respiratory insufficiency
3. Chest pain
4. Dilated cardiomyopathy
5. Congestive heart failure (Cardiogenic Shock)
6. Pulmonary hypertension
7. Aortic stenosis
8. Penetrating chest trauma

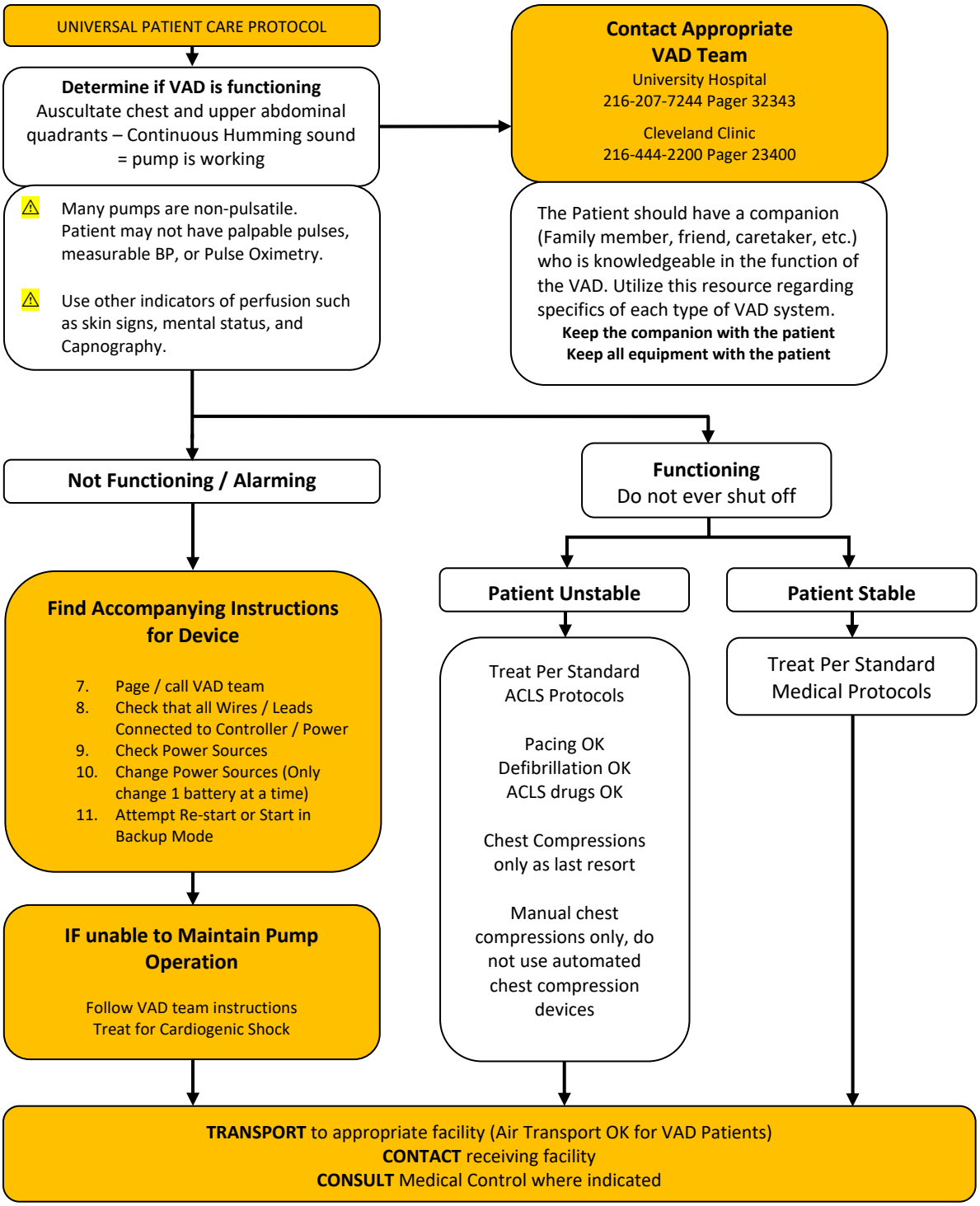
**Precautions:**
1. Children under 25 lbs. may not be cooperative enough to tolerate use of the ResQGARD.
2. The safety and effectiveness in persons suffering from arterial stenosis or asthma has not been established.
3. If respiratory distress develops during use of the ResQGARD, immediately discontinue use.
4. Do not leave the ResQGARD in the hands of untrained healthcare providers.
5. Nausea / Vomiting

**Procedure for Use:**
1. Identify the need for ResQGARD application (assess indication for use).
2. Reassure patient and position as appropriate.
3. Obtain baseline vital signs (pulse, respirations, blood pressure and oxygen saturation) and monitor cardiac rhythm.
4. Explain to the patient that the device will make it slightly more difficult to breathe, but that the resistance is what may make them feel better.
5. Gently (but firmly) hold the ResQGARD over the nose and mouth (or have the patient hold), establishing and maintaining a tight face seal with facemask. The head strap (e.g., ResQStrap) may be used if the patient does not want to hold the ResQGARD in place.
6. Have patient breathe in slowly (over 2 - 3 seconds) and deeply; exhale normally. Breathe at a rate of 10 – 16/minute.
7. If supplemental oxygen is used, attach the tubing to the oxygen port on the ResQGARD and deliver up to 15 lpm, but do not exceed 15 lpm.
8. If end tidal carbon dioxide ($EtCO_2$) monitoring is desired, attach the sensor to the exhalation port of the ResQGARD.
9. Reassess vital signs often (every 3 - 5 minutes).
10. Once the patient's blood pressure has stabilized and risen to an acceptable level it is recommended that you continue ResQGARD treatment for approximately 5 minutes before discontinuing its use. Reapply if necessary if the blood pressure drops again.
11. Document ResQGARD therapy on patient care report (e.g., time initiated and discontinued, vital sign response).

**Special Patient Considerations:**
1. In a patient without intravenous (IV) access, applying the ResQGARD may make it easier to establish an IV because of the improvement in blood pressure.
2. The ResQGARD may be used in conjunction with other indicated treatments for hypotension (e.g., fluids, vasopressors, patient positioning).
3. In cases where the rate of blood loss is unclear, the recommendation is to use the ResQGARD as you would a fluid challenge in the field (i.e., if a fluid challenge is indicated, then the ResQGARD may be too).

# Ventricular Assist Devices (LVAD, RVAD, BiVAD)

Ventricular assist device patients (VAD) are special care situations. Unless these patients are in cardiac arrest they need to be transported to their VAD implantation center. Local or regional hospitals are not equipped to handle these patients.




EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

# AUTOMATED EXTERNAL DEFIBRILATOR (AED)

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Non-traumatic cardiac arrest in patients > 8 years of age | The patient must meet ALL the following criteria:<br>• Unresponsive<br>• Apneic<br>• Pulseless<br>• Weighs greater than 55 lbs.<br>• Pediatric patients >8 years | • If patient is found in water, remove from water and dry patient thoroughly. Do not use an AED in an explosive atmosphere, extremely wet atmosphere, or on a metal surface<br>• If a medication patch is found, remove patch, and wipe clean before applying defibrillation pads<br>• Do not place defibrillation pads directly over patient's implanted defibrillator<br>• Patients < 8 years of age require specific pediatric defibrillation equipment |

## PROCEDURE

Establish that the patient is pulseless and apneic.

1. Perform CPR for (2) minutes.
2. Attach the defibrillation pads to the patient's chest and connect the cables to the AED.
3. The sternum pad is to be attached to the patient's upper right chest, to the right of the sternum on the mid-clavicular line.
4. The apex pad is to be attached to the patient's lower left rib cage, laterally and beneath the left nipple.
5. Turn the unit ON and follow the voice prompts.
6. Rhythm analysis:

   Do not have any patient contact while the AED analyzes.
   Rhythm analysis should take approximately 9 - 13 seconds.
7. If the AED unit's voice prompts advise that "no shock advised":
   Check for a pulse, if no pulse, continue CPR.
8. Visually check that no one is in contact with the patient and announce CLEAR.
9. Press the SHOCK button when advised to by the unit's voice prompts:
10. Continue CPR for 2 minutes.
11. If the patient's pulse has returned:

    Insure that the patient has a patent airway and treat accordingly.
12. If the patient remains pulseless, continue use of CPR and AED.

## KEY POINTS

- Do not use the AED in cases of traumatic or hypovolemic cardiac arrest (unless driver involved in MVA is in cardiac arrest and is suspected of having an acute MI while driving).
- Resuscitation should be withheld in all cases where such efforts would be futile. Patients should be considered DOA and resuscitation should not be attempted in the following situations:
  - Refer to the Dead-on Arrival (DOA) Policy.
  - A valid (within the last 2 years) Do Not Resuscitate (DNR). Refer to the Advanced Directives – Do Not Resuscitate (DNR) Policy.
- Defibrillation cables should be inspected for damage and / or wear.
- Defibrillation pads should be routinely inspected to assure that they are within their expiration and are not opened.
- Assure that batteries are charged, and spares are available.

# CARDIAC DEFIBRILLATION (MANUAL)

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia | The patient must meet ALL the following criteria<br>• Unresponsive<br>• Apneic<br>• Pulseless | • If patient is found in water, remove from water and dry patient thoroughly. Do not use an AED in an explosive atmosphere, extremely wet atmosphere, or on a metal surface<br>• If medication patch found, remove patch, and wipe clean before applying defibrillation pads<br>• Do not place defibrillation pads directly over patient's implanted defibrillator<br>• Pediatric patients < 8 years of age require specific pediatric monitoring equipment |

PARAMEDIC Intervention

AEMT Intervention

**PROCEDURES**

1. Establish that the patient is pulseless and apneic.
2. Provide (2) minutes of CPR.
3. Attach defibrillation pads and cables. Plug cable into EKG monitor.
4. Recognize EKG findings as ventricular fibrillation or pulseless ventricular tachycardia.
5. Charge the device to 360 J or recommended charge.
6. Visually check that no one is in contact with the patient and announce CLEAR.
7. Press the SHOCK button and deliver the shock.
8. Resume CPR for (2) minutes.
9. Check monitor for changes in rhythm. Check pulse.
10. If no change in rhythm repeat steps 5 - 8.
11. If EKG reveals change in findings, treat with the appropriate ACLS Protocol.

**Electrical Vector Change**

A electrical vector (direction) change may be considered where a patient is refractory to defibrillations with the initial defibrillator pad placement.
If initial pad placement is apex / sternum, consider anterior / posterior placement, and vice versa.
Alternate between defibration pads by changing the defibration therapy cable between the pads sets for therapeutic effect.

- **Double Sequential Defibrillation**

**For situations where a second defibrillator is immediately available and AT LEAST 4 previous defibrillations have failed.**

1. Apply 2 defibrillators per typical measures.
2. One set of pads standard apex / sternum placement.
3. One set of pads anterior / posterior placement.
4. Charge BOTH defibrillators to highest joule setting.
5. ONE PERSON clears the patient and presses the shock button on each defibrillator in rapid succession. The first then the second as close together as possible.

# DIAGNOSTIC EKG

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Suspected cardiac patient<br>• Suspected tricyclic overdose<br>• Electrical injuries | • Any complaint of pain or discomfort between the nose and the navel<br>• Chest pain / tightness<br>• Chest discomfort<br>• Chest discomfort relieved prior to arrival<br>• Pulmonary edema<br>• Palpitations<br>• Irregular heartbeat<br>• Syncope<br>• Dizziness<br>• Unexplained diaphoresis<br>• Dyspnea<br>• Weakness / numbness<br>• HR< 50 or > 120<br>• Hypotension / hypertension | • Insufficient training |

**Placement of the "V" Leads**
**LEFT SIDE EKG**

**V1**: 4th ICS – right of the sternum
**V2**: 4th ICS – left of the sternum
**V3**: Between V2 and V4
**V4**: 5th ICS midclavicular LEFT
**V5**: Between V4 and V6
**V6**: Even with V4 midaxillary

**Placement of the "V" Leads**
**RIGHT SIDE EKG**

**V1**: 4th ICS – right of the sternum
**V2**: 4th ICS – left of the sternum
**V3**: Between V2 and V4
**RV4**: 5th ICS midclavicular RIGHT – only lead that needs to be routinely moved
**V5**: Between V4 and V6
**V6**: Even with V4 midaxillary

1. Follow the Universal Patient Care Protocol.
2. Place the patient in a position of comfort and explain the procedure.
3. Apply the Limb and V Leads to the patient, protecting patient privacy.
4. Enter patient information.
5. Avoid patient movement and disturbance of EKG Leads.
6. Press 12 – LEAD button (Or equivalent diagnostic button). Allow monitor to analyze, interpret, and print rhythm strip.
7. Make appropriate connections to transmission device and press TRANSMIT button to send EKG rhythm strip to hospital.

**KEY POINTS**

- A diagnostic EKG should be performed on any patient with a complaint that may be cardiac in origin.
- Any adult medical patient or patients of any age with a cardiac history, irregular pulse, unstable blood pressure, dyspnea, chest pain, medication administration, or venous access must be placed on a cardiac monitor.
- Where clinically indicated, obtain a diagnostic EKG, and transmit to the emergency department. The transmission must include the patient's name, age, and sex.
- Protect the patient's modesty.
- The diagnostic ECG should be acquired **prior** to medication administration (except oxygen) and extrication of the patient.
- If the patient is having an acute MI, contact the receiving hospital as soon as possible.
- The paramedic should give one copy of the diagnostic EKG to the ED physician / nurse immediately upon your arrival and attach a second copy to the run report.
- EKG adhesive patches should remain on the patient for consistent lead placement with follow up EKGs but should be removed before defibrillation patches are applied if necessary.
- The monitor should remain on the patient for continuous cardiac monitoring enroute.
- Automated computer diagnosis of rhythm / STEMI not always accurate. May indicate STEMI where none exists, may not indicate where one does. If any question, transmit to receiving facility for review. Computer diagnosis frequently confused by A-Fib and pacemakers.

**TREATMENT DECISIONS ARE NOT TO BE BASED ON COMPUTERIZED EKG INTERPETATIONS**

**EMTS AND AEMTS ARE EXPECTED TO PLACE LEADS ON THE PATIENT TO OBTAIN AND TRANSMIT A Diagnostic EKG TO THE HOSPITAL IN THE ABSENCE OF A PARAMEDIC.**
**EMT AND AEMTS ARE NOT PERMITTED TO INTERPET THE EKG.**

# PEDIATRIC MEDICATION DOSING

**Certa Dose PALS Syringe Holder Kit**
**Preparation of PALS Syringe Holder Kit Task Completion**

***Patient Weight Estimation***

1. Confirms patient is on their back, legs fully extended
2. Places the end of the Length-Based Resuscitation Tape, labeled "Measure from This End", next to the top of the patient's head
3. Fully extends the Length-Based Resuscitation Tape beyond the heels of the patient and notes the correct color zone relative to the patient's heels

***Drug and Dosing Device Selection and Preparation***

4. Confirms the correct drug and syringe (Bristoject-style) is selected for use in administration
5. Selects the Syringe Holder that matches the drug selected in Step 5 by reviewing the Drug Confirmation Label, and removes the Drug Confirmation Label
6. Slides the Syringe Holder on the injector until it snaps in place; Confirms flanges of Syringe Holder and injector are in direct contact or as close together as possible with Holder affixed
7. Correctly applies Baseline Reference Label to the top of the drug vial just below the vial cap
8. Removes protective caps from drug vial and base of injector
9. Threads vial into injector to assemble the syringe without pushing vial out of alignment
10. Confirms the syringe is assembled according to manufacturer's instructions
11. Re-confirms that the attached Syringe Holder matches the drug to be administered by comparing the color-coded label on the Syringe Holder to the selected drug
12. Removes the syringe's luer-cap
13. Expels the air; depresses the vial until stopper aligns with the zero line on the vial
14. Confirms the Baseline Reference Label is aligned with the baseline on the Syringe Holder
15.(a) If applicable: If the Baseline Reference Label line is below the baseline on the Syringe Holder, the provider gently pushes vial and expels medication until baselines align (as expected in Step 16 above)
15.(b) If applicable: If the Baseline Reference Label line is above the baseline on the Syringe Holder, the provider either uses the Bristoject-style device per its manufacturer's instructions, or restarts the exercise with an unused Certa Dose PALS Syringe Holder Kit
16. Determines and communicates the patient's color zone on the Syringe Holder (must match color zone determined in Steps 3 & 4)

***Drug Administration***

17. Correctly delivers the first dose using the first dose range (labeled with number 1) as a visual aid to confirm the desired volume on the Bristoject vial is administered
18. Correctly delivers the second dose using the second dose range (labeled with number 2) as a visual aid to confirm the desired volume on the Bristoject vial is administered
19. If applicable: Correctly delivers the third dose using the third dose range (labeled with number 3) as a visual aid to confirm the desired volume on the Bristoject vial is administered
20.(a) If applicable (i.e., additional epinephrine): Administers additional doses correctly with a new holder starting at Step 5, above
20.(b) Upon completion of administration, disposes of all medical waste per facility's protocol

# SYCHRONIZED CARDIOVERSION (MANUAL)

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Unstable patient with a tachydysrhythmia<br>• Patient is not pulseless | • Symptomatic narrow complex tachycardia<br>• Symptomatic wide complex tachycardia<br>• Grossly symptomatic atrial fibrillation<br>• Grossly symptomatic atrial flutter | • A pulseless patient |

PARAMEDIC Intervention

**PROCEDURE**

1. Apply limb leads
2. Consider sedation with versed or valium prior to administering synchronized cardioversion.
3. Attach defibrillation pads to the patient and monitor.
4. Push the SYNC button.
5. Observe the EKG rhythm. Confirm that the triangle sense marker appears near the middle of each QRS complex.
6. If the sense markers do not appear or they are displayed in the wrong location adjust the EKG size or select another lead.
7. The location of the sense marker may vary slightly with each QRS complex.
8. Rotate the ENERGY SELECT dial and select the proper setting as required by protocol.
9. Push the CHARGE button.
10. Make sure that everyone is clear of the patient.
11. After confirming that the monitor is still in SYNC mode, push and hold the SHOCK button until it discharges.
12. Reassess the patient and the cardiac rhythm. Repeat steps 4 - 9 as indicated by the protocol.

**KEY POINTS**

- When attempting to cardiovert, double check to make sure that the SYNC button is ON.
- Monitor the patient for ventricular fibrillation.
- If the patient converts into ventricular fibrillation or pulseless ventricular tachycardia, reassess the patient. Immediately defibrillate the patient at and refer to the Ventricular Fibrillation / Pulseless Ventricular Tachycardia Protocol and treat accordingly.
- If the SHOCK button is not pushed, the energy will be internally removed. It will be necessary to recharge to the indicated energy setting.
- When synchronized cardioverting a patient, there may be a delay from when the button is depressed to when the shock is delivered.
- Use EXTREME caution in patients with rapid atrial fibrillation or atrial flutter. Cardioversion of these patients is associated with high risk of embolus. Prehospital cardioversion of these patients is reserved for life-threating situations only.

CARDIAC / ACLS

# TRANSCUTANEOUS PACING

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Patients with symptomatic bradycardia after no response to atropine or primary treatment if unable to start an IV<br>• Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturer's guidelines | • Adult bradycardia with severe hemodynamic compromise.<br>• Symptomatic bradycardia that is refractory to pharmacological intervention.<br>• Symptomatic 2nd or 3rd degree heart block | • Hypothermia |

PARAMEDIC Intervention

PROCEDURE

1. Apply limb leads
2. Consider sedation with Midazolam (Versed) or Lorazepam (Ativan) prior to administering transcutaneous pacing.
3. Attach defibrillation / pacing pads to the patient and monitor.
4. Place the defibrillation / pacing pads anterior-posterior or anterior-lateral.
5. Do not place the pacing patches over the sternum, spine, or nipple.
6. Push the PACER button.
7. Push the RATE button.
8. Push the CURRENT button and increase the milliamps until you reach electrical and mechanical capture (assess the carotid or femoral pulses to confirm mechanical capture).
9. Hold the PAUSE button to stop the pacing so you can assess the patient's underlying rhythm.
10. Push the EVENT button to quick log CPR, medication administration, ETT placement etc.

Start at pacing rate of 60 beats per min (PPM on device).
Increase milliamps until electrical capture, verify mechanical capture with femoral or radial pulses, blood pressure, and capnography.
Increase milliamps a minimum of 10 to maintain capture during transport.

| KEY POINTS |
|---|
| • The pacing will begin immediately once the pacer is turned on.<br>• Monitor the patient for ventricular fibrillation. |

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| MEDICAL |
|---|
| **BLOOD GLUCOSE ANALYSIS** |

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Suspected diabetic emergencies<br>• change in mental status, bizarre behavior, etc.<br>• Medical alert tags<br>• Drug / toxic ingestion<br>• Syncope / Near Syncope<br>• Dizziness / Lightheadedness | • Decreased mental status<br>• Change in baseline mental status<br>• Bizarre behavior<br>• Hypoglycemia (cool, diaphoretic skin)<br>• Hyperglycemia (warm, dry skin; fruity breath; Kussmaul breathing; signs of dehydration) | • Insufficient training |

**PROCEDURE**

1. Gather and prepare equipment.
2. Clean sample site with antiseptic prior to sample and let it dry before obtaining sample.
3. Blood samples for performing glucose analysis shall be obtained from finger stick.
4. Place correct volume of blood in / on the glucometer per the manufacturer's instructions.
5. Time the analysis as instructed by the manufacturer.
6. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
7. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.

| KEY POINTS |
|---|
| • Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro<br>• Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.<br>• It is safer to assume hypoglycemia than hyperglycemia if doubt exists.<br>• Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia.<br>• Low glucose (< 70), normal glucose (70 - 120), high glucose ( > 250)<br>• Consider restraints if necessary for patient's and / or personnel's protection per the restraint procedure.<br>• Glucometers must be calibrated and coded for the appropriate glucose strips following manufacturer and department recommendations or policies.<br>• Know the read range of the device you are using. “LO” and “HI” values vary between manufactures.<br>• Consider repeat evaluations in another location if the indicated reading is inconsistent with patient presentation<br>• Most glucometers are calibrated for capillary blood samples. Other sample routes may provide erroneous values. |

| MEDICAL |
|---|
| **MEDICATION INJECTIONS** |

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • When medication administration is necessary, and the medication must be given via the SQ or IM route or as an alternative route in selected medications | • Determined per protocol | • Allergy to medication per protocol<br>• Aspiration of blood |

**INTRAMUSCULAR – EMT MAY PROVIDE IM INJECTION BY APPROVED AUTOINJECTOR ONLY**

**PROCEDURE**

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The possible injection sites for intramuscular injection include the arm, buttock, and thigh. Injection volume should not exceed 1 ml for the arm and not more than 2.5 ml in the thigh or buttock.
5. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 ml.
6. Expose the selected area and cleanse the injection site with alcohol.
7. Hold intramuscular syringe at 90-degree angle, with skin pinched and flattened.
8. Insert the needle into the skin with a smooth, steady motion.
9. Aspirate for blood. Do not inject if blood present.
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply pressure to the site.
13. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
14. Document the medication, dose, route, and time on the patient care report (PCR).

# MUCOSAL ATOMIZATION DEVICE (MAD)

**INDICATIONS**

- Used for atomizing topical solutions across the nasopharyngeal and oropharyngeal mucous membranes.
- For use when administering the following medications:

  - **Lorazepam** for seizures / sedation – AEMT / PARAMEDIC USE ONLY
  - **Midazolam** for seizures / sedation - AEMT / PARAMEDIC USE ONLY
  - **Naloxone** for opiate overdoses – APPROVED FOR EMT USE
  - **Fentanyl** for analgesia - AEMT / PARAMEDIC USE ONLY
  - **Ketamine** for analgesia - AEMT / PARAMEDIC USE ONLY

**PROCEDURE**

1. Disconnect MAD from the included syringe and/or retrieve a needless syringe.
2. Attach needle to syringe.
3. Fill syringe with the desired volume of solution and eliminate remaining air.
4. Usually no more than 1 – 2 ml for optimum absorption
5. Remove needle and dispose of appropriately.
6. Connect the MAD to the syringe.
7. Place the MAD tip in the nostril or oropharyngeal cavity.
8. Compress the syringe plunger to spray atomized solution into the nasal or oropharyngeal cavity.
9. Re-use the MAD on the same patient as needed, then discard.

**KEY POINTS**

The following are some of the benefits of IN (Atomized) drug delivery for the patient and provider:

- Eliminated the risk of a contaminated needlestick to the EMS provider.
- Simple and convenient for the EMS provider.
- Less frightening for children.
- Disposable.
- Discomfort is minimized for the patient.
- Serum levels of many IN administered medications are comparable to injected medications and much improved over rectal and oral routes.

Studies have shown that the most effective method to deliver a medication through the IN route is to atomize it across the nasal mucosa. Atomized particles (10 to 50 microns) adhere to the nasal mucosa over a large surface area, preventing waste and improving absorption of the medication. Administer half the dose in each nostril to increase the surface area, and further improve absorption.

| MEDICAL |
|---|
| **ORTHOSTATIC BLOOD PRESSURE MEASUREMENT** |

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Patient situations with suspected blood / fluid loss / dehydration<br>• Patients > 8 years of age, or patients larger than the Broselow tape | • Abdominal Pain<br>• Dizziness<br>• Pregnancy<br>• Syncope | • Prepare for patient being unsteady on feet |

**PROCEDURE**

1. Assess the need for orthostatic blood pressure measurement.
2. Obtain patient's pulse and blood pressure while supine.
3. Have patient stand for one minute.
4. Obtain patient's pulse and blood pressure while standing.
5. If pulse has increased by 20 BPM or systolic blood pressure decreased by 20 mmHg, the orthostatic measurements are considered positive.
6. If patient is unable to stand, orthostatic measurements may be taken while the patient is sitting with feet dangling.
7. If positive orthostatic changes occur while sitting, DO NOT continue to the standing position.
8. Document the time and vital signs for supine and standing positions on the patient care report.
9. Determine appropriate treatment based on protocol.

**MEDICAL**

# PAIN ASSESSMENT

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Injury or illness requiring pain management. | • Abdominal pain<br>• Chest pain secondary to infarction or angina<br>• Acute urinary retention<br>• Fractures<br>• Severe burns<br>• Kidney stones<br>• Musculoskeletal trauma | • Altered level of consciousness<br>• Head injuries<br>• Chest injuries (blunt or penetrating)<br>• Intoxication<br>• Maxillofacial injuries<br>• Psychiatric problems<br>• Pediatric patients under 12 years of age<br>• Pregnancy<br>• Respiratory distress / failure |

**PROCEDURE**

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self-report.
2. Pain should be assessed and documented during initial assessment, before starting pain control treatment, and with each set of vitals.
3. Pain should be assessed using the appropriate approved scale.
4. Two pain scales are available: the 0 - 10 and the Wong - Baker "faces" scale.
5. 0 - 10 Scale: the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
6. Wong - Baker Faces scale: this scale is primarily for use with pediatrics but may also be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value or the textual pain description.

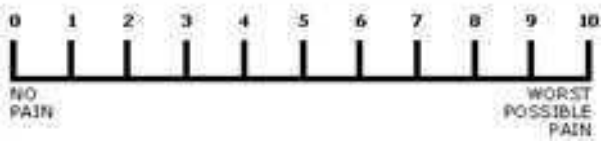
SEVERE PAIN MANAGEMENT

**KEY POINTS**

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

**The Wong-Baker Faces Pain Rating Scale**

Designed for children aged 3 years and older, the Wong-Baker Faces pain rating scale is also helpful for elderly patients who may be cognitively impaired. If offers a visual description for those who do not have the verbal skills to explain how their symptoms make them feel.




To use this scale, you should explain that each face shows how a person in pain is feeling. That is, a person may feel happy because he or she has no pain (hurt), or a person may feel sad because he or she has some or a lot of pain.

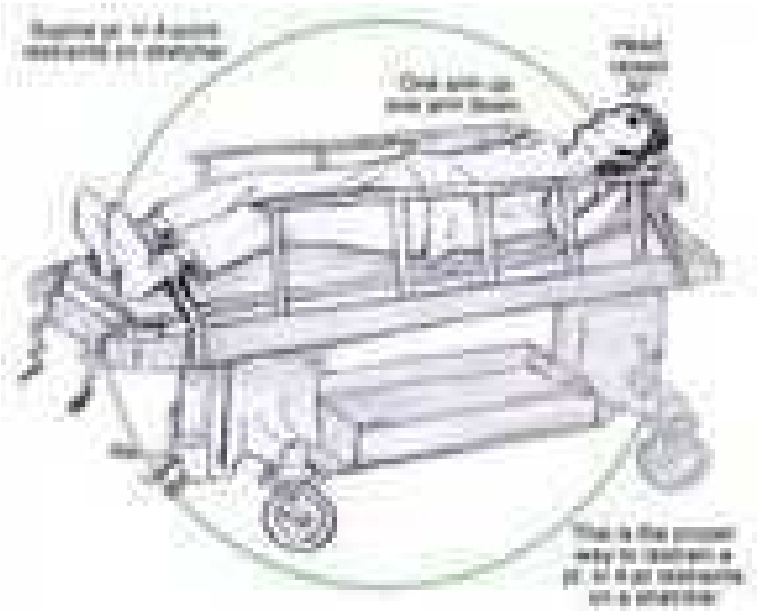
**A Numerical Pain Scale**

A numerical pain scale allows you to describe the intensity of your discomfort in numbers ranging from 0 to 10 (or greater, depending on the scale). Rating the intensity of sensation is one way of helping your doctor determine treatment. Numerical pain scales may include words or descriptions to better label your symptoms, from feeling no pain to experiencing excruciating pain. Some researchers believe that this type of combination scale may be most sensitive to gender and ethnic differences in describing pain.

**MEDICAL**

# PATIENT RESTRAINT

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Patient out of control and may cause harm to self or others.<br>• Necessary force required for patient control without causing harm<br>• Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters | • Head Trauma<br>• Alcohol / drug related problems<br>• Metabolic disorders (i.e., hypoglycemia, hypoxia, etc.)<br>• Psychiatric/stress related disorders | • None if warranted |



**KEY POINTS**

- Soft restraints are to be used only when necessary in situations where the patient is potentially violent and may be of danger to themselves or others. EMS providers must remember that aggressive violent behavior may be a symptom of medical conditions.
- Patient heath care management remains the responsibility of the EMS provider. The method of restraint shall not restrict the adequate monitoring of vital signs, ability to protect the patient's airway, compromise peripheral neurovascular status or otherwise prevent appropriate and necessary therapeutic measures. It is recognized that evaluation of patient vital parameters requires patient cooperation and thus may be difficult or impossible.
- All restraints should have the ability to be quickly released, if necessary.
- Handcuffs applied by law enforcement applied to patients **NOT in custody / under arrest** may be switched to soft restraints for transport
- Handcuffs applied by law enforcement to patients **IN custody / under arrest** require a law enforcement officer to remain available to adjust restraints as necessary for the patient's safety. This policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment to establish scene control.
- Patients shall not be transported in a face down prone position to endure adequate respiratory and circulatory monitoring and management.
- Restrained extremities should be monitored for color, nerve and motor function, pulse quality and place mask on patient for body secretion protection. May use TB mask, or non-rebreather if patient needs oxygen.
- Use supine or lateral positioning ONLY.
- Neurovascular checks are required every 15 minutes.
- DOCUMENT all methods used.

| MEDICAL |
|---|
| **NORMAL CHILDBIRTH** |

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Imminent delivery with crowning | • Urge to push<br>• Visible crowning | • See Gynecological Emergencies Protocol |

**PROCEDURE**

1. Delivery should be controlled to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe. Mouth then nose.
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the Neonatal Resuscitation Protocol for further treatment.
11. The placenta will deliver spontaneously, within 5-15 minutes of the infant. Do not force the placenta to deliver. Contain all tissue in plastic bag and transport.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue rapid transport to the hospital.

**MEDICAL**

# STROKE TELEMEDICINE

FOR DEPARTMENTS EQUIPPED TO PROVIDE TELEMEDICINE

SUSPECTED STROKE BASED ON INITIAL ASSESMENT

BLOOD GLUCOSE PROCEDURE

COMPLETE STROKE ASSESSMENT PER STROKE / CVA PROTOCOL

Consider Alternate Diagnosis

## Positive INITIAL Stroke Screen

Treat Per STROKE / CVA

Have Information Available

- Blood Glucose Level
- Vital Signs
- Last Known Normal
- Patient Name, Age, DOB
- Any Known TPA Exclusions

INITIATE VIDEO CALL WITH RECEIVING HOSPITAL
ACTIVATE STROKE ALERT
This Will Be Your Patient Report

Demonstrate Findings Stroke EXAM

Continue Treatment Per Protocol or Medical Control

## Negative INITIAL Stroke Screen

Have Information Available

- Blood Glucose Level
- Vital Signs
- Last Known Normal
- Patient Name, Age, DOB
- Any Known TPA Exclusions

INITIATE VIDEO CALL WITH RECEIVING HOSPITAL
This Will Be Your Patient Report

Demonstrate Findings Stroke EXAM

ACTIVATE STROKE ALERT IF POSITIVE Stroke EXAM

Continue Treatment Per Protocol or Medical Control

Transport to Primary Stroke Center or Comprehensive Stroke Center

DEVICE USEAGE

Cincinnati Pre-Hospital Stroke Assessment Conducted on Scene Move Patient to Ambulance

Initiate Video Call Select CISCO JABBER App from Home Screen

Select receiving hospital from contacts

Hold Tablet Vertical and with Screen Toward Patient, Camera UP

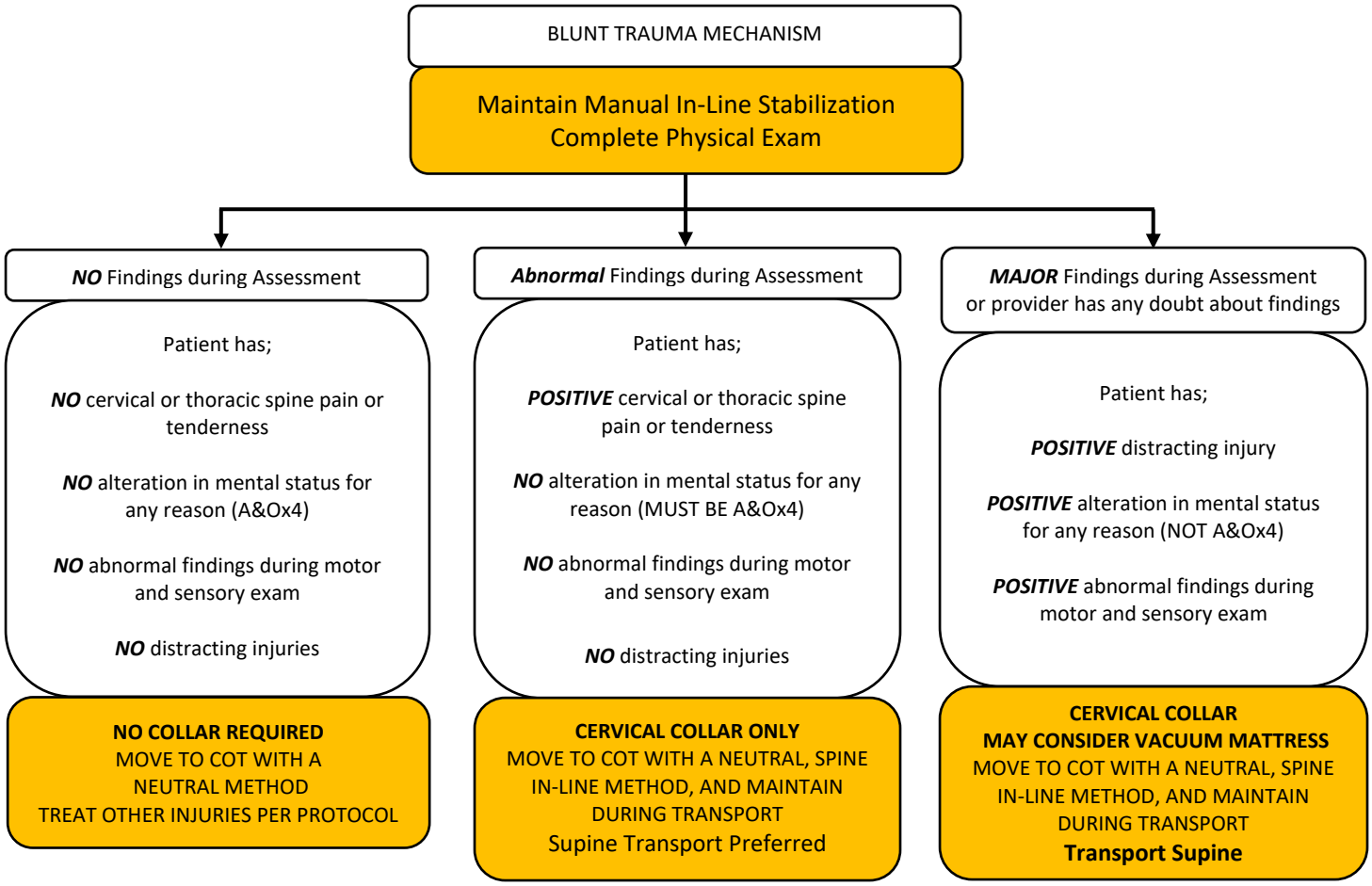
When Call is Answered, A Small Box Appears in the Lower Corner. This is the View the Hospital Sees. Direct Tablet and Viewer(s) to Area

Being Assessed. When Completed with Assessment and ETA, End Video Call

If video call dropped or unavailable, make hospital contact by standard radio or telephone methods

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | MED CONTROL Consult

# SPINAL MOTION RESTRICTION – ADULT *AND* PEDIATRIC




## KEY POINTS

- **Vacuum mattresses may be used for major findings patients, but backboards alone may be harmful. Neutral placement on a cot mattress or a Reeves stretcher with a cervical collar is sufficient if a vacuum mattress is unavailable.**
- Backboards and KED's can still be used for extrication.
- If a backboard is used for extrication, the patient may be left on the board during transport as situationally required.
- If a vacuum mattress is used, place a sheet over the mattress prior to placement of the patient on the device.
- If a vacuum mattress is used, a backboard may be used underneath to provide additional support as required.
- Never leave patients alone if they are collared and supine. Be prepared to turn the patient while maintaining manual in line stabilization of the spine if the patient begins to vomit to maintain their airway.
- **Penetrating trauma does not require cervical motion restriction unless there is evidence of focal neurological deficits.**
- Document thoroughly the decision process and the assessment findings for treatment decision(s).
- Patients shall not be aided to stand then sit on a backboard during extrication. Non-ambulatory patients shall be properly extricated to a backboard or with the use of a KED.
- Mental Status (AVPU), Glasgow Coma Scale (GCS), and thorough documentation of Motor, Sensory, and Pulses (MSP'S) are required to support treatment decisions.
- Mental status defects despite origin will be treated as equal, whether drug, alcohol, traumatic, chronic brain dysfunction, or otherwise

| TRAUMA |
|---|
| **HELMET REMOVAL** |

| REMOVAL OF HELMET | LEAVE HELMET IN PLACE |
|---|---|
| • Inability to access, assess and maintain airway and breathing<br>• Improperly fitted helmet allowing for excessive head movement within helmet<br>• Proper C-spine alignment and immobilization cannot be achieved<br>• Cardiac arrest<br>• EMTs are trained in technique | • Helmet fits well with little or no movement of head in helmet<br>• No impending airway or breathing problems<br>• Removal may cause further injury<br>• Proper C-spine alignment and immobilization can be achieved with helmet in place<br>• There is no interference with the ability to assess and reassess airway and breathing |

**KEY POINTS**

**Helmet Types:**

1. Sport (Football, Ice Hockey, Field Hockey, Fencing, Baseball)
   - Typically, open anteriorly
   - Easier to access airway
   - If shoulder pads are used in conjunction with helmet and helmet is removed, then shoulder pads need to be removed simultaneously for proper C-spine alignment.

2. Motorcycle / Bike / Skateboarding
   - When full-faced, airway is harder to access and maintain.
   - Face shield may be removed for airway access.

**SPORTS HELMETS PROCEDURE:**

1. Most fit athlete tightly, especially football. They should be left in place.
2. All are equipped to have face piece removed separate from helmet. In most cases, removal of facemask is all that is needed, as the alignment of c-spine can be done with shoulder pads and helmet in place.
3. Removal of facemask may be done by cutting snubber straps that hold it in place to access airway.

**Removal**:

- If helmet must be removed due to unusual circumstances, at least 4 people are needed.
- Shoulder pads need to simultaneously be removed. (When shoulder pads are involved is to use forearms to stabilize helmet and place hands at base of neck grasping the shoulder area).
- **While maintaining manual c-spine**, Helmet's inside face pads may be loosened by use of a tongue blade to unsnap them with a twisting motion. Then cut the shoulder pads laces and straps and all shirts and jerseys from end of sleeve to center to allow for quick removal.
- Lift patient flat up for removal of equipment. Helmet should be grasped and tilted slightly to remove – **DO NOT SPREAD SIDES OR BACK EDGE OF HELMET, WILL IMPINGE UPON NECK.**
- At same lift, pull off shoulder pads and clothing.
- Lower patient down and apply c-collar.

**MOTORCYCLE / BIKE / SKATEBOARDING HELMETS PROCEDURE:**

1. Usually do not fit tightly and may allow movement of head inside helmet.
2. If head can move, no c-spine immobilization is possible.
3. Some have separate face piece that can be moved for airway access.
4. Some have full face design that is not moveable where chin section is a rigid continuation of the helmet.
5. C-spine alignment difficult due to no shoulder padding. Must create pad to form straight alignment.
6. If unable to secure c-spine of airway, the helmet should be removed at the scene.

**Removal:**

- Take eyeglasses off before removal of the helmet.
- One EMT stabilizes the helmet by placing hands on each side of the helmet with fingers on mandible to prevent movement.
- Second EMT removes any straps by cutting them.
- Second EMT places one hand on the mandible at the angle of the jaw and the other hand posteriorly at the occipital region.
- The EMT holding the helmet pulls the sides of the helmet outwards away from the head and gently slips the helmet halfway off and stops.
- The EMT maintaining stabilization of the neck repositions hold by sliding the posterior hand superiorly to secure to head from falling back after complete helmet removal.
- Helmet is then completely removed.

# BLEEDING / HEMORRHAGE CONTROL

## TOURNIQUET

**INDICATIONS**

- The tourniquet is a device which is used for life threatening appendage hemorrhage that cannot be controlled with direct pressure and conventional bandaging techniques.

**PROCEDURE**

1. Place the device around the injured appendage above the level of bleeding. Place two tourniquets around lower extremities, one above the other.
2. Pull strap tight.
3. Turn windlass rod or knob to tighten to control bleeding.
4. Monitor the site, distal pulses should be absent if properly tightened.

Apply tourniquet proximal to the bleeding site. Route the band around the limb and pass the tip through the inside slit of the buckle. Pull the band tight.

Pass the tip through the outside slit of the buckle. The friction buckle will lock the band in place.

Pull the band very tight and securely fasten the band back on itself.

Twist the rod until bright red bleeding has stopped and the distal pulse is eliminated.

Place the rod inside the clip; locking it in place. Check for bleeding and distal pulse. If bleeding is not controlled, consider additional tightening or applying a second tourniquet proximal side by side to the first and reassess.

Secure the rod inside the clip with the strap. Prepare the patient for transport and reassess. Record the time of application.

**KEY POINTS**

- Apply directly to the skin 2-3 inches above wound.
- A distal pulse check should be accomplished. If a distal pulse is still present, consider additional tightening of the tourniquet or the use of a second tourniquet side by side and proximal to the first, to eliminate the distal pulse.
- Apply two tourniquets to lower extremity wounds. Tighten both.
- Expose and clearly mark all tourniquet sites with the time of tourniquet application.
- Use tourniquets to control life-threatening external hemorrhage that is possible to apply a tourniquet to for any traumatic amputation.
- Apply tourniquet to bare skin during normal use.
- Apply over clothing in tactical / hot / warm zone

# BLEEDING / HEMORRHAGE CONTROL

## iT CLAMP

**INDICATIONS**

- The ITClamp50 device is indicated for use as an acute skin closure device for short-term soft tissue approximation to inhibit severe bleeding in trauma wounds, lacerations, junctional bleeds, or surgical incisions.

PROCEDURE

1. Open the package by pulling forward on the outer tabs.
2. Remove the device from the package by lifting, taking care not to close the device until it has been applied to the wound.
3. If the device has inadvertently closed, push the side buttons inward with one hand, and pull the device open with the other hand.
4. Locate the wound edges (fig 1).
5. Align the device parallel to the length of wound edge. Position the needles about 1-2 cm (0.5-1 in.) from the wound edge on either side (fig 2).
6. Press the arms of device together to close the device. Device seal will break with pressure (fig 3).
7. Ensure the entire wound is sealed and bleeding stops (fig 4).
8. A gauze or compression wrap can be placed around the device on the wound to protect the device and increase pressure on the wound to limit hematoma expansion.

**NOTE:** More than one device may be required.

).

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

### REMOVAL

(Two-handed operation):

1. Holding the device by the arms, press the device closed (fig 5).

FIGURE 5

2. While maintaining pressure on the arms, press the release buttons with your other hand (fig 6).

FIGURE 6

3. While pressing the release buttons, pull the arms to open the device and rotate the needles out of the wound (fig 7 and 8).

# BLEEDING / HEMORRHAGE CONTROL

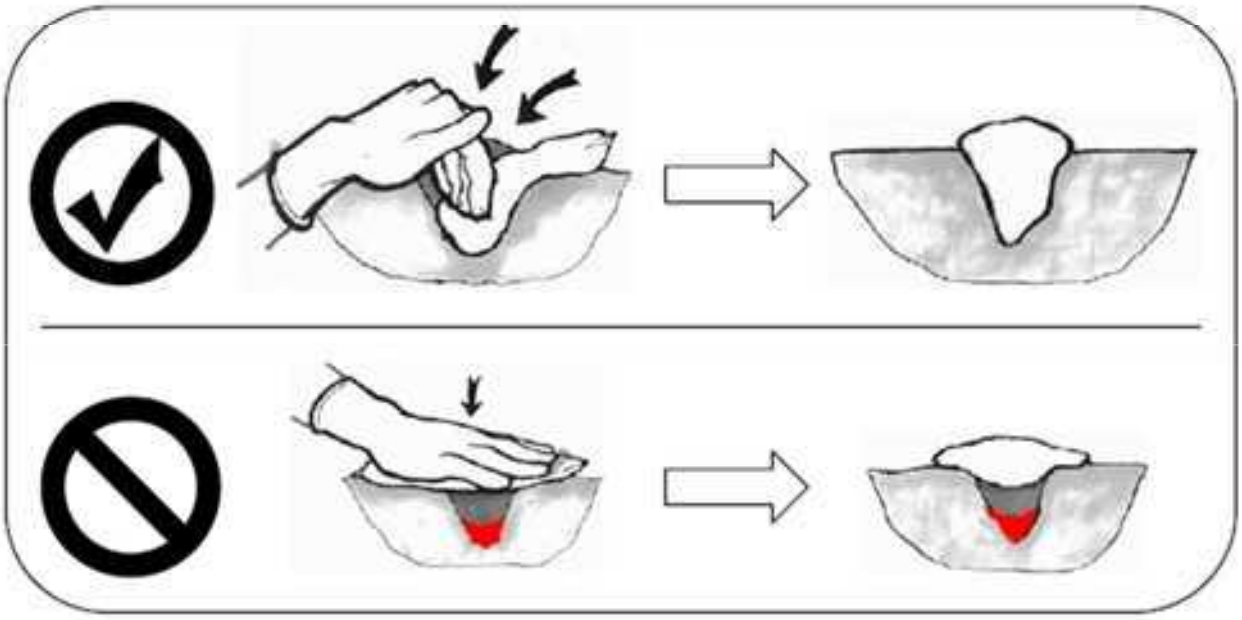
## HEMOSTATIC GAUZE

**INDICATIONS**

- Hemostatic gauze is indicated for supplemental bleeding control in addition to direct pressure where other methods of hemorrhage control are unable to be utilized due to location and direct pressure with standard gauze product has or is likely to fail.

PROCEDURE

1. Open hemostatic gauze package
2. Pack wound with contents
3. Apply pressure for at least 3 minutes
4. Apply standard bandaging over hemostatic gauze to maintain pressure
5. Take hemostatic gauze package with instructions for removal to ER

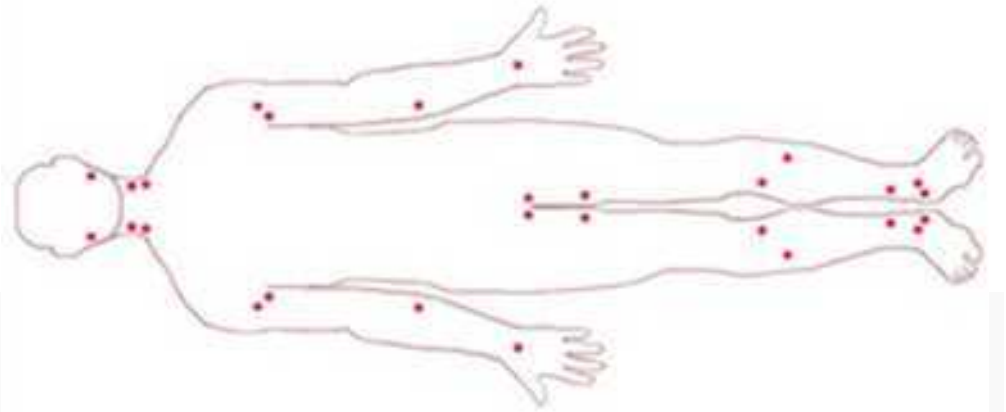


# BLEEDING / HEMORRHAGE CONTROL

## Direct pressure / Gauze

Placing pressure on the wound will constrict the blood vessels manually, helping to stem any blood flow. When applying pressure, the type and direction of the wound may have an effect, for instance, a cut lengthways on the hand would be opened by closing the hand into a fist, whilst a cut across the hand would be sealed by making a fist. A patient can apply pressure directly to their own wound, if their consciousness level allows. Direct pressure can be used with some foreign objects protruding from a wound; padding is applied from each side of the object to push in and seal the wound - objects are never removed. Use available gauze products to cover wounds and roll gauze products and / or tape to provide continued pressure to wounds

## Pressure points



The arterial pressure points

In situations where direct pressure and elevation are either not possible or proving ineffective the use of pressure points to constrict the major artery which feeds the point of the bleed is indicated. This is usually performed at a place where a pulse can be found, such as in the femoral artery. There is particularly high danger if constricting the carotid artery in the neck, as the brain is sensitive to hypoxia and brain damage can result within minutes of application of pressure. Pressure on the carotid artery can also cause vagal tone induced bradycardia, which can eventually stop the heart. Other dangers in use of a constricting method include rhabdomyolysis, which is a buildup of toxins below the pressure point, which if released back into the main bloodstream may cause renal failure.

## Wound Packing

**Step 1: Stop the bleeding. Now!** Immediately apply direct pressure to the wound, using gauze, clean cloth, elbow, knee-whatever it takes to slow or stop the hemorrhage-until you have time to get out your wound packing supplies.

**Step 2: Pack the wound with gauze. Tightly!** Your goal is to completely and tightly pack the wound cavity to stop hemorrhage. Begin packing the gauze into the wound with your finger, while simultaneously maintaining pressure on the wound.

**When no more gauze can be packed inside the wound, hold direct pressure on the wound for 3 minutes**
It is critical that the gauze be packed as deeply into the wound as possible to put the gauze into direct contact with the bleeding vessel.

**Step 3: Keep packing!** The key to successful wound packing is that the wound be *very* tightly packed, applying as much pressure as possible to the bleeding vessel. This pressure against the vessel is the most important component of hemorrhage control. This explains why plain gauze (without an impregnated hemostatic agent), when tightly packed, is also quite effective.

**Step 4: Apply very firm pressure to the packed wound for 3 minutes.** This step pushes the packing firmly against the bleeding vessel and aids in clotting.

**Step 5: Secure a snug pressure dressing and transport.** After applying pressure for 3 minutes, place a snug pressure dressing over the wound. You may consider splinting or immobilizing the area, if possible because movement during transport can dislodge the packing and allow hemorrhage to restart.

# PELVIC STABILIZATION DEVICE

**INDICATIONS**

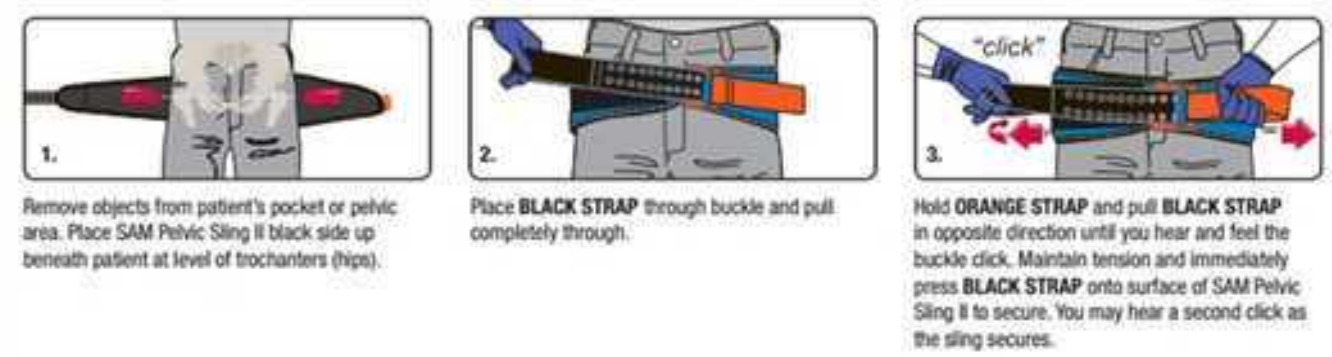
- Suspected adult pelvic fractures and dislocations.

**PROCEDURE**

1. Unfold Pelvic Sling with white surface facing up.
2. Place white side of Pelvic Sling beneath patient at level of buttocks.
3. Firmly close Pelvic Sling by placing black Velcro side of flap down on the black Velcro strip (fold material and center at midline).
4. Grab orange handle on outer surface of flap and release from flap by pulling upward.
5. Firmly pull both orange handles in opposite directions to tighten the Pelvic Sling.
6. Keep pulling free handle until you feel or hear the buckle click.
7. As soon as the buckle clicks, maintain tension and firmly press orange handle onto the black Velcro strip.

**TO REMOVE PELVIC SLING**

1. Lift orange free handle away from flap by pulling upward. Maintain tension and slowly allow Pelvic Sling to loosen.




Device goes over greater trochanters not over the illiac crest

**KEY POINTS**

1. Of 120,000 pelvic fractures reported in the U.S. in a typical year, 21,000 were pelvic ring fractures.
2. The mortality rate of pelvic fractures is reported to be more than 25%.
3. The combination of pelvic ring fractures with other injuries increases the mortality rate.
4. Stabilizing pelvic fractures reduces blood loss.
5. Victims are often confused or unconscious making it difficult to diagnose pelvic fractures without X-rays or CT scans. Physical examination is inaccurate approximately 90% of the time.
6. Trauma surgeons and emergency department physicians have recognized the benefits of circumferential pelvic compression.
7. At the time of initial evaluation, the exact type of facture is usually unknown. In some cases, too little force will not close or stabilize the fracture, in others, too much force can collapse the pelvic ring.
8. Because of the potentially devastating hemorrhage associated with pelvic fractures, standard first aid protocol has included applying some type of circumferential binder around the victim's hips.
9. Cannot be over-tightened. The force applied is safe and correct.
10. Standard size fits 95% of the population without cutting or trimming.

**NOT RECOMMENDED FOR USE ON CHILDREN**

# TRACTION SPLINT DEVICE PROCEDURE

**Indications**

A suspected or obvious isolated fracture of the midshaft femur is an indication for traction splint. If there are other fractures in the foot or ankle traction may not be effective, because traction splints require support on strap sites to be able to apply traction.

**Contraindications**

- Fractures of ankle or foot
- Partial amputation or avulsion with bone separation while only marginal tissue connects the distal limb
- Hip or pelvis injury

**Evaluation**

Clinical diagnosis is usually obvious from mechanism, pain, swelling, and deformity/shortening of the thigh. Extreme pain may mask these secondary injuries. Since most of the femur fracture occurs with high energy trauma, pelvic ring, hip, groin, perineum, and buttock evaluations are crucial. Up to 40% of the femur fractures are associated with an ipsilateral knee injury.

The clinician should assess distal pulses (popliteal, dorsalis pedis, posterior tibialis) with capillary refills on the ipsilateral toenails.

Neurologic injury with isolated femoral shaft fracture is rare, but a careful motor and sensory assessments are important. A standard neurovascular exam of the extremity distal to a femur fracture should include a sharp and light subjective sensation of the sural, saphenous, superficial peroneal, deep peroneal, and tibial nerves. Examiners should assess for dorsiflexion and plantarflexion of the ankle and great toe. In a presumed femur fracture, assessment of the motor function of knee flexion and extension will be limited, but a brief ligamentous examination is appropriate. One should not miss signs of gross knee instability or knee dislocation, which carry a very high association with an acute neurovascular injury that may require urgent surgical intervention and stabilization.

***Bipolar Traction Splints***

It maintains bipolar traction with two steel rods on both sides of the limb. Most importantly, the bipolar traction splint was more compact, easy, and effective for a femur fracture. The bipolar splint is not effective with proximal femur shaft fracture because the ischial pad may rest directly under the fracture. An adult unit is not adjustable for pediatric patients. Below is a simplified application guide.

- Stabilize the injured leg.
- Position the splint against the uninjured leg to adjust the length.
- Place splint under the patient's leg and place the ischial pad against the ischial tuberosity.
- Adjust splint to length, then attach ischial strap over the groin and thigh.
- Apply the ankle hitch to the patient.
- Apply gentle but firm traction until the injured leg length is approximately equal to the uninjured leg length.
- Secure the remaining straps around the leg.
- Reassess proximal / distal neurovascular function.

***Unipolar Traction Splints***

A unipolar traction is unipolar traction. One steel rod sits between a patient's legs and applies traction from the ankle with counter pressure directed onto the ischial tuberosity. unipolar splint sits between the leg against the ischial tuberosity, so it is more effective for proximal femur fracture than hare splint. Also, one unipolar splint can be used for a bilateral femur fracture. However, there is an increased risk of damage to the genitalia as the splint can move from the initial ischial tuberosity placement during transport. unipolar traction splint can measure the actual traction applied on the gauge. The optimal traction is roughly 10% to 15% of a patient's body weight.

- Position the splint between the patient's legs, resting the saddle against the ischial tuberosity.
- Attach the strap to the thigh.
- Secure the ankle strap tight.
- Gently extend the inner shaft until the desired amount of traction, approximately 10% of the patient's body weight.
- Adjust the thigh/leg/foot strap.
- Reassess proximal / distal neurovascular function.

PHARMACOLOGY

# NITROUS OXIDE ADMINISTRATION

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Injury requiring pain management<br>• Patient able to self-administer | • Chest pain secondary to infarction or angina<br>• Acute urinary retention<br>• Fractures<br>• Severe burns<br>• Kidney stones<br>• Musculoskeletal trauma | • Altered level of consciousness<br>• Head injuries<br>• Chest injuries (blunt or penetrating)<br>• Intoxication<br>• Maxillofacial injuries<br>• Psychiatric problems<br>• COPD (because of the 50% oxygen mixture)<br>• Pediatric patients under 12 years of age<br>• Pregnancy<br>• Respiratory distress<br>• Abdominal pain |

PARAMEDIC Intervention

AEMT Intervention

**PROCEDURE**

1. Instruct patients to administer nitrous oxide to themselves by placing the mask tightly against their face and breathing deeply and slowly
2. Allow mask to fall away from face spontaneously when effects are felt
3. Check blood pressure, as nitrous oxide may cause BP to drop in some cases

**KEY POINTS**

- Nitrous oxide is a self-administered analgesic gas containing a mixture of 50% oxygen and 50% nitrous oxide.
- Nitrous oxide is supplied in a carrying case containing two cylinders, one of nitrous oxide and one containing oxygen, with a mixing valve and supply tubing. These agents are mixed on administration to deliver a 50% concentration of each to the patient.
- Nitrous oxide should be given to any patient who is alert and complaining of severe pain.
- Only self-administration by the patient is to be used.
- Upon administration of nitrous oxide, constantly monitor patient to see he does not fall asleep with mask in place.
- The side effects of nitrous oxide, in addition to analgesia, include light-headedness, drowsiness, and very occasionally nausea and vomiting. Changes in heart rate and respiratory rate are minimal.
- Nitrous oxide and oxygen are both non-flammable gases, but both support combustion. For this reason, do not use nitrous oxide in areas where there is a combustion hazard.

**There is an increased risk of liver cancer and birth defects to individuals who are exposed repeated applications of nitrous oxide. For this reason, nitrous oxide should be used in a well-ventilated environment.**

# TASERED PATIENT

**INDICATIONS**

- Any patient that was subjected to taser use.

**PROCEDURE**

1. Follow Universal Patient Care Protocol.
2. Confer with law enforcement officer regarding the patient's behavior prior to EMS arrival.
3. Refer to the appropriate medical protocol if the patient has a life-threatening injury or medical illness or continues to be combative.
4. Determine the location of the Taser probes. Do not attempt to remove barbs if they are embedded in the eyes, ears, nose, mouth, face, neck, genitals, spine, hands, feet, joints
5. Confirm that the TASER has been shut off and the barb cartridge has been disconnected
6. Remove Probes
7.

**If probe removal tool is available (see TASER 7 below):**

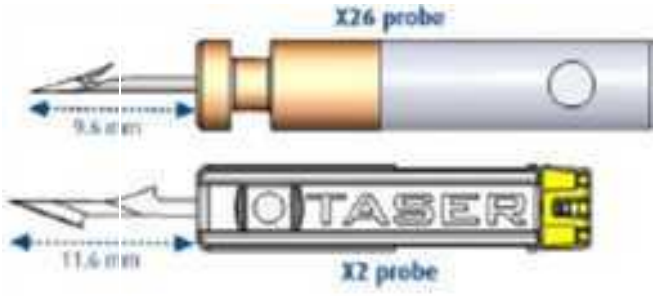
- Place one hand on the patient in the area where the probe is embedded and stabilize the skin surrounding the puncture site
- Slide safety clip notch between the probe and the subject, catching the probe between the dart body and the dart point
- In one uninterrupted motion pull the safety clip--and probe with it--straight out of the puncture site maintaining a 90-degree angle to the skin (avoid twisting or bending the probe)

**If probe removal tool is not available:**

- Place one hand on the patient in the area where the probe is embedded and stabilize the skin surrounding the puncture site while using the other hand (or pliers) to firmly grasp the probe
- In one uninterrupted motion pull the probe out of the puncture site maintaining a 90-degree angle to the skin (avoid twisting or bending the probe)

Once the barb is removed and clean the area apply a dressing as necessary. If the whole barb has not been removed the patient will need further evaluation to have the remainder of the barb removed

1. Perform a Diagnostic EKG and continuously monitor the patient's EKG if the patient has irregular / abnormal pulse, elderly, pacer, AICD, known CAD. If the patient has a dysrhythmia, refer to the appropriate protocol.

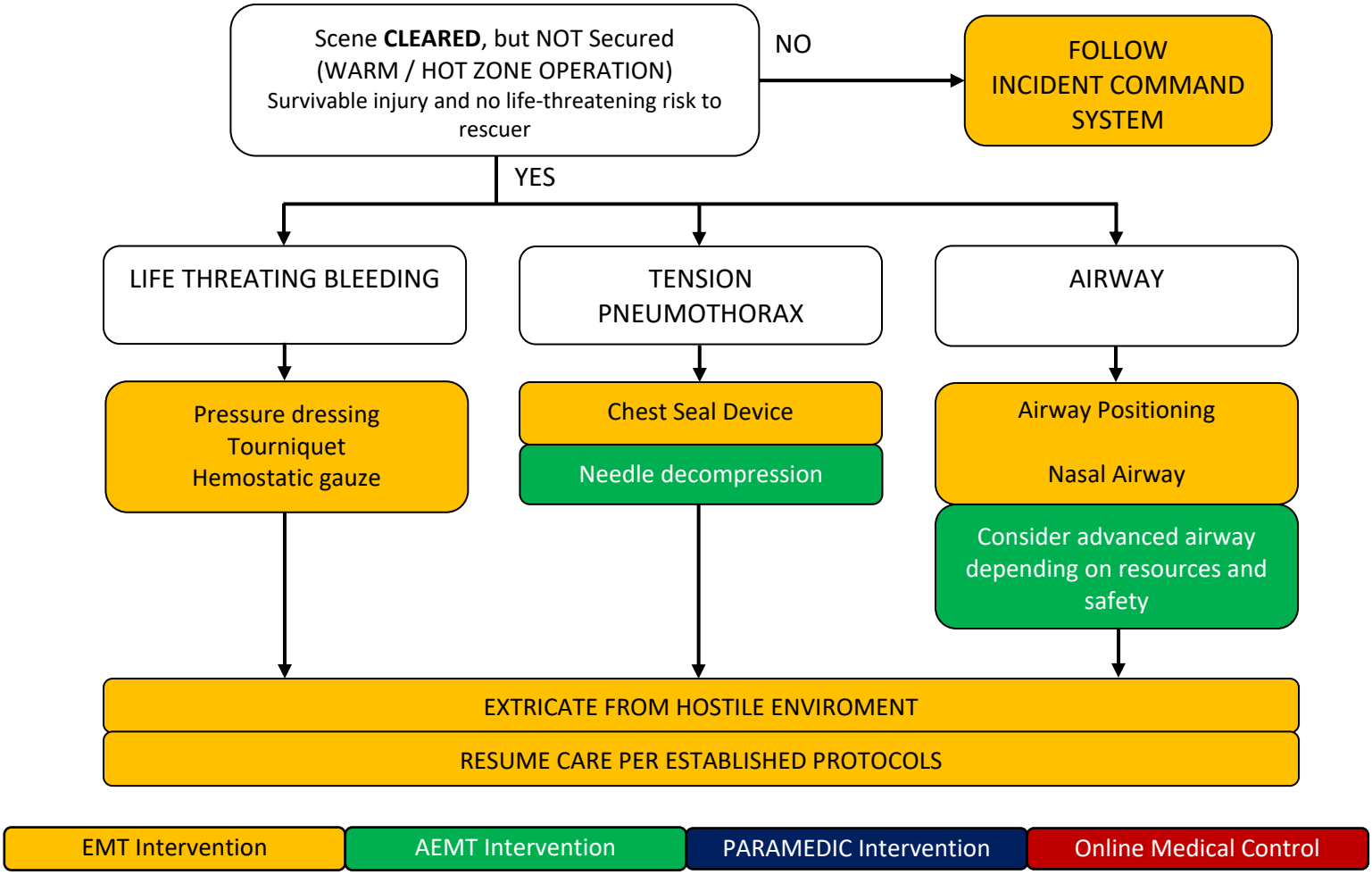


**KEY POINTS**

- With the increased use and deployment of TASERs by our area's local law enforcement agencies, EMS providers must be aware of the appropriate medical assessment of the tasered patient. The TASER is designed to transmit electrical impulses that temporarily disrupt the body's central nervous system. Its Electro-Muscular Disruption (EMD) Technology causes an uncontrollable contraction of the muscle tissue, allowing the TASER to physically debilitate a target regardless of pain tolerance or mental focus.
- All patients subjected to taser use must be assessed for trauma and medical causes for the combative behavior.
- Always apply the cardiac monitor and obtain a strip for patients with irregular / abnormal pulse, elderly, pacer, AICD, known CAD, or excited delirium.
- The patient's vital signs must be reassessed every 5 minutes.
- Determine if the patient used any mind-altering drugs, has a cardiac history, and the date of their last tetanus shot.
- The cord or wire may be cut, but leave the probes embedded in the patient.
- Removal of the probe. (Remove one at a time).
- Stabilize the skin surrounding the puncture site by placing one hand where the probe is embedded.
- Pull the probe straight out from the puncture site in one fluid motion.
- TASER barbs that do penetrate the skin and are removed in the field are to be treated as "contaminated sharps" and are to be placed in an appropriate sharps container. Use small single use containers as law enforcement may wish to hold custody of the barbs after removal.

**SPECIAL OPERATIONS**

# ACTIVE SHOOTER / DIRECT THREAT PROTOCOL




**KEY POINTS**

- To be used in direct threat when scene has been cleared but not secured (Warm Zone).
- Priority is to intervene on immediate life-threatening conditions.
- Direct Threat Care is the care rendered by the medical provider while the provider and the patient are still within an effective hostile environment. These protocols are intended to be a guideline to medical intervention and cannot replace sound judgment and situational awareness. Providers are also cautioned not to rely on these protocols as a sole source of information about patient care, but rather to tailor their therapy to the clinical situation.
- Expedite removal to indirect threat environment.
- There is no need to immobilize the cervical spine with only penetrating trauma to the extremities or trunk. Consider cervical immobilization for penetrating neck trauma.
- Once scene secured, return to standard protocols.
- Warm / Hot Zone terminology should be considered the same as Inner Ring terminology for the purpose of this protocol.

| SPECIAL OPERATIONS |
|---|
| **PATIENT DECONTAMINATION** |

| INDICATIONS | SIGNS AND SYMPTOMS | PRECAUTIONS |
|---|---|---|
| • Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons. | • Ambulatory / Non-Ambulatory<br>• Exposure to toxic substances (dry, liquids, fumes)<br>• Irritants<br>• Emergent / Non- Emergent | • Dry chemicals must be wiped off prior to wet decontamination<br>• Clothing must be removed<br>• Maintain patient privacy as needed.<br>• Gross Decon (Primary)<br>• Fine Decon (Secondary) |

**PROCEDURE**

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

Notify Hospital EARLY of contaminated patients; assure time for mobilization of Hospital Emergency Response Team (H.E.R.T) or other resources.

SPECIAL OPERATIONS

# NERVE AGENT EXPOSURE KIT

ENSURE SCENE SAFETY AND PROPER PPE

UNIVERSAL PATIENT CARE PROTOCOL

Obtain history of exposure
Observe for specific toxidromes
Initiate triage and / or decontamination as indicated

Assess for presence of major or minor symptoms

MINOR SYMPTOMS
(Self-Treatment)
Salivation
Lacrimation
Visual Disturbances

DuoDote x 1 – 2 sets
IM Rapidly

Monitor for appearance of major symptoms

***SLUDGEM***
SALVIATION
LACRIMATION
URINATION
DEFICATION
GASTROINTESTINAL DISTRESS
EMESIS
MUSCLE TWITCHING

MAJOR SYMPTOMS
(Buddy Treatment)
Altered LOC
Seizures
SOB
Respiratory Arrest

DuoDote x 3 sets
IM Rapidly

If Seizures:
DIAZEPAM (VALIUM)
Auto-Injector IM

If Continued Seizures:
MIDAZOLAM
2 mg IV / IO or 5 mg IN / IM
Or
LORAZEPAM
1 - 2 mg IV / IO / IN / IM

If Continued SLUDGEM Symptoms:
ATROPINE
2 mg IV / IM
q 5 minutes until symptoms resolved

**TRANSPORT** to appropriate facility
**CONTACT** receiving facility
**CONTACT** Medical Control where indicated

EMT Intervention | AEMT Intervention | PARAMEDIC Intervention | Online Medical Control

**SPECIAL OPERATIONS**

# NERVE AGENT EXPOSURE KIT

| INDICATIONS | SIGNS AND SYMPTOMS | CONTRAINDICATIONS |
|---|---|---|
| • Nerve agent exposure (e.g., VX, Sarin, Soman, etc.)<br>• For use of Fire, EMS, and Police personnel **only** | • Visual disturbances<br>• Headache<br>• Nausea / vomiting<br>• Salivation<br>• Lacrimation<br>• Respiratory distress<br>• Diaphoresis<br>• Seizure activity<br>• Respiratory arrest | • Vesicant exposure (e.g., Mustard Gas, etc.)<br>• Respiratory irritant exposure (e.g., hydrogen sulfide, ammonia, chlorine, etc.) |

## KEY POINTS

- If Triage / MCI issues exhaust supply of Mark 1 kits or DuoDotes, use Atropine. Give 2 mg IM dose for patients greater than 90 pounds (>40kg).
- Follow local HAZMAT protocols for decontamination and use of personal protective equipment.
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure they not from exposure to another agent. (e.g., narcotics, vesicants, etc.)
- Each DuoDote auto injector contains both 600 mg of pralidoxime (2-PAM) and 2.1 mg of atropine
- Each valium auto injector contains 10 mg of valium
- If the presence of a nerve agent is suspected by presentation of symptoms of large numbers of patients, personnel should immediately contact dispatch to notify other responding units and command staff.
- The patient and / or crew must be decontaminated prior to transport. DO NOT transport a contaminated patient to a treatment facility.
- SLUDGEM: Salivation, Lacrimation, Urination, Gastrointestinal upset, Emesis, Muscle twitching.
- When the nerve agent has been ingested, exposure may continue for some time due to slow absorption from the lower bowel, and fatal relapses have been reported after initial improvement.
- If dermal exposure has occurred, decontamination is critical and should be done with standard decontamination procedures. Patient monitoring should be directed to the same signs and symptoms as with all nerve or organophosphate exposures.
- Continued medical monitoring and transport is mandatory.

# BLOOD COLLECTION FOR EVIDENCE (OHIO SENATE BILL 58)

PARAMEDIC Intervention

AEMT Intervention

Ohio Senate Bill 58 became Law in September 2010.

The Law includes provisions for EMS providers to withdraw blood for evidence collection in cases involving allegations of operating watercraft or vehicles under the influence.

The language of the bill states that drawing blood "shall" not be done for evidence collection "in the course of" providing emergency medical treatment.

- You CANNOT be dispatched or called by the police for the sole purpose of performing phlebotomy when the person does not require emergency medical treatment.
- The Paramedic / AEMT in charge can refuse law enforcements request to draw the blood if doing so would interfere with lifesaving patient care or outcome.
- The patient must consent to the collection of blood for evidence purposes.
  (If unconscious, Implied Consent applies)
- The Police Officer making the request must always be present during the draw and must provide the Paramedic / AEMT with the evidence collection kit.
- EMS Providers MUST use the evidence kit provided by law enforcement to obtain the blood samples for evidence.

# APPENDIX #3: MEDICAL CONTROL

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# EMS LEVELS OF CERTIFICATION

These protocols recognize that there is a role for all levels of Emergency Medical Technician Certification. Not every function defined by the State of Ohio is approved under specific hospital Medical Directors. Patient care should always be delivered at the highest level of EMS available. All Provider levels must function within the State of Ohio EMS Scope of Practice for their Provider level. Every EMS Provider must be aware of the State of Ohio requirements for recertification, and each individual is responsible for personally fulfilling these requirements. Those seeking to fulfill National Registry of Emergency Medical Technician (NREMT) requirements may do so under their own individual responsibility.

Continuing Education certifications must be received through an approved Continuing Education site with a valid accreditation number noted and must be filed properly. Each EMS Provider must maintain his / her own personal records and be responsible for his / her own Continuing Education status.

EMS Provider problems will be addressed promptly and documented by the Medical Director in conjunction with the EMS Coordinator, Fire / EMS Chief. A plan to resolve identified problems will be implemented. The Medical Director has the right to remove an EMS Provider from actively functioning under their Medical Control, either temporarily or permanently.

**RN as an EMS Provider**

**RN only as ALS provider**

- A RN is permitted to operate as an ALS provider with the following requirements;
- The agencies Medical Director has drafted a formal letter authorizing the RN to perform in accordance with EMS protocols.
- The RN has or obtains documented training in skills not covered in traditional RN education specific to EMS care. Examples may include (but are not limited to), Intubation or other advanced airways, extrication techniques or lifting and moving patients.
- A RN is not permitted to operate an emergency vehicle unless they have undergone an emergency vehicle operator course approved by the State of Ohio.
- A RN does NOT count toward the minimum staffing requirement set forth in the ORC 4765.43, unless also certified as an EMS provider.
- A RN still reports to the Board of Nursing, its laws, requirements, and regulations

**RN / EMS provider**

- An RN / EMS provider on an Ambulance can only function at the RN level of licensure when functioning as a third provider in conjunction with 2 other EMS certified providers.
- Otherwise, RN’s can only function at their EMS level of certification as a second provider of an ambulance.

# EMS RECERTIFICATION REQUIREMENTS

Please refer to the Ohio EMS website for current continuing education requirements

https://www.ems.ohio.gov/links/ems_CErequirementsEMS.pdf

For providers wishing to keep up their National Registry certification please refer to the National Registry website

https://nremt.org/document/recertification

# EMS COMMUNICATIONS

Direct communication by EMS with the receiving hospital is required to insure continuity of care and the accurate reporting of the incoming patient's condition, history, and treatment. A member of the prehospital care team must contact the receiving hospital at the earliest time that is conducive to good patient care.

If patient treatment advice is needed or if Medical Command orders are required per the protocol, Medical Command should be contacted. Medical Command will provide advice and any protocol orders deemed necessary in the care of the patient. If transporting the patient to another facility, EMS will then contact the receiving hospital as stated above.

**PURPOSE**

- To provide the receiving hospital and accurate, updated report of the patient's presentation and condition throughout prehospital care and transport.
- To allow the receiving hospital the opportunity to prepare for receiving the patient and continue necessary medical treatment.

**PROCEDURE**

1. Contact the receiving facility and provide the following information:
   - Type of Squad: EMT, Advanced EMT, Paramedic
   - Age and Sex of Patient
   - Type of Situation: Injury and / or Illness
   - Specific Complaint: Short and to the point (i.e., chest pain, skull fracture)
   - Mechanism: MVA / MCA / Fall
   - Vital Signs: B/P / Pulse / Resp. / LOC / EKG
   - Patient Care: Airway Management, Circulatory Support, Drug Therapy
   - General Impression: Stable / Unstable
   - Destination ETA

**KEY POINTS**

- When calling in a report it should begin by identification of the squad calling, and the level of care that can be provided to the patient (EMT, AEMT, Paramedic) and the nature of the call (who you need to talk with, physician or nurse).
- Whenever possible, the EMS provider responsible for the highest level of direct patient care should call in the report.
- Although all EMS Providers have been trained to give a full, complete report, this is often not necessary and may interfere with the physician's duties in the Emergency Department. Reports should be as complete but concise as possible to allow the physician to understand the patient's condition.
- It is not an insult for the physician to ask questions after the report is given. This is often more efficient than giving a thorough report consisting mostly of irrelevant information.
- If multiple victims are present on the scene, it is advisable to contact Medical Control with a preliminary report. This should be an overview of the scene, including the number of victims; seriousness of the injuries, estimated on-scene and transport times to the control hospital or possible other nearby facilities. This allows preparation for receiving the victims and facilitates good patient care.

# EMS DOCUMENTATION

- An EMS patient care report form (PCR) will be completed accurately and legibly to reflect the patient assessment, patient care and interactions between EMS and the patient, for each patient contact which results some assessment component.
- Every patient encounter by EMS will be documented. Vital signs are a key component in the evaluation of any patient and a complete set of vital signs is to be documented for any patient who receives any assessment component.

**PURPOSE**

To document total patient care provided including:

- Care provided prior to EMS arrival.
- Exam of the patient as required by each specific complaint-based protocol.
- Past medical history, medications, allergies, living will / DNR, and personal MD.
- All times related to the event.
- All procedures / medications administered and their associated time and patient response.
- Notation of treatment authorization if any deviation from protocol / narcotic use.
- Reason for inability to complete or document any above item.
- A complete set of vital signs including GCS.

**PROCEDURE**

1. The patient care report should be completed as soon as possible after the time of the patient encounter.
2. All patient interactions are to be recorded on the patient care report form or the disposition form (if refusing care).
3. The patient care report form must be completed with the above information.
4. A copy of the patient care report form should be provided to the receiving medical facility.
5. A copy of the patient care report form is to be maintained by the EMS entity.
6. A copy of the patient care report shall be given to the Medical Director per his or her order.

**KEY POINTS**

- Document the contact and any on-line Medical Control that is given. If you are not able to reach Medical Control, document attempts and cause for failure. Always describe the circumstances of the call. It is very important to document the mental status of the patient who refuses transport. Any refusal call should also note the contact of Medical Control.
- The times vitals are taken must be noted. Vitals should be repeated every five minutes or following any medical treatments. Vitals should be completely recorded. If a part of the set of vitals is omitted, the reason should be clearly given.
- Use accepted medical abbreviations and terminology. Do not make them up.
- Try to spell correctly. Become familiar with the correct spelling of commonly used words.
- The name, dose, route, time and effect should be documented for all medications.
- When standards are followed such as in a full arrest; every step should be documented. To write "ACLS protocols followed" is NOT SATISFACTORY.
- When providing copies of the run report for the Emergency Department and the Medical Director, be sure to include the EKG strips and second sheets.
- A complete set of times must be recorded on every report.

**Documentation of Vital Signs:**

1. An initial complete set of vital signs includes:
   - Pulse rate
   - Systolic AND diastolic blood pressure
   - Respiratory rate
   - Pain / severity (when appropriate to patient complaint)
   - Pulse Oximetry
2. Every attempt should be made to auscultate blood pressures, however if unable to auscultate, a palpated pressure will suffice.
3. If the patient refuses this evaluation, the patient's mental status and the reason for refusal of evaluation must be documented, along with an offer to return and transport. Medical Control contact should be noted.
4. Document situations that preclude the evaluation of a complete set of vital signs.
5. Record the time vital signs were obtained.
6. Any abnormal vital sign should be repeated and monitored closely.
7. All completed run reports should contain a summary statement regarding patient status upon transfer or care and to whom.

# EMERGENCY DEPARTMENT RESTRICTIONS

This procedure provides for hospitals to notify the EMS departments of restrictions in their patient care capabilities. EMS departments should honor hospital restrictions unless doing so would endanger the patient.

**RESTRICTION EXCEPTIONS**

Regardless of what status a hospital has imposed on its facility, there are situations when EMS personnel should be able to transport a patient to the facility. These exceptions apply only to general hospitals having a full-service Emergency Department, and do not apply to specialty facilities. The type of cases that should always be accepted are as follows:

1. Patients in cardiac arrest due to either medical or traumatic causes.
2. Patients whose airways cannot be controlled by the EMS Personnel.
3. Patients felt to be in extremis to the point that diversion to another facility would dangerously delay needed immediate stabilization. This is based on the judgment of the EMS provider in charge.
4. Patients who typically receive their care at the hospital on diversion, and any diversion from that hospital would potentially jeopardize the expedient care of their emergency condition.
5. Unstable Pediatric patients
6. Unstable Obstetric patients
7. If the EMS provider in charge states that they are not comfortable diverting and states that transport must be made to the facility (due to family or physician situation / request).

# ADVANCED DIRECTIVES - DO NOT RESUSCITATE (DNR) ORDERS

**PURPOSE**

- Ideally, any patient presenting to the EMS system with a ***valid*** DNR form shall have the form honored and CPR and ALS therapy withheld in the event of cardiac arrest.
- To honor the end of life wishes of the patient
- To prevent the initiation of unwanted resuscitation

**PROCEDURE**

Ohio's DNR Comfort Care is the only law encompassing EMS. For any other type of DNR documents, you must contact Medical Control and describe your circumstances to a Physician. The Physician will then decide if EMS should honor the DNR document or begin resuscitation of the patient. This includes the Ohio Living Will or any other document to this effect.

A DNR order for a patient of a healthcare facility shall be considered current in accordance with the facility's policy. A DNR order for a patient outside a healthcare facility shall be considered current unless discontinued by the patient's attending physician / CNP / CNS or revoked by the patient. EMS personnel are not required to research whether a DNR order that appears to be current has been discontinued.

**STATE OF OHIO DNR COMFORT CARE GUIDELINES**

Under its DNR Comfort Care Protocol, the Ohio Department of Health has established two standardized DNR order forms.

**DNR Comfort Care – Terminally ill condition and in effect always.**

**DNR Comfort Care – Arrest – In effect in the event of a cardiac or respiratory arrest.**

When completed by a doctor (or certified nurse practitioner or clinical nurse specialist, as appropriate), these standardized DNR orders allow patients to choose the extent of the treatment they wish to receive at the end of life. Ohio DNR Comfort Care can be identified by the original / copy of the State of Ohio DNR Comfort Care Form with official DNR logo, a DNR Comfort Care necklace, bracelet, or card with official DNR Comfort Care logo, the form must be completed with effective date and signed by the patient's physician. To enact the DNR Comfort Care, the patient must be experiencing a terminal event. EMS is not required to search for a DNR identification but should make a reasonable attempt to identify that the patient is the person named in the DNR Comfort Care form. **Only the patient may request reversal of the DNR – Comfort Care.**

**CARE to be provided by EMS:**

- Suction the airway
- Administer oxygen (Including CPAP and BiPap)
- Position for comfort
- Splint of immobilize
- Control bleeding
- Provide pain medication
- Provide emotional support
- Contact other appropriate health care providers (hospice, home health, attending physician or certified nurse)

**Care NOT to be provided by EMS:**

- Administer chest compressions
- Insert artificial airway
- Administer **resuscitative** drugs
- Defibrillate or cardiovert
- Provide respiratory assistance (other than described above)
- Initiate **resuscitative** IV
- Initiate cardiac monitoring

START BLS CARE AND CALL MEDICAL CONTROL IF PRESENTED WITH ANY DNR OR TREATMENT LIMITING PAPERWORK THAT DOES NOT FEATURE THIS LOGO

| KEY POINTS |
|---|

- The DNR order addresses your current state of health and the kind of medical treatment you and your physician decide is appropriate under current circumstances.
- A DNR order for a patient of a health care facility shall be considered current in accordance with the facility's policy. A DNR order for a patient outside a health care facility shall be considered current unless discontinued by the patient's attending physician / CNP / CNS or revoked by the patient. EMS personnel are not required to research whether a DNR order that appears to be current has been discontinued.
- It is imperative that a copy of or the original DNR / Comfort Care orders and identification accompany the patient wherever the patient goes. This will help to alleviate any confusion between health care givers at multiple sites.
- Be careful to check the patient's DNR order or DNR identification to determine if DNR - CC or DNR - CC Arrest.
- EMS is not required to search a person to see if they have DNR identification. If any of the DNR identifiers are in the possession of the patient, EMS must make a reasonable attempt to identify the patient by patient's name given by patient, family, caregiver or friend, health care worker who knows the patient, ID band from health care institution, driver's license or another picture I.D. If identification cannot be verified, the protocol should be followed.
- The patient may request resuscitation even if he / she is a DNR Comfort Care or DNR Comfort Care-Arrest Patient and / or the DNR Comfort Care Protocol has already been activated. The patient's request for resuscitation amounts to a revocation of any or all DNR Comfort Care Status and resuscitative efforts must be activated.
- If EMS has responded to an emergency by initiating any of the "will not perform actions" prior to confirming that the DNR Comfort Care Protocol must be activated, discontinue them when you activate the protocol. You may continue respiratory assistance, IV medications, etc., that have been part of the patient's ongoing course of treatment for their underlying condition or disease.
- If the patient's family or bystanders request or demand resuscitation for a patient for whom the DNR Comfort Care Protocol has been activated, do not proceed with resuscitation. Provide "will perform actions" as outlined above and try to help them understand the dying process the patient's initial choice not to be resuscitated.
- For EMS - The Ohio DNR Comfort Care law is the only one you (EMS) can honor on your own. For any other types of DNR documents, you must contact Medical Control and describe your circumstances to a Physician. The Physician will decide if you should honor the DNR document or begin resuscitation of the patient.
- Your living will document specifies in advance the kind of medical treatment you would want when you have a terminal illness or are in a permanently unconscious state and are no longer able to state your own wishes. It may not protect you from receiving CPR or other heroics. It *only* takes effect if you are in a certifiably terminal or permanently unconscious state, and emergency squad personnel cannot determine if you meet these conditions.
- **A Health Care Power of Attorney is a document that names another person (usually a spouse, child, or other relative, and preferably someone who can understand your health status and make hard decisions on your behalf, if necessary) to make health care decisions for you whenever you are unable to do so yourself. It is not a DNR order, though it ordinarily would permit the person you appoint to agree to a DNR order for you, if you are unable to express your wishes at the time.**
- **The General Power of Attorney usually does not address health care issues and ends if you become disabled. You may have given your general power of attorney to someone to manage your financial affairs while you were on vacation or in the hospital. If you want a *general* power of attorney to continue, even if you become disabled, the document must state that it is a *durable,* or continuing, power of attorney. A health care power of attorney is a *durable* power; it continues even after you become disabled and appoints someone to carry out your health care wishes.**

# AEROMEDICAL TRANSPORT

**Helicopter / Hospital Intercepts**

If the patient requires specialized care, i.e. trauma center, and conditions allow for rapid transport to the nearest facility, a helicopter/hospital intercept can be initiated. When a helicopter / hospital intercept is initiated, the receiving hospital will be contacted, advised of request for helicopter intercept and minimum patient information of nature of call / chief complaint, and then the receiving hospital will direct the appropriate personnel to call for the helicopter.

**Scene Flights**

Scene flights will be organized with the cooperation of the responding EMS, fire, and law enforcement agencies. The following defines how the on-scene Incident Command (IC) should request an Air Ambulance to the scene of an emergency incident due to the mixture of public fire, EMS and private EMS systems.

- Recognize that it is safer to transport a patient from a well - lit, specially designed helipad than it is from an accident scene. EMS must be aware of the potential danger presented by poor lighting and potential scene hazards such as electrical wires or fire. Limit helicopter scene loading to the few cases where it is essential.
- Patient transportation via ground ambulance will not be delayed waiting for helicopter transportation. If the patient is packaged and ready for transport and the helicopter is not on the ground, or within a reasonable distance, the transportation will be initiated by ground ambulance.
- Time estimation should be made from the time the patient is ready for transport to arrival at the medical facility / the most appropriate trauma center. This should include aircraft response to the scene.
- The helicopter crew shall use their best judgment, at the suggestion of On - Line Medical Control, and / or prior guidelines agreed to with Off - Line Medical Control to determine the destination hospital.
- EMS should request aeromedical transport of the patient to the closest most appropriate hospital, based upon location, patient or family request, and the capabilities of the hospitals (i.e.: Trauma Center, OB Unit, etc.).

**A request for aeromedical service response may be initiated when one or more of the following conditions exists:**

- The patient's airway, breathing, or hemorrhage / circulation cannot be controlled by conventional means and the estimated arrival time of the air medical service is less than the time re- quired for ground transport to the nearest hospital.
- High priority patient with > 20-minute transport time.
- Entrapped patients > 10-minute estimated extrication time.
- Access hard to reach victims for whom the helicopter will have a special advantage.
- When enough other Mutual Aid resources are not available.
- Transport assistance in dispersing multiple, serious victims to more distant hospitals. It is recognized that in major emergency incidents, the local Emergency Management Plan permits no direct communications by squads with On-Line Medical Control.
- To bring a physician and equipment resources to a patient who specifically needs these on the scene. (Physician not available on all helicopter services).
- Multiple casualty incident with red / yellow tag patients.
- Multi-trauma or medical patient requiring life-saving treatment not available in prehospital environment (i.e., blood transfusion, invasive procedure, operative intervention).

If a potential need for air transport is anticipated, but not yet confirmed, an air medical transport ser- vice can be placed on standby.

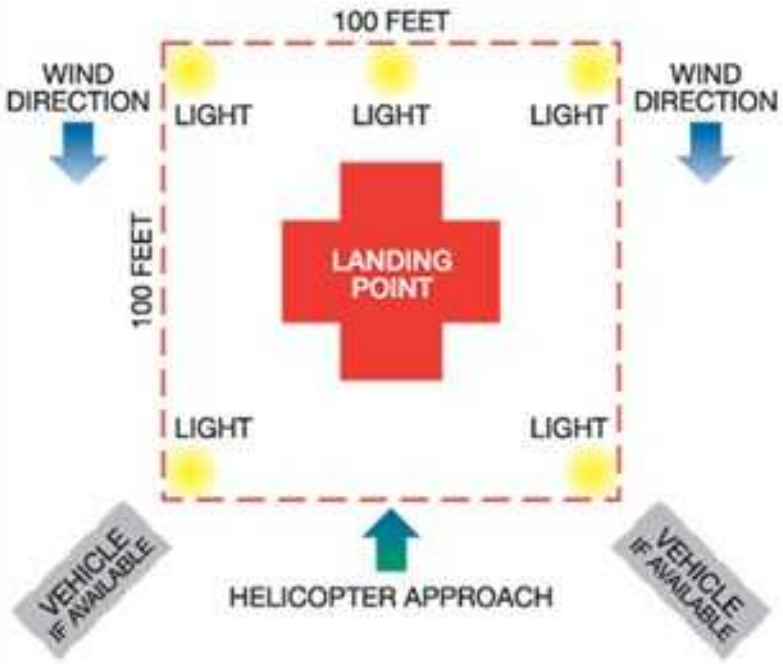
If the scene conditions or patient situation improves after activation of the air medical transport ser- vice and air transport is determined not to be necessary, paramedic or administrative personnel may cancel the request of air transport.

The minimum information which should be provided to the air medical transport service include:

a. Number of patients
b. Age of patients
c. Sex of patients
d. Mechanism of injury or complaint (MVC, fall, etc.)

**AEROMEDICAL LANDING ZONE (LZ) SET UP PROCEDURE**

1. LZ area should be free of obstructions. Eliminate these hazards:
    - Wires (surrounding the landing area and High-Tension power lines within 1/2 mile)
    - Towers (TV, Radio, Cellular within 1/2 mile)
    - Trees
    - Signs and Poles
    - Buildings
    - Vehicles
    - People
2. LZ area should be 100' X 100' if possible.
3. LZ should have as little of a slope as possible (less than 5 degrees).
3. LZ area should be a hard surface (concrete, asphalt, gravel, lawns, etc.).
4. LZ corners should be marked with highly visible devices (cones, flairs, strobes).
5. No debris on landing surface and within 100' of landing area.
6. Land the helicopter(s) a safe distance from the scene / patient.
7. Never point bright lights directly at the aircraft!
8. Maintain security of LZ while helicopter is present.
9. Landing Zone Briefing.
10. Type of LZ surface and size
11. How LZ is marked (cones, flairs, strobes, etc.).
12. All noted obstructions (see list above).




**NEVER ASSUME A FLIGHT CREW WILL SEE A HAZARD**
**NEVER APPROACH A HELICOPTER UNLESS DIRECTED BY FLIGHT CREW**

# ALTERNATIVE TRANSPORT GUIDELINES

- **Under the auspices of each individual EMS jurisdiction and the Medical director,** this protocol provides an alternative transportation option for use by EMS personnel for patients that do not require emergent ambulance transportation.

**PURPOSE**

- To provide a suggested alternative transportation option to non-emergent patients who do not require emergent ambulance transportation.

**PROCEDURE**

Before advocating other means of transportation, EMS personnel must perform ALL the following:

1. Appropriate medical exam, including vital signs.
2. Obtain pertinent patient information.
3. Contact Medical Control

## ALTERNATIVE TRANSPORT GUIDELINES

Patient complaints for which EMS personnel **may recommend other means of transportation** to medical care are limited to the following:

- Ear pain with no apparent object in ear
- Minor extremity lacerations with no gross loss of function
- Pain or burning on urination
- Penile discharge
- Minor vaginal discharge unless the patient is obviously pregnant or suspects she is pregnant
- Toothache without swelling or radiating jaw pain. Pt must be transported if evident of impending airway compromise
- Minor sore throats and colds
- Prescription refills
- Scheduled clinic appointments

## KEY POINTS

EMS personnel **MAY NOT** decline transport, or in any way suggest alternative means of transportation for any of the following patients, complaints, or situations:

1. Less than 18 years of age
2. Suicide Attempt
3. Intoxication
4. Abuse or negligence of adult or child
5. Any situation where the crew's best judgement indicates transport

- Whenever presented with a medical complaint other than those listed in the Alternative Transport Guidelines section follow the appropriate treatment protocol for patient care as authorized in these protocols or contact Medical Control

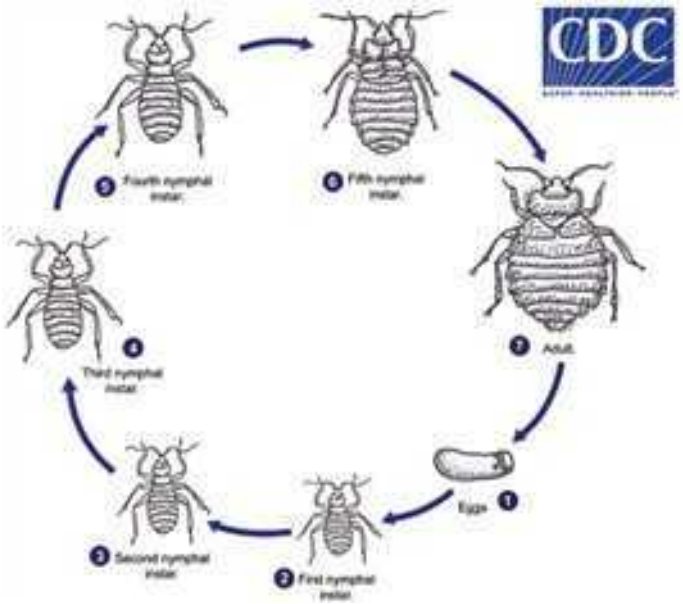
**DO NOT DEVIATE FROM THE GUIDELINES SET FORTH IN THE ALTERNATIVE TRANSPORT POLICY**

# BED BUGS

**PURPOSE:**
To provide personal protection recommendations to EMS providers who are presented with a patient in a known or suspected bed bug infestation.

**PROCEDURE:**

- Take universal precautions.
- Take only needed equipment into the area of infestation to minimize exposure.
- Seal equipment in plastic bags when necessary to prevent exposure.
- Avoid sitting on beds or furniture. If you must sit, do so on a hard surface.
- If you feel you have been infested, shower and seal clothes in a plastic bag.
- Place potentially exposed clothing in a hot dryer for 10 minutes to kill the bugs.
- Footies, caps, and gloves should be worn if available during care.
- Remove these items before entering the vehicle and place in a plastic bag.
- Dispose of trash bags containing used PPE equipment in sealed containers.
- Keep patients wrapped during transport as much as possible to prevent transfer of bed bugs to the ambulance, or locations other than the hospital room the patient is put into.
- Clean and disinfect the vehicle as soon as possible.
- Notify the receiving facility as soon as possible regarding potential for bed bug exposure.



# CHILDREN WITH SPECIAL HEALTCHCARE NEEDS

**GENERAL CONSIDERATIONS**

1. Treat the ABC's first. Treat the child, not the equipment. If the emergency is due to an equipment malfunction, manage the child appropriately using your own equipment.

2. Children formerly cared for in hospitals or chronic care facilities are often cared for in homes by parents or other caretakers. These children may have self-limiting or chronic diseases. There are multitudes of underlying medical conditions that may categorize children as having special needs. Many are often unstable and may frequently involve the EMS system for evaluation, stabilization, and transport. Special needs children include technology-assisted children such as those with tracheostomy tubes with or without assisted ventilation, children with gastrostomy tubes, and children with indwelling central lines. The most serious complications are related to tracheostomy problems.

3. Children with Special Healthcare Needs (CSHCN) have many allergies. Children with spina bifida are often allergic to latex. Before treating a patient, ask the caregivers if the children are allergic to latex or have any other allergies. Stock latex-free equipment. (Some regularly used equipment that contains latex includes gloves, oxygen masks, IV tubing BVM, blood pressure cuff, IV catheters, etc.)

4. Knowing which children in a given area have special needs and keeping a logbook is encouraged.

5. Parents and caretakers are usually trained in emergency management and can be of assistance to EMS personnel. Listen carefully to the caregiver and follow his / her guidance regarding the child's treatment.

6. Children with chronic illnesses often have different physical development from well children. Therefore, their baseline vital signs may differ from normal standards. The size and developmental level may be different from age-based norms and weight / length-based resources used to calculate drug dosages. Ask the caregiver if the child normally has abnormal vital signs. (i.e. a fast heart rate or a low pulse oximeter reading)

7. Some CSHCN may have sensory deficits (i.e. they may be hearing impaired or blind) yet may have age-appropriate cognitive abilities. Follow the caregivers' lead in talking to and comforting a child during treatment and transport. Do not assume that a CSHCN is developmentally delayed.

8. When moving a special needs child, a slow careful transfer with two or more people is preferable. Do not try to straighten or unnecessarily manipulate contracted extremities as it may cause injury or pain to the child. Certain medical conditions will require special care. Again, consult the child's caregiver.

9. Caregivers of CSHCN often carry "go bags" or diaper bags that contain supplies to use with the child's medical technologies and additional equipment such as extra tracheostomy tubes, adapters for feeding tubes, suction catheters, etc. Before leaving the scene, ask the caregivers if they have a "go bag" and carry it with you.

10. Caregivers may also carry a brief medical information form or card. The child may be enrolled in a medical alert program whereby emergency personnel can get quick access to the child's medical history. Ask the caregivers if they have an emergency information form or some other form of medical information for their child.

11. Caregivers of CSHCN often prefer that their child be transported to the hospital where the child is regularly followed or the "home" hospital. When making the decision as to where to transport a CSHCN, take into account: local protocols, the child's condition, capabilities of the local hospital, caregivers' request, ability to transport to certain locations.

## MEDICAL CONTROL / PROCEDURES

## CHILD / ADULT / ELDER - DOMESTIC VIOLENCE / SEXUAL ASSAULT / TRAFFICKING

- Domestic violence is physical, sexual, or psychological abuse and / or intimidation, which attempts to control another person in a current or former family, dating, or household relationship. The recognition, appropriate reporting, and referral of abuse is a critical step to improving patient safety, providing quality health care, and preventing further abuse.
- Elder abuse is the physical and / or mental injury, sexual abuse, negligent treatment, or maltreatment of a senior citizen by another person. Abuse may be at the hand of a caregiver, spouse, neighbor, or adult child of the patient. The recognition of abuse and the proper reporting is a critical step to improve the health and well - being of senior citizens.
- Child abuse is the physical and mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare. The recognition of abuse and the proper reporting is a critical step to improving the safety of children and preventing child abuse.

**PURPOSE**

Assessment of an abuse case based upon the following principles:

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

**PROCEDURE**

1. Assess the / all patient(s) for any psychological characteristics of abuse, including excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, behavioral disorders, substance abuse, medical non-compliance, or repeated EMS requests. This is typically best done in private with the patient.
2. Assess the patient for any physical signs of abuse, especially any injuries that are inconsistent with the reported mechanism of injury. The back, chest, abdomen, genitals, arms, legs, face, and scalp are common sites for abusive injuries. Defensive injuries (e.g. to forearms), and injuries during pregnancy are also suggestive of abuse. Injuries in different stages of healing may indicate repeated episodes of violence
3. Assess all patients for signs and symptoms of neglect, including inappropriate level of clothing for weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Assess all patients for signs of sexual abuse, including torn, stained, or bloody underclothing, unexplained injuries, pregnancy, or sexually transmitted diseases.
5. Immediately report any suspicious findings to the receiving hospital (if transported). If an elder or disabled adult is involved, also contact the Department of Social Services (DSS). After office hours, the adult social services worker on call can be contacted by the 911 communications center. EMS should not accuse or challenge the suspected abuser. This is a legal requirement to report, not an accusation. In the event of a child fatality, law enforcement must also be notified.

### KEY POINTS

**SEXUAL ASSAULT:**

- A victim of a sexual assault has experienced an emotionally traumatic event. It is imperative to be compassionate and non-judgmental. Be sensitive to the victim. Expect a wide range of response to such an assault, depending upon social, cultural, and religious background.
- An abbreviated assessment may be indicated based on the patient's mental state.
- Your responsibility is **patient care** and ***not detective work***. Questioning of the patient should be limited, because there is no need for the EMS provider to attempt to get a detailed description of the assault. That type of questioning by EMS can harm the investigation and should be left up to professional investigators. However, carefully document verbatim anything the patient says about the attack. **DO NOT** paraphrase. Based upon the patient's mental state, the following questions may be asked and documented: (Do not persist with questions.)
- What happened? (A brief description is acceptable)
- When did the attack occur?
- Did the patient bathe or clean up after the attack?
- If the patient changed his / her clothes, attempt to bring the clothes in a brown paper bag. **DO NOT** use a plastic bag.
- If the patient did not change his / her clothes, have the patient bring a change of clothes to the hospital (if possible).
- Transport the patient to an appropriate medical facility. Some hospitals can provide additional sexual assault care (SANE Program).
- Medical care takes PRIORITY over collecting evidence.
- Provide trauma-informed care.
- Document patient's demeanor, visible injuries, & words in quotes
- Document observations of scene
- Evidence collection: Always wear gloves. Use paper bags for all clothing collection.
- Ask about strangulation (choking).
- Ask if the patient was hit in the head.
- Bring clothing worn during assault & clothing to wear home.
- Encourage patient to bring shoes and outerwear (Coats, Jackets), for inclement weather.
- If patient declines transport to hospital:
  Educate on risks associated with strangulation
  Educate on deadline of 96 hours for sexual assault kit collection
  Educate on going to ED if pt does not feel safe

**RED FLAGS TO CHILD ABUSE:**

The presence of a red flag does not necessarily mean maltreatment. The suspicion of maltreatment is also based upon the EMS provider's observations and assessment.

**Signs that parents may display may include (not all inclusive):**

- Parent apathy
- Parent over reaction

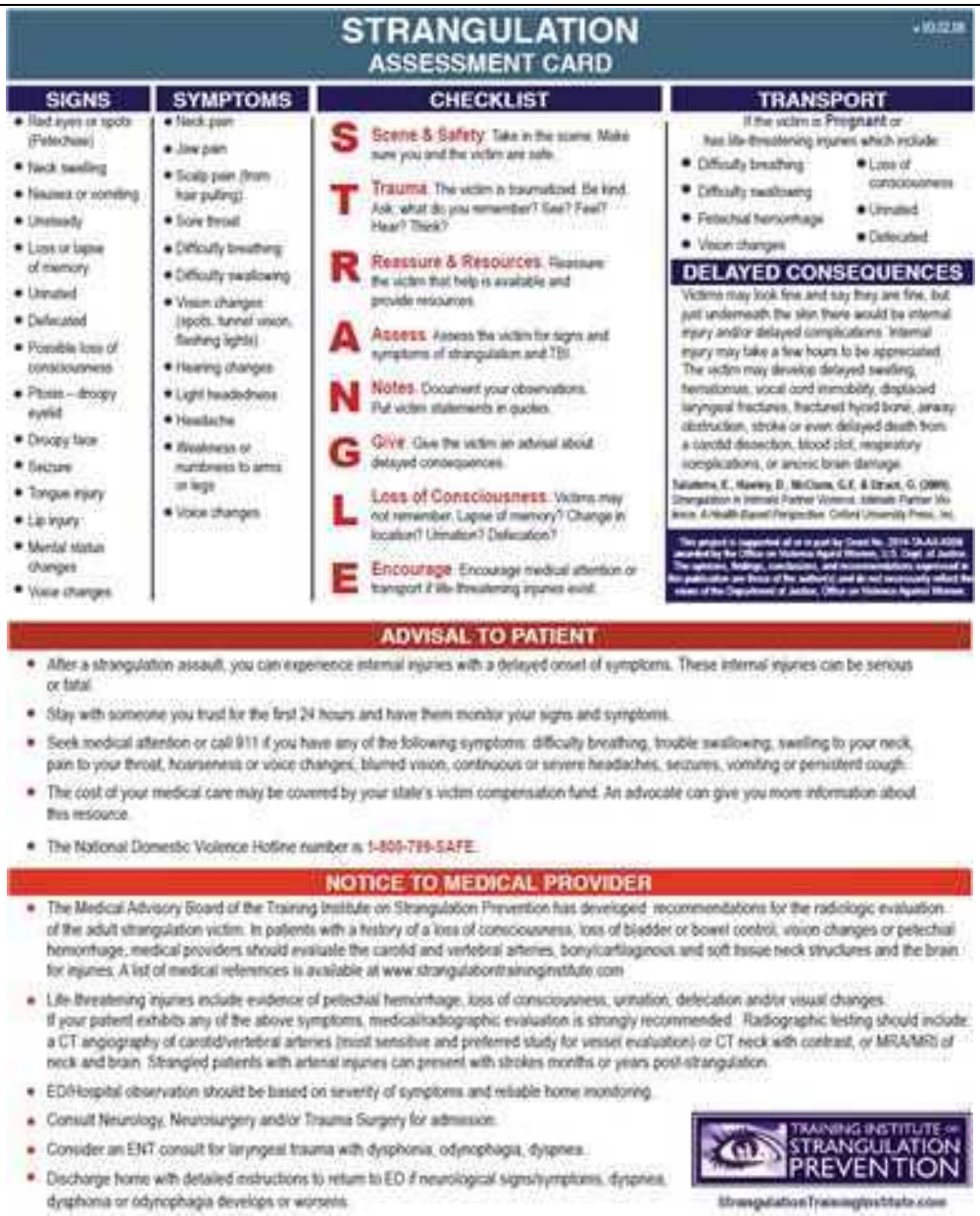
- A story that changes or that is different when told by two different "witnesses"
- Story does not match the injury
- Injuries not appropriate for child's age
- Unexplained injuries

**Signs that the child may display may include (not all inclusive):**

- Pattern burns (donuts, stocking, glove, etc.)
- Child abuse / neglect are widespread enough that nearly all EMS providers will see these problems at some time. The first step in recognizing abuse or neglect is to accept that they exist and to learn the signs and symptoms.
- Initiate treatment as necessary for situation using established protocols.
- If possible remove child from scene, transporting to hospital even if there is no medical reason for transport.
- If parents refuse permission to transport, notify law enforcement for appropriate disposition. If patient is in immediate danger, let law enforcement handle scene.
- Advise parents to go to hospital. **AVOID ACCUSATIONS** as this may delay transport. Adult with child may not be the abuser.

**AREAS FOR CONCERN**

- Communication – Confused, disoriented, forgetful, can't hear well, can't speak well, can't speak English
- Physical Condition – Walks with difficulty, in wheelchair, dirty clothes, uncombed hair, unshaven, bruises, cuts, sores
- Social Condition – Lives alone, isolated from others, may be abused, may be exploited, may be neglected
- Condition of Home – Needs repair, bad odor, pets neglected, yard neglected, rubbish lying about
- Economic Condition – Confused about finances, has difficulty paying bills, can't afford food, can't afford medicine, can't afford transportation
- Emotional Condition – Excessive reminiscing, doesn't eat well, doesn't sleep well, recent death in family, appears nervous / withdrawn / depressed
- Substance Abuse – alcohol or other drugs



# STRANGULATION
## ASSESSMENT CARD

**SIGNS**

- Red eyes or spots (Petechiae)
- Neck swelling
- Nausea or vomiting
- Unsteady
- Loss or lapse of memory
- Urinated
- Defecated
- Possible loss of consciousness
- Ptosis – droopy eyelid
- Droopy face
- Seizure
- Tongue injury
- Lip injury
- Mental status changes
- Voice changes

**SYMPTOMS**

- Neck pain
- Jaw pain
- Scalp pain (from hair pulling)
- Sore throat
- Difficulty breathing
- Difficulty swallowing
- Vision changes (spots, tunnel vision, flashing lights)
- Hearing changes
- Light headedness
- Headache
- Weakness or numbness to arms or legs
- Voice changes

**CHECKLIST**

**S** Scene & Safety: Take in the scene. Make sure you and the victim are safe.

**T** Trauma: The victim is traumatized. Be kind. Ask: what do you remember? See? Feel? Hear? Think?

**R** Reassure & Resources: Reassure the victim that help is available and provide resources.

**A** Assess: Assess the victim for signs and symptoms of strangulation and TBI.

**N** Notes: Document your observations. Put victim statements in quotes.

**G** Give: Give the victim an advisal about delayed consequences.

**L** Loss of Consciousness: Victims may not remember. Lapse of memory? Change in location? Urination? Defecation?

**E** Encourage: Encourage medical attention or transport if life-threatening injuries exist.

**TRANSPORT**

If the victim is **Pregnant** or has life-threatening injuries which include:

- Difficulty breathing
- Difficulty swallowing
- Petechial hemorrhage
- Vision changes
- Loss of consciousness
- Urinated
- Defecated

**DELAYED CONSEQUENCES**

Victims may look fine and say they are fine, but just underneath the skin there would be internal injury and/or delayed complications. Internal injury may take a few hours to be appreciated. The victim may develop delayed swelling, hematomas, vocal cord immobility, displaced laryngeal fractures, fractured hyoid bone, airway obstruction, stroke or even delayed death from a carotid dissection, blood clot, respiratory complications, or anoxic brain damage.

Strangulation in Intimate Partner Violence. Intimate Partner Violence: A Health-Based Perspective. Oxford University Press, Inc.

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**ADVISAL TO PATIENT**

- After a strangulation assault, you can experience internal injuries with a delayed onset of symptoms. These internal injuries can be serious or fatal.
- Stay with someone you trust for the first 24 hours and have them monitor your signs and symptoms.
- Seek medical attention or call 911 if you have any of the following symptoms: difficulty breathing, trouble swallowing, swelling to your neck, pain to your throat, hoarseness or voice changes, blurred vision, continuous or severe headaches, seizures, vomiting or persistent cough.
- The cost of your medical care may be covered by your state's victim compensation fund. An advocate can give you more information about this resource.
- The National Domestic Violence Hotline number is 1-800-799-SAFE.

**NOTICE TO MEDICAL PROVIDER**

- The Medical Advisory Board of the Training Institute on Strangulation Prevention has developed recommendations for the radiologic evaluation of the adult strangulation victim. In patients with a history of a loss of consciousness, loss of bladder or bowel control, vision changes or petechial hemorrhage, medical providers should evaluate the carotid and vertebral arteries, bony/cartilaginous and soft tissue neck structures and the brain for injuries. A list of medical references is available at www.strangulationtraininginstitute.com
- Life-threatening injuries include evidence of petechial hemorrhage, loss of consciousness, urination, defecation and/or visual changes. If your patient exhibits any of the above symptoms, medical/radiographic evaluation is strongly recommended. Radiographic testing should include: a CT angiography of carotid/vertebral arteries (most sensitive and preferred study for vessel evaluation) or CT neck with contrast, or MRA/MRI of neck and brain. Strangled patients with arterial injuries can present with strokes months or years post-strangulation.
- ED/Hospital observation should be based on severity of symptoms and reliable home monitoring.
- Consult Neurology, Neurosurgery and/or Trauma Surgery for admission.
- Consider an ENT consult for laryngeal trauma with dysphonia, odynophagia, dyspnea.
- Discharge home with detailed instructions to return to ED if neurological signs/symptoms, dyspnea, dysphonia or odynophagia develops or worsens.

TRAINING INSTITUTE ON STRANGULATION PREVENTION

StrangulationTraininginstitute.com

# CONCEALED WEAPONS GUIDELINES

While the possibility of finding a dangerous weapon on a scene has always existed, EMS personnel must be aware of current issues, which impose unique hazards upon them while performing their duties. These dangers present in many different ways, regardless of jurisdiction or call volume. Though not all accidents can be prevented, awareness must be made regarding the State of Ohio Concealed - Carry Laws.

Ohio's Concealed - Carry Law permits individuals to obtain a license to carry a concealed handgun in Ohio, including into private businesses if the licensee also carries a valid license and valid identification when carrying the concealed handgun. This law has been in effect since April 8th, 2004. Be aware that all patients may be carrying a dangerous weapon at all times, regardless of whether a permit has or has not been issued.

**GUIDELINES**

- Upon arrival at the scene, EMS personnel should directly ask patients if they are carrying a weapon prior to performing a physical assessment. If the patient is unable to answer, please proceed with caution.
- If a weapon is present on scene or with a patient, it is recommended that a Law Enforcement official be present to secure the weapon.
- The training of EMS personnel in the safe handling and use of firearms lock boxes in squads is a departmental and municipal decision.
- Caution is advised due to the many types of weapons and the handler's ability to modify them.
- When transporting a patient to the hospital, please inform the receiving facility that a weapon has been found on the patient. This will allow enough time for Security to safely secure the weapon and maintain possession of it until Law Enforcement arrives.

*Example of a Standard Warning Sign*

# CONSENT AND REFUSAL OF CARE GUIDELINES

**PURPOSE**
To provide:

- Rapid emergency EMS transport when needed.
- Protection of patients, EMS personnel, and citizens from undue risk when possible.
- Method to document patient refusal of care.

| FEARS Acronym for Managing High Risk / Difficult Refusals | |
|---|---|
| F | Perform a ***FULL*** exam and check vital signs |
| E | ***EXPLAIN*** the real risks to the patient |
| A | ***ASK*** for assistance from family members or a supervisor |
| R | ***RECORD*** the discussion - |
| S | Maintain a ***SUPPORTIVE*** attitude and try to convince and reassure the patient |

**PROCEDURES - ADULT** Consent:

Two types apply**.**
**Express Consent**, where a conscious, oriented (to person, place, and time) competent adult (over 18-year-old) gives the EMS provider permission to care for him. This may be in the form of a nod, verbal consent or gesture after the intended treatment has been explained.
**Implied Consent** occurs when a person is incapable of giving their permission for treatment due to being unconscious or incompetent. It is assumed that their permission would be given for any lifesaving treatments.

**Refusal of Treatment:**

**Capacity:** An adult with mental capacity to make informed decisions, may refuse treatment even after calling for help. The person must be informed that they may suffer loss of life, limb, or severe disability if they refuse care and transport, and sign a Release indicating that they understand this. If the patient refuses to sign, a witness at the scene, preferably a relative should sign. Documentation of the events must be clearly made. It also must be documented on the run sheet that the person is oriented to person place and time, and a set of vital signs should be obtained if possible. An offer to return and transport them later should be made by EMS. Contact with Medical Control should be made if there is any question about the person's capacity to make decision. If the need for treatment is obvious, speaking directly to the Nurse or Physician may assist in convincing the patient to be transported.

For the purposes of this protocol, capacity will be defined as – **Lucid and capable of making an informed decision, alert to Person, Place, Time, and Event.**

| | | |
|---|---|---|
| Understanding | The ability to state the meaning of the relevant information (eg. Diagnosis, risks, and benefits of a treatment or procedure, indications, and options | Ask "Can you tell me in your own words what I just said about (topic)?" |
| Expressing a Choice | The ability to state a decision | "Based on what we have just discussed, which would you choose?" |
| Appreciation | The ability to explain how information applies to oneself | To assess appreciation of diagnosis "Can you tell me in your own words what you see as your medical problem?" |
| Reasoning | The ability to compare information and infer consequences of choices | To assess consequential reasoning "How could X affect your daily activities?" |

**Without Capacity:** While an adult may refuse treatment, in some situations, their refusal may not have basis if they do not have to capacity to make an informed decision. In the following situations, the refusal of treatment may be without capacity.

- Patients showing altered mental status due to head trauma, drugs, alcohol, psychiatric illness, hypotension, hypoxia, or severe metabolic disturbances.
- Violent patients.
- Uncooperative minors.

**PROCEDURES – MINORS consent**

**Consent to treat Minors:**

Consent to treat Minors (under the age of 18 years in Ohio), must be obtained from the parent or guardian with two exceptions; there is need for life saving immediate treatment or there is abuse / neglect. These situations cannot be refused. Contact law enforcement if there are on scene concerns regarding parental cooperation in these situations.

**Refusal of Treatment**:

A **minor** might refuse to cooperate with the EMS crew, or the minor's parent or guardian may refuse to consent to necessary treatment of the minor. A **minor** under the age of 18 years may not refuse treatment in Ohio. Transport should be initiated unless the **parent** or **legal guardian** refuse treatment on behalf of the minor. A circumstance may occasionally arise where the patient is a minor and there is no illness or injury, yet EMS has been called to the scene. If the responsible person is not able to be at the scene, it is acceptable for contact to be made by telephone. If care and transport is refused by the parent or guardian, TWO witnesses should verify this, and this shall be documented and signed by both witnesses on the run sheet. A request may be made that the person come to the fire station as soon as possible, to sign the release. A second circumstance may occur when the minor patient really needs to be transported and the parent or guardian is refusing transport. In this case, action must be taken in the minor's best interest. This is described in the following section, refusal.

**Refusal:**

- Parent / guardian refuses to give consent for treating their child when the child's life or limb appears to be at risk.
- Parent / guardian refuses to give consent where child abuse is suspected.
- Suicidal patients – any age.

In all such cases, **contact with Medical Control and a Physician is mandatory**, as the patient may have a life - threatening problem and is in need of medical care. The involvement of the Police in these situations is often necessary and crucial. They may assist the EMS crew with transport as ordered by the On-line Physician. This is described in the Ohio Revised Code, Section 5122.10.

**INFANTS – BRUE**
Brief Resolved Unexplained Event

An event occurring in an infant < 1year old when the observer reports a sudden, brief, and now resolved episode of 1 or more of the following:

1. Cyanosis
2. Absent, decreased or irregular breathing
3. marked change in tone (hyper-or hypotonia)
4. Altered level of responsiveness

BRUE should be suspected when there is no explanation for a qualifying event after conducting an appropriate history and physical examination – Contact Medical Control with suspicions if parents are refusing treatment / transport to assist with discussion.

**TRANSPORTATION**

**Destination Refusal:**

There may be EMS calls where the EMS unit is unable to transport patient to their destination of choice. If the competent patient refuses this, and is in stable condition, a private ambulance may be called to take the patient. The responding EMS unit must stand by until the private EMS providers arrive and assume care of the patient.

## MEDICAL CONTROL / PROCEDURES

# CONSENT AND REFUSAL OF CARE GUIDELINES

ALL sign offs are risky for the patient and legally risky for the health care providers. Assure thorough documentation of entire patient interaction and detail patients' capacity to understand refusal risks.

ADULT - Patient initiated refusal of care

Inform patient of risks associated with refusal
Patient must be able to repeat in their own words risks and must verbalize understanding of consequences
Document in narrative

Physical assessment of complaint
Assess and document vital signs

Adult patient must exhibit the CAPACITY to refuse
**Lucid and capable of making an informed decision, alert to Person, Place, Time, and Event.**

### Abnormal Vitals / Assessment

Heart Rate <50bpm or >100bpm
SBP < 100 mmHg or > 180mmHg
DBP <50 mmHg or > 100 mmHg
Respirations <12bpm or >24bpm
BGL <60 mg/dl
$SpO_2$ <94

Obtain blood glucose where indicated, Diagnostic EKG, Transmit, and Contact with Medical control strongly encouraged

### Stable vitals / NOT a High-Risk Case

### High-Risk Cases

- Head injury
- Under the influence of drug or ETOH
- Chest Pain
- Syncope
- Dyspnea
- Lift assists with weakness or symptoms
- Elderly
- Dementia

Obtain blood glucose where indicated, Diagnostic EKG, Transmit, and Contact with Medical control strongly encouraged

Assure patient has access to food, water, communications, and can complete activities of daily living
Document these in narrative

Explain to patient if there are changes or concerns after EMS leaves to call back for re-evaluation

Read release form to patient and have them sign.
If unable to sign have witness sign and place witness information (name and relationship) in narrative

### Key Points

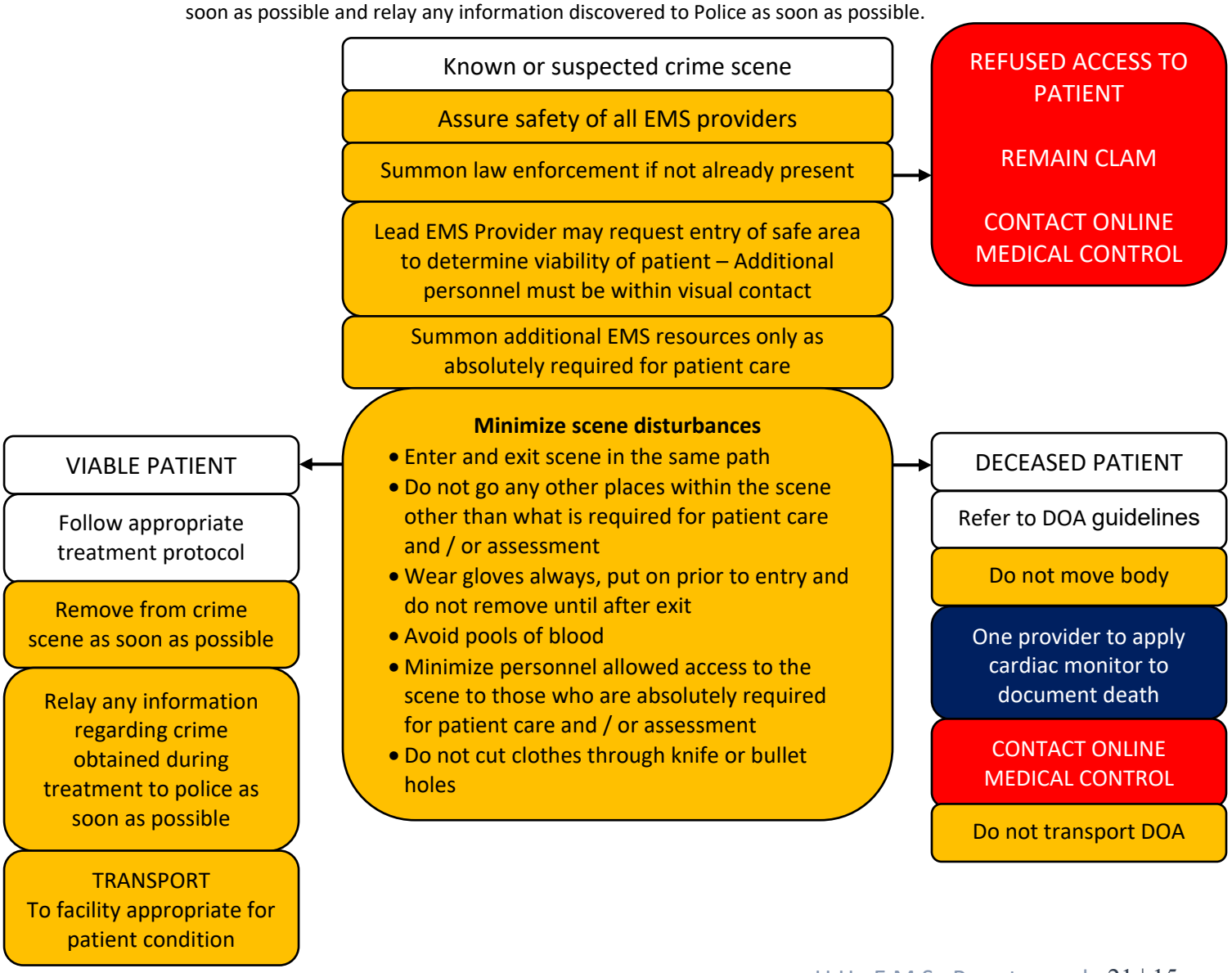
- A patient is defined as someone for whom EMS has responded that is ill, injured, has significant mechanism to presume injury, or is lacking capacity to refuse care once EMS contact has been made.
- Calling Online Medical Control is suggested high risk or unstable patients. This is liability protection for all involved and the Physician may be able to communicate additional facts regarding the patient condition to the providers or the patient directly.
- Online Medical Control is always available to EMS, especially in atypical or uncomfortable situations.
- Patients capable of making informed decisions are permitted to refuse, however efforts to have patient assessed further must be attempted for liability protection.
- Documentation of the efforts for additional assessment must be included in the PCR.
- Patient must be able to repeat in their own words risks and must verbalize understanding of consequences.
- Persons not meeting the criteria for a "patient" that are involved in an incident not as witnesses should be documented in an official call response log. This can be a notation in a transport or refusal chart for another person meeting the "patient" criteria from that scene, or in a call response log system if there are no persons meeting the "patient" criteria.

# CRIME SCENE GUIDELINES

This guideline shall be used when law enforcement personnel advise EMS that they have responded to a crime scene, or EMS determines that a crime scene may exist. The purpose is to ensure the protection of the patient welfare as well as to ensure the ability to conduct an effective and through investigation of the crime.

If a provider finds themselves on a known or suspected crime scene;

- Assure safety of all EMS providers
- Summon Law Enforcement if not already present
- Lead EMS provider may request entry of safe area to determine viability of patient
- Additional personnel must be with visual contact
- Summon additional resources to the patient side only as necessary
- Minimize scene disturbances
- Enter and exit on same path
- Do not go anywhere else on the scene except as necessary for patient care
- Wear gloves always
- Avoid pools of blood
- Minimize personnel to only those required for patient care
- Do not cut through knife / bullet holes in clothing
- Do not go through patient's effects
- If patient is believed to be DOA, one provider to approach and attach cardiac monitor to confirm death
- If patient is believed to be viable, follow appropriate treatment protocol for situation, remove from crime scene as soon as possible and relay any information discovered to Police as soon as possible.



# DEAD ON ARRIVAL (DOA)

**Some jurisdictions may have special policy on the handling of DOA cases, and, among other points, Online Medical Control may not need to be contacted. Refer to organizational policy in these cases if your department participates.**

**PURPOSE**

EMS should not begin to resuscitate if any of the following criteria for death in the field are met for a patient who presents pulseless, apneic and with any one of the following:

- Injury incompatible with life (i.e. decapitated, gross incineration)
- Signs of decomposition, rigor mortis, extreme dependent lividity
- Cardiac arrest, secondary to massive blunt trauma without signs of exsanguination
- Adult: Absence of vital signs >20 minutes with asystole on the EKG, not secondary to hypothermia or cold-water drowning.
- Ohio DNR Comfort Care order
- Other DNR as validated by on-line physician

**PROCEDURE**

In cases where death is not obvious (decapitation, gross incineration, decomposition, rigor, etc.)

- Obtain an EKG of asystole in two leads
- Palpation of central pulses
- Absence of spontaneous respirations

Contact with Online Medical Control for a time of death (or follow departmental policy). **Once this is done, the police should assume control of the scene, and EMS may go back into service.**

**KEY POINTS**

- If a bystander or first responder has initiated CPR or automated defibrillation prior to an EMS Paramedic's arrival and any of the above criteria (signs of obvious death) are present, the Paramedic may discontinue CPR and ALS therapy. All other EMS personnel levels must communicate with medical control prior to discontinuation of the resuscitative efforts.
- If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:
    - Resuscitation efforts meet the criteria for implementing the Termination of Resuscitative Efforts Protocol, if valid in the EMS jurisdiction.
    - Patient care responsibilities are transferred to the destination hospital staff.
    - When a Dead-on Arrival (DOA) patient is encountered, the squad members should avoid disturbing the scene or the body as much as possible, unless it is necessary to do so in order to care for and assist other victims. Once it is determined that the victim is, in fact, dead the EMS should move as rapidly as possible to transfer responsibility or management of the scene to the Police Department of EMS should not pronounce enroute.
    - Pregnant patients estimated to be 20 weeks or later in gestation should have standard resuscitation initiated and rapid transport to a facility capable of providing an emergent c-section. Paramedics CANNOT perform a c-section even with Medical Control permission.
    - Fetus gestational age less than 20 weeks is considered stillbirth, greater than 20 weeks spontaneous abortion and is a coroners case.
    - Victims of lightning strike, drowning, or a mechanism of injury that suggested non-traumatic cause for cardiac arrest should have standard resuscitation initiated.
    - If the patient is pronounced on scene, leave the ETT, IV, and other interventions in place.

# Health Insurance Portability and Accountability Act - HIPAA

**What does HIPAA stand for?**

- The Health Insurance Portability and Accountability Act. Enacted in 1996, this federal law regulates health insurance and insurance benefit programs.

**What is HIPAA's privacy rule?**

- The privacy rule is a set of laws created to protect the privacy of a patient's health information, including medical records.

**Why was HIPAA created?**

- Before this rule was created, it was possible for patient information to be easily accessible without the patient's authorization and for reasons that had nothing to do with medical treatment. For example, a patient's medical information might be passed to a bank or lender, who might deny or approve a loan requested by the patient.

**Who has to follow the rule?**

- The privacy rule directly relates to healthcare providers (such as ambulance services, hospitals, physicians, and home health agencies), health plans and insurance companies, and healthcare clearing houses (such as companies that bill for healthcare services).

**What if you don't comply?**

- The penalty for one violation is $100, with a limit of $25,000 per year for any single organization that fails to comply with multiple requirements. The authority to impose penalties is carried out by the Department of Health and Human Services. In cases involving grossly flagrant and intentional misuse of patient information, violators may be socked with criminal penalties up to $250,000, ten years in jail, or both - depending on the circumstances.

**What should I do at the scene?**

- Exercise confidentiality on the scene by:
  - Not sharing information with bystanders.
  - Limiting radio transmissions that identify patients.
  - Avoid disclosure of unnecessary information to police (appropriate info includes patient's name, DOB, and destination hospital.)
  - Protecting patient's privacy whenever possible.
  - Don't volunteer patient medical information with people at the scene.

**Hospital Contact and EMS**

The relationship of the hospital and EMS are not really affected by HIPAA. The process of Performance Improvement is an important element of patient care that is worked on at each department under Medical Control and then the issues are addressed by the Medical Director during Run Reviews at each station. Information about the patient may be given to the Emergency Department by radio, phone, fax, or electronically. The information is needed for treatment of the patient and becomes part of the medical record.

Following the privacy policy along with common sense regarding your patient's right will assure that no HIPAA rules are violated.

# LEVEL OF EMS CARE REASSINGMENT

This Protocol recognizes the following hierarchy of State of Ohio recognized EMS provider levels:

- Emergency Medical Responder
- Emergency Medical Technician (EMT)
- Advanced Emergency Medical Technician (AEMT)
- Paramedic

For single patient encounters the overall patient care is the responsibility of the highest level of care provider on the scene.

If, following an appropriate assessment by the highest level of care provider on the scene it is determined that appropriate care can be provided by a "lower level" of care provider, care may be transferred to the lower level of care provider on scene if the following criteria are met.

- Patient's condition may be appropriately cared for by the lower level of care provider.
- No higher-level provider skills or procedures have been attempted or performed except EKG interpretation.
- No medications restricted to the higher level of care provider have been administered.
- Both providers are comfortable with the lower level of care provider assuming patient care.
- The lower level of care provider is willing to assume patient care.
- There is no foreseeable likelihood of the patient requiring the care of the higher level of care provider.
- Appropriate care and services are not being omitted through this process, (e.g. Appropriate analgesics are being withheld in order to have the lower level of care provider assume the care of the patient).
- The higher level of care provider is required to co-sign the patient's medical record, (PCR).

It is noted that the higher level of care provider retains joint responsibility for the care rendered to the patient. Care may be resumed by the higher level of care provider at any time.

Online Medical Control authorization is not required for application of this Protocol. Medical Control may be contacted at any time for authorization / discussion regarding situations not clearly outlined in this document.

This Protocol applies, for example, to a two-person crew consisting of an EMT and a Paramedic where only EMT patient care is required and ii is desired for the EMT to care for the patient during transport while the Paramedic drives the squad. This Protocol could also apply in the scenario where the higher level of care provider elects to remain in service, within their jurisdiction, and not accompany the patient during their transport to the Emergency Department, (assuming all other conditions of this Protocol are met).
This Protocol is not in effect during multiple patient encounters where standard EMS triage processes may determine the assignment of resources, including personnel, and care provided.

This Protocol is not in effect when a higher level of care provider remains with the patient during transport and is simply supervising the care provided by a lower level of care provider.

Numerous patient presentations warrant ongoing care by the highest level of care provider on the scene, even if specific assessments, skills, and/or medications limited to the higher level of care provider have not yet been required. In these cases, transfer of care to a lower level of care provider is unauthorized. (Examples include, but are not limited to: Cardiac type chest pain, shortness of breath, syncope, unresponsiveness, major trauma, anaphylaxis, shock, etc.)

# NEWBORN ABANDOMENT

Ohio law provides that a parent may drop off a newborn baby within the first 30 Days after birth at any law enforcement agency, hospital, or emergency medical service. Should this occur, the first priority is to care for the infant's health and safety. Notification should then be made to the Public Children's Services agency for that county. If possible, obtain any medical information that may be available. If it appears that the infant has suffered any type of physical harm, attempts should be made to detain the person who delivered the child.

**PURPOSE**

To provide:

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

**PROCEDURE**

1. Initiate the Pediatric Assessment Procedure.
2. Initiate other treatment protocols as appropriate.
3. Keep infant warm.
4. Contact Medical Control as soon as infant is stabilized.
5. Transport infant to medical facility as per local protocol.
6. Assure infant is secured in appropriate child restraint device for transport.
7. Document protocols, procedures, and agency notifications.

# OBESE PATIENTS

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

**PURPOSE**

To provide:

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

**PROCEDURE**

1. Each situation may dictate its own procedure for the transport of morbidly obese patients.
2. It is the responsibility of EMS personnel at the scene to provide the most appropriate medical care, including the protection of the patient, EMS personnel, and bystanders, while transporting morbidly obese patients.
3. Utilization of additional resources may be required, at the discretion of the on - scene EMS personnel.

**KEY POINTS**

In any community there may be one or more individuals who fall into this extreme. As patients, these individuals are frequently classed as high risk because of the increased medical complications associated with their excess weight. In the EMS system they present the additional problem of movement and transportation. These individuals have the right to expect prompt and expert emergency medical care. Therefore, in order to facilitate the care of these individuals without risking the health of EMS workers, the following protocol is established.

- In managing a patient with weight over 300 lbs., at no time should the patient be moved without at least sufficient manpower to assist.
- At the scene, as many EMS personnel as can be mobilized may be supplemented by police or other safety personnel as appropriate. If sufficient manpower is not available, mutual aid may be required.
- It may be necessary to remove doors, walls or windows. The situation is no different than extrication from a vehicle, although property damage may be higher. At all times the patient's life must be the first priority.
- The patient is to be placed on at least 2 (double) backboards or other adequate transfer device for support.
- The patient is to be loaded on a cot that is in the down position, and the cot is to be kept in the down position at all times. Be aware of the cot weight limitations.
- It is necessary to notify the hospital well in advance of arrival so that preparations can be completed in a timely fashion.
- If individuals in the community are known to fall within this special category it is appropriate to inform them in advance of the type of assistance they can expect from the EMS system and help them make plans well in advance to assist you.
- When calling for the squad, and if they identify themselves and their special needs, it will promote the timeliness of your efforts.

# ON - SCENE EMT / NURSE / PHYSICIAN INTERVENER

The Medical Control of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care.

**PURPOSE**

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

**PROCEDURE**

1. When a non - Medical Control Physician offers assistance to EMS or the patient is being attended by a Physician with whom they do not have an ongoing patient relationship, EMS personnel must review the On-Scene Physician form with the Physician. All requisite documentation must be verified and the Physician must be approved by on – line Medical Control.
2. When the patient is being attended by a Physician with whom they have an ongoing patient relationship, EMS personnel may follow orders given by the Physician if the orders conform to current EMS guidelines, and if the Physician signs the PCR. Notify Medical Control at the earliest opportunity. Any deviation from local EMS protocols requires the Physician to accompany the patient to the hospital.
3. EMS personnel may accept orders from the patient's Physician over the phone with the approval of Medical Control. The Paramedic should obtain the specific order and the Physician's phone number for relay to Medical Control so that Medical Control can discuss any concerns with the Physician directly.

**KEY POINTS**

**EMT / Nurse / Healthcare - Intervener:**

On an EMS run where an unknown EMT / Nurse / Healthcare - Intervener from outside the responding EMS agency wishes to intervene in the care of patients, the following steps should be initiated:

- Ideally, if no further assistance is needed, the offer should be declined.
- If the intervener's assistance is needed or may contribute to the care of the patient:
  - An attempt should be made to obtain proper identification of a valid license / certification. Notation of intervener name, address and certification numbers must be documented on the run report.
  - Medical Control should be contacted, and permission given.

**On - Scene Physician:**

This is a Physician with no previous relationship to the patient, who is not the patient's private Physician but is offering assistance in caring for the patient. The following criteria must be met for this Physician to assume any responsibility for the care of the patient:

- Ideally, if no further assistance is needed, offer should be declined.
- Medical Control must be informed and give approval. Encourage Physician to Physician contact.
- The physician must have proof they are a Physician. They should be able to show you their medical license. Notation of Physician name, address and license numbers must be documented on the run report.
- The Physician should have expertise in the medical field for which the patient is being treated.
- The Physician must be willing to assume responsibility for the patient until relieved by another Physician, usually at the Emergency Department.
- The Physician must not require the EMT to perform any procedures or institute any treatment that would vary from protocol and / or procedure.
- If the Physician is not willing or able to comply with all the above requirements, his / her assistance must be declined.

**On - Scene Personal Care Physician:**

This is a Physician with a current relationship to the patient, who is offering assistance in caring for the patient. The following criteria must be met for this Physician to assume further responsibility for the care of the patient:

- EMS should perform its duties as usual under the supervision of Medical Control or by protocol.
- Physician to ED Physician contact is optimal.
- The Physician may elect to treat the patient in their office.
- EMS should not provide any treatment under the Physician's direction that varies from protocol. If asked, EMS should decline until contact is made with Medical Control.
- Once the patient has been transferred into the squad, the patient's care comes under Medical Control unless the Physician rides with the patient.

# PINK SLIPPED PATIENTS

**What is a "pink slip"?**
"Pink slip" is the common term for the paperwork used to detain an individual for the purpose of hospitalization. The correct, term is "Application for Emergency Admission." Completion of this form allows for the involuntary admission of individuals as outlined in the Ohio Revised Code Section 5122.10. This document includes a statement from the authorized individual completing the form outlining the reasons for the belief that the person is a mentally ill person subject to court order and represents a substantial risk of physical harm to self or others if allowed to remain at liberty pending examination

**Who can institute a "pink slip"?**

- Psychiatrist;
- Licensed physician;
- Licensed clinical psychologist;
- Clinical nurse specialist who is certified as a psychiatric-mental health CNS by the American nurses credentialing center;
- Certified nurse practitioner who is certified as a psychiatric-mental health NP by the American nurses credentialing center;
- Health officer;
- Parole officer;
- Police officer;
- Sheriff

**When should EMS pursue the issuance of a "pink slip?"**

- Represents a substantial risk of physical harm to self or others if allowed to remain at liberty pending examination.
- Is a mentally ill person subject to hospitalization by court order under division B Section 5122.01 of the Revised Code, i.e., this person
  (1) Represents a substantial risk of physical harm to self as manifested by evidence of threats of, or attempts at, suicide or serious self-inflicted bodily harm;
  (2) Represents a substantial risk of physical harm to others as manifested by evidence of recent homicidal or other violent behavior, evidence of recent threats that place another in reasonable fear of violent behavior and serious physical harm, or other evidence of present dangerousness;
  (3) Represents a substantial and immediate risk of serious physical impairment or injury to self as manifested by evidence that the person is unable to provide for and is not providing for the person's basic physical needs because of the person's mental illness and that appropriate provision for those needs cannot be made immediately available in the community; or
  (4) Would benefit from treatment in a hospital for his mental illness and is in need of such treatment as manifested by evidence of behavior that creates a grave and imminent risk to substantial rights of others or himself.

**Guidelines for Pink Slipped Patients:**
Contact Medical Control or a Police Officer regarding issuance of a "pink slip".

**Overview:**
Safety of the crew is priority. Summon law enforcement as necessary to assure crew safety.

**General Requirements:**

- If patient is restrained follow the restraint procedure if applicable.
- Patient must be searched by Law Enforcement prior to transport for crew and patient safety.
- Consider elopement risk and plan accordingly. Consider sedation and restraint options.
- Eloped patients from EMS care are to be followed at a safe distance, and police summoned for recovery.
- Belongings must be kept separate from the patient.
- Secure any items in the truck that may be used as a weapon against the crew.

**Recommendations:**

- Lights and sirens are not to be used unless the patient experiences a medical emergency aside from the reason for restraint or crew safety is in immediate jeopardy.
- Same sex (as the patient) providers should be utilized whenever possible.

# SCHOOL BUS ACCIDENTS

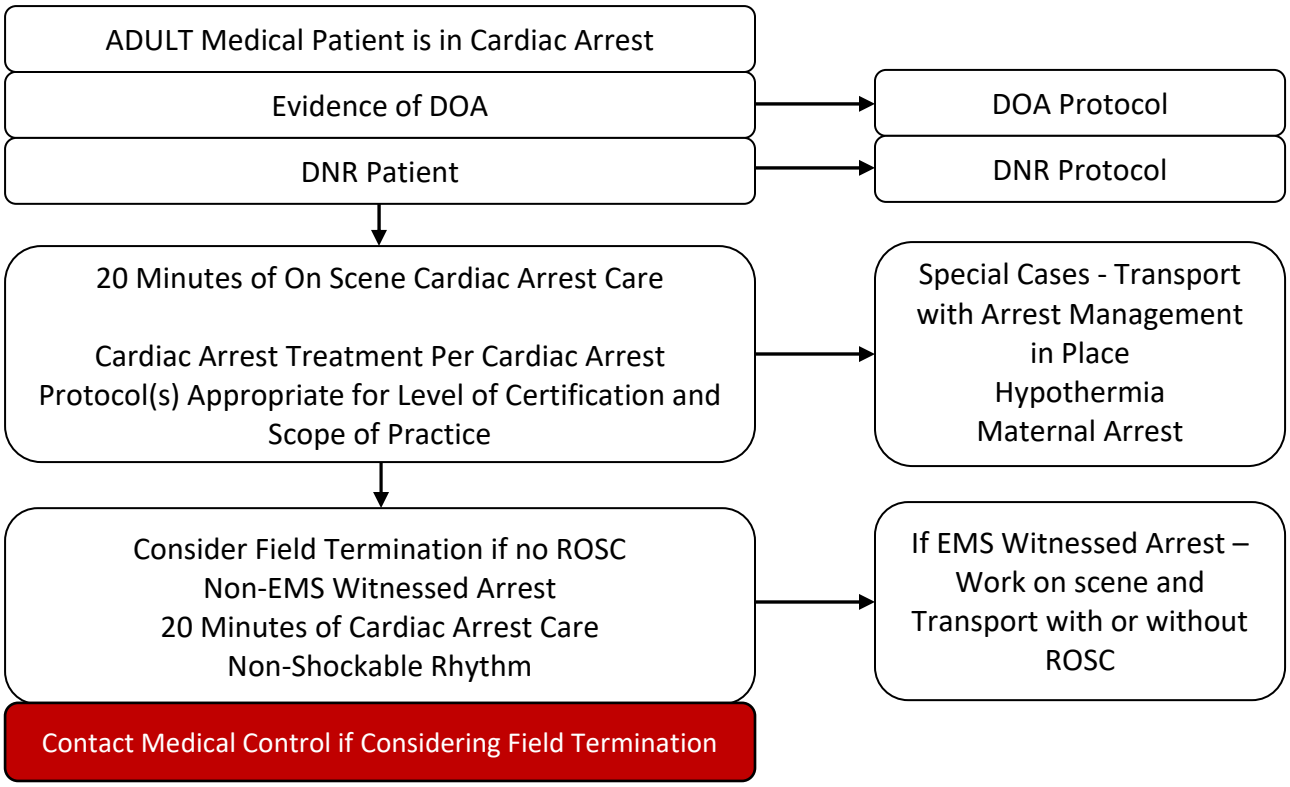
**PURPOSE:**

Provide treatment / transport guidelines for on scene providers when faced with incidents involving school buses

**PROCEDURE:**

- Check with the school district regarding their specific school bus response polices
- School administrators are responsible for the students; a school administrator should be requested to the scene as soon as possible.
- Administrators may take the children back to the school in another bus or school vehicle; they may arrange for transportation back to the home or have the student parents pick them up at school.
- Children should be cleared from the scene as safely and as quickly as possible.
- ANY injury should be transported to the nearest most appropriate emergency department and the parents notified.
- EMS responders must be prepared to enact mass casualty protocols in the event of any serious school bus accident.
- If school administrators accept responsibility for the non-injured children as per their bus accident protocols / policies, then individual releases are not required.
- If for whatever reason there is no school administrator on scene, EMS providers must take responsibility for all children until school administrators arrive.
- If there will be a significant delay in the arrival of school administrators, and the accident is minor, the bus should be directed to return to the school or to a safe area out of traffic.
- Notification of the number and types of injuries should be communicated with the receiving facilities in the event of transportation of injured students to the receiving facilities as early as possible.

# TERMINATION OF RESUSCITATIVE EFFORTS




**SAFETY**
Consider the scene when implementing this termination policy. Crew safety is paramount.

**PURPOSE**
The purpose of this policy is to:

- Allow for discontinuation of prehospital resuscitation after delivery of adequate and appropriate therapy.
- EACH PATIENT SHOULD BE EVALUATED ON A CASE-BY-CASE BASIS

**INDICATIONS**

When a patient that is in cardiac arrest has failed to resuscitative efforts, it may be decided to terminate the effort and not transport the patient to the hospital. When the EMS provider determines that this option is appropriate, the following criteria must be met:

**FOR BLS Providers**

1. The victim is 18 years or older.
2. Cardiac arrest must not have been witnessed by EMS or first responders.
3. NO ROSC have been achieved after 20 minutes of CPR.
4. The cardiac rhythm is non shockable.

**FOR ALS Providers**

1. The victim is 18 years or older.
2. The victim must be in asystole in two leads, or bradycardic wide complex PEA and have the absence of a pulse confirmed.
3. The victim must not be in arrest due to hypothermia.
4. The victim must have a properly placed advanced airway.
5. The patient must have a patent IV / IO access.
6. At least two rounds of ACLS drugs have been administered.
7. At least 20 minutes of resuscitation has been performed.
8. Medical control must be contacted - the physician must speak directly with the paramedic. Then the physician and paramedic must agree on the termination of efforts. The physician must give consent for the resuscitation effort to cease.

   An intra-arrest capnography reading <10 indicates no perfusion and may be helpful in considering termination or efforts.

- Do not remove endotracheal tubes, IV'S, etc.
- Document Medical Control Doctors name and time of termination / death on PCR
- If transport started and then field termination initiated, transport to the nearest hospital or follow local established policy.

# TRANSPORT DESTINATION CONSIDERATIONS

When determining the receiving facility for a patient being transported many factors come into play. Each EMS agency, and in fact each patient encounter, may encompass unique factors impacting upon the receiving facility decision.
It is acknowledged that EMS departments may have internal, department specific, SOPs and guidelines limiting the selection of receiving facilities.
For the purposes of this guideline, the terms "closest" and "nearest appropriate" are to be viewed with significant latitude, and are NOT to be taken in their literal sense. Transporting to a facility that is 10 minutes more distant than another facility may be viewed as equivalent, for example, while a facility that is an hour more distant is clearly viewed as not equivalent, from a transport time perspective. The cutoff is somewhat arbitrary, however, and is best locally determined. One in not expected to calculate destination "exact" distances and times, or factor in traffic, weather, construction, road accidents, etc., in real time, when making transport time sensitive destination decisions.

Ultimately the selection of a patient's destination facility is at the discretion of the senior EMS medical care provider caring for the patient.

It is often appropriate to by-pass closer Emergency Departments in order to deliver a patient to a facility that has specialty care capabilities, such as, but not limited to, those mentioned below.

- Patients experiencing a STEMI should be taken to a facility with cardiac cath lab capabilities.
- Patients experiencing a stroke should be taken to the closest facility with either a Primary Stroke Center or a Comprehensive Stroke Center designation, (i.e. capable of providing an emergent CAT Scan and subsequent thrombolytic care, if indicated).
- High acuity trauma patients should be taken to a designated Level I, II, or III, Trauma Center.
- High acuity pediatric trauma patients should be taken to a designated Level I, II, or III, Pediatric Trauma Center.
- A trauma patient's injuries may warrant by-passing a lower-level Trauma Center for a higher-level Trauma Center.
- It is acknowledged that many "trauma patients" can be appropriately cared for at a non-trauma designated Emergency Department.
- Patients with significant burns, (based upon the extent of the burn, and/or its location(s)), should be transported to a designated Burn Center. Given the paucity of such facilities, this may not always be reasonable.
- Patients experiencing a possible post-operative complication should be transported to the facility that performed their surgery. This obviously does not apply to those patients that had their surgery at a free-standing surgery center, and not within a hospital.
- Patients in extremis, presenting with a challenging airway, or with a deteriorating condition from shock, should be transported to the closest Emergency Department.
- Stable patients and their family members should have significant input into the selection of their destination facility. Their choice might well be dependent upon where they have received care in the past, their healthcare insurance network, where their physician(s) practice, and proximity to their residence. This does not supersede the need for transport to a specialty center, such as mentioned above. At times, EMS might well present the patient and their family with two choices, e.g.: "I need to take you to a Trauma Center. It is your choice, however, whether we go to Hospital A or Hospital B".
- A (potential) receiving facility may "request" or "order" a squad to divert to another facility. When this request is made because a service is not available, (e.g. The CAT scanner is down for maintenance, or the cardiac cath lab is in use, etc.), this request should be honored when it is feasible to do so. If one is being diverted solely because a facility is experiencing a high patient volume then EMS is at liberty to ignore this request / order, particularly if many of the area's Emergency Departments are on diversion.
- When air medical services are utilized, the decision of the patient's destination facility should usually be made in conjunction with the air medical crew.

# INFECTION CONTROL / EXPOSURE POLICY GUIDELINES

Ohio law provides for the welfare and protection of EMS and other Emergency Care Workers (ECW) in two separate sections of the Ohio Revised Code:

- If there has been either an Airborne or Bloodborne exposure to the ECW, every hospital must have a policy to follow - up appropriately. This may include testing of the patient source and the ECW. **It is important to report the exposure, so the patient source can be tested at the facility where the patient has been transported.**

- The second section establishes the obligation of the hospital, once a patient has been diagnosed with a communicable disease, to find out if there was any exposure during transport of the patient.

All possible exposures must be documented both at the hospital and at the place of employment. Various forms must be completed.

**STANDARD PRECAUTIONS**

Emergency Care Workers are to consider **ALL** patients as potentially infected with a communicable disease and are to adhere **RIGOROUSLY** to Infection Control precautions for minimizing the risk of exposure to blood and body fluids of **ALL** patients.

**Guidelines:**

1. Wear gloves **ALWAYS.**

2. **ALWAYS** Wear gloves, mask, and goggles when performing Airway Maneuvers such as Bagging, King Insertion, Intubation, and Suctioning.

3. Wear apron, jumpsuit or other coverall when exposed to large amounts of blood or body fluids.

4. For **Airborne Communicable Diseases,** care must be taken to wear the proper mask, ventilate the squad, and limit exposure of EMS personnel as much as possible. If a patient has fever, cough or rash, a mask is a good idea.

5. Maintain good handwashing practices after removing gloves.

6. Obtain Hepatitis B Vaccination and other testing and vaccines as recommended.

7. Handle "Sharps" carefully - dispose of properly.

8. Wear personal protective gear when **CLEANING** contaminated equipment.

9. Dispose of contaminated waste, equipment and clothing carefully and properly

**Report EXPOSURES immediately and at location of patient transport.**
**Document and follow up properly.**

## Contact your Medical Control for Exposure control Policy and Exposure forms

# INFECTION CONTROL / EXPOSURE POLICY GUIDELINES

**Purpose**

It is reasonably anticipated that any operation, including fires, Haz-mat, extrication, MVA's etc. may involve exposure to blood, body fluids or other potentially infectious material. The health and welfare of everyone is the responsibility of each department (where employed), however it is recognized the need to offer guidance to minimize each individual's risk of exposure to communicable diseases during all aspects of care. This comprehensive program will provide individuals with education, immunization and personal protective equipment to minimize exposure to blood borne pathogens and/or communicable diseases. The major areas of exposure control encompass:

- Standard Precautions
- Engineering Controls
- Work Practice Controls
- Hand Hygiene
- Personal Protective Equipment
- Cleaning Procedures
- Hepatitis B vaccination
- Training regarding infection prevention and control will occur upon hire, yearly & as needed.

**Standard Precautions**

The blood and body fluids/substances of ALL patients are be treated as potentially infectious, regardless of diagnosis (or before diagnoses is determined in the case of prehospital care). Appropriate barrier precautions (i.e., gloves, gowns, masks, and goggles) must be routinely and consistently used for contact with blood and body fluids/substance, mucous membranes and non-intact skin of ALL patients.

**Engineering controls**

The following engineering controls are available to hospital care providers:

- Hand Hygiene methods (soap & water – sinks &/or hand sanitizers in rescue vehicles)
- Sharps containers are available at point of use – they are puncture resistant and leak proof
- Sharps safety devices are available for venipuncture devices, syringes and lancets
- Exposure from failed engineering controls must be reported to allow review of incident and follow-up.

**Patient Care Equipment Cleaning**

- Patient care equipment will be cleaned on a daily, weekly or monthly schedule as determined by individual EMS department.
- EMS will follow any additional recommendations for decontamination given by Medical Control Infection Control Department, Cuyahoga County Board of Health, Ohio Dept. of Health and/or Centers for Disease Control.

**General Requirements**

- Hand hygiene is routinely and consistently performed (methods are described below).
- Avoid touching eyes, nose, or mouth while giving patient care or handling contaminated

equipment.

- Contaminated needles and sharps are handled and disposed of in the appropriate container.
- Needles are never to be recapped, bent or broken or otherwise manipulated.
- After use, all needles and sharps are discarded uncapped and intact in a sharps container.
- Safety devices MUST be activated by the user.
- Needle/sharps containers are changed when ¾ full and sealed.
- All procedures involving blood or other infectious materials are performed to minimize splashing, spraying or other actions generating droplets. Caregivers must anticipate potential exposures and wear appropriate protective equipment to protect themselves from splashing or spraying.
- Patient items/equipment – any reusable patient care equipment that becomes contaminated must be cleaned with an appropriate disinfectant or sterilized before it used again.
- Eating, drinking, smoking, applying cosmetics/lip balm or handling contact lenses is prohibited in work areas where there is potential for exposure to blood borne pathogens.
- Food and drink are not kept in refrigerators, freezers, counter tops or in other storage areas where blood or other potentially infectious materials are present.
- Where communicable exposure is possible or anticipated, individuals not immediately needed will remain a safe distance from operations.
- Patients will be advised of respiratory etiquette (cover their nose/mouth when coughing/sneezing, use tissue to contain respiratory secretion/dispose of tissue after use, perform hand hygiene prn, wear a surgical mask if he/she is unable to cover his nose/mouth or contain respiratory secretions).
- Disposal of infectious waste in red biohazard bags to prevent further contamination to personnel, patients, and the environment. The types of waste designated as infectious at are: micro biologicals, pathological waste, blood and blood products, sharps, contaminated laboratory waste, fluid-filled containers of body substances, items that would release blood or other potentially infectious materials (OPIM) in a liquid or semi-liquid state if compressed (i.e. drippy or super-saturated), items caked with dried blood or OPIM and are capable of releasing these during handling.
- EMS, Infection Control and ED will follow established lines of communication to allow 24/7 alerting of prehospital care providers, surveillance of potentially infectious disease outbreaks and minimize risks.
- Post exposure follow-up will be done through EMS, ED and Infection Control Depts.
- If an exposure occurs, complete patient care, then seek immediate treatment in the ED.
- It is essential that the source patient be identified and tested.

**Hand Hygiene**

Hand hygiene is the single most important means of preventing the spread of infection.
Hand hygiene includes “washing” with soap and water or “sanitizing” with alcohol-based hand rub.

Wash with soap and water (scrub together, at least 15 seconds) in the following situations:

- On your arrival to work
- When hands are visibly soiled (dirty)
- When hands are visibly contaminated with blood or body fluids

- Before eating or after using the bathroom
- Before preparing, handling or serving food
- On completion of duty before going home

Sanitize with an alcohol hand rub in the following situations: (soap & water may also be used)

- Before and after having direct contact with patients (taking BP, pulse or lifting a patient)
- Before inserting indwelling catheters, peripheral vascular catheters or other invasive devices not requiring a surgical procedure
- Before donning sterile gloves when inserting a central intravascular device
- After contact with body fluids or excretions, mucous membranes, non-intact skin and wound dressings if hands are not visibly soiled
- If moving from a contaminated body site to a clean body site
- After contact with inanimate, environmental objects (including medical equipment) in the immediate vicinity of the patient
- After removing personal protective equipment (i.e. gloves, gowns, masks)
- After sneezing, coughing, or blowing your nose
- Alcohol hand rub is available in all rescue vehicles

**Personal Protective Equipment**

Occupational exposure may remain after engineering and work control practices have been implemented, requiring the use of personal protective equipment (PPE). PPE is a barrier that prevents blood or other infectious materials from passing through to skin and/or clothing underneath. These barriers include but are not limited to single use gloves, disposable gowns, face shields/masks, and protective eyewear. Individuals must anticipate the type of exposure that may occur during each patient contact and wear the appropriate PPE to prevent an exposure to blood and/or other potentially infectious body fluids. Although each situation will be different, below are general guidelines to consider for PPE:

**Gloves**

- Gloves should be worn for all EMS runs.
- Gloves shall be replaced as soon as possible when soiled, torn, or punctured.
- "Disposable gloves" are single patient use only, carefully remove by turning gloves inside out and disposing in the trash
- "Structural firefighting gloves" shall be worn in situations where sharp or rough edges are likely to be encountered. If contaminated, gloves must be washed before being re-used.
- "Heavy-duty utility gloves" may be used for handling, cleaning, or decontamination of equipment.
- Wash hands immediately after glove removal.

**Gowns/Shoes/Head Covers**

Fluid resistant disposable gowns are worn when it is anticipated that clothing may be soiled by blood or body fluids during the performance of a task or procedure. Under certain circumstances, head covers and/or shoe covers will be required to protect these areas from potential contamination. The goal is to protect the employee and their clothing from becoming contaminated. Structural firefighting gear may be substituted to protect clothing from splashes and preferable in fire, rescue or vehicle extrication activities. Disposable, paper gowns may interfere with or present a hazard to the individual in these circumstances. The decision of what type of barrier protection to use to protect clothing will be left to the individual. If disposable gowns are used:

- Shoe and head cover and gowns are single patient use and only removed immediately after use.
- They should be rolled/folded with contaminated surface inside and disposed in the trash.

**Mask / Eye / Mouth Protection**

Masks and/or eye protection must be used whenever a reasonable potential for splashing or aerosolization of blood or body fluids to the eyes, nose or mouth exists.

Face shields on structural firefighting helmets are not adequate for infection control purposes.

When treating a patient with known or suspected droplet transmissible disease (i.e. seasonal influenza, meningitis), a surgical mask must be worn if you anticipate being within 3 feet of the patient.

When treating a patient with known or suspected airborne transmissible disease (i.e. TB, Avian Flu), N95 face masks must be used. If possible have the patient wear a surgical mask. (Also, notify the ED of need for isolation as they will need to prepare a negative pressure room for the patient.)

In times of limited supplies of N95 masks, masks can be re-used by the same person unless wet, dirty or torn. Place disposable surgical mask over N95 to prevent external contamination and extend use.

**After removal of PPE**

Upon returning to quarters, wash grossly contaminated uniforms in hot water with washer provided by department. If washer is being used, place clothing into biohazard bag and wash A.S.A.P.

- Under no circumstance should grossly contaminated clothing be removed from the station without being washed.
- After any contact with contaminated item perform hand hygiene. (wash or sanitize hands) No living area may be entered by personnel if clothes are contaminated.
- The individual shall shower if body fluids were in contact with skin under work clothes.
- All individuals shall have (2) complete changes of uniform clothing.
- Per NFPA 1971 contaminated structural firefighting gear shall be cleaned according to the manufacturer's recommendations found on attached labels. (i.e. gloves, boots, turnout coats, bunker pants.)

**Expanded Precautions**

Expanded precautions are designed for patients documented or suspected to be infected with highly transmissible or epidemiologically important pathogens spread by airborne or droplet transmission or by contact with the patient or contaminated surfaces. It is felt that precautions beyond Standard Precautions are necessary or may be helpful to interrupt transmission in health care settings both pre-hospital and in the health center.

These precautions are to be used in addition to Standard Precautions.

| EXPANDED PRECAUTION TYPE | PRE-HOSPITAL IMPLEMENTATION |
|---|---|
| **CONTACT PRECAUTIONS (Green)** | **Gloves** worn by everyone providing care and/or handling patient care equipment.<br>**Gowns required** for anyone having direct contact with patient or patient environment.<br>Wash hands with **soap and water** after care.<br>DO NOT use alcohol hand rub (sanitizer) |
| **DROPLET PRECAUTIONS (Orange)** | Surgical mask required if you are within 3 feet of the patient. **AND**<br>Surgical mask on patient during transport. |
| **AIRBORNE PRECAUTIONS (Pink)** | N95 mask for everyone providing care. **AND**<br>Turn on exhaust fan in transporting vehicle **AND** Surgical mask on patient during transport. |
| **COMPROMISED PATIENT (White)**<br>The immuno-compromised host is a person with one or more defects in the body's normal defense mechanisms that predispose them to infections, often life-threatening, that would otherwise not occur. | Frequent, meticulous hand hygiene.<br>Associates with active infections such as colds, herpes virus, upper respiratory illness, diarrhea, or other infectious diseases must have no contact with the patient. If this is unavoidable, they must wear a mask or other appropriate barriers. |

**Preparedness**

Routine surveillance may detect an individual who requires "Expanded Precautions" such as a person being transported with possible Tuberculosis, Clostridium Difficile, or MRSA (Methicillin Resistant Staphylococcus Aureus). This is handled with routine procedures.
Some patient presentations may require extraordinary procedures such as implementation of internal, external or hazmat disaster plans at the health center. This may be for suspected cases of SARS, Avian Flu, Bioterrorism, etc.…or for clusters of unusual infectious diseases being identified. EMS will notify the ED of suspected cases that may require the health center to implement their Emergency Management Plans. If this happens, "PPE" (Personal Protective Equipment) may be added to the disaster phase if it is implemented.

| Examples of situations that may require activation of disaster plans (Internal/External/Hazmat) and PPE is announced with the Disaster Phase: | |
|---|---|
| **PHASE I**<br><br>**PHASE I PPE** | • A threatened biologic incident, an event where an intention is expressed, or warning made that an infectious agent will be used (or has been used) to cause harm to people. No patients are presenting currently.<br>• New influenza virus (i.e. SARS, Avian Flu) is detected in the United States.<br>• Unusual infectious disease cases identified or suspected such as SARS, Anthrax, Avian Flu, etc…..<br>• Clinical staff needs to locate their PPE (including N95 mask if already fit-tested). |
| **PHASE II**<br><br>**PHASE II PPE** | • Potential terrorist utilizing biologic agents may not always threaten or notify that an event has taken place. Recognition then, in some instances, takes place by hospitals, ED Physicians, laboratory personnel who report increased numbers of ill persons to their supervisor, risk manager or infection control.<br>• Clusters of patients with unusual infectious disease identified or suspected in one or more facilities.<br>• New influenza virus (i.e. SARS, Avian Flu) is detected in Ohio.<br>• Clinical staff responding to patient care areas must look for and follow Expanded Precautions signs: "Contact", "Droplet", "Airborne", or "Compromised Patient".<br>• Personal Protective Equipment will be available in their usual locations.<br>• Managers or designees are responsible to obtain replacement N95's.<br>• Labor Pool may be utilized to assist with their distribution. |
| **PHASE III**<br><br>**PHASE III PPE** | • Pandemic Level 6 determined by the World Health Organization (virus transmission increases significantly and there is sustained transmissibility in the general population).<br>• Multiple infectious patients are presenting to all facilities.<br>• All associates in all facilities will be required to wear PPE.<br>• Infection Control will determine what PPE will be required.<br>• Associate Occupational Health Services (AOHS) Department will distribute PPE.<br>• Associates to be screened by AOHS (i.e. temperature checked, history asked). If cleared, associate will be given appropriate PPE. |

# BLOOD COLLECTION FOR EVIDENCE (OHIO SENATE BILL 58)

Ohio Senate Bill 58 became Law in September 2010.

The Law includes provisions for EMS providers to withdraw blood for evidence collection in cases involving allegations of operating watercraft or vehicles under the influence.

The language of the bill states that drawing blood "may" not "shall" be done for evidence collection "in the course of" providing emergency medical treatment.

- You CANNOT be dispatched or called by the police for the sole purpose of performing phlebotomy when the person does not require emergency medical treatment.
- The Medic/AEMT in charge can refuse law enforcements request to draw the blood if doing so would interfere with lifesaving patient care or outcome.
- The patient must consent to the collection of blood for evidence purposes.
  (If unconscious, Implied Consent applies)
- The Police Officer making the request must always be present during the draw and must provide the Medic/AEMT with the evidence collection kit.
- EMS Providers MUST use the evidence kit provided by law enforcement to obtain the blood samples for evidence.

# DEPARTMENT SUPPLIED PATIENT CARE EQUIPMENT

**PURPOSE**

- To allow equipment supplied by individual EMS departments, but not specifically referenced in EMS protocol to be used for the benefit of patient care.
- Define the process of Medical Director review and approval of EMS Department supplied patient care equipment
- Define where and who is responsible for the Operating Procedures for EMS department supplied patient care devices.

**POLICY**

It is understood that EMS departments may have equipment that is not necessarily referenced in this EMS protocol. For these items to be used within the scope of University Hospitals EMS Medical Control and as an adjunct to these EMS protocols the following must occur.

1. The device must be approved by the Medical Director in writing.
2. The Department must develop, implement, and periodically review operating procedures for the device. These will become the protocol for the use of the referenced device. The operating procedure must include indications, contra-indications, instructions for use, approved levels of EMS certification, signs and symptoms, key points, outline training requirements, and define maintenance (if applicable). The operating procedures must be approved and signed by the Medical Director.
3. The Department must be willing to incur all costs associated with operating said device, including disposable items.
4. The Department must provide training on the device to all department members expected to use the device under the direction and approval of the Medical Director
5. The Department must be willing to share performance data on the device with the University Hospitals EMS Medical Control, including Patient Care Reports, within the scope of HIPAA.
6. The Department must report adverse patient outcomes that may be attributed to the patient care device as soon as identified.
7. The Department must agree to discontinue use of the device on the instruction of the Medical Director.

# DRUG EXCHANGE

There are several methods of EMS drug exchange. Medications may be managed by the Medical Control hospital, or some agencies may purchase their own medications. Refer to individual hospital or agency rules regarding management of medications. Any method of medication management and restocking must be consistent with all federal, state, and local laws, rules, and regulations.

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# APPENDIX #4: ODPS EMS SCOPE OF PRACTICE

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# Scope of Practice

## Approved by
## State Board of Emergency Medical, Fire and Transportation Services and the Ohio Department of Public Safety, Division of EMS

## February 19, 2026

This document offers an "at-a-glance" view of the Scope of Practice for Emergency Medical Responders (EMR), Emergency Medical Technicians (EMT), Advanced Emergency Medical Technicians (AEMT), and Paramedics as formally written in Ohio Revised Code and Ohio Administrative Code and approved by the State Board of Emergency Medical, Fire, and Transportation Services (EMFTS Board). The authorized services can be found in sections 4765.35 (FR/EMR), 4765.37 (EMT-B/EMT), 4765.38 (EMT- I/AEMT), and 4765.39 (EMT-P/Paramedic) of the Revised Code. The scopes of practice can be found in rules 4765-12-04 (EMR), 4765-15-04 (EMT), 4765-16-04 (AEMT), and 4765-17-03 (Paramedic) of the Administrative Code. The Ohio EMS scope of practice authorized by the EMFTS Board applies to emergency and non-emergency settings.

All services provided by certified Ohio EMS providers must be approved by the EMFTS Board. Following Board approval, all services that are provided must be authorized by a physician who meets the qualifications to serve as the medical director of an Ohio EMS agency as cited in Ohio Administrative Code 4765-3-05. In addition to authorization, the medical director must provide a written protocol, training, continuing education, and a quality assurance program for the services provided. The medical director of an Ohio EMS agency retains the authority to restrict the performances of services that have been approved by the EMFTS Board. However, regardless of the amount of training provided, the medical director is not permitted to exceed the scope of practice that has been approved by the EMFTS Board.

Within the Ohio EMS scope of practice that has been approved by the EMFTS Board, there are two categories of authorized services, "core competencies" and "added competencies." Core competencies are services that are required to be taught and are included in the statewide approved initial training curricula of Ohio EMS education institutions for EMRs, EMTs, AEMTs, and Paramedics. Added competencies are elective services that are not required to be taught and are not included in the statewide approved initial training curricula for EMRs, EMTs, AEMTs, and Paramedics. For services classified as added competencies, the medical director is responsible for providing the education for each specific service he or she elects to authorize. Analogous to core competencies, the medical director must also provide training, a written protocol, continuing education, and a quality assurance program for each added competency.

Performance of services outlined in this document and in the aforementioned code sections shall only be performed if the EMR, EMT, AEMT, and Paramedic have received training as part of an initial certification course or through subsequent training approved by the EMFTS Board. If specific training has not been specified by the EMFTS Board, the EMR, EMT, AEMT, and Paramedic must have received training regarding such services approved by the local medical director before performing those services.

The individual medical director of each EMS agency may limit or ask that providers obtain approval from medical direction for certain treatments. Each medical director may need to tailor and revise their protocol to meet their community's needs and to fit their region and individual practice, but they must ensure that all protocols remain within the approved scope of practice. EMS medical directors are reminded that they are not permitted to expand or exceed the scope of practice for EMS providers which has been authorized by the EMFTS Board; however, they may provide clarifications or limitations on services that are permitted.

EMS medical directors and EMS providers are strongly encouraged to review the EMFTS Board's policy statement "Regarding EMS Provider Prehospital Transport of Patients with Pre-Existing Medical Devices or Drug Administrations" dated June 2023 (located at: State Board Policies and Position Papers). This statement clarifies how EMS providers, in the prehospital setting, should deal with medical devices and medication administrations that are outside their scope of practice.

Pursuant to rule 4765-6-04 of the Administrative Code, the EMFTS Board may allow EMRs, EMTs, AEMTs, and Paramedics to perform services beyond their respective scopes of practices as part of a board-approved research study. An entity must submit a research proposal to the EMFTS Board in accordance with the requirements of rule 4765-6-04 of the Administrative Code. The EMFTS Board is not obligated to approve the proposed research study nor accept any recommendation to permanently amend the scope of practice.

Updated 11/19/03; 5/17/05; 10/26/05; 10/17/07; 3/8/12; 8/22/13, 10/16/13, 12/18/13, 4/16/2014, 10/19/16, 2/15/17, 10/18/17, 6/20/18, 4/1/20, 1/1/21, 4/21/22, 1/1/24, 4/18/24, 6/26/24, 4/16/25, 8/12/2025, 8/20/25, 12/17/2025, 2/19/2026

## CORE COMPETENCIES

| | Airway Management | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|---|
| 1 | Open and maintain the airway | X | X | X | X |
| 2 | Oropharyngeal airway adjunct | X | X | X | X |
| 3 | Nasopharyngeal airway adjunct | X | X | X | X |
| 4 | Manual removal of obstructed airway | X | X | X | X |
| 5 | Laryngoscopy for removal of airway obstruction | | | X | X |
| 6 | Oral suctioning | X | X | X | X |
| 7 | Endotracheal (ET) tube suctioning through a previously established airway or a stoma | | X | X | X |
| 8 | Tracheostomy tube replacement [A] | | | X | X |
| 9 | Cricothyrotomy, surgical [A] | | | | X |
| 10 | Cricothyrotomy, needle [A] | | | | X |
| 11 | Apply and obtain readings of pulse oximeter, CO-oximeter, and capnography or capnometry equipment | X | X | X | X |
| 12 | Oxygen administration | | | | |
| | a. Nasal cannula | X | X | X | X |
| | b. Simple face mask | X | X | X | X |
| | c. Non-rebreather mask | X | X | X | X |
| | d. Mouth-to-barrier devices, mask, mouth, nose, or stoma | X | X | X | X |
| | e. Partial rebreather mask | | X | X | X |
| | f. Venturi mask | | X | X | X |
| 13 | Ventilation management | | | | |
| | a. Bag valve mask | X | X | X | X |
| | b. Ventilation with a flow-restricted oxygen-powered device | X | X | X | X |
| | c. Positive pressure ventilation devices (manually triggered or automatic ventilators) | | X | X | X |
| 14 | Ventilator management of patients with invasive airway devices - 16 years of age or older [A, B] | | | | X |

| | | | | | |
|---|---|---|---|---|---|
| 15 | Non-emergent ambulance transport of a stable patient less than 16 years of age who has a chronic condition requiring a tracheostomy tube and a ventilator provided the patient's caregiver accompanies the patient during transport. The caregiver must have received appropriate training in use of the patient's ventilator. A caregiver is not required to accompany the patient if the patient is accompanied by an Ohio licensed registered nurse or respiratory therapist, or other appropriately trained and licensed Ohio healthcare provider. [A] | | | | x |
| 16 | Orotracheal intubation [A] | | | | x |
| | a. Apneic patients | | | x | x |
| | b. Pulseless and apneic patients | | | x | x |
| 17 | Nasotracheal intubation [A] | | | | x |
| 18 | Dual lumen airway [A] | | | | x |
| | a. Apneic patients | | | x | x |
| | b. Pulseless and apneic patients | | x | x | x |
| 19 | Extraglottic airways [A] | | | | x |
| | a. Apneic patients | | | x | x |
| | b. Pulseless and apneic patients | | x | x | x |
| 20 | CPAP administration and management | | x | x | x |
| 21 | BiPAP administration and management | | | | x |
| 22 | High flow nasal cannula | | | | x |
| 23 | Positive end-expiratory pressure (PEEP) | | | | x |
| 24 | End tidal $CO_2$ monitoring and detecting | | x | x | x |
| 25 | Oxygen humidifier equipment application and monitoring | | x | x | x |
| 26 | Chest tube placement – assist only | | | | x |
| 27 | Chest tube monitoring and management | | | | x |
| 28 | Nasogastric (NG) tube placement | | | | x |
| 29 | Orogastric (OG) tube placement | | | | x |

[A] The utilization of waveform capnography is mandatory for all patients requiring invasive airway devices with the exception of stable patients with no cardiac or pulmonary complaints or symptoms unless ordered by the transferring physician. An invasive airway device is any airway device inserted or pre-positioned into a patient's airway by means of the mouth, directly into the trachea, or into the trachea by means of a tracheostomy tube, cricothyrotomy or nasotracheal intubation. Dual lumen and extraglottic airways, even though they are blindly inserted into the hypopharynx or the esophagus, are considered invasive airway devices.

[B] Traditional ventilators solely perform mechanical ventilation; however, multi-function ventilators are capable of performing mechanical ventilation as well as positive end expiratory pressure (PEEP), bilevel positive air pressure (BiPAP),

continuous positive airway pressure (CPAP), and/or high-flow oxygen generation. When providing airway management with a multi-function ventilator, the administration of PEEP, BiPAP, CPAP, and high-flow oxygen is permitted for patients of all ages per the written protocol provided by the EMS medical director. When a multi-function ventilator is used during the provision of mechanical ventilation to patients with invasive airway devices, the patient must be 16 years of age or older. An invasive airway device is any airway device inserted or pre-positioned into a patient's airway by means of the mouth, directly into the trachea, or into the trachea by means of a tracheostomy tube, cricothyrotomy, or nasotracheal intubation. Dual lumen and extraglottic airways, even though they are blindly inserted into the hypopharynx or the esophagus, are considered invasive airway devices.

| | Cardiac Management | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|---|
| 1 | Cardiopulmonary resuscitation (CPR) | x | x | x | x |
| 2 | Chest compression assist devices | X | x | x | x |
| 3 | Automated external defibrillator (use of an AED) | x | x | x | x |
| 4 | Manual defibrillation | | | x | x |
| 5 | Negative impedance threshold devices | | x | x | x |
| 6 | Administration of cardiac medication | | | | x |
| 7 | Set up cardiac monitor in the presence of an AEMT or Paramedic | | x | | |
| 8 | Cardiac monitor strip interpretation | | | x | x |
| 9 | Cardioversion | | | | x |
| 10 | Transcutaneous cardiac pacing | | | | x |
| 11 | Transvenous cardiac pacing – monitoring and maintenance | | | | x |
| 12 | Diagnostic EKG performance and interpretation | | | | x |
| 13 | Diagnostic EKG application assisting a Paramedic who is present | | x | x | |
| 14 | Diagnostic EKG set up and application for electronic transmission [c] | | x | x | x |

[c] An EMT or AEMT may set up and apply a diagnostic electrocardiogram when assisting a Paramedic or for the purposes of electronic transmission if all of the following conditions are met: 1) performed in accordance with written protocol; 2) EMT or AEMT shall not interpret the electrocardiogram; 3) delay in patient transport is minimized; and 4) EKG is used in conjunction with destination protocols approved by the local medical director.

| | Medical Management | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|---|
| 1 | Epinephrine administration via auto-injector | x | x | x | x |
| 2 | Epinephrine administration via SQ or IM routes | | | x | x |
| 3 | Epinephrine administration via IV or IO route | | | | x |
| 4 | Aspirin administration | | x | x | x |
| 5 | Oral glucose administration | | x | x | x |
| 6 | Oral over-the-counter (OTC) analgesics for pain or fever | | x | x | x |
| 7 | Nitroglycerin administration (patient assisted) [D] | | x | x | x |

| | | | | | |
|---|---|---|---|---|---|
| 8 | Nitroglycerin administration (non-patient assisted) | | | x | x |
| 9 | Aerosolized or nebulized medications administration (patient assisted) [E] | | x | x | x |
| 10 | Administration of aerosolized or nebulized medications (non-patient assisted) | | | x | x |
| 11 | Naloxone administration via auto-injector | x | x | x | x |
| 12 | Naloxone administration via intranasal route | x | x | x | x |
| 13 | Naloxone administration via ETT, IM, IV, IO, or SQ routes | | | x | x |
| 14 | Medication administration (protocol-approved) [E] | | | x | x |
| 15 | Medication administration via the intradermal route | | | | x |
| 16 | Administration of intranasal medications (in addition to naloxone) [E] | | | x | x |
| 17 | Immunizations for influenza to firefighters, EMTs, AEMTs, or Paramedics (ORC 4765.391) | | | | x |
| 18 | Set up of IV administration kit in the presence of an AEMT or Paramedic | | x | | |
| 19 | Transport of central/peripheral IV without an infusion | | x | x | x |
| 20 | Intravenous access and peripheral initiation | | | x | x |
| 21 | Access indwelling catheters and implanted central IV ports | | | | x |
| 22 | IV maintenance and fluid administration | | | x | x |
| 23 | Maintenance of medicated IV fluids | | | | x |
| 24 | Central line monitoring | | | | x |
| 25 | IV infusion pump | | | | x |
| 26 | Intraosseous needle insertion | | | x | x |
| 27 | Saline lock initiation | | | x | x |
| 28 | Peripheral IV blood specimens | | | x | x |
| 29 | Maintenance of blood administration | | | | x |
| 30 | Thrombolytic therapy initiation and monitoring | | | | x |
| 31 | Administration of immunizations [F] | x | x | x | x |

[D] Patient Assisted Definition: May assist with 1) patient's prescription upon patient request and with written protocol – OR – 2) EMS-provided medications with verbal medical direction.

[E] See "AEMT Medications Approved by the EMFTS Board."

[F] So long as the route of administration is within the scope of practice and the certificate holder administers the immunization pursuant to medical direction and training on the specific immunization, which includes adherence to the recommendations and instructions of the Food and Drug Administration.

| | Trauma Management | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|---|
| 1 | Long spine board | X | X | X | X |
| 2 | Short spine board | X | X | X | X |
| 3 | Splinting devices | X | X | X | X |
| 4 | Traction splint | | X | X | X |
| 5 | Manual cervical immobilization | X | X | X | X |
| 6 | Cervical immobilization device (CID) | X | X | X | X |
| 7 | Helmet removal | | X | X | X |
| 8 | Rapid extrication procedures | | X | X | X |
| 9 | Needle decompression of the chest | | | X | X |
| 10 | Soft tissue management | X | X | X | X |
| 11 | Management of suspected fractures | X | X | X | X |
| 12 | Controlling of hemorrhage | X | X | X | X |
| 13 | Wound packing | X | X | X | X |

| | Basic Performances | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|---|
| 1 | Personal protective equipment (PPE) Selection/donning/doffing | X | X | X | X |
| 2 | Taking and recording of vital signs | X | X | X | X |
| 3 | Emergency moves for endangered patients | X | X | X | X |
| 4 | Patient Care Report (PCR) documentation | X | X | X | X |
| 5 | Trauma triage determination per OAC 4765-14-02 | X | X | X | X |

| | Additional Services | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|---|
| 1 | Emergency childbirth management [G] | X | X | X | X |
| 2 | Glucose monitoring system use (with Clinical Laboratory Improvement Amendments (CLIA) waiver in place | | X | X | X |
| 3 | Blood analysis | | | | X |
| 4 | Eye irrigation | X | X | X | X |
| 5 | Eye irrigation with Morgan lens | | | | X |
| 6 | Maintenance of blood administration | | | | X |
| 7 | Thrombolytic therapy initiation and monitoring | | | | X |
| 8 | Mechanical patient restraints | | X | X | X |
| 9 | Telemetric monitoring devices and transmission of clinical data, including video data | | X | X | X |

[G] An EMR may only assist with emergency childbirth management.

| Emergency Medical Services in Hospital | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|
| *June 30, 2021-October 1, 2022: A first responder, emergency medical technician-basic, emergency medical technician-intermediate, and emergency medical technician-paramedic may perform emergency medical services in any setting, including in any area of a hospital, if the services performed under the direction and supervision of one of the following:*<br>*(1) A physician;*<br>*(2) A physician assistant designated by a physician;*<br>*(3) An advanced practice registered nurse designated by a physician*. [H] | x | x | x | x |
| Prior to June 30, 2021 and after October 1, 2022: In a hospital, an EMT, AEMT or Paramedic may perform emergency medical services in accordance with the following conditions: only in the hospital's emergency department (ED) or while moving a patient between the ED and another part of the hospital; only under the direction and supervision of a physician, a physician assistant designated by a physician, or a RN designated by a physician (ORC 4765.36). The EMT, AEMT, or Paramedic cannot perform any service outside the scope of practice of his or her certificate to practice. | | X | X | X |
| [H] House Bill 110 | | | | |

| Additional Services in a Declared Emergency | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|
| In the event of an emergency declared by the governor that affects the public's health, an EMS provider may administer drugs or dangerous drugs, in relation to the emergency, provided the EMS provider is under physician medical direction and has received appropriate training regarding the administration of such drugs or dangerous drugs (OAC 4765-6-03) | x | x | x | x |

| Nerve Agent or Organophosphate Release | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|
| An EMS provider may administer drugs or dangerous drugs contained within a nerve agent antidote auto-injector kit, including a MARK I® kit, in response to suspected or known exposure to a nerve or organophosphate agent provided the EMS provider is under physician medical direction and has received appropriate training regarding the administration of such drugs within the nerve agent antidote auto-injector kit. (OAC 4765-6-05) | x | x | x | x |

| COVID-19 Testing | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|
| Per the Ohio Revised Code 4765.53 which became effective on July 6, 2022, an EMT, AEMT, and Paramedic may administer a test for COVID-19 and may collect and label specimens from a test for COVID-19 if that individual has received proper training to engage in those activities. | | x | x | x |

| Withdrawing of Blood for Evidence Collection | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|
| Withdraw blood for the purpose of determining the alcohol, drug, controlled substance, metabolite of a controlled substance, or combination content of the whole blood, blood serum, or blood plasma only if the medical director provides authorization, a written protocol, and training. It may only be performed in the course of the provision of emergency medical treatment and at the request of a law enforcement officer, and only in response to a request for emergency medical treatment and transport to a health care facility. A clinically competent patient may refuse transport.<br>Withdrawal of blood shall not be done:<br>1. If the physical welfare of the patient, EMS provider, or other person would be endangered<br>2. If it causes an unreasonable delay in treatment or transport of the patient or any other person<br>3. Consent of the patient is not obtained (an unconscious person or a person with a condition rendering | | | x | x |

| | | | | |
|---|---|---|---|---|
| the person incapable of refusal shall be deemed to have consented)<br>4. From a pre-existing central venous access device<br>5. Withdrawal of blood violates any rule in this chapter (OAC 4765-6)<br>6. The person is deceased<br>(OAC 4765-6-06) | | | | |

| AEMT Medication Administration Approved by the EMFTS Board | | |
|---|---|---|
| ***A certified AEMT may administer medications from the following list, provided the AEMT is under physician medical direction and has received appropriate training regarding the administration of such medications. A medication that does not appear on the following list SHALL NOT be added to the department's AEMT protocol.*** | | |
| | | |
| Benzodiazepines | | Lidocaine for pain relief after intraosseous needle insertions |
| Bronchodilators | | Nalbuphine |
| Buprenorphine | | Naloxone |
| Dextrose in water | | Narcotics or other analgesics for pain relief |
| Diphenhydramine | | Nitrous oxide |
| Epinephrine 1 mg per 1 ml (subcutaneous or intramuscular) | | Ondansetron [!] |
| Glucagon | | Sublingual nitroglycerin |
| Ketamine | | Tranexamic acid |
| [!] A certified AEMT may administer ondansetron for patients age 4 years or older. | | |
| ***The approved route of administration of any specific medication is stated in the respective EMT, AEMT, and Paramedic curriculum. The EMS provider shall administer medications only via the route addressed in each respective curriculum and consistent with their level of training.*** | | |

**As stated in the introduction of this Ohio EMS scope of practice matrix, all core competencies and added competencies must be approved by the EMFTS Board. Added competencies are elective services that are not required to be taught and are not included in the statewide approved initial training curricula for EMRs, EMTs, AEMTs, and Paramedics. For services classified as added competencies, the medical director is responsible for providing the education for each specific service he or she elects to authorize. Analogous to core competencies, the medical director must also provide training, a written protocol, continuing education, and a quality assurance program for each added competency.**

## ADDED COMPETENCIES

| | Medical Management | EMR | EMT | AEMT | PARAMEDIC |
|---|---|---|---|---|---|
| 1 | Epinephrine administration IM via syringe for anaphylaxis [2301] | | x | | |
| 2 | Metered-dose or nebulized bronchodilator administration [2401] | | x | | |
| 3 | Glucagon administration via intranasal or IM routes for hypoglycemia [2401] | | x | | |
| 4 | Initiation of blood or blood products [2401] | | | | x |
| 5 | Sound doppler devices [2501] | x | x | x | x |
| 6 | Finger thoracostomy [2501] | | | | x |
| 7 | Ultrasound device utilization to be performed only as authorized by the local medical director [2501] | | | | x |
| 8 | Urinary catheter initiation and maintenance[2502] | | | | x |
| 9 | Oral ondansetron for patients age 12 years and older[2502] | | x | | |
| 10 | Buprenorphine administration within an established substance use disorder bridge program[2601] | | x | | |

[2301]EMFTS Board approval on 12/13/2023; effective January 1, 2024
[2401]EMFTS Board approval on 6/26/2024; effective June 26, 2024
[2501]EMFTS Board approval on 8/20/2025; effective August 20, 2025
[2502]EMFTS Board approval on 12/17/2025, effective December 17, 2025
[2601]EMFTS Board approval on 2/19/2026, effective February 19, 2026

**Mark Marchetta, Sr.**, Chair
**Mark Resanovich**, Vice Chair
**Dr. Carol Cunningham**, State Medical Director

The State Board of Emergency Medical, Fire, and Transportation Services ("EMFTS Board") issues the following statement:

Regarding EMS Provider Prehospital Transport of Patients with
Pre-Existing Medical Devices or Drug Administrations
June 2023

*This statement is an attempt to provide general information about the above issue facing EMS providers. It should not be treated as legal advice or medical direction. For direct advice regarding a particular scenario, please consult with your medical director and legal counsel. Although the following statement represents the EMFTS Board's general position on the above issue, this statement in no way precludes the EMFTS Board from taking disciplinary action in a particular case if necessary. Any potential complaints brought before the EMFTS Board will be decided on a case-by-case basis.*

**Introduction:**
The State Board of Emergency Medical, Fire, and Transportation Services (EMFTS Board) and the Ohio Department of Public Safety, Division of Emergency Medical Services, has developed a defined scope of practice for EMS providers. The scope of practice for each level of EMS providers is established in Ohio Administrative Code Chapters 4765-12, 4765-15, 4765-16, and 4765-17. An outline of the Ohio EMS scope of practice is available in matrix form and is posted on the Ohio Department of Public Safety, Division of EMS website as a reference for public access. This scope of practice addresses all levels of EMS providers and has been approved by the EMFTS Board. Updates to the scope of practice are made as necessary and after approval by the EMFTS Board.

From time to time, EMS providers are confronted on-scene with patients with preexisting medical situations not included or addressed in their respective EMFTS Board approved scope of practice. Specifically, patients with pre-existing medical devices and drug administrations that require prehospital EMS services are becoming more commonplace. The intent of this position paper is to address the EMS provider's approach to that prehospital patient with a pre-existing physician-ordered medical device or drug administration ("MDDA") not covered in the provider's scope of practice.

**Discussion:**
In general, the EMS provider should maintain the pre-existing MDDA and transport the patient to the appropriate facility. There is no expectation that the EMS provider will initiate, adjust, or discontinue the pre-existing MDDA. This implies that the EMS provider will maintain and continue care so that the patient can be transported.

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The EMS provider is expected to follow local protocols regarding the overall evaluation, treatment, and transportation of this type of prehospital patient requiring EMS service. It applies to EMS provider situations where alternative transportation and care is not available or practical (prehospital or "911 scene response"). It implies that the most appropriate and available level of EMS provider will respond to the request for prehospital EMS service. It also implies that the patient requires the pre-existing MDDA and it is not feasible or appropriate to transport the patient without the pre-existing MDDA. For the rare circumstance when it is impossible to transport a MDDA with the patient, the EMS provider must receive authorization and formal training in the removal of the MDDA and subsequent patient management from the EMS medical director well in advance of the emergency response. As a last resort, the EMS provider shall contact medical direction and, if available, the customer service and/or resource department of the manufacturer of the device for information regarding appropriate patient and device management.

The number and type of pre-existing MDDAs currently or potentially encountered by the EMS provider in the community setting is extensive and may change frequently. The intent of this position paper is not to provide an inclusive list of pre-existing MDDAs. However, as a guideline for the EMS provider, current pre-existing MDDAs may include ventilatory adjuncts (CPAP, BiPAP), continuous or intermittent IV medication infusions (analgesics, antibiotics, chemotherapeutic agents, vasopressors, cardiac drugs), continuous gastric or parenteral infusion of nutrition, and nontraditional out-of-hospital drug infusion routes (subcutaneous infusaports, central venous access lines, direct subcutaneous infusions, self-contained implanted pumps). An example of a pre-existing MDDA that is impossible to transport with the patient is a home dialysis machine.

**Conclusion:**
In conclusion, the EMS provider confronted with a prehospital patient with a pre-existing physician-ordered medical device or drug administration not covered in the EMS provider's respective scope of practice should provide usual care and transportation while maintaining the pre-existing MDDA, if applicable. Concerns or questions regarding real-time events associated with a pre-existing MDDA should be directed to the relevant physician providing medical direction. Concerns or questions regarding previous, recurrent, or future prehospital transportations with a pre-existing MDDA should be directed to the appropriate EMS medical director and legal counsel.

State Board of Emergency Medical, Fire, and Transportation Services
Thomas Allenstein, Chair
Dudley H.A. Wright II, Vice-Chair
Dr. Carol Cunningham, State Medical Director
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The State Board of Emergency Medical, Fire, and Transportation Services ("EMFTS Board") issues the following statement:

# Regarding Interfacility Transport of Patients by EMS Providers and the Scope of Practice
June 2018

*This statement is an attempt to provide general information about the above issue facing EMS providers. It should not be treated as legal advice or medical direction. For direct advice regarding a particular scenario, please consult with your medical director and legal counsel. Although the following statement represents the EMFTS Board's general position on the above issue, this statement in no way precludes the EMFTS Board from taking disciplinary action in a particular case if necessary. Any potential complaints brought before the EMFTS Board will be decided on a case-by case basis.*

## Introduction:

The State Board of Emergency Medical, Fire, and Transportation Services and the Ohio Department of Public Safety, Division of Emergency Medical Services, have developed a defined scope of practice for all EMS providers. The scope of practice for emergency medical technicians (EMTs), advanced emergency medical technicians (AEMTs), and Paramedics is established respectively in Ohio Administrative Code Chapters 4765-15, 4765-16, and 4765-17. An outline of the Ohio EMS scope of practice is available in a matrix form and is posted on the Ohio Department of Public Safety, Division of EMS' website as a reference for public access. This scope of practice addresses all levels of EMS providers and has been approved by the EMFTS Board. Updates to the scope of practice are made as necessary and must be approved by the EMFTS Board.

From time to time, during interfacility transport, EMS providers are confronted with medications, interventions, and therapies that are beyond of their routine scope of practice and training. In these scenarios, additional training (particularly for the Paramedic) paired with initial and ongoing demonstration or testing of skills, is required. The intent of this position paper is to address the approach of the EMS providers and their medical directors to these situations which are not explicitly covered in the Ohio EMS scope of practice.

## Discussion:

The number and type of medications, interventions, and therapies in the medical field currently or potentially encountered by the EMS provider in the interfacility transport setting are extensive and may change frequently. The intent of this position paper is not to provide an inclusive or exclusive list of medications, interventions, and therapies that should be included or excluded from the EMS provider's scope of practice. Rather, the intention of this document is to frame the discussion around maintenance of patient safety during interfacility transport and provision of patient care that is appropriate to the EMS provider's level of training, including additional training that has been approved and documented by the medical director and completed well in advance of the transfer.

Additionally, the success of any EMS service requires robust medical direction from an actively involved physician who meets the requirements set forth in Ohio Administrative Code 4765-3-05. This includes, but is not limited to, the initial and ongoing training of EMS providers, as well as an active performance improvement process in which all transports are subject to review for quality assurance.

The scope of this document includes all transports in which the highest level of training of the personnel in the transport vehicle is a Paramedic, including transports that require additional training. A mobile intensive care unit, as legislated in Ohio Revised Code 4766.01, is qualified to transport patients whose conditions require care beyond the scope of practice of a Paramedic. A mobile intensive care unit requires the inclusion of a registered

nurse or other allied health professional as cited in Ohio Administrative Code 4766-4-12 and a transport vehicle that has the vehicle specifications and required equipment cited in Ohio Revised Code 4766.07 and Ohio Administrative Code 4766-4-08.

**Conclusion:**
All authorized services provided by certified Ohio EMS providers, which are cited in Ohio Revised Code 4765 and Ohio Administrative Code 4765, require a written protocol from the medical director. The EMT, AEMT, and Paramedic certification is limited to the scope of practice that is set forth respectively in Ohio Administrative Code Chapters 4765-15, 4765-16, and 4765-17. Furthermore, this position paper does not provide an inclusive or exclusive list of medications, interventions, and therapies that should be included or excluded from the EMS provider's scope of practice. Patient care or services provided that are beyond the routine practice of the certified Ohio EMS provider require additional training that has been approved and documented by the medical director. All additional training must be completed well in advance of the patient transfer and should be paired with initial and ongoing demonstration or testing of skills as an adjunct to support competency.

Prior to accepting a patient for interfacility transportation, the EMS provider:

- Shall complete training for all services provided, including the management of medical equipment and devices, well in advance of the patient transfer, and any additional training must be approved and documented by the medical director.
- Shall complete training for all medications administered, including indications, contraindications, pharmacology, and side effects, well in advance of the patient transfer, and any additional training must be approved and documented by the medical director

In addition, during the interfacility transportation of patients, the EMS provider:

- Shall follow written protocols, which have been developed and signed by the EMS provider's medical director.
- Shall not initiate the infusion of blood or blood products including the initiation of infusion of additional units. Under the current scope of practice, the Paramedic may only maintain the infusion of blood or blood products.
- Shall not initiate the infusion of intravenous parenteral nutrition including the initiation of infusion of additional units. Under the current scope of practice, the Paramedic may only maintain the infusion of intravenous parenteral nutrition.
- Shall not initiate or continue the infusion of chemotherapeutic agents.
- Should refuse to initiate a transport if the EMS provider feels that adequate training on a specific medication, intervention, or therapy has not been provided well in advance of the transfer as outlined above or if the EMS provider feels uncomfortable with the transport for any reason, including but not exclusive to safety reasons, patient scenario, or any requested parameter of patient care delivery ordered during patient transport.

Concerns or questions regarding specific interfacility transports should be directed to the Ohio Department of Public Safety, Division of Emergency Medical Services.

OHIO DEPARTMENT OF PUBLIC SAFETY
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- Bureau of Motor Vehicles
- Emergency Management Agency
- **Emergency Medical Services**
- Office of Criminal Justice Services
- Ohio Homeland Security
- Ohio Investigative Unit
- Ohio State Highway Patrol

**John R. Kasich, Governor**
**John Born, Director**
**Melvin R. House**
*Executive Director*

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To: Ohio EMS providers and Ohio EMS medical directors
From: Carol A. Cunningham, M.D., FAAEM, FACEP
State Medical Director, Ohio Department of Public Safety, Division of EMS
Date: August 18, 2015
RE: Electronic transmission of 12-lead EKGs and the Ohio EMS scope of practice

On August 18, 2015, the Emergency Medical Services, Fire, and Transportation Services (EMFTS) Board approved a position statement regarding electronic technologies and the impact on EMS. For EMS agencies who wish to implement policies and procedures for the use of electronic technology for the transmission of data and images, this will provide additional options for the modes of transmission of prehospital 12-lead electrocardiograms (EKGs), and in some cases, cardiac monitor strips, by Ohio EMS providers.

At the time when the rules addressing the performance and transmission of prehospital 12-lead EKGs were promulgated, the majority of cellular phones lacked camera and internet capabilities, and the primary mode for transmission of a 12-lead EKG to a receiving facility was by telemetry. With the expanded modalities that are cited in the EMFTS Board position paper as inclusive in the definition of electronic transmission, it is important to reinforce the fact that the primary goal of the acquisition of a prehospital 12-lead EKG is to rapidly activate a cardiac catheterization laboratory when a patient experiencing an acute ST-segment myocardial infarction is identified.

The ability to transmit the image of an EKG or a cardiac monitor strip as a digital image via telemedicine avenues or via a cellular phone does not alter the Ohio EMS scope of practice. Regardless of an EMS agency's policies and procedures to utilize electronic technologies or the protocols provided by the EMS medical director, Ohio EMS providers may not exceed the Ohio EMS scope of practice for their respective level of Ohio EMS certification.

As a review, please note the following key information regarding cardiac monitoring and 12-lead EKG acquisition:

1. The Ohio EMS scope of practice permits Emergency Medical Technicians (EMTs) and Advanced Emergency Medical Technicians (AEMTs) to set up and apply a 12-lead EKG when assisting a Paramedic or for the purposes of electronic transmission if all of the following conditions are met:
   A. The EKG is performed in accordance with a written protocol
   B. The EMT and the AEMT shall not interpret the EKG
   C. Delay in patient transport is minimized
   D. The EKG is used in conjunction with destination protocols approved by the local medical director

2. The Ohio EMS scope of practice does not permit EMTs to set up a cardiac monitor unless an AEMT or a Paramedic is present. The EMT shall not perform cardiac monitor interpretation.

Due to the Ohio EMS scope of practice for EMTs and AEMTs, the EMFTS Board continues to strongly recommend the inactivation of the automated interpretation function that is installed in many 12-lead EKG machines and/or the blockade of the printing of the interpretation when the EKG is acquired by an EMT or by an AEMT in the absence of a Paramedic. This action has three benefits:

A. The lack of an automated 12-lead EKG interpretation prevents the EMT and the AEMT from exceeding the Ohio EMS scope of practice.
B. The EMT and the AEMT will avoid the scenario where a patient experiencing chest pain refuses prehospital care and/or transport due to a "normal" automated 12-lead EKG interpretation.
C. Automated interpretations should not be used and are not intended to serve as a substitute for the primary interpretation of a 12-lead EKG by a Paramedic or other medical professional whose training and scope of practice includes 12-lead EKG interpretation.

EMS Care to Dogs and Cats

House Bill 187 was signed by the Governor on May 31, 2016 and becomes effective on August 31, 2016. This legislation establishes Ohio Revised Code 4765.52, which permits EMS certificate holders to provide care to dogs and cats within the following guidelines.

• The law applies to all EMS certificate holders (EMR, EMT, AEMT, Paramedic).

• Only dogs and cats are referenced in the Bill. The law does not authorize care to any other animals.

• Medical care for dogs and cats should only be performed in the course of an emergency medical response, fire response, or response to aid law enforcement. The law does not apply to a call for EMS care for animals and, furthermore, does not require EMS organizations to respond to calls for animal assistance.

• The scope of practice is not expanded for care to animals. The certificate holder is only authorized to perform the corresponding form of medical services that could be provided to a human patient including:
-Opening and manually maintaining an airway;
-Giving mouth to snout or mouth to barrier ventilation;
-Administering oxygen;
-Managing ventilation by mask;
-Controlling hemorrhage with direct pressure;
-Immobilizing fractures;
-Bandaging;

-Administering Naloxone if administering Naloxone has been authorized by the medical director and the drug is administered either in accordance with a written protocol established by a veterinarian or pursuant to consultation with a veterinarian.

• Immunity applies to EMS certificate holders when providing care to dogs and cats under the same circumstances as when providing care to human patients.

• Veterinarians who assist EMS certificate holders with medical services to a dog or cat have the same level of immunity as medical directors who assist with EMS matters.

This document has been prepared for informational purposes only. As always, certificate holders and EMSOs should consult with their legal counsel for advice.