



**MIAMI TOWNSHIP FIRE & EMS  
CLERMONT COUNTY, OHIO**



***2017***  
***PROTOCOLS***  
***AND***  
***STANDING ORDERS***  
***FOR***  
***PARAMEDIC SERVICES***

**[www.miamitwpoh.gov](http://www.miamitwpoh.gov)**



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *INDEX TO PROTOCOLS*

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The Miami Township Fire & EMS Paramedic protocol is modeled after the Southwest Ohio Paramedic protocol.

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# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *ADMINISTRATIVE PROTOCOLS*

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## INITIATING MEDICAL COMMAND CALL

1. Calls may be initiated from any Miami Township Paramedic to a physician at any 24 hour staffed emergency department. The emergency department receiving the patient is the preferred medical command contact.
2. A call **MUST** be initiated:
  - A. About any patient who is unstable,
  - B. When required to do so in the applicable management protocol,
  - C. When there is doubt about diagnosis, treatment, or disposition of the patient,
  - D. For multiple casualty incidents (greater than 5 victims), OR
  - E. For radiation or other hazardous materials incidents are encountered.
3. A call **MAY** be initiated:
  - A. When notification will speed or improve patient care, OR
  - B. Whenever it is thought necessary by the paramedic.
4. When a call is not possible, these protocols shall act as standing orders for procedures which may be performed by certified paramedics and paramedic trainees under the direct supervision of a certified paramedic. These protocols do not limit the activity of a paramedic who is in direct contact with the medical command physician. Certain procedures and medications require physician consultation prior to performance of the procedure or administration of the medication. These procedures are noted in the individual protocols. Under certain circumstances, an exception is permitted when communication problems are encountered. In these cases, complete documentation of the incident must include description of why a physician was not consulted.



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## CONTROL OF EMERGENCY MEDICAL SERVICES AT THE SCENE OF AN EMERGENCY

One of the most difficult situations for the paramedic is that created by the arrival of a physician at the scene. A different set of responsibilities exists when that physician knows and has established a previous doctor-patient relationship with the patient as opposed to when no such relationship exists. Physicians who are part of the EMS system such as the service's medical advisor or on-line medical command physician are generally responsible for patient care.

### **Physician Without Previous Doctor-Patient Relationship**

1. For a fully licensed physician who is not a part of the EMS system to assume control at the scene of an emergency, all of the following must take place:
  - A. Proof of the physician's identity and current Ohio licensure must be provided to the senior EMT-P.
  - B. The physician must agree to accompany the patient to the hospital.
  - C. The on-line medical command physician must be notified and agree to relinquish control to the on-scene physician. This can usually best be accomplished by having the medical command physician speak directly with the physician at the scene.
  - D. The physician at the scene must agree to sign his or her orders.
2. If control of the emergency is given to the on-scene physician, then the physician can only issue orders within the scope of training and practice of the EMT-P.
3. Any orders or procedures outside of the EMT-P's scope of practice will have to be carried out personally by the on-scene physician.

### **Physician With Previous Doctor-Patient Relationship**

1. As a general rule, it is desirable that the EMT-P's called to the scene of an emergency, even within a physician's office, perform an assessment and manage the patient just as would be done in any other location.



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2. If the physician wishes to take control of the patient's management, he or she may do so if:
  - A. Communication is established between on-line medical command and the physician at the scene, AND
  - B. The scene physician agrees to accompany the patient to the hospital.
3. If control of the emergency is assumed by the on-scene physician then:
  - A. The physicians' Ohio license number will be recorded on the run report.
  - B. Orders within the scope of training and practice of the EMT-P will be carried out.
  - C. Orders outside the scope of training and practice of the EMT-P will be personally carried out by the on-scene physician.
  - D. The on-scene physician will sign his or her orders.
  - E. The on-scene physician must accompany the patient in the ambulance to the hospital unless released by the on-line medical command physician.



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## PREHOSPITAL TRAUMA TRIAGE AND MASS CASUALTY CONSIDERATIONS

In cases of significant trauma, transport to a trauma center should be considered. Individual circumstances may demand flexibility and judgment on the part of the responsible paramedic or physician. These guidelines are not to be construed as mandatory or all inclusive.

Time, distance, and patient condition are extremely important variables to consider when triaging injured patients to hospitals. In the rural environment, an injured patient may be at a substantial distance from a trauma center. Such patients may be treated initially at the nearest JCAHO approved (24 hour physician coverage) emergency facility.

### **An MCI Exists If:**

1. The number of patients exceeds the number of equipment, resources, and personnel to effectively manage the operation.
2. Any EMS response that generates 5 or more patients.

### **Protocol**

1. In the event of an MCI, personnel will function and operate under the Miami Township Fire & EMS Incident Management SOP. Consideration of establishing Triage, Treatment, Transportation, and Staging Groups/Branches within the IMS are recommended.
2. Additional EMS resources will be requested per the Miami Township Fire & EMS, EMS Multiple Alarm document.
3. During any MCI the use of triage tags are required.
4. All patient care protocol sections contained within this protocol requiring contact with Medical Command are voided.
5. The only calls made directly to any hospital should be made by the Transportation Group Manager.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *ADMINISTRATIVE PROTOCOLS*

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## DETERMINATION OF DEATH / TERMINATION OF ACLS

### Protocol

1. Advanced cardiac life support must be started on all patients who are found apneic and pulseless, **UNLESS**:
  - A. EMS providers are presented with a valid Do Not Resuscitate (DNR) Comfort Care or DNR Comfort Care-Arrest order as defined in the DNR protocol, OR
  - B. There is an injury that is obviously incompatible with life. Examples are decapitation or burned beyond recognition, OR
  - C. The victim shows signs of rigor mortis (in a warm environment), dependent lividity, or decomposition, OR
  - D. The mechanism of injury is blunt trauma; and the victim has no vital signs, no signs of life such as breathing activity or movement, and asystole on the monitor, OR
  - E. The mechanism of injury is penetrating trauma; and the victim has no vital signs, no signs of life such as breathing activity or movement, asystole on the cardiac monitor, and the cardiac arrest occurred prior to the arrival of EMS personnel. If the cardiac arrest occurs after the arrival of EMS personnel, the patient **MUST** be transported immediately to the nearest appropriate hospital.
2. Once started, resuscitation efforts must be continued until a physician terminates the resuscitation. When all of the following circumstances exist, advanced cardiac life support may be stopped prior to hospital arrival:
  - A. There must be good contact between the paramedic unit and the medical command physician.
  - B. There must be at least two paramedics on the scene during the resuscitation effort.
  - C. There must have been early, successful airway management and medication administration consistent with resuscitation protocols.
  - D. Resuscitative efforts have been tried for at least 20 minutes.



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- E. There has NOT been any restoration of spontaneous circulation with a spontaneous palpable pulse greater than 60 beats per minute for at least one five-minute period at any time during the resuscitation.
- F. The patient does NOT have spontaneous respiration; eye opening, motor response, or other continued neurologic activity at the time stopping the resuscitation is contemplated.
- G. The cardiac rhythm is not persistent or recurrent ventricular fibrillation or ventricular tachycardia. If persistent or recurrent ventricular fibrillation or ventricular tachycardia is present, then resuscitative efforts should be continued until hospital arrival.
- H. All paramedics and the medical command physician must be in agreement concerning termination of ACLS.
- I. The cause of the cardiac arrest must be something other than drowning, hypothermia, acute airway obstruction, overdose, electrocution, lightning strike, or trauma.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *ADMINISTRATIVE PROTOCOLS*

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## **DO NOT RESUSCITATE ORDERS IN THE FIELD**

### **Protocol**

1. All home care Do Not Resuscitate (DNR) orders must be dated and signed by the patient and at least two witnesses.
  - A. Home care DNRs shall not expire unless the document specifies a time for expiration. If the patient lacks capacity to make informed health care decisions on the date the DNR would expire, then the DNR shall continue in effect until the patient regains the capacity to make informed health care decisions for himself.
2. DNRs set forth in long-term care facility medical records shall be signed by the attending physician and dated.
  - A. DNRs set forth in long-term care facility medical records shall not expire unless the document specifies a time for expiration. If the patient lacks capacity to make informed health care decisions on the date the DNR would expire, then the DNR shall continue in effect until the patient regains the capacity to make informed health care decisions for himself.
3. In the event a DNR is presented to an EMT, communication with a base hospital physician, EMS medical advisor, family physician or physician on the scene shall be established.
  - A. A DNR may be honored in accordance with the provisions of this protocol where it is determined that the patient is in a terminal condition and the patient is no longer capable of making informed decisions.
  - B. A DNR may not be honored where the patient is pregnant, where withholding CPR would terminate the pregnancy, and where it is probable that the fetus will develop to the point of live birth if treatment is provided.
  - C. If the EMT believes a DNR is valid, there is no need to commence CPR while waiting for physician orders. If the EMT has any doubt, the EMT need not comply with the DNR (and may commence CPR) unless and until a physician has verbally authorized compliance. Such authorization shall be documented by the EMTs in the run report.



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4. In the case of any doubt or reservation as to the validity or authenticity of any DNR, and absent authorization by a base hospital physician, EMS medical advisor, family physician or physician on the scene to withhold CPR, the EMT shall provide CPR to the patient and shall document the reasons for not complying with the DNR.
5. In the event resuscitation is initiated on a patient and then a valid DNR is subsequently identified, resuscitation may be terminated in compliance with that DNR upon specific verbal authorization from a base hospital physician, EMS medical advisor, family physician, or physician on the scene. Documentation shall be made on the run sheet indicating the events that happened set forth in chronological order, including the authorization to stop CPR in the field. In the event a DNR is identified after a patient has been intubated, the tube shall not be removed in the prehospital setting. If the initial resuscitation has restored cardiac rhythm, the patient should be transported to the nearest appropriate medical facility with no further procedures or pharmacological measures undertaken, except by authorization from the base hospital physician, medical advisor, or attending physician. Communication with a physician should be established.
6. A DNR signed by both parents of a minor child or by the spouse of a patient in a terminal condition who is no longer able to make informed decisions, and signed by two witnesses, may be honored.
7. A copy of all DNR paperwork should be copied and attached to the medical record. This paperwork should be attached whether or not the DNR was exercised.
8. The State of Ohio Do Not Resuscitate Comfort Care Program will be adhered to.

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**OHIO DNR COMFORT CARE PROGRAM SYNOPSIS**

[See state of Ohio Comfort Care Website:](#)

**Patient With DNR Comfort Care Program:**

<i><b>WILL NOT RECEIVE</b></i>	<i><b>WILL RECEIVE</b></i>
Administration of chest compression	Suction the airway
Initiation of CPR	Administer oxygen / CPAP
Intubation- ET tube or combitube	Position of comfort
Initiation of cardiac monitoring	Splinting
Administration of cardiac resuscitative drugs	Control bleeding
Defibrillation	Provide pain management
Provision of ventilatory assistance	Provide emotional support
	Contact physician, hospice, or home health care

**The following Procedures Will Stop At The Time Of Recognition Of The Patient As A DNR Comfort Care Patient:**

1. Cardiopulmonary resuscitation.
2. Ventilatory assistance.
3. Resuscitation medications.

**Patient with DNR Comfort Care Arrest Program Will Receive:**

Standard current resuscitative care.
Utilization of current pre-hospital protocols.
Termination of CPR and its components immediately after cardiac or respiratory arrest occurs.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *ADMINISTRATIVE PROTOCOLS*

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## Defining “Cardiac or Respiratory Arrest”:

1. Cardiac Arrest: Absence of a palpable pulse.
2. Respiratory Arrest: Absence of spontaneous respiration or agonal breathing.

## EMS Specific Documentation:

1. Note on the EMS run sheet “DNR Comfort Care Patient.”
2. Patient's name, gender, age and attending physicians.
3. Type of DNR Comfort Care identification seen.
4. Time, date and location of event.
5. Assessment and *care provided*.
6. If revocation was directly witnessed by EMS personnel.



# MIAMI TOWNSHIP FIRE & EMS

## CLERMONT COUNTY, OHIO

### SCOPE OF PRACTICE



State EMS Board Division of EMS/Ohio Dept. of Public Safety					
AIRWAY MANAGEMENT		FR	B	I	P
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	Obstructed airway management	X	X	X	X
5	Oral suctioning	X	X	X	X
6	ET suctioning		X	X	X
7A	Trach tube suctioning		X	X	X
7B	Trach tube replacement			X	X
8	Pulse oximeter equipment application/reading		X	X	X
9	Oxygen administration				
	a. Nasal cannula	X	X	X	X
	b. Non-rebreather mask	X	X	X	X
	c. Mouth-to-barrier devices	X	X	X	X
10	Ventilation management				
	a. Bag valve mask	X	X	X	X
	b. Ventilation with a flow-restricted O2 powered device	X	X	X	X
11	Orotacheal intubation				X
	a. Apneic patients			X	X
	b. Pulseless AND apneic patients		X	X	X
12	Nasotracheal intubation				X
13	Cricothyrotomy, surgical				X
14	Cricothyrotomy, needle				X
15	Dual lumen airway				X
	a. Apneic patients			X	X
	b. Pulseless AND apneic patients		X	X	X
16	Supraglottic Airways (4/16/08)				X
	a. Apneic patients			X	X
	b. Pulseless AND apneic patients		X	X	X
17	Ventilator management - 16 y/o or older				X
18	Bi-PAP administration and mgt.				X
19	C-PAP administration and mgt. (7/18/07)		X	X	X
20	End Tidal CO2 Monitoring & Detection		X	X	X
21	Nasogastric (NG) tube placement (4/16/08)				X
22	Orogastric (OG) tube placement (4/16/08)				X



# MIAMI TOWNSHIP FIRE & EMS

## CLERMONT COUNTY, OHIO

### SCOPE OF PRACTICE



CARDIAC MANAGEMENT		FR	B	I	P
1	Automated External Defibrillator(AED)	X	X	X	X
2	Cardiac monitor strip interpretation			X	X
3	Manual defibrillation			X	X
4	Cardiopulmonary Resuscitation (CPR)	X	X	X	X
5	Transcutaneous Cardiac pacing				X
6	Aspirin administration		X	X	X
7	Cardiac medication administration				X
8	Cardioversion				X
9	12-lead EKG performance & interpretation				X
10	12-lead EKG set up and application for electronic transmission* (4/16/08)		X	X	X
11	Chest compression assist devices		X	X	X

\* If an EMT-P is not present, the EMT-B and EMT-I may only set up and apply a 12 lead electrocardiogram if all of the following conditions are met: 1) completed in accordance with written protocol; 2) only for the purpose of electronic transmission; 3) any delay in patient transport is minimized; 4) electrocardiogram is used in conjunction with destination protocols approved by the local medical director. The EMT-B and EMT-I cannot interpret the EKG.

MEDICAL MANAGEMENT		FR	B	I	P
1	Glucose monitoring system use (with C.L.I.A waiver in place)		X	X	X
2	Peripheral IV blood specimens			X	X
3	Oral Glucose administration		X	X	X
4	Auto-injector Epinephrine (Pt. Assisted)	X	X	X	X
5	Epinephrine administration (Subcutaneous)			X	X
6	Activated Charcoal administration		X	X	X
7	Nitroglycerine administration (Pt. Assisted)		X	X	X
8	Nitroglycerine administration (Non pt. Assist)			X	X
9	Metered dose inhaler (Pt. Assisted)		X	X	X
10	Nebulized medications			X	X

Patient Assisted Definition: 1) May assist with patient's prescription upon patient request and with written protocol. - OR -2) May assist from EMS provided medications with verbal medical direction.

PRE-HOSPITAL ALS ASSISTANCE		FR	B	I	P
1	Set up of IV administration kit *		X		
2	Cardiac monitor *		X		
3	12 lead EKG application **		X	X	

\* Set-up of equipment only. An EMT-I or EMT-P must be present, or procedure(s) cannot be performed

\*\* Set-up of equipment only. If an EMT-P is not present, procedure(s) shall not be performed except as previously noted in cardiac management section



# MIAMI TOWNSHIP FIRE & EMS

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### SCOPE OF PRACTICE



TRAUMA MANAGEMENT		FR	B	I	P
1	PASG		X	X	X
2	Long spine board	X	X	X	X
3	Short spine board	X	X	X	X
4	Splinting devices	X	X	X	X
5	Traction splint		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

PREPARATORY / BASIC PERFORMANCES		FR	B	I	P
1	Body Substance Isolation precaution/administration	X	X	X	X
2	Taking and recording of vital signs	X	X	X	X
3	Patient Care Report (PCR) documentation	X	X	X	X
4	Emergency childbirth management	X	X	X	X
5	Trauma triage determination per OAC 4765-14-02	X	X	X	X

OTHER		FR	B	I	P
1	Medication administration (Protocol approved)			X	X
2	IV lifeline and fluid administration (does not include blood or blood products)			X	X
3	Intraosseous infusion			X	X
4	Saline lock initiation			X	X
5	IV infusion pump				X

ADDITIONAL SERVICES	
<p>In the event of an emergency declared by the governor that affects the public's health, an EMT-intermediate, or EMT-paramedic may perform immunizations and administer drugs or dangerous drugs, in relation to the emergency, provided the EMT is under physician medical direction and has received appropriate training regarding the administration of such immunizations and/or drugs.</p>	
<p>Nerve Agent or Organophosphate Release</p> <p>A first responder, EMT-basic, EMT-intermediate, or EMT-paramedic, 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 first responder or EMT is under physician medical direction and has received appropriate training regarding the administration of such drugs within the nerve agent antidote auto-injector kit.</p>	



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *CARDIAC ARRHYTHMIA PROTOCOLS*



## VENTRICULAR FIBRILLATION AND VENTRICULAR TACHYCARDIA WITHOUT PULSE

### Historical Findings

1. Age  $\geq$  16.
2. Patient is unconscious.

### Physical Findings

1. Patient is unresponsive.
2. Patient is without a pulse.

### EKG Findings

1. Ventricular fibrillation
2. Ventricular tachycardia.

### Protocol

#### Ventricular Fibrillation/Tachycardia without Pulse

1. Initiate CPR immediately while the defibrillator is being attached at a rate of 100 beats per minute.
  - A. Do not interrupt CPR to attach the defibrillator.
  - B. Ventilate at a rate of 8 to 10 breaths per minute.
2. If rhythm is ventricular fibrillation or ventricular tachycardia:
  - A. Continue CPR while the defibrillator is charging.
  - B. Defibrillate at 200 joules biphasic.
3. Resume CPR immediately following the defibrillation.
  - A. If utilizing a Zoll E series monitor with “*See Thru CPR*” there is no need to pause compressions for a rhythm analysis. The only interruption of CPR should be for defibrillation.
  - B. If utilizing a Zoll M series monitor without “*See Thru CPR*” continue CPR for 2 minutes after defibrillation before another rhythm check.



# MIAMI TOWNSHIP FIRE & EMS

## CLERMONT COUNTY, OHIO

### CARDIAC ARRHYTHMIA PROTOCOLS

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4. Initiate the following interventions simultaneously while CPR is being performed:
  - A. Intubate the patient, confirm placement and secure tube.
    - i. Ventilations should be delivered asynchronous to chest compressions.
  - B. Initiate IV access with 0.9% normal saline KVO.
    - i. If IV access is unsuccessful obtain IO access.
5. **Return of Spontaneous Circulation Following Defibrillation**
  - A. Administer amiodarone (Cordarone) 150 mg IV/IO slow over 10 minutes.
    - i. Mix 150 mg/3 cc in a 20 cc syringe with 17 cc 0.9 % normal saline.
    - ii. If the patient has a known allergy to amiodarone (Cordarone), lidocaine (Xylocaine) 0.5mg/kg slow IV/IO can be administered for breakthrough ventricular arrhythmias not to exceed the max dose of 3 mg/kg instead of amiodarone (Cordarone).
  - B. Obtain a 12-lead EKG and transmit to receiving hospital.
  - C. Determine patient eligibility for post-resuscitative hypothermia during transport.

#### **Inclusion Criteria:**

- i. Patient is **Not Alert** (does not follow commands).
  - ii. Cause of arrest is considered to be cardiopulmonary
    - a) If cause of arrest is suspected **NOT** to be cardiopulmonary (trauma, intracranial bleeding, etc.) **DO NOT** initiate cooling.
    - b) Actively cooling a patient with internal and intracranial bleeding is harmful. If in doubt about cause of cardiac arrest **DO NOT** initiate cooling in the pre-hospital setting.
  - iii. Systolic blood pressure > 90.
    - a) If initial blood pressure is < 90, but improves with fluid administration, hypothermia may be initiated.
- D. **Hypothermia Procedures**
- i. Expose patient completely
  - ii. Place ice packs in bilateral axillae, neck, and groin.



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- iii. Administer Chilled saline as IV/IO bolus, maximum 2 liters.
  - iv. If patient regains consciousness (follows commands) at any point discontinue cold packs and chilled saline. Use room temperature fluid as needed.
  - v. If patient SBP becomes <90 after beginning cooling procedures, the full 2 Liters of chilled saline may be used before dopamine or room temp fluid. Treat aggressively.
  - vi. If patient relapses into Cardiac Arrest ACLS care, not cooling, is the priority. Treat per protocol.
6. If rhythm has not converted following initial defibrillation, resume CPR and continue with protocol.
  7. Epinephrine 1 mg 1:10,000 IV/IO, **OR** epinephrine 2 mg 1:10,000 diluted with 10 cc of normal saline via the endotracheal route if IV/IO access is unavailable.
  8. Epinephrine can be repeated every 3-5 minutes for duration of arrest.
  9. If rhythm is ventricular fibrillation or ventricular tachycardia:
    - A. Defibrillate at 200 joules biphasic.
  10. Resume CPR immediately per line 3 in this protocol.
  11. Administer amiodarone (Cordarone) 300 mg IV/IO **OR** lidocaine 2 mg/kg via the endotracheal route if IV/IO access is unavailable.
    - A. May repeat amiodarone (Cordarone) 150 mg IV/IO in 5 minutes x1 if rhythm unchanged.
    - B. If patient has a known allergy to amiodarone (Cordarone), administer lidocaine (Xylocaine) 1.5 mg/kg IV/IO repeated in 3-5 minutes at 0.5 to 0.75 mg/kg to a max dose of 3 mg/kg instead of amiodarone (Cordarone).
  12. If rhythm is ventricular fibrillation or ventricular tachycardia:
    - A. Defibrillate at 200 joules biphasic.
  13. Resume CPR immediately per line 1 in this protocol.
  14. Magnesium sulfate 2 grams IV/IO can be administered at any time for suspected hypomagnesemia or if torsades de pointe is present.
  15. Calcium gluconate 10% 1 gram IV/IO can be administered at any time for:
    - A. Known or suspected hyperkalemia.
      - i. Cardiac arrest following the administration of succinylcholine (Anectine).



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- ii. Renal failure patients on dialysis.
  - B. Calcium channel blocker overdose.
  - C. A minimum of 20 mL saline flush is required between the administration of calcium gluconate and sodium bicarbonate to prevent precipitation.
- 16. Sodium bicarbonate 1 mEq/kg IV/IO can be administered at any time for:
  - A. Overdose of tricyclic antidepressants.
  - B. Known or suspected hyperkalemia.
    - i. Cardiac arrest following the administration succinylcholine (Anectine).
    - ii. Renal failure patients on dialysis.
  - C. A minimum of 20 mL saline flush is required between the administration of calcium gluconate and sodium bicarbonate to prevent precipitation.
- 17. If patient has a return of spontaneous circulation:
  - A. If amiodarone (Cordarone) has not been given, administer amiodarone (Cordarone) as outlined in 5A of this protocol.
  - B. If the patient has a known allergy to amiodarone (Cordarone), lidocaine (Xylocaine) 0.5 mg/kg slow IV can be administered for breakthrough ventricular arrhythmias not to exceed the max dose of 3 mg/kg instead of an amiodarone (Cordarone).
- 18. If patient has a return of spontaneous circulation and is hypotensive, refer to Cardiogenic Shock protocol – **M103**.
- 19. During the course of the resuscitation search for and treat possible contributing factors:
  - A. Hypovolemia – if suspected administer 1 liter fluid bolus with 0.9% normal saline.
  - B. Hypoxia – confirm advanced airway placement and ensure oxygen delivery.
  - C. Hyperkalemia – reference line 15 and 16 of this protocol.
  - D. Hypothermia – if suspected, consider core rectal temperature and treat per Hypothermia protocol.
  - E. Toxins – Naloxone has no role in the management of cardiac arrest and should not be given even if opiate overdose is suspected. If cyanide poisoning is suspected (such as in cardiac arrest secondary to



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- F. smoke inhalation) see Protocol **M113** for guidelines on use of the cyanide kit. For other cardiac arrests where specific toxins are suspected to be involved, contact Medical Command (University may be the best option as a toxicology doctor may be available for consult).
- G. Cardiac Tamponade – consider transport for possible pericardiocentesis.
- H. Tension Pneumothorax – perform immediate needle decompression.



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## ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

### Historical Findings

1. Age  $\geq$  16.
2. Patient is unresponsive.

### Physical Findings

1. Patient is without a pulse.

### EKG Findings

1. Electrical activity with no mechanical activity (PEA), **OR**
2. Cardiac stand still (Asystole).

### Protocol

1. Initiate CPR immediately while defibrillator is being attached at a rate of 100 beats per minute.
  - A. Do not interrupt CPR to attach defibrillator.
  - B. Ventilate at a rate of 8 to 10 breaths per minute.
  - C. If utilizing a Zoll E series monitor with “*See Thru CPR*” there is no need to pause compressions for a rhythm analysis. The only interruption of CPR should be for defibrillation.
  - D. If utilizing a Zoll M series monitor without “*See Thru CPR*” continue CPR and pause briefly every 2 minutes for rhythm analysis.
2. Initiate the following interventions while CPR is being performed:
  - A. Intubate the patient, confirm placement and secure tube.
    - i. Ventilations should be delivered asynchronous to chest compressions.
  - B. Initiate IV access with 0.9% normal saline KVO.
    - i. If IV access is unsuccessful obtain IO access.



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3. Epinephrine 1 mg 1:10,000 IV/IO, **OR** epinephrine 2 mg 1:1000 diluted with 10 cc of normal saline via the endotracheal route if IV/IO access is unavailable.
4. Epinephrine 1 mg IV/IO may be administered every 3-5 minutes.
5. If at any time the patient converts to a shockable rhythm, move to Ventricular Fibrillation and Ventricular Tachycardia protocol (**C101**).
6. During the course of the resuscitation search for and treat possible contributing factors:
  - A. Hypovolemia – if suspected administer 1 liter fluid bolus with 0.9% normal saline.
  - B. Hypoxia – confirm advanced airway placement and ensure oxygen delivery.
  - C. Hyperkalemia – if suspected administer calcium gluconate 10 % 1 gram IV/IO followed by 20 mL normal saline flush then sodium bicarbonate 1 mEq/kg IV/IO.
  - D. Hypothermia – if suspected, consider core rectal temperature and treat per Hypothermia protocol.
  - E. Toxins –Naloxone has no role in the management of cardiac arrest and should not be given even if opiate overdose is suspected. If cyanide poisoning is suspected (such as in cardiac arrest secondary to smoke inhalation) see Protocol M-113 for guidelines on use of the cyanide kit. For other cardiac arrests where specific toxins are suspected to be involved, contact Medical Command (University may be the best option as a toxicology doctor may be available for consult).
  - F. Cardiac Tamponade – consider transport for possible pericardiocentesis.
  - G. Tension Pneumothorax – perform immediate needle decompression.



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## BRADYCARDIA

### Historical Findings

1. Age > 16.

### Physical Findings

1. Pulse rate < 60 beats/minute.
2. **SIGNS** of rate-related cardiovascular compromise:
  - A. Acute altered mental status.
  - B. Ongoing chest pain.
  - C. Severe shortness of breath.
  - D. Presyncope or syncope.
  - E. Systolic blood pressure  $\leq$  90 mm/Hg.

### EKG Findings

1. Ventricular rate < 60 beats/minute.
2. Evaluate for Heart Block

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.
5. Prepare for transcutaneous pacing without delay for:
  - A. High-degree blocks (2<sup>nd</sup> degree type II or third degree AV block).

**OR**

  - B. Symptomatic bradycardia associated with acute myocardial infarction (AMI).



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6. Initiate transcutaneous pacing as follows:
  - A. The Zoll M & E series are defaulted for *DEMAND* pacing. This means that the pacemaker will only fire to maintain the set rate in coordination with the patient's intrinsic rate.
  - B. Set the rate to 62 bpm.
  - C. Start at 40mA.
  - D. Titrate current output up by 2 mA until both electrical and mechanical capture is achieved. Once mechanical capture is achieved increase current output an additional 10 %.
    - i. Typical capture is 40-80 mA.
7. Initiate IV access with 500ml normal saline bag and extension at KVO.
8. If the patient requires sedation:
  - A. Administer midazolam (Versed) 1 mg IV/IO titrated to max dose of 5 mg.
  - B. If IV access is unavailable, administer versed (midazolam) 5 mg IM/IN.
9. Atropine 0.5 mg IV may be administered every 3-5 minutes to a total dose of 3 mg for:
  - A. Symptomatic bradycardia not associated with a heart block.

**OR**
  - B. Low-degree blocks (1<sup>st</sup> degree or 2<sup>nd</sup> degree type I AV block).
10. If the patient is taking beta-blockers or calcium channel blockers consider glucagon (GlucaGen) 2 mg IV/IO/IM.
11. If the patient is deemed unstable at any time initiate transcutaneous pacing.
12. If symptomatic bradycardia is unresponsive to atropine and pacing administer **Epinephrine Push Dose Presser** at 10 mcg/1ml every 5 minutes to desired BP > 100 systolic and/or HR > 60bpm..
  - A. Epinephrine Push Dose Presser Set Up:
    - i. Equipment Needs:
      - a. Epinephrine 1:10,000 pre-filled
      - b. 10ml syringe with 18g transfer needle
      - c. 500ml Normal Saline Bag



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- ii. Steps to obtain desired Concentration (mcg/ml)
  - a. Draw 1ml from Epinephrine 1:10,000 from pre-filled using the 10ml syringe
  - b. Using the same 10ml syringe with the 1 ml of Epinephrine 1:10,000 draw 9ml from the 500ml normal saline bag
  - c. The 10ml syringe will now have a concentration of 10mcg/ml



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## WIDE COMPLEX TACHYCARDIA (UNSTABLE)

### Historical Findings

1. Age  $\geq$  16.

### Physical Findings

1. **SIGNS** of rate-related cardiovascular compromise:
  - A. Acute altered mental status
  - B. Ongoing chest pain
  - C. Severe shortness of breath
  - D. Presyncope or syncope
  - E. Systolic blood pressure  $\leq$  90 mm/Hg
  - F. Trauma
  - G. Fever

### EKG Findings

1. Rate above 150 beats/minute.
2. Rhythm may be supraventricular or ventricular in origin.
3. Absent P waves.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 Lead ECG if time permits, and maintain cardiac monitoring at all times.
5. Initiate IV access with a saline lock or 0.9 % normal saline KVO if time permits.



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6. Patient may be sedated with midazolam (Versed) 2-4 mg IV/IO/IM titrated up to a max dose of 5 mg or 5 mg IM/IN if time permits. Systolic blood pressure of 100 mm Hg is not required for sedation in unstable tachycardia patients because hypotension is typically related to impaired ventricular filling as a result of the rapid tachycardia.
7. Perform synchronized cardioversion at 100 joules biphasic.
8. If unstable tachycardia persists, repeat synchronized cardioversion at 120 joules biphasic.
9. If unstable tachycardia persists, repeat synchronized cardioversion at 150 joules biphasic.
10. If unstable tachycardia persists, repeat synchronized cardioversion at 200 joules biphasic.
11. If the unstable tachycardia persists after synchronized cardioversion administer amiodarone (Cordarone) 150 mg IV/IO. Base the rate of administration on the stability of the patient. If the patient is still conscious and alert, administer it slow over 10 minutes by mixing 150 mg/3 cc in a 20 cc syringe with 17 cc 0.9 % normal saline. If the patient is unconscious administer it bolus and prepare for unsynchronized defibrillation at 200 joule biphasic.
12. If patient has a known allergy to amiodarone (Cordarone), administer lidocaine (Xylocaine) 1.5 mg/kg IV/IO repeated in 3-5 minutes at 0.5 to 0.75 mg/kg to a max dose of 3 mg/kg instead of amiodarone (Cordarone).
12. If the patient has a known allergy to amiodarone (Cordarone), lidocaine (Xylocaine) 0.5 mg/kg slow IV can be administered for breakthrough ventricular arrhythmias not to exceed the max dose of 3 mg/kg instead of an amiodarone (Cordarone).
13. Repeat 12 lead if patient is converted.



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## WIDE COMPLEX TACHYCARDIA (STABLE)

### Historical Findings

1. Age  $\geq$  16.

### Physical Findings

1. ***NO signs*** of rate-related cardiovascular compromise:
  - A. Acute altered mental status.
  - B. Ongoing chest pain.
  - C. Severe shortness of breath.
  - D. Presyncope or syncope.
  - E. Systolic blood pressure  $\leq$  90 mm/Hg.

### EKG Findings

1. Rate above 150 beats/minute.
2. Wide QRS ( $\geq$  0.12 seconds or 3 little blocks).
3. Absent P waves.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.
5. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
6. If rhythm is Torsades de Pointes then give Magnesium 1 g IV/IO
7. May consider trial of Adenosine if the rhythm is regular
  - A. Administer adenosine 6 mg followed by 10 ml flush of normal saline. If rhythm persists, then 12 mg of adenosine and a second syringe of 10 ml of normal saline should be administered. The adenosine is given rapid IV push followed immediately by the flush of normal saline.



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8. Administer amiodarone (Cordarone) 150 mg IV **slow over 10 minutes**.
  - A. Mix 150 mg/3 cc in a 20 cc syringe with 17 cc 0.9 % normal saline.
9. If the wide complex tachycardia persists, Amiodarone may be repeated after 3-5 minutes at 150 mg IV **slow over 10 minutes**.
10. Obtain a 12-lead EKG after any rhythm change.
11. If the wide complex tachycardia persists after the second dose of amiodarone (Cordarone) and the patient remains stable, contact medical command.
12. If patient has a known allergy to amiodarone (Cordarone), administer lidocaine (Xylocaine) 1.5 mg/kg IV/IO repeated in 3-5 minutes at 0.5 to 0.75 mg/kg to a max dose of 3 mg/kg instead of amiodarone (Cordarone).
13. If the patient has a known allergy to amiodarone (Cordarone), lidocaine (Xylocaine) 0.5 mg/kg slow IV can be administered for breakthrough ventricular arrhythmias not to exceed the max dose of 3 mg/kg instead of an amiodarone (Cordarone).



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## NARROW COMPLEX TACHYCARDIA (STABLE)

### Historical Findings

1. Age  $\geq$  16.
2. Ascertain if the patient has a history of Wolff Parkinson White syndrome.
3. Ascertain if the patient has a history of Atrial Fibrillation/Flutter.

### Physical Findings

1. *No signs* of rate-related cardiovascular compromise:
  - A. Acute altered mental status
  - B. Ongoing chest pain
  - C. Severe shortness of breath
  - D. Presyncope or syncope
  - E. Systolic blood pressure  $\leq$  90 mm/Hg

### EKG Findings

1. Rate above 150-250 beats/minute.
2. Narrow QRS ( $\leq$  0.12 seconds or 3 little blocks).
3. P waves are usually absent.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.
5. If the rhythm is a regular narrow complex tachycardia (SVT), attempt vagal maneuvers.
6. Initiate IV access with a saline lock or 0.9 % normal saline KVO.



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7. If the rhythm is clearly atrial fibrillation, atrial flutter, or multifocal atrial tachycardia, vagal maneuvers and adenosine are not indicated. Proceed to number 11 of this protocol.
8. Administer adenosine (Adenocard) 6 mg rapid IV push followed by a 10 cc flush of 0.9 % normal saline.
  - A. If adenosine (Adenocard) slows AV conduction enough to determine that the underlying rhythm is atrial fibrillation, atrial flutter, or multifocal atrial tachycardia (MAT), withhold additional adenosine and go to number 11 of this protocol.
9. If a regular narrow complex tachycardia (SVT) persists after first dose of adenosine (Adenocard), administer adenosine (Adenocard) 12 mg rapid IV push followed by a 10 cc flush of 0.9 % normal saline.
10. If a regular narrow complex tachycardia (SVT) persists after the second dose of adenosine (Adenocard), administer adenosine (Adenocard) 12 mg rapid IV push followed by a flush of 0.9 % normal saline.
11. If the rhythm is atrial fibrillation, atrial flutter, or multifocal atrial tachycardia:
  - A. Administer diltiazem (Cardizem) 10 mg slow IV over 2 minutes if the above rhythms are present **with rapid ventricular response  $\geq 130$** . The goal of administering diltiazem (Cardizem) is to control the ventricular rate, however conversion to sinus rhythm can occur.
    - i. Withhold or discontinue diltiazem (Cardizem) for the following:
      1. Systolic blood pressure  $\leq 100$  mmHg. **\*\*SEE NOTES\*\***
      2. Ventricular rate  $\leq 100$ .
      3. Currently taking digoxin (Lanoxin, Digitek)
      4. Wolff Parkinson White (WPW) syndrome. If the patient has a history of WPW, delta waves are present or the 12 Lead algorithm identifies WPW do *not* administer diltiazem (Cardizem). WPW is defined as:
        - a. Shortened PR interval ( $<0.12$  sec) with normal P wave.
        - b. Wide QRS complex ( $\geq 0.11$  sec).
        - c. Delta waves (see figure 10.9 & 10-10)



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- d. See example of 12 Lead ECG with WPW (Figure 10.11)
- B. If no change in ventricular rate is observed 15 minutes after initial dose, administer diltiazem (Cardizem) at 10 mg slow IV over 2 minutes.

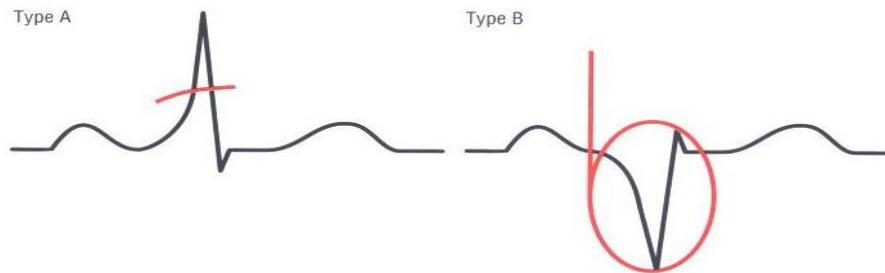
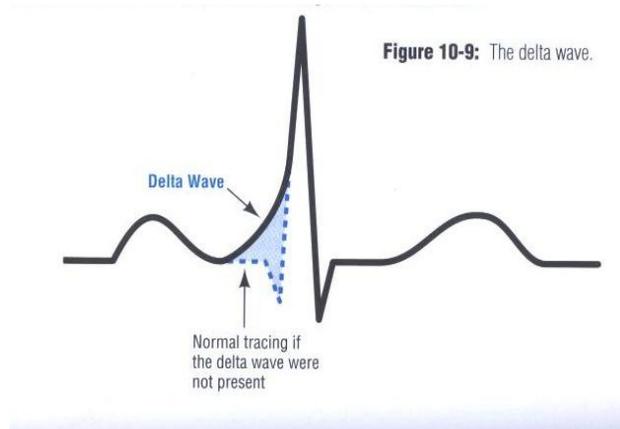


Figure 10-10: WPW Syndrome, Types A and B.



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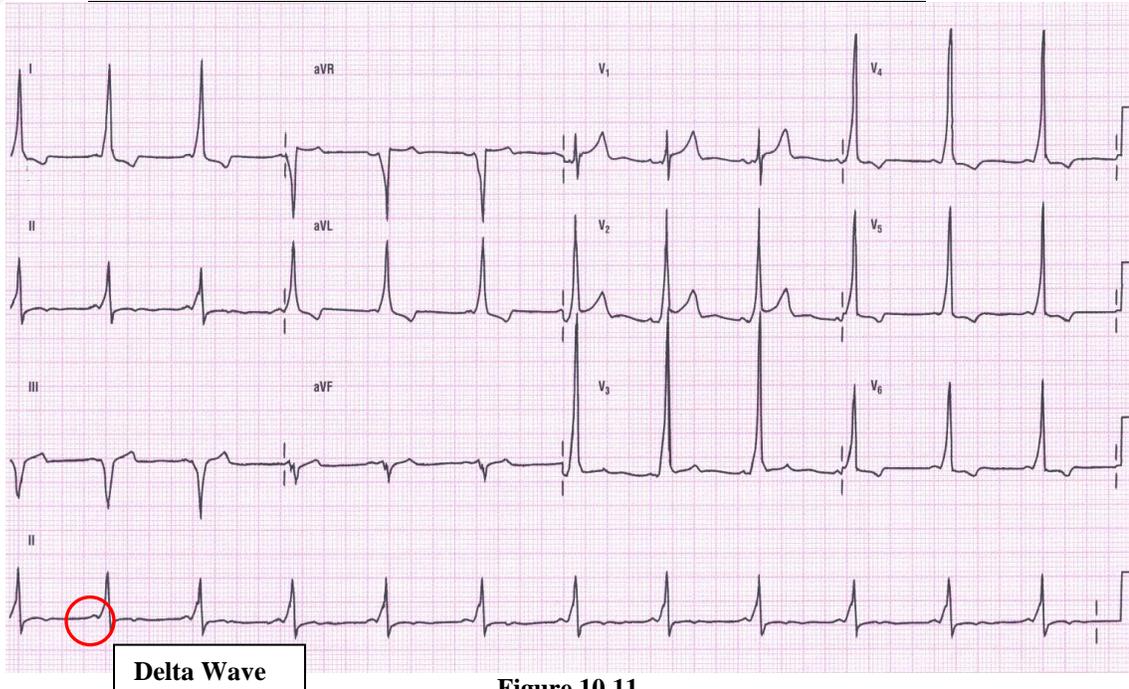


Figure 10.11

12. If at any time the patient deteriorates and displays signs of rate-related cardiovascular compromise move to the unstable tachycardia protocol for synchronized cardioversion.

### Notes:

1. Do not administer diltiazem (Cardizem) if the systolic blood pressure is  $\leq 100$  mm/hg at any time during the patient encounter.
2. If a fluid bolus is administered to increase the systolic blood pressure  $\geq 100$  mm/Hg, diltiazem is still contraindicated due to the potential for refractory hypotension.



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## NARROW COMPLEX TACHYCARDIA (UNSTABLE)

### Historical Findings

1. Patient's age is 16 years and older
2. No history of trauma or fever.

### Physical Findings

1. *Signs* of rate-related cardiovascular compromise:
  - A. Acute altered mental status
  - B. Ongoing chest pain
  - C. Severe shortness of breath
  - D. Presyncope or syncope
  - E. Systolic blood pressure  $\leq 90$  mm/Hg

### EKG Findings

1. Rate above 150-250 beats/minute.
2. Narrow QRS ( $\leq 0.12$  seconds or 3 little blocks).
3. P waves are usually absent.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.
5. If the rhythm is a regular narrow complex tachycardia (SVT), attempt vagal maneuvers.
6. Initiate IV access with a saline lock or 0.9 % normal saline KVO.



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7. Patient may be sedated with midazolam (Versed) 2-4 mg IV/IO/IM titrated up to a max dose of 5 mg or 5 mg IM/IN if time permits. Systolic blood pressure of 100 mm Hg is not required for sedation in unstable tachycardia patients because hypotension is typically related to impaired ventricular filling as a result of the rapid tachycardia.
8. Synchronized cardioversion for Atrial Fibrillation: initial energy level of 120-200 J biphasic.
9. Synchronized cardioversion for all Atrial Flutter and all other SVTs: initial energy level 50-100 J biphasic.
10. If initial energy level fails, energy should be increased in a stepwise fashion with each subsequent shock:
  - Synchronized at 100 J (Biphasic Equivalent)
  - Synchronized at 120 J (Biphasic Equivalent)
  - Synchronized at 150 J (Biphasic Equivalent)
  - Synchronized at 200 J (Biphasic Equivalent)
11. If still no change contact medical control for treatment options.
12. If patient converts out of Narrow Complex Tachycardia, perform 12 Lead EKG.

## Notes

1. Do not delay cardioversion if symptoms are severe.
2. Severe symptoms related to tachycardia are uncommon if heart rate less than 150.



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## VENTRICULAR ECTOPY

### Historical Findings

1. Age > 16.
2. Patient does not have a history of chronic benign PVC's.

### Physical Findings

1. *No signs* of rate-related cardiovascular compromise:
  - A. Acute altered mental status.
  - B. Ongoing chest pain.
  - C. Severe shortness of breath.
  - D. Presyncope or syncope.
  - E. Systolic blood pressure  $\leq$  90 mm/Hg.

### EKG Findings

1. Ventricular rate is greater than 60 beats/minute.
2. Multifocal PVC's, coupling, or R on T phenomenon.

### Differential Diagnosis

1. Chronic benign PVC's.
2. PVC's secondary to hypoxia.
3. Bradycardia with ventricular escape beats.
4. Atrial fibrillation with aberrancy.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.



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5. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
6. Contact medical command at receiving hospital for treatment plan and guidance on the use of antiarrhythmics.



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## POST-RETURN of SPONTANEOUS CIRCULATION CARE

### Historical Findings

1. Patient's age 16 years or older

### Physical Findings

1. Recent cardiac arrest
2. Patient has a palpable pulse.
3. Patient's mental status may range from awake/alert to unresponsive

### Protocol

1. Continue to follow protocol covering presumptive underlying medical condition.
2. Maintain patent airway as needed and administer oxygen.
3. Provide ventilatory support as needed and maintain a respiratory rate of 8-10/minute. Do NOT over-ventilate.
  - A. Use continuous capnometry/capnography to maintain  $ETCO_2$  35-45 mm Hg.
4. Maintain cardiac monitoring at all times.
  - A. EKG findings may vary from bradycardia to ST-segment elevation or depression.
5. Obtain 12-lead EKG and transmit to receiving hospital.
6. Aggressively treat hypotension (SBP < 90) with fluid bolus (may be chilled if available) and consider Epinephrine Push Dose Presser - 10 mcg/1ml every 1-2 minutes to desired BP > 100 systolic and/or HR > 60bpm.
7. Monitor vital signs frequently.
8. Determine patient eligibility for post-resuscitative hypothermia during transport. If eligible, begin following procedures listed
  - A. Eligibility Criteria:
    - i. Patient is Not Alert (does not follow commands)
    - ii. Cause of Arrest Considered to be Cardiopulmonary



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- a. If cause of cardiac arrest is suspected to be NOT cardiopulmonary (trauma, intracranial bleeding, etc.) DO NOT initiate cooling.
- b. Actively cooling a patient with internal and intracranial bleeding is harmful. If in doubt about cause of cardiac arrest DO NOT initiate cooling in the pre-hospital setting.
- iii. Systolic Blood Pressure > 90
  - a. If initial SBP <90 but improves with fluid administration, hypothermia may be initiated
- B. Hypothermia Procedures
  - i. Expose patient completely
  - ii. Place ice packs in bilateral axillae, neck, and groin
  - iii. Administer Chilled saline (if available) as IV/IO bolus, maximum 2 liters.
  - iv. If patient regains consciousness (follows commands) at any point discontinue cold packs and chilled saline. Use room temperature fluid as needed.
  - v. If patient SBP becomes <90 after beginning cooling procedures, the full 2 Liters of chilled saline may be used before push dose epi or room temp fluid. Treat aggressively.
- C. If patient relapses into Cardiac Arrest, ACLS care, not cooling, is the priority. Treat per protocol.
  - i. Consider early Sodium Bicarbonate administration in this situation (see notes)
9. Transport destination determination
  - A. Follow Trauma Triage Guidelines if applicable
  - B. If cause of arrest is presumed cardiac the patient should go to a hospital with 24-hour cath lab availability.
  - C. Even without Prehospital cooling procedures performed, if ROSC patient is NOT alert, transport to a hospital capable of post-resuscitation cooling
10. Notify receiving hospital and transport the patient.



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## Notes

1. Over-ventilation reduces cerebral perfusion and may worsen neurologic outcomes after cardiac arrest. Maintaining a normal ventilation rate may be helpful. Monitoring ETCO<sub>2</sub>, and keeping levels within normal range, can assist evaluation of ventilation.
2. Acute Coronary Syndromes (including ST-elevation myocardial infarction) are the most common proximate causes of sudden cardiac death. Coronary thrombosis is one of the “T’s” to consider when managing a patient in PEA/Asystole. Urgent reperfusion in a cardiac cath lab with percutaneous coronary intervention (PCI) is safe and effective in survivors of cardiac arrest.
3. Acute MI is a common cause of out of hospital cardiac arrest. Thrombolytics are relatively contra-indicated after prolonged CPR, and urgent cardiac cath is better for those in cardiogenic shock. Transporting the patient to a hospital capable of providing PCI in a cardiac cath lab is beneficial.
4. Post-resuscitative hypothermia improves neurologic outcomes for victims of out of hospital VT/VF arrest who do not immediately regain consciousness (ACC/AHA Class IIa recommendation); benefit for PEA and asystole is likely, but has not been as clearly established (ACC/AHA Class IIb recommendation). In-hospital therapeutic hypothermia is supported by the National Association of EMS Physicians.
5. EMS Organizations should follow Therapeutic Hypothermia guidelines based on equipment available. All organizations will be expected to have cold packs but chilled saline may be limited. “Ideal” temperature for chilled saline is 4°C/39°F. However, saline chilled below room temperature will have benefit in cooling patient. Cold packs on IV tubing lines may lower temperature with benefit if chilled saline is limited.
6. Hypothermia can contribute to acidosis, which may make Sodium Bicarbonate useful if the patient re-arrests.
7. Active warming of ROSC patient is harmful and should not be done prehospitally
8. Should treat opiate overdose if suspected per **M113**



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## ACUTE CORONARY SYNDROMES (CHEST PAIN)

### Historical Findings

1. Age  $\geq$  25 years. **If age < 25 years, consult with Medical Command.**
2. Chest pain description suggests cardiac origin (heaviness, pressure, tightness, dull) and *may* be accompanied by shortness of breath, diaphoresis, nausea, vomiting or weakness.
3. Pain is not clearly pleuritic or musculoskeletal. If any doubt exists, treat as cardiac.
4. Evaluate risk factors (e.g., smoking, diabetes, HTN, high cholesterol, family hx).
5. Atypical signs and symptoms may be seen in women, the elderly, chronic hypertensives and diabetics.

### Physical Findings

1. Pulse between 60 and 130 beats per minute.

### Differential Diagnosis

- |                           |                       |
|---------------------------|-----------------------|
| 1. Non-cardiac chest pain | 5. Pulmonary Embolism |
| 2. COPD                   | 6. Pneumonia          |
| 3. Cardiogenic shock      | 7. Pleurisy           |
| 4. Arrhythmia             | 8. Pericarditis       |

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.
  - A. Transmit the 12 Lead ECG to the receiving hospital if possible for Cath Lab activation.



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- B. If the 12 lead shows elevation in the inferior leads (II, III, & aVf) perform a right sided 12 lead to rule out an RVI.
- 5. Administer aspirin (ASA) 324 mg PO (chewed).
  - A. Withhold aspirin for any of the following:
    - i. Allergy to ASA or NSAIDS.
    - ii. Recent GI bleeding.
    - iii. Acute hemorrhagic stroke.
- 6. Administer nitroglycerin (Nitrolingual) 0.4 mg SL every 3-5 minutes for a total of 3 doses.
  - A. Withhold or discontinue *all* nitrates for any of the following:
    - i. Systolic blood pressure  $\leq$  100 mmHg.
    - ii. Recent erectile dysfunction drug use:
      - 1. Viagra  $\leq$  24hrs.
      - 2. Levitra  $\leq$  48hrs.
      - 3. Cialis,  $\leq$  72hrs
    - iii. Pulmonary hypertension medications (Flolan, Revatio) within past 24-72 hours (consultation with medical control is recommended).
  - B. Contact medical control regarding the use of nitrates for patients with right ventricular infarction (RVI).
- 7. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
  - A. The left arm is the site of choice to facilitate Cardiac Cath Lab procedures and two IV lines are preferred.
- 8. Patients who have no relief of pain after three doses of nitroglycerin (Nitrolingual) SL and NO obvious acute ECG changes do not require administration of additional nitroglycerin.
- 9. Administer nitroglycerin paste (Nitro-bid) TD 1 inch to the left chest if:
  - A. ST elevation consistent with an acute injury pattern is present on 12 Lead ECG. This can be administered with the first SL dose.

**OR**

  - B. Patients have partial or complete relief of pain after three doses of nitroglycerin SL and if blood pressure remains  $\geq$  100 mmHg systolic.



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10. If the patient experiences any change in level of consciousness remove the nitroglycerin paste (Nitro-bid).
11. If systolic blood pressure drops below 100 mmHg and lung sounds are clear administer a 500 cc normal saline bolus and reevaluate. Discontinue the use of nitrates at this point and manage hypotension per the cardiogenic shock protocol (**M103**).
12. Administer fentanyl (Sublimaze) 25-50 micrograms IV for ischemic chest pain.
  - A. Fentanyl (Sublimaze) 25 micrograms IV can be titrated every 5 minutes to a max total dose of 100 micrograms IV if systolic blood pressure remains above 100 mmHg.
  - B. Withhold or discontinue fentanyl (Sublimaze) if systolic blood pressure  $\leq$  100 mmHg or decrease in mental status.
13. Morphine sulfate 1-5 mg IV can be substituted for fentanyl (Sublimaze) in patients who have a hypersensitivity to fentanyl (Sublimaze).
  - A. Morphine sulfate 1-5 mg IV can be repeated every 5 minutes to a total dose of 10 mg if systolic BP remains above 100 mmHg.
  - B. Withhold or discontinue morphine sulfate if systolic blood pressure  $\leq$  100 mmHg or decrease in mental status.
14. Naloxone (Narcan) 0.5 mg IV titrated up to 2 mg or 2 mg IN/IM may be administered for respiratory depression associated with fentanyl/morphine.
15. Ondansetron (Zofran) 4 mg slow IV over 2 minutes.
  - A. If IV access is unavailable, administer ondansetron (Zofran) 4 mg solutab PO.
16. Lorazepam (Ativan) 1-3 mg IV diluted 1:1 with 0.9% NS may be administered for anxiety.
17. Nitroglycerin (Nitrolingual) 0.4 mg SL can be continued up to a total of 6 doses, continued as outlined in line 9 of this protocol.

## Notes:

1. There is very little evidence for narcotic pain medication in STEMI and actually a slight recommendation against its use in non-STEMI. The



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protocol however includes the use of pain medication for patient comfort and anxiolysis.

2. Revatio is a drug approved for treatment of pulmonary arterial hypertension (same disease that may be treated with Flolan at end stage). The drug improves exercise ability and contains Sildenafil which is Viagra. For this reason, organic nitrates are contraindicated with Revatio as they are with Viagra. One major difference with Revatio is that it is indicated for both men and women. Fortunately, a history of pulmonary hypertension is more likely to be shared than one of erectile dysfunction. Providers should query patients, particularly PAH patients, about Revatio before giving nitroglycerin.



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## ANAPHYLAXIS/ALLERGIC REACTION

### Historical Findings

1. Age > 16
2. Exposure to an allergen (insect sting, medications, foods, or chemicals).
3. History of allergic reaction.
4. Patient complains of itching, shortness of breath, tightness in chest or throat, weakness, or nausea.

### Physical Findings (One or More)

1. Flushing, hives, or swelling.
2. Shortness of breath, wheezing or stridor.
3. Tightness in chest or throat
4. Weakness
5. Nausea
6. Anxiety or restlessness.
7. Pulse > 100 beats/minute (adult) however bradycardia does not rule out anaphylaxis as it can be seen in some patients.
8. Blood pressure < 90 mmHg systolic in an adult,

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Airway assessment and management are extremely important since airway compromise may develop initially or at anytime during the call.
4. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
5. Remove allergen (stinger from skin, etc.)



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## **If reaction is mild (e.g. limited to a few hives or rash)**

6. Administer Diphenhydramine 25-50 mg IV/IM.

## **If reaction is more serious (e.g. exceeds simply a few hives or rash)**

7. Bronchospasm (wheezing) is present, administer albuterol (Proventil) aerosol treatment 2.5 mg in 3.0 ml normal saline via hand held nebulizer.
8. Initiate IV access with a saline lock or 0.9% normal saline KVO.
  - A. If the patient is hypotensive administer a 1 liter 0.9 % normal saline bolus.
9. Administer epinephrine 0.3 ml 1:1,000 solution intramuscularly (IM) if patient is in anaphylaxis or extremis (severe respiratory distress and/or hypotension).
10. If the patient remains hypotensive (BP < 80 mmHg) despite initial epinephrine and fluid bolus with any of the following signs and symptoms administer **Epinephrine Push Dose Pressor** as outlined in line 11.
  - A. Altered mental status
  - B. Severe respiratory distress (hypoxia, bronchospasm, stridor)
  - C. Upper airway swelling
11. **Epinephrine Push Dose Pressor**: 10 mcg/1ml every 5 minutes to desired BP > 100 systolic.
  - A. Epinephrine Push Dose Pressor Set Up:
    - i. Equipment Needs:
      - a. Epinephrine 1:10,000 pre-filled
      - b. 10ml syringe with 18g transfer needle
      - c. 500ml Normal Saline Bag
    - ii. Steps to obtain desired Concentration (mcg/ml)
      - a. Draw 1ml from Epinephrine 1:10,000 from pre-filled using the 10ml syringe.
      - b. Using the same 10ml syringe with the 1 ml of Epinephrine 1:10,000 draw 9ml from the 500ml normal saline bag.
      - c. The 10ml syringe will now have a concentration of 10mcg/ml.



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12. The following medications can be given for patients that present with signs and symptoms of a systemic reaction, however if the patient is in extremis **DO NOT DELAY EPINEPRINE:**
  - A. Diphenhydramine (Benadryl) 25-50 mg IV/IM.
  - B. Methylprednisolone (Solu-medrol) 125 mg slow IV.
  - C. Famotidine (Pepcid) 20 mg IV.
13. If the patient is on beta-blockers or calcium channel blockers and not responding to treatment, administer glucagon (Glucagen) 2 mg IM/IV.
14. If the patient is exhibiting signs and symptoms of a dystonic reaction, administer diphenhydramine (Benadryl) 25-50 mg IM/IV.



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## CARDIOGENIC SHOCK

### Historical Findings

1. Age > 16; Age < 30, contact medical command.
2. History of chest pain suggestive of cardiac origin and/or dyspnea.
3. No evidence or history of trauma or bleeding.

### Physical Findings

1. Systolic BP < 80mmHg supine, OR
2. Systolic blood pressure 80 – 100mmHg with signs of cardiovascular compromise:
  - A. Acute altered mental status, agitation or restlessness.
  - B. Ongoing chest pain.
  - C. Severe shortness of breath.
  - D. Presyncope or syncope.
  - E. Pulse greater than 120, OR
  - F. Skin changes suggestive of shock

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 lead ECG and maintain cardiac monitoring at all times.
  - A. Treat all arrhythmias prior to hypotension because the arrhythmia is often the cause of the hypotension.
  - B. If an acute RVI AMI is suspected, hypotension should be managed with aggressive IV fluids in the absence of rales on lung exam. Establish IV access and administer a 1 liter 0.9 % normal saline bolus and reassess.
  - C. All other acute myocardial infarctions should be treated cautiously with IV fluids due to the risk of pulmonary edema. Establish IV access and administer a 500 mL 0.9% normal saline bolus in the



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- absence of rales on lung exam and reassess. May repeat if lungs remain clear for a total saline bolus of 1,000ml.
- D. Nondiagnostic ECGs should be treated initially with IV fluids in the absence of rales on lung exam. Establish IV access and administer a 500 mL 0.9 % normal saline bolus and reassess.
5. If hypotension is refractory to IV fluids or the patient has signs and symptoms of pulmonary edema administer **Epinephrine Push Dose Pressor** at 10 mcg/1ml every 5 minutes to desired BP > 100 systolic.
- A. Epinephrine Push Dose Pressor Set Up:
- i. Equipment Needs:
    - a. Epinephrine 1:10,000 pre-filled
    - b. 10ml syringe with 18g transfer needle
    - c. 500ml Normal Saline Bag
  - ii. Steps to obtain desired Concentration (mcg/ml)
    - a. Draw 1ml from Epinephrine 1:10,000 from pre-filled using the 10ml syringe.
    - b. Using the same 10ml syringe with the 1 ml of Epinephrine 1:10,000 draw 9ml from the 500ml normal saline bag.
    - c. The 10ml syringe will now have a concentration of 10mcg/ml.
6. Update medical command on patient's condition.



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## CEREBRAL VASCULAR ACCIDENT (STROKE)

### Historical Findings

1. Patient's age  $\geq 16$
2. Patient is NOT a victim of trauma.
3. Patient may complain of headache, confusion, vomiting, blurred vision, shortness of breath, loss of sensory or motor function or may exhibit sign and symptoms of an altered mental status.

### Physical Findings

1. Altered mental status (occurs often but may not occur at all).
2. Altered neurological exam.
3. Hypertension may or may not be present.
4. Speech disturbance – slurred speech, garbled, or incomprehensible speech to complete loss of speech.
5. Numbness, weakness, or paralysis on one side of the body.
6. Weak, sagging muscles, paralysis, or loss of expression on one side of the face.

### Differential Diagnosis

1. Craniocerebral / cervical trauma.
2. Meningitis / encephalitis.
3. Hypertensive encephalopathy.
4. Seizure.
5. Migraine.
6. Metabolic problems (including *hypoglycemia*, hyperglycemia or drug overdose).

### Protocol

1. Initiate contact; reassure, and explain procedures.



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2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Evaluate neurological condition using the Cincinnati Prehospital Stroke Scale:
  - A. Facial Droop (ask patient to show teeth and smile).
  - B. Pronator drift (ask patient to extend arms, palms up, with eyes closed).
  - C. Speech (ask patient to say "the sky is blue in Cincinnati").
  - D. Document all abnormalities.
5. Determine time of symptom onset as precisely as possible.
  - A. Hospital treatment of strokes has maximal benefit if started within three (3) hours of symptom onset.
6. If patient has abnormalities in the Stroke Scale exam, then transport should be initiated immediately.
7. Establish IV access with a saline lock or 0.9 % normal saline KVO.
8. Test blood glucose, if blood glucose is < 70 mg/dL, administer dextrose 50 % 12.5 gm IV, reassess and re-check blood glucose. If neurologic symptoms do not improve and the blood glucose level is above 70 mg/dL do not repeat administration of dextrose.
9. Notify receiving hospital for possible "Stroke Team" activation.

## FACIAL DROOP EXAM



NORMAL



ABNORMAL

## PRONATOR DRIFT EXAM



NORMAL



ABNORMAL



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## Notes:

1. Patients who experience transient ischemic attack (TIA) or reversible ischemic neurologic deficit (RIND) develop most of the same signs and symptoms as those who are experiencing a stroke. The signs and symptoms of TIAs can last from minutes up to 24 hours. The signs and symptoms of RINDs can last from 24 to 72 hours. 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 to the hospital for further evaluation.
2. Some patients who have had a stroke may be unable to communicate but can understand what is being said around them.
3. Place the patient's affected or paralyzed extremity in a secure and safe position during patient movement and transport.
4. Hypertension in stroke patients should not be treated in the prehospital setting. Observations show that hypertension in a stroke patient tends to improve without drug therapy.
5. New therapies for stroke are now available. However, successful use is only possible during a short time window after the start of symptoms. Early notification of the receiving hospital and minimizing scene time are important parts of a strategy to treat patients quickly. Do not discount rapid transport just because the "window" is over, allow the ED to determine timeframes for treatment.
6. Hypoglycemia is more likely to mimic stroke in patients with a history of previous stroke since the area of the brain previously damaged is especially sensitive to a drop in blood glucose.



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## FOREIGN BODY AIRWAY OR ESOPHAGEAL OBSTRUCTION

### Historical Findings

1. Patient complains of shortness of breath or cannot speak because of airway obstruction.
2. MAY have history suggestive of foreign body aspiration such as sudden onset of shortness of breath while eating.
3. May have complaint of painful or difficulty swallowing, following eating.

### Physical Findings

1. Airway exam has little or no air movement, stridor, or decreased breath sounds.
  - A. MAY have use of accessory muscles of respiration.
  - B. MAY have fever or drooling.
  - C. MAY have retractions or rapid respiratory rate.
2. In the presence of an esophageal obstruction the airway exam will be normal and signs and symptoms of respiratory distress will be absent.

### Differential Diagnosis

1. Congestive heart failure.
2. Epiglottitis.
3. Croup (in a child).
4. Obstructive lung disease (asthma, bronchitis, emphysema)
5. Spontaneous pneumothorax.

### Protocol

1. Initiate contact; reassure and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment and obtain vital signs.



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4. Consider IV access with a saline lock or 0.9% normal saline KVO.
5. If complete airway obstruction by foreign body is suspected, follow the most current AHA Guidelines.
6. If an unconscious patient still has airway obstruction and equipment is available:
  - A. Visualize the larynx using the laryngoscope and remove any foreign body with suction device or Magill forceps.  
(Utilize RSI protocol if needed – **S112**)
  - B. If spontaneous breathing does not begin, intubate the trachea.
  - C. If unable to intubate or mask ventilate perform cricothyrotomy.
7. If foreign body esophageal obstruction is suspected in a patient > 16 years, glucagon (glucagen) 1 mg IM/IV may be administered.
8. Allow the patient to sit up in a position of comfort for transport.



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## HYPERTENSIVE CRISIS

### Historical Findings

1. Age  $\geq$  16.
2. Patient is NOT a victim of trauma or pregnant.
3. Patient is symptomatic with possible complaints of headache, confusion, vomiting, blurred vision, chest pain, or shortness of breath.

### Physical Findings

1. Systolic blood pressure of 180 mmHg or above, **OR**
2. Diastolic blood pressure of 110 mmHg or above.
3. **No signs or symptoms of acute CVA.**

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Acquire a 12 lead ECG and maintain cardiac monitoring at all times.
5. Repeat blood pressure in the opposite arm of baseline blood pressure.
6. Initiate IV access with a saline lock or 0.9% normal saline KVO.
7. Treat arrhythmias, chest pain (**M101**), respiratory distress (**M116, M117**), seizures (**M118**), or coma per protocol.
8. If no erectile dysfunction drug usage, administer nitroglycerin paste (nitro-bid) TD 1 inch to the left chest.
  - A. Viagra  $\leq$  24 hrs
  - B. Levitra  $\leq$  48
  - C. Cialis,  $\leq$  72 hrs.
9. If the patient experiences any change in level of consciousness, wipe off the nitroglycerin paste.



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## HYPERTHERMIA / HEAT EMERGENCIES

### Historical Finding

1. Patient displaying signs and symptoms of a heat related emergency.

### Physical Findings

1. **HEAT CRAMPS** – occurs in response to patients who exercise and sweat profusely without adequate fluid replacement mixed with salt. Heat cramps generally affect the major muscle groups associated with exercise (calves, quads and hamstrings).
  - A. Temperature: Usually normal.
  - B. Mental status: Alert.
  - C. Skin: Sweaty, may be warm or cool to touch
  - D. Neurological exam: Normal except for muscle cramps.
  - E. Blood pressure: Normotensive.
2. **HEAT EXHAUSTION** – characterized by an increase in core temperature and heart rate. Patients respond well to boluses of normal saline solution.
  - A. Temperature: Normal to slight elevation.
  - B. Mental status: Alert to slight confusion.
  - C. Skin: Sweaty, usually hot to touch.
  - D. Neurological exam: weak, but maintains extremity control.
  - E. Blood pressure: Normal to mild hypotension.
3. **HEAT STROKE** – this occurs when the body's thermoregulator fails. This is a true emergency. If the body is not cooled, organ systems begin to fail and the body will shut itself down. **NOTE**: exertional heat stroke may exhibit persistent sweating.
  - A. Temperature: Core temperature of 104° F or greater.
  - B. Mental status: Altered (from extreme agitation to coma).
  - C. Skin: Usually flushed and hot; may or may not be diaphoretic.
  - D. Neurological exam: At risk for seizures.
  - E. Blood pressure: Hypotension.



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### Differential Diagnosis

1. Fever (infection).
2. Dehydration.
3. Medications.
4. Hyperthyroidism.
5. CNS lesions or tumors.
6. Delirium tremors.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Move patient to a cool environment and loosen or remove nonessential clothing.
4. Perform patient assessment, obtain vital signs including temperature and begin cardiac monitoring.
5. If possible a temperature should be documented.
6. Promote evaporative cooling by positioning fans close to undressed patient and then spraying patient with tepid water. **Do Not** cover patient with wetted sheets as this will impair evaporation.
7. Promote conductive cooling by applying ice bags, if available, to axilla, groin, and neck. The neck is vitally important as it supplies blood to the brain.
8. Avoid cooling patient so much that they begin to shiver as this will cause increase in body temperature.
9. Initiate IV access with a saline lock or 0.9% normal saline KVO.
  - A. Administer 500-1000ml (0.9 % normal saline bolus) if the patient is hypotensive.
    - i. Many patients with true heat stroke are not dehydrated, while heat exhausted patients usually are dehydrated.
10. Check blood glucose; if glucose is less than 70 mg/dL refer to hypoglycemia protocol (**M108**).



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11. If shivering begins, administer lorazepam (Ativan) 2-4 mg IV/IM diluted 1:1 with 0.9 % NS.
12. When core temperature (if available) reaches 101° F discontinue cooling efforts.

## Notes

1. There is no minimum body temperature for heat related illnesses. Patients can be normo-thermic with heat cramps and heat exhaustion, but are usually hyperthermic with heat stroke. The level of hyperthermia 102 to 108°F (38.8 to 42.2°C).
2. Many patients with true heat stroke are not dehydrated, while heat exhaustion patients usually are.
3. Shivering can begin when the skin temperature drops but the core temperature remains high. Versed is then given to stop shivering to prevent a patient's core temperature from rising despite cooling efforts.
4. Measuring core temperature in the pre-hospital setting is very difficult and does not correlate well to skin/temporal/tympanic temperature.



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## HYPOGLYCEMIA / HYPERGLYCEMIA (Adult & Pediatric)

### Historical Findings

1. Patient may have a history of diabetes, infection, tumors, alcohol ingestion, beta-blocker use, renal or liver failure.

### Physical Findings

1. Patient may have an altered mental status with focal neuro deficits.
2. Patient may be diaphoretic, have tremors or complain of a headache.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
5. Check blood glucose; if glucose is less than 70 mg/dL consider oral glucose 15 gm if conscious and able to swallow otherwise:
  - A. **Adults (Hypoglycemia):** Age  $\geq$  16:
    1. Administer dextrose 50 % 12.5-25 gm IV/IO.
    2. Administer glucagon (Glucagen) 1 mg IM/IN.
      - i. Glucagon (given prior to EMS or by EMS providers) should improve the patient's level of consciousness within about 10 minutes of administration. However, Glucagon must be followed with some Glucose either IV/IO, if the patient does not awaken, or orally as noted above.
  - B. **Adults (Hyperglycemia):** Age  $\geq$  16:
    1. Glucose Level is greater 400 mg/dL or glucometer reads "HIGH"
    2. Administer a fluid bolus of 500-1000mL IV/IO during transport if no evidence of pulmonary edema.



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## **C. Pediatric (Hypoglycemia):**

### **Inclusion Criteria**

1. Age is younger than 16 years.
2. Infants less than 30 days with a blood glucose level less than 45.
3. Pediatric patients older than 30 days with a blood glucose level < 70.
  - i. Ages 3 to 16: administer 1 ml/kg of D50 IV/IO
  - ii. Ages < 3 or < 15kg: administer 2 ml/kg of D25 IV/IO
  - iii. **Unable to establish IV/IO access:**
    - a. Ages 6 to 16: administer 1 mg Glucagon IM/IN
    - b. Ages < 6: administer 0.5 mg Glucagon IM/IN
    - c. Glucagon does not work reliably in younger children, however; so after Glucagon administration, continue to attempt IV/IO access.

## **D. Pediatric (Hyperglycemia):**

1. Glucose Level is greater 400 mg/dL or glucometer reads "HIGH"
2. Administer a fluid bolus of 20mL/Kg not to exceed 1000mL IV/IO during transport if no evidence of pulmonary edema.
6. Re-check blood glucose. If glucose remains less than 70 mg/dL repeat the age-appropriate intervention in number 5 of this protocol.
7. If the patient is on an oral hypoglycemic drug such as glypizide, glyburide, or chlorpropamide, the hypoglycemic episode may last hours or days. Patients on oral hypoglycemic agents should be strongly encouraged to go to the hospital for evaluation regardless of their response to field treatment.

### Notes

1. D25 is made by mixing D50 1:1 with normal saline. It is very important that you verify that you have a working IV/IO. Dextrose which infiltrates into the surrounding tissues can be damaging to the tissues and blood vessels.
2. Microdot Extra glucometers read HIGH at > 520 mg/dL and LOW at 25 mg/dL).



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## HYPOTHERMIA

### Definitions

1. True hypothermia is a body temperature less than 95°F (35°C).
2. Mild hypothermia is a body temperature from 86 to 93°F (30-34°C).
3. Severe hypothermia is less than 86°F (less than 30°C).

### Historical Findings

1. High risk groups: elderly, infants, outdoor workers, and alcoholics.
2. Predisposing factors:
  - A. Increased loss of body heat due to:
    - i. Prolonged exposure to cold.
    - ii. Inadequate clothing.
    - iii. Intoxication.
    - iv. Illness or injury.
  - B. Decreased heat production due to:
    - i. Malnutrition.
    - ii. Endocrine disorders.
  - C. Impaired thermoregulation due to:
    - i. Hypoglycemia.
    - ii. Drugs (alcohol, barbiturates, phenothiazines).
    - iii. Sepsis.
    - iv. Central nervous system disorders.
3. Hypothermia can occur under relatively mild weather conditions.

### Physical Findings

1. Variable presentation with a range of presenting symptoms from mild nonspecific complaints to unresponsiveness.
2. Mild symptoms include decreases in coordination, reflexes, and alertness.
3. If unresponsive, may appear pulseless, with pupils fixed and dilated.
4. Pulse rate may be severely bradycardic. A radial pulse may be very difficult to palpate. The pulse rate should be obtained with palpation of a central pulse (carotid or femoral) for at least one minute.



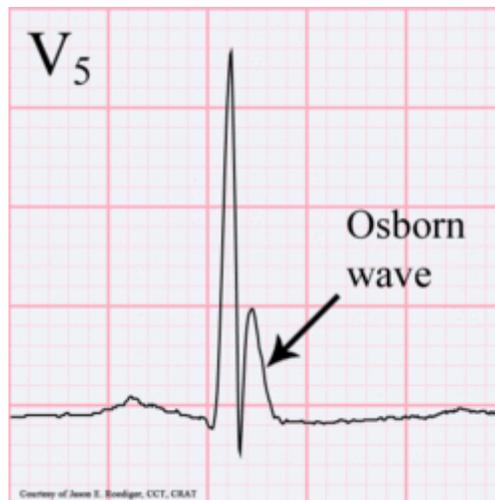
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5. Extremities may be stiff resembling rigor mortis, or may be cyanotic or edematous.

## EKG Findings

1. Bradycardia.
2. If the core temperature falls below 89.6°F (32°C), a characteristic “J” wave, Osborne wave, can be seen. The J wave occurs at the junction of the QRS complex and the ST segment.



## Differential Diagnosis

1. Cardiac arrest.
2. Coma.
3. Severe shock.
4. Narcotic abuse.



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## Protocol

### Cardiac arrest management

1. **Mild (TRUE) hypothermia ( $>34^{\circ}\text{C}$  [ $>93.2^{\circ}\text{F}$ ])**
  - A. Follow appropriate arrest protocol without alterations.
  - B. Provide active internal rewarming.
    - i. Humidified warm oxygen  $42^{\circ}\text{C} - 46^{\circ}\text{C}$  [ $108^{\circ}\text{F} - 115^{\circ}\text{F}$ ].
    - ii. Warm intravenous fluid, 0.9 % normal saline at  $43^{\circ}\text{C}$  ( $109^{\circ}\text{F}$ ).
2. **Moderate (MILD) hypothermia ( $30^{\circ}\text{C}$  to  $34^{\circ}\text{C}$  [ $86^{\circ}\text{F}$  to  $93^{\circ}\text{F}$ ])**
  - A. Follow the appropriate arrest protocol with prolonged intervals between medications.
  - B. Provide active internal rewarming.
    - i. Humidified warm oxygen  $42^{\circ}\text{C} - 46^{\circ}\text{C}$  [ $108^{\circ}\text{F} - 115^{\circ}\text{F}$ ].
    - ii. Warm intravenous fluid, 0.9 % normal saline at  $43^{\circ}\text{C}$  ( $109^{\circ}\text{F}$ ).
3. **Severe hypothermia ( $<30^{\circ}\text{C}$  [ $86^{\circ}\text{F}$ ])**
  - A. Initiate CPR, if defibrillation is indicated deliver only one shock at 360 joules monophasic or 200 joules biphasic and withhold medications until temperature  $> 30^{\circ}$  ( $86^{\circ}\text{F}$ ).
  - B. Priority should be focused on active internal rewarming.
    - i. Humidified warm oxygen  $42^{\circ}\text{C} - 46^{\circ}\text{C}$  [ $108^{\circ}\text{F} - 115^{\circ}\text{F}$ ].
    - ii. Warm intravenous fluid, 0.9 % normal saline at  $43^{\circ}\text{C}$  ( $109^{\circ}\text{F}$ ).
4. Consider transport of hypothermic cardiac arrest to a facility capable of cardiopulmonary bypass. (B-North, Mercy Anderson, Jewish, UC, CCHMC)

### Perfusing patients NOT in cardiac arrest

1. Initiate contact; reassure, and explain procedures.
2. Prevent additional evaporative heat loss by removing wet garments and insulating the victim from further environmental exposures.
3. Perform all procedures gently while closely monitoring cardiac rhythm due to increased risk of ventricular fibrillation.



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4. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
5. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
  - A. If the patient presents with an altered mental status, assess for hypoglycemia and drug overdoses and treat per protocol in conjunction with this protocol to help determine and treat possible causes.
6. Do **NOT** massage extremities (causes increased cutaneous vasodilation and decreases shivering).
7. Do **NOT** use hot packs (can cause serious burns, as well as possibly increased mortality).
8. Initiate IV access with a saline lock or 0.9% normal saline KVO.
9. Initiate rewarming therapies as follows:
  - A. Mild (**TRUE**) hypothermia ( $>34^{\circ}\text{C}$  [ $>93.2^{\circ}\text{F}$ ): passive rewarming
    - i. Warm blankets and warm environment.
  - B. Moderate (**MILD**) hypothermia ( $30^{\circ}\text{C}$  to  $34^{\circ}\text{C}$  [ $86^{\circ}\text{F}$  to  $93^{\circ}\text{F}$ ): active external rewarming.
    - i. Warm blankets and warm environment.
    - ii. Warm intravenous fluid, 0.9 % normal saline at  $43^{\circ}\text{C}$  ( $109^{\circ}\text{F}$ ).
  - C. Severe hypothermia ( $<30^{\circ}\text{C}$  [ $86^{\circ}\text{F}$ ): active internal rewarming
    - i. Humidified warm oxygen  $42^{\circ}\text{C}$  –  $46^{\circ}\text{C}$  [ $108^{\circ}\text{F}$  –  $115^{\circ}\text{F}$ ].
    - ii. Warm intravenous fluid, 0.9 % normal saline at  $43^{\circ}\text{C}$  ( $109^{\circ}\text{F}$ ).



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## MANAGEMENT OF PATIENTS WITH NERVE AGENT / ORGANOPHOSPHATE OR BIOLOGICAL AGENT EXPOSURE

### Historical Findings

1. Large number of patients exhibiting signs and symptoms of nerve agent poisoning.
2. Circumstances provide no reason to suspect an industrial accident involving organophosphates (pesticides).
3. Known terrorist incident involving chemical or biological agents.

### Physical Findings

1. Over stimulation of muscarinic sites increases secretions. Two acronyms which help to identify the presence of increased secretions are:

S- Salivation	S- Salivation
L- Lacrimation	L- Lacrimation
U- Urination	U- Urination
D- Defecation	G- Gastrointestinal emptying
G- Gastrointestinal distress	B- Bradycardia; Bronchiol Constriction
E- Emesis	A- Abdominal effects
	M- Miosis (constricted pupils)
2. Over stimulation of the nicotinic sites causes severe muscle twitching, cramping, and weakness.
3. Release of or exposure to possible biological agent

### Differential Diagnosis

#### Chemical Agent

1. The effects caused by a mild vapor exposure, namely rhinorrhea and tightness in the chest, may easily be confused with an upper respiratory malady or allergy.



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2. Miosis (constricted pupils), if present, will help distinguish this as a nerve agent incident, but the eyes must be examined in a very dim light to detect this.
3. GI symptoms from an earlier illness may be confused with those from the nerve agent effects.
4. Exposure to organophosphates will produce the same signs and symptoms as exposure to nerve agents.
5. History is the best indicator of nerve agent exposure:
  - A. Large number of patients exhibiting signs and symptoms of nerve agent poisoning.
  - B. Circumstances provide no reason to suspect an industrial accident involving organophosphates (pesticides).
  - C. Known terrorist incident.

## **Biological Agent**

1. Known event involving the release of a possible biological agent.
2. Area Health Departments or agencies have reason to suspect a large number of people have been exposed to a biological agent and are in need of prophylactic antibiotic therapy.

## **Protocol**

### **General Guidelines for Chemical and Biological Incident**

1. Self-protection of the rescuers is the first priority. Do not rush in. Assess the situation. Be alert for secondary devices.
2. Remove patient from the toxic environment as quickly as possible. Emergency personnel should be dressed in the appropriate level of PPE.
3. Remove the patient's clothing and decontaminate the patient immediately.



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## Specific Guidelines Related to a Chemical Incident

4. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
5. If practical, maintain cardiac monitoring at all times.
6. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
7. Medical management may include use of the following medications:
  - A. Atropine – May be administered IV, ET or IM. Medication may be administered using a Mark 1 autoinjector (NDC 6505-01-174-9919), or medication may be in the form of 0.1 mg/ml x 10ml prefilled syringe (NDC 0000747911) or 0.4 mg/ml x 20 ml single dose vial (NDC 63323-0234-20).
  - B. Pralidoxime Chloride (2-PAMCl) – May be administered IV or IM. Medication may be administered using a Mark 1 autoinjector (NDC 6505-01-174-9919), or medication may be in the form of a 1gram powder vial for injection (NDC 0046-0347-06).
  - C. Diazepam (Valium) – May be administered IV or IM. Medication may be administered using a 10 mg autoinjector (NDC 6505-01-274-0951), or medication may be in the form of a 5 mg/ml single dose vial (NDC 0000041933 or 10019-005-42 or 00641-0371-25).

*Since dosages needed may be higher than normally used, consult with on-line medical command for instructions.*
8. Transport patients to a facility capable of managing a nerve agent exposure. Although field decontamination should already have been accomplished, consult with the **receiving hospitals** concerning further decontamination procedures that will be performed at their facility.

## Specific Guidelines Related to a Biological Incident

9. The need for distribution of antibiotics to the public will be determined by local health departments / agencies and use / distribution of these antibiotics will be performed only under the direction of Medical Control.



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10. Medical management may include the use of the following medications. Choice of medications and their concentration and form will be directed by Medical Control.
  - A. Ciprofloxacin – May be administered orally or in some cases IV. Medication may be in the form of 500 mg tablets (NDC 00026-8513-51 or 00026-8513-48), 250 mg/ml x 100 ml bottle of oral suspension (NDC 00026-8551-36) or IV solution 400 mg in D5W 200 ml bag (NDC 8527-63/00026-8).
  - B. Doxycycline - May be administered orally or in some cases IV. Medication may be in the form of 100 mg tablets (NDC 00172-3626-70), 25 mg/5ml x 60 ml bottle of oral suspension (NDC 00069-0970-65) or 100 mg powder vial for IV use (NDC 63323-0130-10).
  - C. Erythromycin – May be in the form of 500 mg powder vial (NDC 00074-6365-02).
  - D. Gentamicin – May be in the form of a 40 mg/ml multi-dose vial (NDC 63323-0010-20).



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## NAUSEA AND VOMITING (ADULT & PEDIATRIC)

### Historical Findings

1. Any age patient.

### Indications

1. Nausea.
2. Vomiting.

### Contraindications

1. Hypersensitivity to 5-HT<sub>3</sub> antagonists: ondansetron (Zofran), granisetron, palonosetron, or dolasetron.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
5. Administer ondansetron (Zofran):
  - A. Can be given IM/IV/IO or PO
  - B. **Adults:** single 4 mg dose **IM/PO**
    - i. Onset of IM is approximately 30 minutes with half-life similar to IV dose.
    - ii. Onset of PO dose is more rapid than IM
  - C. **Adults:** 4 mg slow **IV/IO** (over at least 30 seconds, preferably over 2-5 minutes)



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- D. **Pediatrics > 2 years and > 40 kg (88 lbs):**
    - i. 4 mg slow IV over 2 minutes OR
    - ii. 4 mg PO solutab if IV access is unavailable.
  - E. **Pediatrics ≤ 2 years or ≤ 40 kg (88 lbs):**
    - i. 0.1 mg/kg slow IV over 2 minutes.
    - ii. **NO PO** dose for children under this age and weight.
6. Repeat 4mg IV/IO dose in 5 minutes if symptoms have not resolved.

### Notes:

- 1. May be used safely in pregnancy.
- 2. Use with caution in patients with impaired liver function.
- 3. Ondansetron can increase the QT interval and should be used with caution in patients who are on other medications that can increase the QT interval.
- 4. The frequency of side effects is extremely low, but may include:
  - A. Headache and/or dizziness, fever, urinary retention, rash, agitation, mild sedation and extra pyramidal (dystonic); May cause Bronchospasm and Arrhythmias however incidence is uncommon.
  - B. Ondansetron does not prevent motion sickness



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### NON TRANSPORT OF INSULIN DEPENDENT DIABETICS

#### Historical Findings

1. Decreased level of consciousness without suspected trauma.
2. Prior medical history of insulin dependent diabetes mellitus.
3. Following treatment, patient is conscious, alert to time, date and place, and requests that they not be transported to a hospital.
4. No other associated findings of serious illnesses or circumstances that may have contributed to the hypoglycemic episode, including excessive alcohol consumption, shortness of breathe, chest pain, headaches, etc.
5. The patient's history reveals circumstances that may have contributed to the hypoglycemic episode, such as lack of oral intake or an insulin reaction.
6. Patient is not on oral hypoglycemic medication such as glypizide, glyburide or chlorpropamide.

#### Physical Findings

1. Patient is initially found to have a decreased level of consciousness.
2. Systolic blood pressure  $\geq 90$  mmHg or child with normal perfusion.
3. Patient has rapid glucose test of  $\leq 70$  mg/dL.
4. During treatment under the hypoglycemia protocol the patient responds to oral, IV glucose (dextrose 50%), or glucagon (Glucagen) IM/IN to a normal level of consciousness.

#### Protocol

1. The patient is assessed and treated per the hypoglycemia protocol.
2. Repeat rapid glucose test should be  $>100$  mg/dL. However if the patient is awake, alert, oriented, and able to consume carbohydrates orally, the glucose test does not have to be absolutely  $> 100$  mg/dL.
3. The patient is given written instructions for follow up care prior to being released.



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4. The patient is released to the care of a responsible adult who will remain with the patient as an observer for a reasonable time and can call 911 should symptoms recur.



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## OVERDOSE/TOXICOLOGY/SMOKE INHALATION (CYANIDE)

1. NARCOTIC
2. INGESTION
3. BETA-BLOCKER
4. CALCIUM CHANNEL BLOCKER
5. TRICYCLIC ANTIDEPRESSANT (TCA)
6. CYANIDE

### Historical Findings

1. Age > 16. Consult CHMC statline for consult on all pediatric patients.
2. History of accidental or intentional ingestion, injection, absorption or inhalation of drugs or chemicals.

### Physical Findings

1. Patient may have an altered level on consciousness.
2. Patient may have nasal residue, needle tracks on extremities, and or odor of alcohol.

### Protocol

1. Evaluate scene for provider safety.
2. Initiate contact; reassure, and explain procedures.
3. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
4. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
5. Attempt to obtain the following history:
  - A. What substance(s) were taken.
  - B. When was the time of ingestion, injection etc.
  - C. How much of substance (dose) was taken.
6. Initiate IV access with a saline lock or 0.9 % normal saline KVO.



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### 7. **NARCOTIC OVERDOSE:**

If there is a suspicion of a narcotic overdose with associated respiratory depression (pinpoint pupils, needle tracks):

- A. **Adults ≥ 16** : administer naloxone (Narcan) in 0.5 mg IV/IO increments titrated up to 2 mg.
  - i. **Adults ≥ 16** : If no arousal after 3-5 minutes administer a second dose of Naloxone. Continue to repeat as necessary.
- B. **Pediatrics < 16**: administer naloxone (Narcan) 0.1 mg/kg IV/IO (max 2 mg).
- C. If IV access is unavailable or anticipated to be difficult:
  - i. **Adults**: administer naloxone (Narcan) 2 mg IN/IM.
  - ii. **Pediatrics**: administer naloxone (Narcan) 0.1 mg/kg IN/IM.
- D. For drowsy patient who can't seem to stay awake administer 2 mg Narcan in 3 ml NS via nebulizer.
- E. Do **NOT** administer naloxone (Narcan) to any patient actively seizing due to the risk of vomiting and aspiration. These patients are typically poly-pharmacy overdoses and naloxone (Narcan) will not be effective in controlling seizures.

8. If the patient has an altered mental status, check blood glucose. If glucose is less than 70 mg/dL refer to Hypoglycemia protocol (**M108**).

9. Re-check blood glucose. If glucose remains less than 70 mg/dL repeat the age-appropriate intervention in number 8 of this protocol.

### 10. **SEIZING**

- A. **Adults**: administer lorazepam (Ativan) 2 mg IV diluted 1:1 with 0.9 % NS titrated to 4 mg
- B. **Pediatrics**: administer lorazepam (Ativan) 0.1mg/kg IV diluted 1:1 with 0.9 % NS. See pediatric medication chart, broslow tape or consult Statline for dose.
- C. If the patient is in the third trimester or up to six weeks postpartum, is actively seizing, and has no history of seizures consider administration of magnesium sulfate 4 gm slow IV over 15 minutes.
  - i. Magnesium is diluted by mixing 4 gm/8 mL in a 20 cc syringe diluted with 12 mL of D5W.



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- D. **If IV access is unavailable:**
- i. **Adults:** administer midazolam (Versed) 5 mg IN/IM
  - ii. **Pediatrics:** administer midazolam (Versed) 0.1 mg/kg IN/IM.  
See pediatric medication chart, or consult Statline for dose.
11. *BE PREPARED TO MANAGE THE AIRWAY.*
12. If seizures continue prepare for RSI and contact medical command for consult.
13. Consult the Poison Control Center (**513-558-5111**) and or medical command for specific guidance on antidote management.
14. **INGESTION OVERDOSE:**  
If overdose is ingestion and has been within **1 hour:**
- A. Administer activated charcoal 1 gm/kg PO or via gastric tube per protocol (**S109**) to all ages.
    - i. **Adult ≥ 16:** usually 25-50 grams
    - ii. **Children < 16:** usually 12.5-25 grams
  - B. Contraindications
    - i. Altered mental status
    - ii. Ingestion of an acid or alkali substance (hydrochloric acid, bleach, ammonia, ethanol, oven cleaners, drain cleaners, toilet bowl cleaner, lye)
    - iii. Ingestion of lithium, iron or other toxic substances
    - iv. Ingestion of petroleum products (paint thinner, kerosene, gasoline, cleaning fluid, fuel oil)
    - v. Unable to swallow.
    - vi. Ingestion that occurred more than 1 hour prior to administration of charcoal.
15. **BETA-BLOCKER:**  
Overdose is suspected and the patient is bradycardic and or hypotensive:
- A. Administer glucagon (Glucagen) 2 mg IV/IO/IM.
    - i. Atropine is often ineffective but can be administered in 0.5 mg increments IV/IO up to a maximum of 3 mg.
    - ii. Consider early use of TCP for symptomatic bradycardia.



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16. **CALCIUM CHANNEL BLOCKER:**  
Overdose is suspected and the patient is bradycardic and or hypotensive:  
A. Administer calcium gluconate 1 gm IV/IO.
17. **TRICYCLIC ANTIDEPRESSANT:**  
Overdose is suspected and the patient has a wide complex tachycardia and or is hypotensive:  
A. Consider administration of sodium bicarbonate 1 mEq/kg IV/IO.
18. **CYANIDE (SUSPICION OF)**  
A. Cyanide poisoning can occur through inhalation, ingestion and absorption  
B. If patient was exposed to fire/smoke in confined space and cyanide poisoning is suspected or known then administer Cyanokit® if available (this is an optional drug). (There is a difference between **Cyanokit®** and a **cyanide antidote kit**. The cyanide antidote kit should not be used. See notes)  
i. **Adult** dose is 5g (one 5g vial) IV over 15 minutes (~15 mL/minute) as per Manufacturer's recommendations (see next page).  
ii. **Pediatric** dose is 70mg/kg  
iii. Medication Preparation  
a. The 5g vial must be reconstituted with **200 mL** of 0.9% NaCl using supplied sterile transfer spike. There is an indicator line on the vial representing this volume. (Normal Saline is the recommended diluent)  
b. Once filled gently rock or invert the vial to mix for **60 seconds**. **DO NOT** shake the vial.  
c. If solution does not turn dark red or particulate is still present after mixing dispose of solution and do not administer.  
d. The glass vial must be spiked with the **vented** IV tubing set included with the Cyanokit®.



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- e. Depending on severity or clinical response a repeat dose of 5g may be given. The infusion rate for this dose can range from 15 minutes to 2 hours.
  - f. Due to potential incompatibility with drugs commonly used in resuscitation effort and drugs in the cyanide antidote kit, **DO NOT** administer other drugs through the line supplying the Cyanokit®. (If you believe that you will also need to give other meds while infusing the Cyanokit®, it is recommended that a second IV line be started.)
- C. If patient has seizure activity refer to seizure protocol (**M118**).
- D. If additional Cyanokits® are needed on the scene, call AirCare. They will bring the additional kits by helicopter or by ground.

## **CYANOKIT®**

(hydroxocobalamin for injection)

**5 g per vial**

**For Intravenous Use**  
To be reconstituted with 200 mL of 0.9% Sodium Chloride Injection  
Diluent Not Included

1

2

3

**Complete Starting Dose: 5 grams**

- 1. Reconstitute**  
Place the vial in an upright position.  
Add 200 mL of 0.9% Sodium Chloride Injection to the vial using the transfer spike. **Fill to the line.**
- 2. Mix**  
The vial should be repeatedly inverted or rocked, not shaken, for at least **60 seconds** prior to infusion.
- 3. Infuse Vial**  
Use vented intravenous tubing, hang and infuse over **15 minutes**.

**One 5 g vial is a complete starting dose**

See Package Insert for alternate diluents, incompatibilities with other drugs and full prescribing information.

For more information visit [www.cyanokit.com](http://www.cyanokit.com)  
or call 1-800-776-3637  
See reverse for additional information

Component # 377-1      NDC 11704-370-01

**MERIDIAN**  
MEDICAL TECHNOLOGIES™



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## ADULT PAIN/ANXIETY MANAGEMENT

### Historical Findings

1. Age  $\geq$  16. Pediatric Pain Management Protocol (**P111**)
2. **Acute** pain related to musculoskeletal, burns, or abdominal etiologies.
3. No history of allergy to fentanyl (Sublimaze), morphine sulfate, ketamine (Ketalar), ondansetron (Zofran), or lorazepam (Ativan).

### Physical Findings

1. Systolic blood pressure  $>$  100 mmHg.
2. No altered level of consciousness, mental status change, or suspected head injury.
3. **No signs or symptoms of shock.**

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Perform continuous pulse oximetry and closely monitor patient oxygenation and ventilatory status.
5. Assess and document the patient's pain level using the following tools:
  - A. Adults: Numeric Pain Scale (NPS)

#### NPS





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- D. Patients with dementia or cognitive impairment: Pain Assessment in Advanced Dementia scale (PAINAD)

## PAINAD

Items	0	1	2
<b>Breathing independent of vocalization</b>	Normal	Occasional labored breathing. Short period of hyperventilation.	Noisy labored breathing. Long period of hyperventilation. Cheyne – Stokes respirations.
<b>Negative vocalization</b>	None	Occasional moan or groan. Lowlevel speech with a negative or disapproving quality.	Repeated troubled calling out. Loud moaning or groaning. Crying.
<b>Facial Expressions</b>	Smiling or inexpressive	Sad. Frightened. Frown.	Facial grimacing.
<b>Body Language</b>	Relaxed	Tense. Distressed pacing. Fidgeting.	Rigid. Fists clenched. Knees pulled up. Pulling or pushing away. Striking out.
<b>Consolability</b>	No need to console	Distracted or reassured by voice or touch.	Unable to console, distract or reassure.

6. Administer **either**:
  - A. Fentanyl 25-50 mcg IV/IO/IN/IM
  - B. Morphine Sulfate 1-5 mg IV/IO/IM
7. Recheck BP, respirations and mental status
8. If patient's pain is not relieved and their systolic BP is greater than 100mmHg, repeat every 5 minutes **either**:
  - A. Fentanyl 25-50 mcg IV/IO/IN/IM (up to 100 mcg total)
  - B. Morphine Sulfate 1-5 mg IV/IO/IM (up to 10 mg total)
  - C. Ketamine (Ketalar) 0.3mg/kg IV/IO can be administered and repeated every 15 minutes after maximum doses of Morphine or Fentanyl have been reached.

**Note:** If findings are consistent with significant **TRAUMA**, (e.g. Significant burns, acute musculoskeletal deformities (fractures), penetrating trauma **OR** the patient requires analgesia for splinting complicated fractures, and/or to facilitate extrication/patient movement) Ketamine should be considered before Morphine or Fentanyl.



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- D. If the patient experiences signs and symptoms of emergence reaction (rare <20%), ie. recovery agitation and/or hallucinations, administer midazolam 1-2 mg IV/IO. Be cognizant of the respiratory depressant effect of benzodiazepines in combination with ketamine and monitor closely.
9. If the patients experiences persistent respiratory depression, Naloxone (Narcan) can be administered 0.4 to 2 mg IV/IO/IN or IM.
10. For signs and symptoms of nausea/vomiting administer **Ondansetron (Zofran)**:
- A. Ondansetron can be given IM/IV/IO or PO
  - B. **Adults**: single 4 mg dose **IM/PO**
    - i. Onset of IM is approximately 30 minutes with half-life similar to IV dose.
    - ii. Onset of PO dose is more rapid than IM
  - C. **Adults**: 4 mg slow **IV/IO** (over at least 30 seconds, preferably over 2-5 minutes)
  - D. Repeat 4mg IV/IO dose in 5 minutes if symptoms have not resolved.
11. **Anxiety**:
- A. Lorazepam (Ativan) 1 - 2 mg IV diluted 1:1 with 0.9% NS may be administered for anxiety.

## Notes

1. Pain medication should be given prior to splinting if the patient is hemodynamically stable.
2. Pain control is an important medical intervention. Recent medical research indicates that the development of pain management protocols could contribute to the improvement of the patient's prehospital pain therapy. It is the intention of the Protocol Subcommittee that patient's with the above-mentioned historical and physical findings is given pain relief medication.



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## PSYCHIATRIC PROTOCOL

### Historical Findings

1. A medically stable patient who is manifesting unusual behavior including violence, aggression, altered affect, or psychosis.

### Physical Findings

1. Patient demonstrates behavior including violence, delirium, altered effect, or psychosis.
2. If obtainable, serum blood sugar greater than or equal to 70 mg/dL. (If assessment cannot be obtained prior to physical restraint, then measurement should occur after patient restraint whenever safe or feasible to do so.)
3. If obtainable, systolic blood pressure greater than or equal to 90 mm Hg and less than 180 mm Hg. (If assessment cannot be obtained prior to physical restraint, then measurement should occur after patient restraint whenever safe or feasible to do so.)
4. If obtainable, heart rate greater than or equal to 50 bpm. (If assessment cannot be obtained prior to physical restraint, then measurement should occur after patient restraint whenever safe or feasible to do so.)

### Differential Diagnosis

1. Anemia	9. Hypoxia
2. Cerebrovascular accident	10. Infection (meningitis/ encephalitis)
3. Drug / Alcohol intoxication	11. Metabolic disorders
4. Dysrhythmias	12. Myocardial ischemia / infarction
5. Electrolyte imbalance	13. Pulmonary Embolism
6. Head Trauma	14. Seizure
7. Hypertension	15. Shock
8. Hypoglycemia	16. Toxicological ingestion



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## Protocol

1. If EMS personnel have advance knowledge of a violent or potentially dangerous patient or circumstance, consideration should be given to staging in a strategically convenient but safe area prior to police arrival. If staging is indicated and implemented, dispatch should be notified that EMS is staging, the location of the staging area, and to have police advise EMS when scene is safe for EMS to respond.
2. If EMS intervention is indicated for the violent or combative patient, patients should be gently and cautiously persuaded to follow EMS personnel instructions. If EMS has cause to believe that the patient's ability to exercise an informed refusal or is impaired by an existing medical condition, EMS shall, initiate restraints per the restraint protocol when necessary. Such restraint shall whenever possible, be effected with the assistance of police personnel (See restraint protocol). It is recognized that urgent circumstances may necessitate immediate action by EMS prior to the arrival of police.
  - A. Urgent circumstances requiring immediate action are defined as:
    - i. Patient presents an immediate threat to the safety of self or others.
    - ii. Patient presents an immediate threat to EMS personnel.
3. Urgent circumstances authorize, but do not obligate, restraint by EMS personnel prior to police arrival. The safety and capabilities of EMS are a primary consideration. Police shall immediately be requested by EMS in any urgent circumstance requiring restraint of a patient by EMS personnel.
4. If police initiate restraint inconsistent with the medical provisions of the restraint protocol (**S113**), with the intent that EMS will transport the patient, police must prepare to submit an APPLICATION FOR EMERGENCY ADMISSION in accordance with Section 5122.10 ORC, or the patient must be placed under arrest with medical intervention indicated. Police shall, in either instance, accompany EMS to the hospital.
5. APPLICATION FOR EMERGENCY ADMISSION can only be implemented by
  - A. Psychiatrist
  - B. Licensed Clinical Psychologist



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- C. Licensed Medical Physician (MD, DO)
  - D. Health or Police Officer
  - E. Sheriff or Deputy Sheriff
6. EMS shall not be obligated to transport without an accompanying police officer any time a patient is currently violent, exhibiting violent tendencies, or has a history indicating a reasonable expectation that the patient will become violent.
7. If the patient is medically stable then he/she may be transported by police in the following circumstances:
- A. Patient has normal orientation to person, place, time, and situation.
  - B. No evidence of medical illness or injury.
  - C. Patient has exhibited behavior consistent with mental illness and or is in police custody for other law enforcement issue.
  - D. If there is a question concerning transport consult the Fire/EMS supervisor or medical command physician.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *MEDICAL PROTOCOLS*

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## RESPIRATORY DISTRESS (Congestive Heart Failure)

### Historical Findings

1. Age  $\geq$  16.
2. Patient complains of worsening shortness of breath.
3. Patient may have a past medical history of heart failure.

### Physical Findings

1. Tachypnea  $\geq$  20
2. Skin is pale and diaphoretic.
3. Lung exam may reveal diminished sounds, rales and or wheezing (cardiac asthma).
4. May have accessory muscle and show sign of fatigue.
5. May have jugular venous distention and or peripheral edema.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Consider Continuous Positive Airway Pressure (CPAP) protocol (**S106**).
5. Initiate IV access with a saline lock or 0.9% normal saline KVO.
6. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.
7. If wheezing is present on lung exam administer albuterol (Proventil) aerosol 2.5 mg in 3.0 ml normal saline mixed with ipratropium (Atrovent) 500 microgram in 2.5 ml normal saline via hand held nebulizer, or in-line with CPAP or Medrafter, if intubated.
8. Repeat Step 7 using albuterol (Proventil) aerosol **only** as long as patient's condition is improving to a maximum of five (5) doses.



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9. Administer nitroglycerin (Nitrolingual) 0.4 mg SL every 3-5 minutes for a total of 3 doses.
  - A. Withhold or discontinue *all* nitrates for any of the following:
    - i. Systolic blood pressure  $\leq$  100 mmHg.
    - ii. Recent erectile dysfunction drug use:
      1. Viagra  $\leq$  24hrs.
      2. Levitra  $\leq$  48 hrs.
      3. Cialis  $\leq$  72hrs
    - iii. Pulmonary hypertension medications (Flolan, Revatio) within past 24-72 hours (consultation with medical control is recommended).
  - B. Use nitrates with caution in patients with right ventricular infarction (RVI).
10. Administer nitroglycerin paste (Nitro-bid) 1 inch TD to the left chest concurrently with sublingual nitroglycerin if systolic blood pressure remains  $\geq$  100 mmHg systolic.
11. Allow the patient to sit up in a position of comfort for transport.

### Notes:

1. Revatio is a drug approved for treatment of pulmonary arterial hypertension (same disease that may be treated with Flolan at end stage). The drug improves exercise ability and contains Sildenafil which is Viagra. For this reason, organic nitrates are contraindicated with Revatio as they are with Viagra. One major difference with Revatio is that it is indicated for both men and women. Fortunately, a history of pulmonary hypertension is more likely to be shared than one of erectile dysfunction. Providers should query patients, particularly PAH patients, about Revatio before giving nitroglycerin.



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## RESPIRATORY DISTRESS (Obstructive Lung Diseases)

### Historical Findings

1. Age  $\geq$  16.
2. Patient complains of worsening shortness of breath.
3. Patient has a past medical history of asthma, bronchitis, pneumonia, emphysema or COPD.

### Physical Findings

1. Tachypnea
2. Lung exam may reveal diminished breath sounds, rales/rhonchi and or wheezing.
3. May have accessory muscle and show sign of fatigue.
4. May have pursed lip breathing (auto-PEEP).
5. May have fever.
6. Signs of poor perfusion
7. Tripod/positional breathing

### Differential Diagnosis

1. Congestive heart failure.
2. Foreign body aspiration.
3. Spontaneous pneumothorax.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Consider Continuous Positive Airway Pressure (CPAP) protocol (**S106**).
5. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.



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6. Initiate IV access with a saline lock or 0.9% normal saline KVO.
7. If the patient is in extreme distress with minimal air movement and < 40 years of age without known history of coronary artery disease, administer epinephrine 1:1000, 0.3 mg IM.
8. Administer albuterol (Proventil) aerosol 2.5 mg in 3.0 ml normal saline via hand held nebulizer or in-line with Medrafter if intubated mixed with ipratropium (Atrovent) 500 microgram in 2.5 ml normal saline.
9. Albuterol (Proventil) may be repeated to a maximum of 5 doses.
10. If the patient requires more than one nebulizer treatment, consider administration of methyprednisone (Solu-medrol) 125 mg slow IV.
11. If the patient requires intubation, consult medical command for magnesium sulfate 2 gm slow IV diluted.
  - A. Magnesium is diluted by mixing 2 gm in a 20 cc syringe diluted with 12 mL of D5W.
12. Allow the patient to sit up in a position of comfort for transport.

### **Notes:**

1. Magnesium is used as a bronchodilator after beta-agonist and anticholinergic agents have been tried.



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## SEIZURE (ADULT & PEDIATRIC)

### Historical Findings

1. Patient's of any age
2. Patient has a decreased level of consciousness.
3. Recent suspicion of seizure activity based upon description from eyewitnesses, parents, or caretakers.
4. Patient may or may not have a known history of seizure disorder.
5. The patient may be pregnant or postpartum.

### Physical Findings

1. The patient may currently display seizure activity (subtle, clonic, tonic, myoclonic).
2. The patient may now be postictal with an altered level of consciousness.
3. The patient may have focal neurological deficits, which should be noted.
4. The patient may have a fever.
5. May be incontinent of urine or stool
6. May be salivating
7. May have depressed respiratory status

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Assess for spinal injuries and treat/immobilize appropriately.
4. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
5. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
6. Check blood glucose; if glucose is less than 70 mg/dL consider oral glucose 15 gm if conscious and able to swallow otherwise refer to protocol **M108** for guidance on treatment of Hypoglycemic or Hyperglycemic patient.



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7. If actively seizing and not hypoglycemic or hyperglycemic:
  - A. **Adults**: administer lorazepam (Ativan) 2 mg IV diluted 1:1 with 0.9 % NS titrated to 4 mg.
  - B. **Pediatrics**: administer lorazepam (Ativan) 0.1mg/kg IV diluted 1:1 with 0.9 % NS. See pediatric medication chart, broslow tape or consult CCHMC Statline for dose.
  - C. If the patient is in the third trimester or up to six weeks postpartum, is actively seizing, and has no history of seizures consider administration of magnesium sulfate 4 gm slow IV diluted over 15 minutes.
    - i. Magnesium is diluted by mixing 4 gm/8 mL in a 20 cc syringe diluted with 12 mL of D5W.
  - D. **If IV access is unavailable**:
    - i. **Adults**: administer midazolam (Versed) 5 mg IN/IM.
    - ii. **Pediatrics**: administer midazolam (Versed) 0.1 mg/kg IN/IM. See pediatric medication chart, or consult CCHMC Statline for dose.
8. *BE PREPARED TO MANAGE AIRWAY.*
9. If seizures continue prepare for RSI (**S112**) and contact medical command for consult.
10. Do **NOT** administer naloxone (Narcan) to any patient actively seizing due to the risk of vomiting and aspiration. These patients are typically poly-pharmacy overdoses and naloxone (Narcan) will not be effective in controlling the seizure.

### Notes

1. If seizures develop for the first time in a patient over the age of 50, suspect a cardiac cause.
2. Trauma to the tongue is unlikely to cause serious problems, but trauma to the teeth may. Attempts to force an airway into the patient's mouth can completely obstruct the airway. Use of a nasopharyngeal airway may be helpful.



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3. Most seizures that patients experience are self-limited to 1-3 minutes and will need only oxygen and attention to airway management and will not need treatment with Versed (midazolam).
4. Each department should have training on using Intranasal Narcan® (naloxone) with an atomizer device. This route may take longer for a response than the IV method.
5. Be aware that rectal Valium (Diastat) may have been administered to some patients with known seizure disorders prior to EMS arrival. Adding Versed on top of rectal Valium will exacerbate respiratory depression.



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## GUIDELINES FOR ASSESSMENT / TRANSPORT OF ADULT TRAUMA PATIENTS

### EVALUATION OF THE ADULT TRAUMA PATIENT – ANY OF THESE CONSTITUTE A “TRAUMA PATIENT”

#### Physiological Criteria

1. Age  $\geq$  16
2. Significant signs of shock accompanied by:
  - A. Pulse greater than 120 or blood pressure less than 90
  - B. Absence of radial pulse when carotid pulse is present
  - C. Geriatric patients may be in shock with a BP greater than 90
3. Airway or Breathing Difficulties
  - A. Respiratory rate of less than 10 or greater than 30
  - B. Intubated patient
4. Neurologic Considerations
  - A. Evidence of Head Injury
  - B. Glasgow coma scale less than or equal to 13
  - C. Alteration in LOC during examination or thereafter; loss of conscious greater than 5 min.
  - D. Failure to localize pain.
  - E. Suspected spinal cord injury (paralysis due to an acute injury; sensory loss)

#### Anatomic Criteria

1. Penetrating trauma (to the head, chest or abdomen, neck and extremities proximal to knee or elbow)
2. Injuries to the extremities where the following physical findings are present:
  - A. Amputations proximal to the wrist or ankle
  - B. Visible crush injury
  - C. Fractures of two or more proximal long bones
  - D. Evidence of neurovascular compromise



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3. Tension pneumothorax that is relieved (an unrelieved tension pneumothorax would fit the definition of an unstable ABC)
4. Injuries to the head, neck, or torso where the following physical findings are present:
  - A. Visible crush injury
  - B. Abdominal tenderness, distention, or seat belt sign
  - C. Pelvic fracture
  - D. Flail chest
5. Signs or symptoms of spinal cord injury.
6. Burn injury greater than 10% TBSA and potential for other associated traumatic injuries.

## **Other Criteria/Considerations that Alone do not Constitute a Trauma Patient**

1. Significant Mechanisms of Injury Should Prompt a High Index of Suspicion
2. Age greater than 70 should Prompt a High Index of Suspicion
  - A. See Geriatric Specific Inclusion Criteria listed in T103 Geriatric Trauma Patients

## **TRANSPORTATION OF THE ADULT TRAUMA PATIENT**

### **Ground Transportation Time Guidelines**

1. 30 minutes or less from a Trauma Center → TRAUMA CENTER  
(excluding uncontrolled airway or traumatic CPR)
2. Greater than 30 minutes to a trauma center → nearest appropriate facility

### **Ground Transportation Guidelines**

1. Patients should be transported to the nearest appropriate facility if any of the following exists:
  - A. Airway is unstable and cannot be controlled/managed by conventional methods
  - B. Potential for unstable airway, i.e., (facial/upper torso burn)



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- C. Blunt trauma arrest (no pulses or respirations)
- D. Patient does "NOT" meet criteria for a trauma patient as defined above.

\*\*\* PRE-ARRIVAL NOTIFICATION OF THE  
RECEIVING FACILITY IS ESSENTIAL!!! \*\*\*

## **Air Medical Transportation**

1. General principles:
  - A. Prolonged delays at the scene waiting for air medical transport should be avoided. If air medical transportation is unavailable (e.g., weather conditions), patient should be transported by ground guidelines as listed above.
  - B. Air transport, if dispatched to the scene, should be diverted to the hospital if the patient appeared appropriate for air transport but the decision was made to transport to the nearest facility (non-trauma center) in the interim.
  - C. Air Medical Programs share the responsibility to educate EMS units and facilities on appropriate triage. They should also institute an active utilization and quality review program that provides feedback to EMS units.
  - D. Patients with uncontrolled ABC's should be taken to the closest appropriate facility (24 hour emergency department) if that can be achieved prior to the arrival of air medical transport.
  - E. Traumatic cardiac arrest due to blunt trauma is not appropriate for air transport.
2. Reasons to Consider a Call for Air Transport:
  - A. Prolonged extrication
  - B. Multiple victims/trauma patients



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- C. Time/distance factors:
- i. If the transportation time to a trauma center by ground is greater than 30 minutes AND the transport time by ground to the nearest trauma center is greater than the total transport time\*\* to a trauma center by helicopter.
    - \*\*Total transport time includes any time at scene waiting for helicopter and transport time to trauma center.
    - In the rural environment, immediate transfer with severely traumatized patients by air medical transport may be appropriate and should be encouraged if it does not significantly delay intervention for immediate life-threatening injuries.



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## EVALUATION OF THE PEDIATRIC TRAUMA PATIENT < 16 YEARS OLD

### Physiological Criteria

1. Significant signs of shock (weak pulses, pallor) accompanied by:
  - A. Tachycardia (Table 1) or bradycardia (Table 2)
  - B. Hypotension (Table 3)
2. Airway/Breathing difficulties
  - A. Intubated patient
  - B. Tachypnea (Table 4)
  - C. Stridor
  - D. Hoarse voice or difficulty speaking
  - E. Significant grunting, retractions
  - F. Cyanosis or need for supplemental oxygen
3. Neurologic considerations
  - A. Evidence of head injury
    - i. Glasgow Coma Scale less than or equal to 13
    - ii. Alteration in LOC during examination or thereafter; loss of conscious greater than 5 minutes
    - iii. Failure to localize pain
  - B. Suspected spinal cord injury (paralysis or alteration in sensation)

### Anatomic Criteria

1. Penetrating trauma (to the head, chest or abdomen, neck and extremities proximal to the knee or elbow).
2. Injuries to the extremities where the following physical findings are present:
  - A. Amputations proximal to the wrist or ankle
  - B. Visible crush injury
  - C. Fractures of two or more proximal long bones
  - D. Evidence of neurovascular compromise
3. Tension pneumothorax which is relieved (an unrelieved tension pneumothorax would fit the definition of an unstable ABC).



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4. Injuries to the head, neck or torso where the following physical findings are present:
  - A. Visible crush injury
  - B. Abdominal tenderness, distention, or seat belt sign
  - C. Pelvic fracture
  - D. Flail chest
5. Signs or symptoms of spinal cord injury.
6. Burn injury greater than 10% TBSA and potential for other associated traumatic injuries.

## **Other Criteria/Considerations That Alone Do Not Constitute a Pediatric Trauma Patient:**

1. Significant mechanism of injury should prompt a high index of suspicion and should be considered in the evaluation. Mechanisms particularly dangerous for pediatric patients include:
  - A. Improperly restrained child in MVC (airbag injuries included)
  - B. ATV crashes
2. Special situations that may require the resources of a pediatric trauma center
  - A. Congenital defects
  - B. Chronic respiratory illness:
  - C. Diabetes
  - D. Bleeding disorder or anticoagulants
  - E. Immuno-suppressed patients (i.e., patients with cancer, organ transplant patients, HIV/AIDS, longterm use of corticosteroids, etc.)

## **Transportation Of The Pediatric Trauma Patient:**

1. Ground transportation guidelines – time considerations
  - A. 30 minutes or less from a Pediatric Trauma Center (excluding uncontrolled airway or traumatic arrest)
  - B. Greater than 30 minutes to a Pediatric Trauma Center transport to nearest appropriate facility



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2. Ground transportation guidelines
  - A. Patients should be transported to the nearest appropriate facility if any of the following exists:
    - i. Airway is unstable and cannot be controlled/managed by conventional methods
    - ii. Potential for unstable airway, (i.e., facial/upper torso burn)
    - iii. Blunt trauma arrest (no pulses or respirations)
    - iv. Patient does NOT meet criteria for a trauma patient as defined above.
    - v. Pre-arrival notification of receiving facility is essential!
3. Air Medical Transportation
  - A. General principles
    - i. Prolonged delays at the scene waiting for air medical transport should be avoided if air medical transportation is unavailable.(e.g., weather conditions), patient should be transported by ground guidelines as listed above.
    - ii. Air transport if dispatched t the scene should be diverted to the hospital if the patient appeared appropriate for air transport but the decision was made to transport to the nearest facility (non-trauma center) in the interim.
    - iii. Air Medical Programs share the responsibility to educate EMS units and facilities on appropriate triage. They should also institute an active utilization and quality review program that provides feedback to EMS units.
    - iv. Patients with uncontrolled ABC's should be taken to the closest appropriate facility (24-hour emergency department) if that can be achieved prior to the arrival of air medical transport.
    - v. Traumatic cardiac arrest due to blunt trauma is not appropriate for air transport.
4. Reasons to consider a call for air transport:
  - A. Prolonged extrication
  - B. Multiple victims/trauma patients



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- C. Time/distance factors:
- i. If the transportation time to a trauma center by ground is greater than 30 minutes AND the transport time by ground to the nearest trauma center is greater than the total transport time\*\* to a trauma center by helicopter. \*\*Total transport time includes any time at the scene waiting for a helicopter and transport time to the trauma center.
  - ii. In the rural environment, immediate transfer with severely traumatized patients by air medical transport may be appropriate and should be encouraged if it does not significantly delay intervention for immediate life-threatening injuries.

**Table 1: Maximum Acceptable Heart Rates by Age**

AGE	HEART RATE (BPM)
less than 6 Months	180
6 Months – 1 Year	170
1 Year – 2 Years	150
3 – 7 Years	140
8 – 11 Years	130
12 – 16 Years	120

Therapy should be reserved for the patient who is symptomatic as manifested by signs or symptoms of decreased blood flow to end organs.



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**Table 2: Bradycardia**

AGE	HEART RATE (BPM)
Infant	80
Child	70
Adolescent	60

**Table 3: Minimum Acceptable Systolic Blood Pressure by AGE**

AGE	SYSTOLIC BLOOD PRESSURE
less than 1 Month	60 mmHg
1 Month – 1 Year	70 mmHg
greater than 1 Year	$70 + (\text{age in years} \times 2)$

**Table 4: Maximum Acceptable Respiratory Rates by AGE**

AGE	RESPIRATORY RATE (RESP/MIN)
less than 6 Months	50
6 Month – 6 Years	40
greater than 6 Year	30



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## GERIATRIC TRAUMA

### Historical Findings

1. Age  $\geq$  70 years of age.

### Protocol

1. The criteria listed below are in addition to the Adult Trauma Triage Guidelines. Geriatric trauma patients should be triaged for evaluation in a trauma center for:
  - A. Glasgow Coma Score less than 14 with known or suspected traumatic brain injury
  - B. Systolic blood pressure less than 100 mmHg
  - C. Falls with from any height, including standing falls, with evidence of traumatic brain injury
  - D. Pedestrian struck by motor vehicle
  - E. Known or suspected proximal long bone fracture sustained in a motor vehicle crash
  - F. Injury sustained in two or more body regions

### NOTES:

1. Geriatric trauma patients should be given special consideration for evaluation at a trauma center if they have diabetes, cardiac disease, pulmonary disease (COPD), clotting disorder (including anticoagulants), immunosuppressive disorder (i.e. HIV/AIDS, Organ Transplant, Chemotherapy, Long-term use of corticosteroids, etc), or require dialysis.
2. The geriatric trauma recommendations were taken from the Geriatric Trauma Task Force report released in December of 2007 by the State of Ohio Board of Emergency Medical Services, Trauma Committee. The data used to make these recommendations came directly from the Ohio Trauma EMS Registry.



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3. Exceptions to these Trauma Triage Guidelines are listed in the Trauma Patient Assessment and Transport Guidelines Protocol **T101** under Section VI. These same exceptions apply to pediatric, adult, and geriatric trauma patients.



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## HEAD OR SPINAL TRAUMA

### Historical Findings

1. Patient's Age  $\geq 16$
2. History of loss of consciousness following head injury, OR
3. History of motor vehicle accident, diving accident, fall, or other trauma.

### Physical Findings

1. Head contusions, abrasions, or lacerations, OR
2. Fluid or blood from nose, ears, or mouth, OR
3. Altered mental status.
4. May have loss of sensation or movement.
5. May have pain in back or neck.
6. No signs of shock. If shock is present, refer to hemorrhagic shock protocols (**Adult: T105, Pedi: T106**).

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess Glasgow Coma Scale, and perform neurological exam.
3. Aggressively manage the airway:
  - A. Assess for hypoxemia ( $SpO_2 < 95\%$ ) continuously. Hypoxemia should be avoided.
  - B. If the patient has a patent airway and is breathing adequately, administer oxygen to maintain  $SpO_2 > 95\%$ . If hypoxemia cannot be corrected with supplemental oxygen, initiate airway management protocol (**S101**).
  - C. If the patient does not have a patent airway, is not breathing adequately or has an altered mental status initiate airway management protocol (**S101**).
  - D. Maintain normal breathing rates ( $RR=12 - 10$ ). Monitor  $ETCO_2$  (goal range 35 - 40).



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- E. **ONLY** if patient has **asymmetric pupils (>1mm difference)** and is comatose hyperventilate to a goal end - tidal CO<sub>2</sub> of 30mmHg. **STOP** if pupils normalize.
4. Obtain vital signs and begin cardiac monitoring.
5. Immobilize patient with a rigid cervical collar and long backboard per the spinal immobilization protocol (**S115**).
6. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
  - A. **ONLY** if patient has **asymmetric pupils (>1mm difference)** and is comatose, consider administration of 500 mL 3% saline solution if available. **STOP** if pupils normalize.
7. Begin transport as soon as possible to destination hospital as directed in Trauma Triage Protocol (**Adult: T101, Geriatric: T102, Pedi: T103**).
8. Assess and treat for hypoglycemia (**M108**), overdose (**M113**), and seizures (**M118**) per protocol.

### Notes

1. Shock is not usually due to head injuries. If patient is in shock, consider another cause for the hypotension.
2. Remember that restlessness can be due to hypoxia and shock, not just head injury.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *TRAUMA PROTOCOLS*

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## ADULT HEMORRHAGIC SHOCK WITH OR WITHOUT TRAUMATIC BRAIN INJURY (TBI)

### Historical Findings

1. Patient's Age  $\geq 16$
2. Any significant extremity or truncal wound (neck, chest, abdomen, pelvis), with or without obvious blood loss or hypotension, irrespective of blood pressure. If the patient is coherent, and has a palpable radial pulse, the blood loss has likely stopped.
3. The trauma patient **with a head injury** requires special considerations.
  - A. Hypotension (Systolic Blood Pressure (SBP) less than 90mmHg) and hypoxia (Oxygen Saturation (SpO<sub>2</sub>) less than 90%) are known to exacerbate secondary brain injury.
  - B. The target SBP is 90mmHg or greater, and improvement in any initial altered mental status.
4. Patients experiencing hemorrhagic shock **without head injury** are only resuscitated when they have a decreased mental status or absent radial pulses.

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. If patient is not maintaining adequate respirations, intubate with c-spine precautions if the patient will tolerate the attempt. No more than one minute should be spent attempting endotracheal intubation in patients with spontaneous breathing.
4. Perform rapid trauma survey to identify and treat immediate life-threatening injuries (i.e. tension pneumothorax, external hemorrhage).



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO

## *TRAUMA PROTOCOLS*

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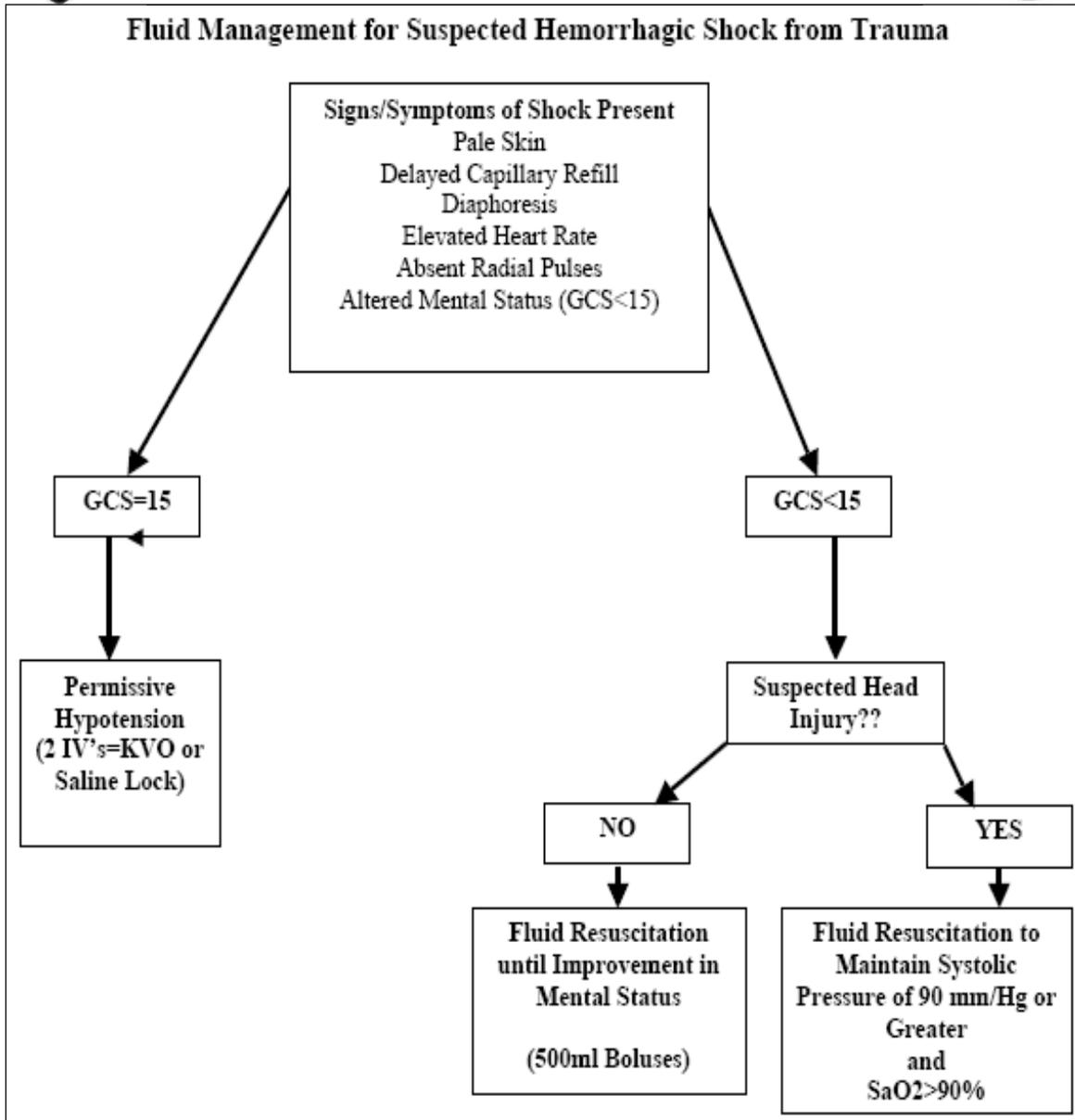
5. If patient is a victim of blunt trauma (i.e. MVA, fall, etc.) or penetrating injury to head or neck, immobilize patient with a rigid cervical collar and long back board. Assure that the patient's head is immobilized and secured to the back board.
6. Patients who are hypovolemic quickly become hypothermic. All patients should be aggressively managed to decrease body-heat loss.
7. Begin transport as soon as possible to appropriate hospital as directed in Trauma Triage Protocol (**Adult: T101, Geriatric: T102, Pedi: T103**). Unless the patient is entrapped, scene time should be less than 10 minutes. Hospital notification should be made whenever possible.
8. Continuously reassess mental status, perfusion and vital signs, and breath sounds at least every 5 minutes.
9. In patients with penetrating trauma who are mentating normally and/or have a palpable radial pulse, it is acceptable to initiate and continue transport without the administration of IV fluid administration.
10. Without delaying transport, initiate 2 large bore IVs of Normal Saline (NS). Begin with 500 ml of Normal Saline and reassess the patient's mental status; if no improvement, continue with an additional fluid bolus of 500 ml NS.
11. As in adults, fluid resuscitation in Pediatric patients (age younger than 16 years), is also based on their mental status. They should be administered Normal Saline in 20 ml/kg boluses until there is a noted improvement in their mental status.
12. Continue secondary assessment throughout transport.



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## TRAUMA PROTOCOLS





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## PEDIATRIC HEMORRHAGIC SHOCK WITH OR WITHOUT TRAUMATIC BRAIN INJURY (TBI)

### Historical Findings

1. Significant penetrating injury to extremities or trunk (neck, chest, abdomen, pelvis), with suspected blood loss and risk for hypotensive shock.
2. The trauma patient **with suspected head injury** in addition requires special considerations.
  - A. Hypotension (Systolic Blood Pressure (SBP) less than  $70 + (2 * \text{age})$  and hypoxia (Oxygen Saturation (SpO<sub>2</sub>) less than 90%) are known to exacerbate secondary brain injury.
  - B. The target SBP is  $70 + (2 * \text{age})$  or greater, and improvement in any initial altered mental status.
3. Patients experiencing hemorrhagic shock **without suspected head injury** are only bolused with intravenous or IO fluids for decreased mental status or absent peripheral pulses

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Identify and treat life-threatening respiratory problems (i.e. open chest wounds, flail chest). For treatment of tension pneumothorax see Protocol (**S119**).
4. If patient is a victim of any blunt trauma, or a penetrating injury to the head or neck, immobilize patient with full spinal precautions as per Protocol (**S117**).
5. Control all external bleeding.
6. Patients who are hypovolemic quickly become hypothermic. All patients should be aggressively managed to decrease body-heat loss.



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## *TRAUMA PROTOCOLS*

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7. Begin transport as soon as possible to appropriate hospital as directed in Trauma Triage Protocol. Unless the patient is entrapped, scene time should be less than 10 minutes. Hospital notification should be made whenever possible.
8. Continuously reassess mental status, perfusion and vital signs, and breath sounds at least every 5 minutes.
9. For patients with penetrating trauma and no suspected head injury who are mentating normally with palpable peripheral pulses, it is acceptable to initiate and continue transport without the administration of IV/IO fluids.
10. For patients whose mental status and/or peripheral pulses require IV/IO fluid resuscitation, initiate a minimum of one IV/IO without delaying transport. Syringe push 20 mL/kg of Normal Saline and reassess the patient's mental status and/or peripheral pulses; if no improvement, repeat fluid bolus and contact medical control.
11. Continue secondary assessment throughout transport.



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## MAJOR BURNS (THERMAL OR ELECTRICAL)

### Historical Findings

1. Patient complains of pain related to a burn.
2. Patient complains of shortness of breath, cough, or hoarseness.
3. Any patient with electrical injury.

### Physical Findings

1. Second degree burns greater than 20% of body surface area, OR
2. Third degree burns greater than 15% of body surface area, OR
3. Singed nasal or facial hair, soot or erythema of mouth, or respiratory distress, OR
4. Circumferential burns, OR
5. Any second or third degree burns of the hands, feet or genitals.

### Protocol

1. Evaluate scene for safety and remove patient from source of burn including clothing.
2. Initiate contact; reassure, and explain procedures.
3. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
4. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
5. If EKG findings are other than NSR, ST, or Afib with controlled ventricular response, proceed to appropriate ECC protocol.
6. Consider assessment of carbon monoxide level with RAD57.
7. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
8. Remove all prosthesis, rings, and constricting bands from all extremities.
9. Cover burns with clean, dry sheet.



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10. Provide pain management per the pain/anxiety protocol (M114).
  - A. Administer either:
    - i. Fentanyl 25-50 mcg IV/IO/IN/IM
    - ii. Morphine Sulfate 1-5 mg IV/IO/IM
  - B. Recheck BP, respirations and mental status
  - C. If patient's pain is not relieved and their systolic BP is greater than 100mmHg, repeat every 5 minutes either:
    - i. Fentanyl 25-50 mcg IV/IO/IN/IM (up to 100 mcg total)
    - ii. Morphine Sulfate 1-5 mg IV/IO/IM (up to 10 mg total)
  - D. If pain still not relieved after reaching maximum dose of fentanyl or morphine, **contact medical control.**
  - E. If the patients experiences persistent respiratory depression, Naloxone (Narcan) can be administered 0.4 to 2 mg IV/IO/IN or IM.
11. Transport patient to an appropriate trauma center as per the Trauma Triage Guidelines.



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## EYE INJURY

### Historical Findings

1. History of actual or suspected eye injury.
2. MAY have foreign body sensation or pain in eye.

### Physical Findings

1. MAY have visible foreign body or visible globe laceration.
2. MAY have light sensitivity.
3. MAY have poorly reactive or non-reactive pupil.

### Protocol

1. If there is an impaled object, then stabilize it in place and cover the other eye to prevent movement.
2. If there is evidence of a penetrating eye injury such as visible globe laceration or fluid draining from the globe, then cover the affected eye and unaffected eye with a sterile dressing and metal eye patch. Do not press on the globe.
3. If the patient has a chemical exposure to the eye or a non-penetrating foreign body in the eye, then proceed in the following manner:
  - A. Remove contact lenses immediately.
  - B. Instill 1-2 drops of 0.5% tetracaine (Pontocaine) or proparacaine (Alcaine) into the affected eye. The dose can be repeated in 20 minutes.
  - C. Warn the patient not to rub the eye while the cornea is anesthetized, since this may cause corneal abrasion and greater discomfort when the anesthesia wears off.
  - D. If there has been a chemical exposure, then begin eye irrigation by flushing with copious amounts of tap water or normal saline solution. If patient is being transported continue irrigation until arrival at the hospital.



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## *TRAUMA PROTOCOLS*

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### Notes:

1. The time of onset for proparacaine ranges from 6 to 20 seconds
2. Transport the patient with the bed elevated to at least 30° if spinal immobilization is not needed.
3. IV tubing can be used for irrigation purposes.



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## HEMORRHAGE CONTROL (CAT & HEMOSTATIC GAUZE)

### Historical Findings

1. Patient of any age

### I. TOURNIQUET

#### Physical Findings

1. Potentially life threatening hemorrhage from a limb.

#### Contraindications

1. Non-life threatening hemorrhage
2. Hemorrhage from a junctional (axillary or groin), torso, or head / neck wound.

#### Definition

A compressive device used to stop all blood flow distal to the device. This includes improvised techniques as well as commercially available products. High quality, effective devices include the: **Combat Application Tourniquet**<sup>™</sup>, Special Operations Forces Tactical Tourniquet–Wide<sup>™</sup>, Emergency Military Tourniquet<sup>™</sup>, and the Mechanical Advantage Tourniquet<sup>™</sup>.

#### Protocol

1. Tourniquet application may be performed by providers of all levels who have received specialized training in general tourniquet use and the specific device to be utilized.
2. The tourniquet should be placed 1–2 inches proximal to the site of hemorrhage. In some situations it may be appropriate to place the tourniquet as proximal as possible on the limb for expediency. A tourniquet should never be placed on a joint.



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3. Tourniquets may be placed over typical clothing. Pockets should be empty and overlying objects, such as holsters, should be removed.
4. The tourniquet should be tightened until hemorrhage is controlled. A second, preferably immediately proximal tourniquet may be required, particularly on the thigh.
5. Assure that the tourniquet is well secured and will not accidentally loosen.
6. Application time should be recorded.
7. Tourniquets may be loosened (do not remove, as reapplication may be required) if the situation necessitating their use has resolved, e.g. vehicle extrication completed, no longer in the care-under-fire setting. An alternative hemorrhage control technique should be in place first.
8. The receiving facility and providers **MUST** be made clearly aware of the use of a tourniquet.

## II. WOUND PACKING

### Physical Findings

1. Potentially life threatening hemorrhage from a wound to the groin, axilla, or neck.

### Contraindications

1. Non-life threatening hemorrhage
2. Hemorrhage treatable by tourniquet

### Definition

Using gauze to thoroughly fill a hemorrhaging penetrating wound cavity and produce hemostasis through moderate continuous pressure. This may be performed using standard sterile gauze or commercially available hemostasis products such as Combat Gauze™, Celox gauze™, Hemcon Chito Gauze™.

### Protocol

1. Wound packing may be performed by providers of all levels who have received specialized training in the technique.



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2. Gauze should be placed as deeply in the wound as possible using a gloved digit and continuous pressure ensured. Excessive force is not necessary and may be harmful.
3. A pressure dressing should be applied, and manual direct pressure should be place over the packed wound for at least 3 minutes.
4. Wound packing should never be removed in the prehospital setting.
5. The receiving facility and providers **MUST** be made clearly aware of the use of wound packing.

### Notes

1. Well-aimed direct pressure will control most hemorrhage. However, some situations necessitate more aggressive techniques discussed here, potentially as first-line interventions. Examples of such situations may include Tactical EMS operations, CPR in progress, mass casualty incidents, and active vehicle extrications.
2. Permanent damage to the limb caused by an appropriate tourniquet is nearly non-existent for tourniquets left in place for less than two hours.
3. An inadequately tightened tourniquet can actually worsen blood loss.
4. Periodic loosening of a tourniquet to “allow limb perfusion” should never be performed.



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The C-A-T is delivered in its one-handed configuration. This is the recommended storage configuration.



## Instructions for Use: Two-handed Application

- 1** Route the band around the limb and pass the red tip through the inside slit of the buckle. Pull the band tight.

inside slit of the buckle. Pull the band tight.



- 2** Pass the red tip through the outside slit of the buckle.

The friction buckle will lock the band in place.



- 3** Pull the band **very tight** and securely fasten the band back on itself.

When the band is pulled tight, no more than 3 fingers will fit between the band and the limb.



- 4** Twist the rod **until bright red bleeding has stopped**

and the distal pulse is eliminated.



- 5** Place the rod inside the clip locking it in place. **Check for bleeding and distal pulse.**

If bleeding is not controlled, apply a second tourniquet proximal to the first and reassess.



- 6** Secure the rod inside the clip with the strap.

**Prepare the patient for transport and reassess.** Record the time of application.

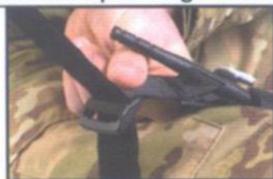


## Using the Friction Buckle

For two-handed application or when *the band becomes dirty*, use the friction buckle to lock the band in place.

- 1** Pass the red tip through the

inside slit of the buckle. Pull the band tight.



- 2** Pass the red tip through the

outside slit of the buckle.



- 3** Pull the band tight

and securely fasten the band back on itself.





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## ADMINISTRATION OF TRANEXAMIC ACID (TXA)

### Historical Findings

**Age  $\geq$  16 years** with evidence of or concern for severe internal or external hemorrhage. (ex: bleeding requiring a tourniquet, unstable pelvic fracture, two or more proximal long-bone fractures, flail chest etc.).

*AND*

**Time since the initial injury is KNOWN to be less than 3 hours.** It is preferable that TXA be administered as soon as possible after the initial traumatic insult. The greatest benefit to patients is seen when TXA is administered within 1 hour of injury.

*AND*

### Physical Findings

**Evidence of significant blunt or penetrating trauma** based on the history of present illness and or physical exam findings. (ex: ejection from automobile, rollover MVC, fall  $>$  20 feet, pedestrian struck, penetrating injury to head, neck, torso, etc.).

*AND*

#### **Presence of hemodynamic instability as evidenced by**

- A. Sustained systolic blood pressure  $<$  90mmHg or  $<$ 100mmHg if patient age is  $>$  55 years (sustained is defined as 2 independent blood pressure measurements).
- B. Sustained heart rate  $>$  110 beats per minute.

### Exclusion Criteria

1. Patients  $<$  16 years old. TXA has not yet been studied in the pediatric trauma patient population.
2. Time elapsed from initial injury is unknown or is known to be greater than 3 hours.
3. Patients with clear contraindications for anti-fibrinolytic agents (evidence of active intravascular thrombotic disease or disseminated intravascular coagulation, etc).
4. TXA should not be given to isolated head injury.
5. TXA should NOT be given to a patient who has received or will receive prothrombin complex concentrate (PCCs), factor VIIa, or factor IX complex concentrates as this may increase the risk of thrombotic events.



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6. TXA should be used carefully in the setting of urinary tract bleeding as ureteral obstruction due to clotting has been reported.
7. TXA should **NOT** be given to women who are known or suspected to be pregnant with a fetus of viable gestational age. (>24 weeks).
8. Previous allergic reaction to TXA.
9. Medical control discretion as to the appropriateness of TXA administration in any particular patient.

## Protocol

1. Aggressively manage the airway and administer oxygen.
2. Control all external bleeding and manage hemorrhagic shock per protocol (**T105**).
3. If the patient meets the above inclusion criteria administer TXA as follows:
  - A. **Mix 1g of TXA in 100ml of 0.9% Normal Saline or Lactated Ringers and infuse over approximately 10 minutes IV or IO.** (If given as an IV push, may cause hypotension)
  - B. Use dedicated IV/IO line if possible and **Do NOT administer in the same IV or IO line as blood products, factor VIIa, or Penicillin.**
  - C. During radio report, notify the receiving trauma center that TXA was initiated during transport per protocol.
  - D. When transferring care to hospital staff and completing PCR: note the time of injury and time of TXA administration.

## Notes

1. Tranexamic Acid is an anti-fibrinolytic synthetic lysine analogue that inhibits clot breakdown and thus reduces hemorrhage. Other potential beneficial mechanisms of action including decreasing the systemic inflammatory response to trauma are currently being explored.
2. Part of the physiologic response to surgery or trauma in any patient is the formation and subsequent breakdown (fibrinolysis) of intravascular clots. In some cases, clot break down can become excessive (hyper-fibrinolysis) thus causing increased hemorrhage and blood loss.
3. Since 2010, two large clinical trials (CRASH-2 and MATTERS) have examined the specific role for TXA in adult trauma patients with evidence of or concern for severe hemorrhage. These studies found significantly favorable reductions in all-cause mortality when victims of trauma received TXA.
4. TXA is now a Class I recommendation in the U.S. Military's Tactical Combat Casualty Care Guidelines and is included in the World Health Organization list of essential medicines.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *OBSTETRICAL PROTOCOLS*

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## IMMINENT DELIVERY

### Historical Findings

1. Pregnant woman who is in active labor as defined by regular, frequent uterine contractions and who feels the urge to push.

### Physical Findings

1. Crowning of fetal part at vaginal opening with imminent delivery.

### Differential Diagnosis

1. Delivery not imminent.

### Protocol

1. Call for additional manpower if needed.
2. Obtain brief obstetrical history.
  - A. Estimated Date of Confinement (EDC) –the due date
    - i. Greater than 24 weeks is a viable baby
    - ii. 24 -36 6/7 weeks is a premature baby
    - iii. 37 -42 weeks is a term baby
  - B. Gravidity –Number of pregnancies
  - C. Parity –Number of deliveries
  - D. Complications during the pregnancy or anticipated problems such as pre-eclampsia, gestational diabetes, drug use, twins, etc.
3. Prepare for delivery
4. Prepare for neonatal care
5. Wear Personal Protective Equipment (PPE)
6. Maintain patient privacy.
7. Administer oxygen
8. If time permits, establish IV access
9. Assist with normal spontaneous vaginal delivery if the head is the presenting part.



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- A. As baby crowns, support the head and the perineum with gentle pressure to control the emergence of the head and minimize perineal trauma.
- B. If amniotic membrane is still intact as the head is crowning, rupture with your fingers to allow amniotic fluid to leak out. Note the color and viscosity of the fluid.
- C. Check for the presence of the umbilical cord around the baby's neck. If cord is around the baby's neck, gently slip it over the head. Do not force it!
- D. If the cord is too tight to slip over the head, apply 2 umbilical cord clamps 1 inch (2.5 cm) apart and cut between them.
- E. Allow the mother to push and support the baby's head as it rotates.
- F. After head rotates to face mother's thigh, guide the head and neck downward to encourage the top shoulder to deliver.
- G. When you can see the baby's top shoulder deliver, guide the head and neck upward to deliver the bottom shoulder. The rest of the baby should follow with passive participation.
- H. Clamp the umbilical cord by placing the first clamp approximately 4 inches (10 cm) from the baby. Place the second clamp approximately 2 inches (5 cm) further from the baby (closer to the mother) than the first clamp, cut the umbilical cord between the clamps.
- I. Hand the infant to a second provider to establish neonatal care.
10. Assist with delivery of placenta.
  - A. DO NOT pull on the umbilical cord to facilitate placental delivery
  - B. DO NOT delay transport waiting for the placenta to deliver.
  - C. If placenta delivers, place in a plastic bag and transport to the hospital with the mother and the infant.
11. If baby is delivering in mal-presentation (e.g. buttocks, foot or arm), elevate hips of mother and transport immediately.
  - A. If the baby is breech (feet or buttocks are presenting) and delivery is imminent, support the baby as it delivers.
  - B. After the legs and the buttocks have delivered, support the baby wrapped in a towel as a sling.



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- C. After shoulders are delivered, gently elevate trunk and legs to aid in delivery of head (if face down).
- D. Head should deliver in 30 seconds. If not-reach 2 fingers into the vagina to locate infant's mouth. Press vaginal wall away from baby's mouth to access an airway.
- E. Apply gentle pressure to mother's fundus.
- 12. If cord is prolapsed:
  - A. Relieve pressure on the cord
  - B. Elevate hips of mother
  - C. Keep cord moist
  - D. Transport.
- 13. After complete delivery, provide routine new born care with special attention to maintenance of infant body temperature. Place infant on room air and suction if needed. Refer to newborn resuscitation protocol P600 if needed. See NOTES.
- 14. Examine for excessive bleeding
  - A. Apply pressure to any active bleeding sites.
  - B. Massage fundus to control uterine bleeding.
- 15. Notify the receiving hospital.
- 16. Resume transport of mother and baby to a hospital with labor and delivery service.
- 17. If a complication such as massive bleeding or neonatal distress occurs, proceed to nearest appropriate hospital.

## **Notes:**

- 1. Pregnant teenagers being transported to the hospital for any issues related to the pregnancy (i.e. vaginal bleeding, imminent delivery, abdominal pain, elevated blood pressure, seizure, etc.) should be taken to a hospital with a labor and delivery service. If uncertain where patient should be taken, then contact medical control.
- 2. The Committee on Obstetric Practice agrees with the recommendation of the American Academy of Pediatrics and the American Heart Association that all infants with meconium-stained amniotic fluid should no longer routinely receive intrapartum suctioning. If the newborn is vigorous, defined as having



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strong respiratory efforts, good muscle tone, and a heart rate greater than 100 beats per minute, there is no evidence that tracheal suctioning is necessary. Injury to the vocal cords is more likely to occur when attempting to intubate a vigorous newborn.

3. If meconium is present and the newborn is depressed, refer to **P101** Pediatric Newborn Resuscitation.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *PEDIATRIC PROTOCOLS*

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## NEWBORN RESUSCITATION

### Historical Findings

1. Newborn infant

### Physical Findings

1. Central cyanosis, poor or no respiratory effort, or limp muscle tone.

### Protocol

1. Ensure adequate airway. Suction mouth, oropharynx, then nose.
2. Dry infant to provide stimulation and prevent chilling. Keep the infant warm, especially the head.
3. Check heart rate by palpating the umbilical cord or listening to the heart with a stethoscope. If less than 100, bag-valve-mask (BVM) with **ROOM AIR** at a rate of 60 per minute. If heart rate is less than 60 beats/min despite 30 seconds of adequate BVM ventilation, begin chest compressions at a ratio of 3:1 with breaths.
4. Check color. If there is central cyanosis, provide 100% oxygen and assist ventilation's if needed.
5. Once positive-pressure ventilation or supplementary oxygen administration is begun, reassessment should consist of simultaneous evaluation of 3 clinical characteristics: heart rate, respiratory rate, and evaluation of the state of oxygenation (optimally determined by pulse oximetry rather than assessment of color). If heart rate remains less than 100 after 30 seconds of BVM ventilation, reassess airway and consider intubation.
  - A. **FULL TERM:** 3.0 - 3.5 ET tube
  - B. **PREMATURE:** 2.5 - 3.0 ET tube
6. Assess response to intubation. Check the position of the endotracheal tube using an exhaled CO<sub>2</sub> detector, and document the centimeter mark at the gum line. If heart rate < 60, initiate cardiac compressions (1/2 – 1 inch depth) at 120 per minute. In the newborn, a chest compression to ventilation



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ratio of 3:1 is used. It is important that you use only enough bag pressure to move the chest. This limits the chance for pneumothorax.

7. Contact medical command.
8. Transport as soon as possible.
9. If heart rate is still < 60 after 30 seconds of chest compressions and adequate assisted ventilation, consider epinephrine 1:10,000 at 0.4 mL IV (0.2 mL for preterm newborn). If vascular access is not available, then give epinephrine 1:10,000 at 0.8 mL via ET (0.4 mL for preterm newborn). Repeat epinephrine every 3 to 5 minutes until heart rate is greater or equal to 60.
10. If hypovolemia is suspected due to blood loss at delivery, then give normal saline 40 mL (10 mL/kg) IV (20 mL for preterm newborn).
11. Provide medical command with patient update.

## Notes:

1. Resuscitations on newborns should begin with a BVM without supplemental oxygen. Even healthy newborns that do not require resuscitation can take more than 10 minutes to reach saturations of greater than 90%. Using supplemental oxygen for newborns requiring resuscitation may worsen their neurological outcomes because of injury due to oxygen free radicals.
2. Newborns lose heat rapidly and need to be kept warm to decrease oxygen demands and prevent metabolic acidosis.
3. When dealing with such a short trachea, remember that slippage of even a centimeter in endotracheal tube position can result in inadvertent extubation. Reassess the airway frequently.
4. Intubation and suctioning is reserved for newborns with thick meconium who are NON-VIGOROUS (poor respiratory effort, decreased muscle tone, AND heart rate less than 100).
5. It is important that you inform medical control of the length of your resuscitation since the new AHA guidelines (Dec. 2010) support the PHYSICIAN discontinuation of resuscitation for newborns born without a heart beat and respirations after 10 minutes.



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6. Decisions about resuscitating newborns with stigmata of extreme prematurity (i.e., very small, fused eyelids, gelatinous skin, etc.) should involve online medical control.
7. Term infants who have undergone prolonged resuscitation should not be actively warmed in the pre hospital setting.



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## ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)

### Historical Findings

1. Age is younger than 16 years.
2. Patient is unconscious.

### Physical Findings

1. Patient is apneic
2. Patient has no pulse.

### EKG Findings

1. There is an organized cardiac rhythm with QRS complexes indicating PEA
2. Patient shows asystole on the monitor in two or more leads.

### Protocol

1. Ensure airway and begin ventilation with bag-valve-mask with 100% oxygen.
2. Begin CPR and consider intubation
3. Check cardiac rhythm and immediately resume CPR.
4. Establish an IO or other vascular access with normal saline at keep open rate.
5. Epinephrine 1:10,000 at 0.1 mL/kg IO/IV. If vascular access is not available, then give epinephrine 1:1000 at 0.1 mL/kg via ET (maximum dose 5 mL)
6. Begin transport. **Identify and treat causes (see note #4)**
7. Reassess airway and breathing frequently, as hypoxia is a top cause of PEA.
8. Contact medical control.
9. Administer normal saline 20 ml/kg IV or IO.



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10. If PEA persists after 3 to 5 minutes, repeat epinephrine 1:10,000 at 0.1 mL/kg (maximum dose 5 mL) IV, IO, or 1:1000 at 0.1 mL/kg per ET.

### **Medical control may consider the following:**

1. Additional 20 mL/kg fluid boluses.
2. Needle decompression of the chest.

### **Notes**

1. Airway management with adequate bag-valve-mask (BVM) ventilation is a priority, and intubation should be considered if ventilation and oxygenation with BVM is difficult to maintain.
2. Both cuffed and uncuffed endotracheal tubes are acceptable for intubating infants and children. Training in inflating cuffed tubes to minimal airway occlusion pressure is important. In certain circumstances (e.g., poor lung compliance, high airway resistance, or a large glottic air leak) a cuffed endotracheal tube may be preferable to an uncuffed tube, provided that attention is paid to endotracheal tube size, position, and cuff inflation pressure (Class IIa, LOE B)
3. Since a main cause of PEA is hypoxia, the effectiveness of BVM ventilation and oxygenation should be reevaluated constantly.
4. The reversible causes of PEA include hypovolemia, cardiac tamponade, tension pneumothorax, hypoxemia, acidosis, and pulmonary embolism



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## BRADYCARDIA

### Historical Findings

1. Age is younger than 16 years.

### Physical Findings

1. Alteration of level of consciousness OR
2. Evidence of poor circulation (delayed capillary refill, or weak peripheral pulses) OR
3. Evidence of respiratory distress or failure.

### EKG Findings

1. Rhythm is sinus bradycardia for child's age.

### Protocol

**THE PATIENT MUST BE SYMPTOMATIC BEFORE PROCEEDING WITH THIS PROTOCOL**

1. Ensure airway, apply 100% oxygen, bag-valve-mask (BVM) ventilate as needed, and recheck pulse rate.
2. If despite adequate oxygenation and ventilation, the heart rate is < 60 in a newborn or child, perform chest compressions at a rate of 100 per minute.
3. Establish vascular access or IO (IO for evidence of shock: altered mental status and poor skin perfusion or weak peripheral pulses).
4. Epinephrine 1:10,000 at 0.1 ml/kg IV or IO. If vascular access is not available, then give epinephrine 1:1000 at 0.1 ml/kg via ET (maximum dose 5.0 ml).
5. Begin transport.
6. Reassess airway and breathing frequently.
7. Contact medical command.
8. If symptomatic bradycardia persists, repeat epinephrine IV/IO every 3 to 5 minutes.



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9. If symptomatic bradycardia persists, administer atropine 0.02 mg/kg (min 0.1 mg, max 1.0 mg) IV, ET, or IO.
10. Reassess airway and breathing.
11. If hypotensive, normal saline 20 ml/kg IV push.

### Notes

1. The most common cause of bradycardia in the child is hypoxia. Therefore attention to airway is the most important intervention.
2. It is important to treat the patient and not the rate. Remember that athletes may have heart rates of 40-60.



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## PEDIATRIC STABLE & UNSTABLE TACHYCARDIA

### Historical Findings

1. Age is younger than 16 years
2. Older child may complain of chest pain or rapid heart beat.

### Physical Findings

1. Heart rate in infants less than 2 years is usually greater than 220. Heart rate in older children is usually greater than 180.
2. The unstable patient displays signs of shock with weak or no distal pulse, delayed capillary refill, poor skin perfusion, and change in mental status.

### EKG Findings

1. QRS duration < 0.08 (2 little boxes).
2. P waves may or may not be seen.
3. Little variability in heart rate noted with respiration and movement.
4. Wide complex tachycardia (V-Tach) – refer to Protocol Section 7

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Initiate IV access with a saline lock or 0.9 % normal saline KVO.
5. Acquire a 12 Lead ECG and maintain cardiac monitoring at all times.
6. **STABLE PATIENT WITH ADEQUATE PERFUSION**
  - A. Consider one attempt at vagal maneuvers (crushed ice to the mid face for 15 seconds).
  - B. Attempt vascular access preferably in an antecubital vein.



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- C. Contact medical control.
  - D. Administer Adenosine 0.1 mg/kg IV rapid IV push. (Maximum first dose 6 mg) Adenosine should be administered as close to the heart as possible, preferably in the antecubital vein. Consider use of a double stopcock to administer 5 mL flush immediately.
  - E. May double and repeat Adenosine once IV rapid IV push. (maximum second dose 12 mg).
  - F. If the patient is conscious and **only on the order of a medical control physician** give Versed 0.1 mg/kg (max 5 mg) IV/IM or other medications as directed by medical control.
  - G. **Only on the order of a medical control physician:** synchronized cardioversion 0.5 J/kg
  - H. If unsuccessful, repeat synchronized cardioversion at 1 J/kg
  - I. If unsuccessful, repeat synchronized cardioversion at 2 J/kg.
7. **UNSTABLE PATIENT (POOR PERFUSION)**
- A. Contact medical control.
  - B. If IV access has been established, preferably in an antecubital vein, medical control may consider administration of adenosine 0.1 mg/kg rapid IV push (Maximum first dose 6 mg).
  - C. If IV has not been established, prepare for immediate cardioversion.
  - D. If the patient is conscious and **only on the order of a medical control physician** give Versed 0.1 mg/kg (max 5 mg) IV/IM or other medications as directed by medical control.
  - E. **Only on the order of a medical control physician:** synchronized cardioversion 0.5 J/kg.
  - F. If unsuccessful, repeat synchronized cardioversion at 1 J/kg.
  - G. If unsuccessful, repeat synchronized cardioversion at 2 J/kg.
8. Reassess ABC's, consider CPR, and transport

## Notes

1. Children without underlying heart disease or myocardial dysfunction will often tolerate SVT for up to 24 hours without compromise.



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## V-FIBRILLATION & V-TACHYCARDIA WITHOUT PULSES

### Historical Finding

1. Age is less than or equal to 16 years.
2. Patient is unconscious.

### Physical Findings

1. Patient is apneic.
2. Patient has no pulses.

### EKG Findings

1. Ventricular fibrillation or ventricular tachycardia without pulse.

### Protocol

1. Begin CPR and bag-valve-mask (BVM) ventilation.
2. If rhythm is ventricular fibrillation or ventricular tachycardia without pulses, defibrillate immediately at 2 joules/kg (max 200 J).
3. Immediately resume CPR for 2 minutes or 5 cycles
4. Check cardiac rhythm. If PEA or asystole, use appropriate protocol (**P102**).
5. If ventricular fibrillation or ventricular tachycardia without pulses, resume CPR immediately while preparing to deliver shock.
6. Defibrillation at 4 J/kg (max 360 J) and resume CPR immediately.
7. Consider intubation.
8. Establish IV/IO access. IO is indicated if unable to obtain IV within 90 seconds. Use normal saline at keep open rate.
9. Administer epinephrine 1:10,000 at 0.1 mL/kg IV/IO. If IV or IO is unattainable, give epinephrine 1:1000 at 0.1 mL/kg via ET (maximum dose 5 mL). Repeat epinephrine every 3 to 5 minutes, and follow each dose with 2 minutes of CPR or 5 cycles.



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10. Check cardiac rhythm. If PEA or asystole, use appropriate protocol (**P102**).
11. If ventricular fibrillation or ventricular tachycardia without pulses, resume CPR immediately while preparing to deliver shock.
12. Defibrillate at 4 J/kg (maximum 360 joules), then resume CPR immediately.
13. Administer amiodarone 5 mg/kg (max 300 mg) IV/IO push then resume CPR immediately.
14. If Amiodarone is not available, give lidocaine 1 mg/kg IV/IO push then resume CPR immediately, contact medical control, and go back to step 10.
15. Transport to closest appropriate facility

## Notes:

1. As in all pediatric cardiac arrests, airway control is a key factor in improving the odds of successful resuscitation. Both cuffed and uncuffed endotracheal tubes are acceptable for intubating infants and children. Training in inflating cuffed tubes to minimal airway occlusion pressure is important. In certain circumstances (e.g, poor lung compliance, high airway resistance, or a large glottic air leak) a cuffed endotracheal tube may be preferable to an uncuffed tube, provided that attention is paid to endotracheal tube size, position, and cuff inflation pressure (Class IIa, LOE B).
2. Limit the time a pulseless patient is not getting good CPR.
3. AEDs may now be used on children of ALL ages. For infants, a manual defibrillator is preferred to an AED for defibrillation. If a manual defibrillator is not available, an AED equipped with a pediatric dose attenuator is preferred. If neither is available, an AED without a pediatric dose attenuator may be used.
4. Ventricular fibrillation is rare in children, unlike adults. It is usually due to hypoxia or cardiac disease.
5. Dilute Amiodarone by mixing 150 mg of Amiodarone in 100 mL of normal saline. This is 1.5 mg/mL.
6. Consider the use of a stopcock for the administration of Amiodarone.
7. When choosing joules for defibrillation in pediatric patients, round up.



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## **PEDIATRICS: ANAPHYLAXIS/ALLERGIC REACTION**

### **Historical Findings**

1. Age less than or equal to 16 years.
2. Exposure to an allergen (insect sting, medications, foods, or chemicals).
3. Patient complains of itching, shortness of breath, tightness in chest or throat, weakness, or nausea.

### **Anaphylaxis Definition**

Serious, rapid onset (minutes to hours) reaction to a suspected trigger **AND**

1. Two or more body systems involved (e.g., skin/mucosa, cardiovascular, respiratory, GI) **OR**
2. Hemodynamic instability **OR**
3. Respiratory compromise

### **Physical Findings (One or More)**

1. Flushing, hives, or swelling.
2. Shortness of breath, wheezing or stridor.
3. Anxiety or restlessness.
4. Tachycardia.
5. Hypotension:
  - A. < 85 mmHg systolic in a child age 5-10 years old
  - B. < 75 mmHg systolic in a child < 5 years old

### **Protocol**

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol.



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3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
  - A. Remove allergen (stinger from skin, etc.)
4. Initiate IV access with a saline lock or 0.9% normal saline KVO.
  - A. If the patient is hypotensive administer a 20 mL/kg (max 1 liter) normal saline bolus.
5. For patients with anaphylaxis and a prescribed epinephrine auto-injector:
  - A. Assure injector is prescribed for the patient.
  - B. Check medication for expiration date.
  - C. Check medication for cloudiness or discoloration.
  - D. Remove safety cap from injector.
  - E. Select appropriate injection site. If possible, remove clothing from the injection site. If removing the clothing would take too much time, the auto-injector can be administered through clothing.
  - F. Push injector firmly against site.
  - H. Hold injector against the site for a minimum of ten seconds.
  - G. Keep injector to give to hospital personnel upon arrival.
6. Administer epinephrine 1:1000 at a dose of 0.01 mL/kg IM (max 0.3 mL) if hypotensive or severe respiratory distress is present.
7. If bronchospasm (wheezing) is present, administer albuterol (Proventil) aerosol treatment 2.5 mg in 3.0 ml normal saline via hand held nebulizer or mask depending on the patient's age/ability. Blow-by administration is ineffective.
8. If the patient has signs and symptoms of a systemic reaction consider the administration of the following medications:
  - A. Diphenhydramine (Benadryl) 1 mg/kg IV/IM (max 50 mg).
  - B. Consult CCHMC Statline for consult:
    - i. Methylprednisolone (Solu-medrol) 2 mg/kg IV (max 80 mg).
    - ii. Famotidine (Pepcid) 0.5 mg/kg IV (max 20 mg)

## Notes

1. Anaphylaxis is extremely rare in babies. Without history of sudden onset of rash and difficulty breathing, most babies with rashes and tachypnea have respiratory infections responsible for their symptoms.



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## PEDIATRIC RESPIRATORY DISTRESS (STRIDOR)

### Historical Findings

1. Age 6 months to 6 years.
2. Barky "seal" sounding cough with hoarse voice and stridor.
3. May have fever and cold symptoms
4. No history suggesting foreign body aspiration.

### Physical Findings

1. Inspiratory and expiratory stridor at rest.
2. Chest wall retractions.

### Differential Diagnosis

1. Foreign body aspiration
2. Croup
3. Epiglottitis
4. Asthma
5. Bacterial tracheitis

### Protocol

1. Keep the patient calm. You may have a parent or other trusted adult administer oxygen by non-rebreather mask or blow-by to keep oxygen saturation above 94%.
2. Place the patient on a cardiac monitor.
3. Consider normal saline mist via nebulizer. This can be helpful in croup patients.
4. Begin transport.
5. Contact medical control if considering nebulized epinephrine.
  - A. **Medical control may order** epinephrine 0.5 mL of 1:1000 solution mixed in 2.5 mL of normal saline, administered via updraft nebulizer with oxygen and a facemask.



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6. Continue normal saline mist via nebulizer when the epinephrine nebulizer is complete.
7. Reassess patient frequently.

### Notes

1. Pediatric patients with fever, drooling, and stridor should be suspected to have epiglottitis or other potential source of airway obstruction. Epiglottitis is a bacterial infection of the epiglottitis that sometimes obstructs the tracheal opening. These may worsen from sticking objects such as fingers or tongue depressors in the patient's throat. These patients are best treated by reassurance and immediate transportation to the hospital. Have the patient breath oxygen by mask or blow-by as long as this does not cause the patient to become upset.
2. The purpose of the medical control call is to allow the medical control physician input into the decision to administer nebulized epinephrine. The potential downside to giving nebulized epinephrine is that the patient will need to be observed for 3-4 hours. If the case of croup is mild and receives nebulized epinephrine, the patient will require an unnecessarily longer emergency department stay.



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## **PEDIATRIC RESPIRATORY DISTRESS (WHEEZING OR ASTHMA)**

### **Historical Findings**

1. Age is younger than 16
2. Patient complains of worsening shortness of breath or trouble breathing.
3. Patient **USUALLY** has a past medical history of asthma or seasonal allergies.

### **Physical Findings**

1. Tachypnea.
2. Lung exam may reveal diminished breath sounds, poor air exchange and or wheezing.
3. May have retractions, accessory muscle and show signs of fatigue.
4. May have pursed lip breathing (auto-PEEP).

### **Differential Diagnosis**

1. Bronchitis, Bronchiolitis.
2. Foreign Body Aspiration
3. Pneumonia.

### **Protocol**

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol (**S101**).
3. Perform patient assessment, obtain vital signs and begin cardiac monitoring.
4. Initiate IV access with a saline lock or 0.9% normal saline KVO.



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5. Administer albuterol (Proventil) aerosol 2.5 mg in 3.0 ml normal saline via hand held nebulizer or via mask depending on the age/ability of the patient. Do not administer via blow-by due to its ineffectiveness.
  - A. Consider adding 1 vial Ipratropium Bronide (0.5mg of 0.017%) to the Albuterol aerosol. May substitute Duoneb (Albuterol plus Ipratropium Bromide that is premixed).
6. Albuterol (Proventil) may be repeated to a maximum of 3 doses.
7. If the patient is in extreme distress with minimal air movement, administer epinephrine 1:1000, 0.01 mL/kg IM (max 0.3mL)
  - A. Do not delay administration to start IV or administer updraft
8. If the patient requires more than one nebulizer treatment, contact CCHMC Statline for orders to administer methyprednisone (Solu-medrol) 2 mg/kg slow IV. (max 80 mg)
9. Allow the patient to sit up in a position of comfort for transport.

### Notes

1. Wheezing in a patient **WITHOUT** a past medical history of asthma, may still be asthma, but should alert you to the possibility of a foreign body aspiration or pneumonia.



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## PEDIATRIC FEVER

### Historical Findings

1. Fever is usually the body's normal response to some type of an infection. Temperatures that do not exceed 105 degree F are benign. A temperature of 100.4 degree F is considered a fever in an infant less than 36 months of age. Children older than 36 months of age are considered to have a fever with a temperature greater than 101.5 degree F.

### Physical Findings

1. Patient warm to touch.
2. Flushed skin.
3. Level of consciousness maybe decreased.

### Protocol

1. If core temperature is between 100.4 and 105 degree F:
  - A. Maintain airway and provide supplemental oxygen as needed.
  - B. Facilitate passive cooling by removing excess clothing and blankets.
  - C. If child has not been given acetaminophen in the last 4 hours, then offer to *assist* parent/guardian with administration of acetaminophen at 10-15 mg/kg or refer to dosage guidelines on medicine bottle. If patient has been receiving Ibuprofen, repeat doses should be given every 6 hours at 10 mg/kg or follow the guidelines on the medicine bottle.
  - D. If patient begins to have an active seizure, refer to seizure protocol.
2. If core temperature > 105 degree F:
  - A. Maintain airway and provide supplemental oxygen as needed.
  - B. Facilitate active cooling by applying wet towels with tepid water to trunk and head.
  - C. **Do not** submerge in water or use ice or rubbing alcohol.



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- D. If patient begins to have an active seizure, refer to seizure protocol.

## Notes

1. Fever induced seizures (febrile) are the direct result of a rapid increase in body temperature, usually occurring when the temperature reaches 102 degree F.
2. Fever induced seizures (febrile) generally occur between the ages of six months to five years.
3. Fever induced seizures (febrile) usually occur once in a 24-hour period. If a patient has more than one seizure in a 24-hour period suspect a different etiology (i.e., meningitis or some type of systemic infection).
4. Most typical febrile seizures last less than 5 minutes and stop on their own without medications. A seizure, which has lasted longer than 5 minutes and is associated with fever, may not be a typical febrile seizure, and should be treated with Versed just as any other seizure lasting longer than 5 min.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *MEDICAL PROTOCOLS*



## PEDIATRIC PAIN MANAGEMENT

### Historical Findings

1. Age 5 to 16 years.
2. Acute pain related to isolated extremity deformity, and burns.
3. Contact Statline for other painful conditions.
4. No history of allergy to fentanyl (Sublimaze), morphine, ondansetron (Zofran).

### Physical Findings

1. Systolic blood pressure  $> (2 \times \text{age in years}) + 85$ .
2. Normal mental status.
3. **No signs or symptoms of shock.**

### Protocol

1. Initiate contact; reassure, and explain procedures.
2. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol.
3. Assess and document the patient's pain level using the Wong Baker or FLACC scale.
4. **Wong Baker Scale**





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Infants and Toddlers: Face Legs Activity Cry Consolability scale (FLACC)

## FLACC

Category	Scoring		
	1	2	3
<b>Face</b>	No Particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
<b>Legs</b>	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
<b>Activity</b>	Lying quietly normal position, moves easily	Squirming, shifting back and forth, tense	Arched, ridged or jerking
<b>Cry</b>	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs; frequent complaints
<b>Consolability</b>	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

5. Begin continuous pulse oximetry and end-tidal CO<sub>2</sub> monitoring if available.
6. Administer a single dose of either:
  - A. Fentanyl (Sublimaze) 1 microgram/kg IV/IO (max 50 mcg)
    - i. Administer over 3-5 minutes slow IV/IO push to prevent rigid chest.
  - B. Fentanyl (Sublimaze) 2 microgram/kg IN (max dose 100 mcg)
    - i. Use the undiluted injectable Fentanyl product (100 mcg/2 mL), draw up an extra 0.1 mL of drug solution to prime the atomizer and administer a max of 1 mL per nostril (if giving to larger kid and need to use 100 mcg, you should use the same atomizer for both nostrils).
  - C. Morphine Sulfate 0.1 mg/kg IV/IO/IM (max dose 5 mg)
7. If the patient experiences a drop in systolic B/P < (2 x age in years) + 65, administer a 20 mL/kg bolus of normal saline.
8. If the patient's pain is not well controlled after initial dose contact Statline for additional orders.



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9. Naloxone (Narcan) 0.1 mg/kg IV/IN/IM (max dose 2 mg) may be administered for respiratory depression associated with fentanyl (Sublimaze) or morphine administration.
10. Ondansetron (Zofran) may be administered for nausea and or vomiting:
  - A. Pediatrics > 2 years and > 40 kg (88 lbs): 4 mg slow IV over 2 minutes or 4 mg PO (solutab) if IV access is unavailable.
  - B. Pediatrics ≤ 2 years or ≤ 40 kg (88 lbs): 0.1 mg/kg slow IV over 2 minutes or IM once.

## Notes

1. In general, pain medications can and should be given prior to splinting.
2. An injured extremity found cool, with poor pulses should be splinted prior to administration of pain medications.
3. Complications such as respiratory depression and hypotension are as rare in children as they are in adults when dosed appropriately.
4. Pain control is an important medical intervention. Medical research proves that children are treated for pain much less often than adults with the exact same injuries. It is the intention of this protocol that patients with burns and isolated fractures who meet the above criteria be given pain relief medication.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *PEDIATRIC PROTOCOLS*

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## PEDIATRIC INTRAOSSEOUS INFUSION

### Historical Findings

1. Age is younger than 16

### Indications

1. Emergency vascular access to the pediatric patient when peripheral intravenous access is unavailable.
2. Cardiopulmonary arrest (non-breathing and absent central pulses).
3. The patient must have uncompensated shock (absent peripheral pulses or systolic blood pressure less than 70 mmHg) when a peripheral IV cannot be established after two attempts (attempts can include actual venipunctures or looking at two different sites to find a vein).

### Contraindications

1. Use of a limb with a suspected fracture or prior puncture of the bone since fluid will leak out.
2. Placement through an infected or burned area unless this is the only available site.

### Complications

1. Extravasation (leaking/effusion) of fluids into the subcutaneous tissue.
2. Infection of tissue or bone.
3. Injury to the epiphysis (growth plate).



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### Procedure

1. Except in the circumstance of cardiopulmonary arrest, this procedure requires the **direct order of a medical command physician**.
2. The preferred site is the proximal tibia, one finger breadth (1-3 cm) below the prominence (tibial tuberosity) on the flat anteromedial surface. A different bone should be chosen if the primary bone is fractured or the overlying skin is burned or infected. A secondary site is the distal femur in the midline approximately 3 cm above the patella.
3. Place a towel under the knee.
4. Prep the skin.
5. Adjust the bone marrow needle for insertion by lowering the depth guard to cover about  $\frac{1}{4}$  to  $\frac{1}{2}$  of the needle.
6. Insert a 15 to 18 gauge bone marrow needle through the skin with the point directed at a slight angle away from the knee (away from the growth plate). Use a boring or screwing motion until a give is felt upon entering the marrow cavity. If a pop or give is not felt, then raise the depth guard on the needle and continue to apply pressure.
7. Remove the stylet and attempt to flush the needle with IV solution. If the solution can be flushed easily and there is no evidence of swelling around the site, then the needle can be safely assumed to be in the correct place. If resistance is met, then try to pull the needle back slightly and flush again. If still unsuccessful, the remove needle and try again in a different bone.
8. Attach IV tubing with stopcock to needle.
9. Screw the flange of the needle so it is flush to the skin and tape it in place.
10. Begin infusion of medications and fluids (a pressure bag or syringe may be needed).
11. If using IO insertion device, follow manufacturer instructions.

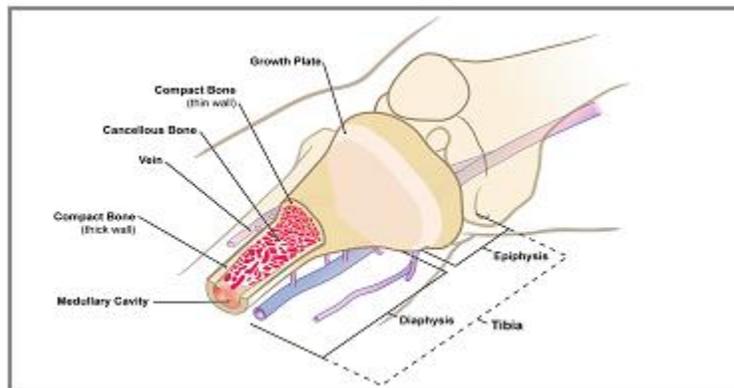


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## Notes

1. Medications and fluids should be given push since gravity flow is often slow.
2. If unable to push fluid from the syringe, consider the following:
  - A. If “pop” was not felt, continue advancing needle until a pop is felt.
  - B. A piece of bone may be blocking the end of the needle. Reinsert the stylet, remove it, and reattempt to push fluid.
  - C. The tip of the needle may have gone through the marrow cavity and is the other side of the bone. Slowly pull back the needle while pushing fluids from the syringe. When you are able to push fluid from the syringe easily without swelling around the site, secure the needle in place and continue giving fluids and medications.
3. If there is swelling around the site due to fluids in the soft tissues, consider the following:
  - A. The fluid may be leaking from a previous puncture site.
  - B. It may be leaking through the hole around the needle, which was enlarged by bumping or jiggling the needle.
  - C. The needle may have gone all the way through the bone and the fluid is leaking from the end of the needle on the other side. You must remove the needle and attempt access in another bone.





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## PEDIATRIC CRICOTHYROTOMY

### Indications

1. Age  $\leq$  15.
2. Acute upper airway obstruction, which cannot be relieved using basic airway maneuvers, finger sweep, or endotracheal visualization and Magill forceps removal.
3. Respiratory arrest with facial or neck anatomy or injury, which make bag mask ventilation impossible.

### Causes of Upper Airway Obstruction

1. Massive facial trauma.
2. Foreign body aspiration.
3. Laryngoedema.
4. Airway burns.
5. Laryngeal fracture.
6. Epiglottitis.

### Complications

1. Bleeding (minimized by puncturing in the lower third of the cricothyroid membrane to avoid vessels).
2. Subcutaneous emphysema.
3. Pneumothorax (from allowing insufficient time for passive exhalation in between breaths)

### Protocol

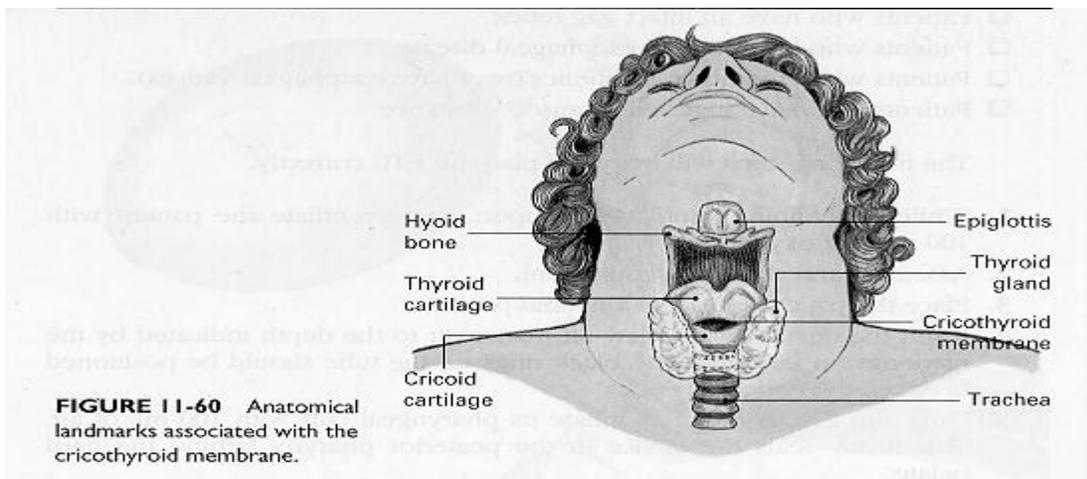
1. Following exposure of the neck, identify the trachea, cricoid cartilage and cricothyroid membrane.
2. Prep the skin, if time permits.



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3. Attach a 5 mL syringe with 2-3 mL of normal saline to a 16 or 18 gauge IV catheter.
4. Hold the trachea in place and provide skin tension with the thumb and fingers of the non-dominant hand.
5. Puncture the cricothyroid membrane with the IV catheter attached to the syringe. This should be at a 30-45 degree angle from the skin and directed toward the patient's feet.
6. Advance the needle downward with continual aspiration. The appearance of bubbles confirms tracheal placement. Proceed to slide the cannula off the needle until the hub rests securely on the skin surface.
7. After removing the needle, connect the cannula to the manual jet ventilator and set the manometer to 30 psi. The jet ventilator must be attached to the quick connect DISS outlet on a portable oxygen cylinder or directly to a DISS outlet in the ambulance.
8. Ventilate the patient using 1 second bursts at a rate of 20 breaths per minute.





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### Notes

1. This procedure will allow enough oxygen to be delivered but will not adequately ventilate the patient. The CO<sub>2</sub> level will continue to rise, and this setup must be replaced as soon as possible with another technique which will adequately ventilate the patient.
2. Prepackaged kits to obtain tracheal access using a Seldinger-type technique are available. For example, Pertrach by Pertrach Inc. can be used for pediatric patients with airway obstruction. This type of product should be used only upon the direction of medical command.
3. If the cricothyroid membrane cannot be located, the catheter may be safely inserted in a lower intercartilaginous tracheal space.
4. Because children vary greatly in size from one to another, many commonly used rescue airway devices for adults such as QuickTrach by Rusch, Inc. are not approved for use in pediatric patients.



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## PEDIATRIC IMMERSION INJURY

### Historical Findings

1. Patient's age under 16 years

### Physical Findings

2. Patients submerged under water or recently pulled from the water with coughing, respiratory distress, or lifelessness.

### Protocol

1. Remove the victim from the water if still required. Perform warming as described in protocol (M109).
2. If there is suspicion that the events involved a diving accident or axial load to the head, apply cervical spine precautions as described in protocol (S115).
3. Ensure adequate airway, breathing, and oxygenation.
  - A. Note coughing, cyanosis or respiratory distress.
  - B. Administer oxygen via non-rebreather mask for all patients with cough, cyanosis, hypoxia, or respiratory distress. Consider BVM ventilating if patient remains hypoxic despite this or is not breathing adequately.
  - C. All victims of submersion events for which EMS responds should be transported for medical evaluation. Even patients with mild residual symptoms may develop significant pulmonary edema in the hours to come.
4. **For patients with lifelessness**, establish if the water has obvious signs of ice and, if possible, an estimate of the duration of submersion. Proceed with one of the following pathways:
  - A. **If there are obvious signs of ice on the water**, proceed with the cardiac arrest protocols **P105** or **P102** depending on whether their initial presentation is VF/VT or PEA/Asystole.
    - i. Maintain airway and administer oxygen.



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- ii. Initiate transport to Cincinnati Children's Burnet Campus, which is capable of performing pediatric extracorporeal membrane oxygenation (ECMO).
- iii. Notify Cincinnati Children's.
- B. **If there are NO obvious signs of ice, and the patient has been submerged for 30 minutes or longer**, the evidence suggests the patient is unlikely to survive. Proceed with the cardiac arrest protocols **P105** or **P102** depending on whether their initial presentation is VF/VT or PEA/Asystole. Contact medical control to discuss CPR limits. If patient is transported, transport to the closest emergency department while performing CPR.
- C. **If there are NO signs of ice, and the patient has been submerged for less than 30 minutes or the time is unknown**, proceed with the cardiac arrest protocols **P105** or **P102** depending on whether their initial presentation is VF/VT or PEA/Asystole). Transport to the closest emergency department while performing CPR. Notify receiving hospital.

## Notes

1. Patients experiencing drowning have been noted to have their largest fall in temperature after being removed from the water. Efforts should be made to remove wet clothing, insulate with dry warm covering, and cover patient's head (not face) to begin the rewarming process.
2. It is unnecessary to perform spinal immobilization on every submersion injury patient. Patients at highest risk for spinal injury tend to be adolescents and those who drown after diving and horse playing.
3. Evidence for survival after ice water submersion exists in the form of case reports, with variable outcome. These patients may benefit from ECMO. Although there are hospitals in the region capable of performing ECMO on infants and adults, **currently, Cincinnati Children's Burnet Campus is the only hospital prepared to perform ECMO on children.**
4. Submersion time has been noted in literature to be the most important factor related to patient outcome.
5. Hypoxic arrest is the most common etiology of arrest in drowning victims.
6. It is generally unnecessary to obtain the victim's temperature in the field.



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## AIRWAY, OXYGEN ADMINISTRATION, & VENTILATION

### Airway Procedures

1. Basic manual airway opening procedures.
  - A. Head tilt/chin lift for unconscious adults in the absence of trauma.
  - B. Modified jaw thrust without head extension for trauma patients.
  - C. Sniffing position without hyperextension for pediatric patients  $\leq 8$  years.
2. Basic airway adjunct procedures.
  - A. Oral pharyngeal airway (OPA) for patients without a gag reflex.
  - B. Nasal pharyngeal airway (NPA) for patients with a gag reflex and or a clenched jaw.
    - i. Do not use in patients with severe maxillofacial trauma or suspected basilar skull fractures.
3. Advanced airway procedures.
  - A. Oral tracheal intubation is the preferred technique for intubation in all of the following situations:
    - i. Any apneic patient. (cardiac or respiratory arrest)
    - ii. Impending respiratory failure utilizing RSI.
    - iii. Acute GCS  $\leq 8$  (trauma, drug overdose, status epilepticus) utilizing RSI.
    - iv. All pediatric patients  $< 14$  years.
  - B. King LTS-D should only be utilized as a rescue airway when primary intubation techniques are unsuccessful and the following criteria are met:
    - i. Patients must be 5-6 ft tall.
    - ii. No known esophageal disease.
    - iii. No acute ingestion of caustic substances.
  - C. Quicktrach is the surgical airway device of choice for patients that urgently need an airway for ventilation when all other methods to facilitate *VENTILATION* have failed.



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## **Oxygenation**

Oxygen administration should be based on clinical exam including respiratory effort, oxygen saturation, capnograph and any acute or chronic medical conditions that may be present. In general, any patient with an oxygen saturation of < 95% should be given supplemental oxygen. The following information outlines the appropriate oxygen device, recommended flow, and clinical situation.

1. Nasal cannula: 2-6 LPM for patients in mild distress without signs of hypoxia.
2. Non-rebreather mask: 10-15 LPM for patients in moderate to severe distress with signs of hypoxia.
3. Nebulizer: 6-8 LPM for patients with signs of bronchospasm (wheezing) or poor air movement (tight breath sounds).
4. CPAP: 100 % oxygen through 50 psi DISS for patients with signs of acute pulmonary edema.
5. Bag-Mask Ventilation: 15 LPM for patients requiring ventilatory support.

## **Ventilations**

Bag-mask positive pressure ventilations should be performed on all patients requiring ventilatory support. The following information outlines the appropriate rates of ventilation:

1. Cardiac arrest
  - A. Adult/Pediatric 8-10 breaths per minute.
2. Ventilatory support with a perfusing rhythm.
  - A. Adult 10-12 breaths per minute (PCO<sub>2</sub> 35-45 mm Hg).
  - B. Pediatric 12-20 breaths per minute (PCO<sub>2</sub> 35-45 mm Hg).
3. Elevated ICP with possible herniation 10-20 breaths per minute titrated to a PCO<sub>2</sub> level 30-35 mm Hg.
  - A. Signs of impending herniation: *Cushing's Triad*
    - i. Bradycardia
    - ii. Hypertension (widening pulse pressure)
    - iii. Change in respiratory pattern (Cheyne-Stokes)
    - iv. Unequal pupils (not part of Cushing's but often present)
    - v. GCS ≤ 8



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## ADULT CRICOTHYROTOMY USING THE RUSCH QUICKTRACH DEVICE

### Indications

1. Age  $\geq$  16.
2. Acute upper airway obstruction, *which cannot be relieved* using basic airway maneuvers, finger sweep, or endotracheal visualization and Magill forceps removal.
3. *Respiratory arrest* with facial or neck injury, or abnormal anatomy, which make endotracheal intubation impossible.
4. *Inability to ventilate* patient with a bag valve mask.

### Causes of Upper Airway Obstruction

1. Massive facial trauma.
2. Foreign body aspiration.
3. Laryngoedema.
4. Laryngospasms.
5. Airway/facial burns.
6. Epiglottitis.
7. Fractured larynx.

### Complications

1. Bleeding.
2. Vocal cord injury.
3. Failure to place the catheter in the trachea.

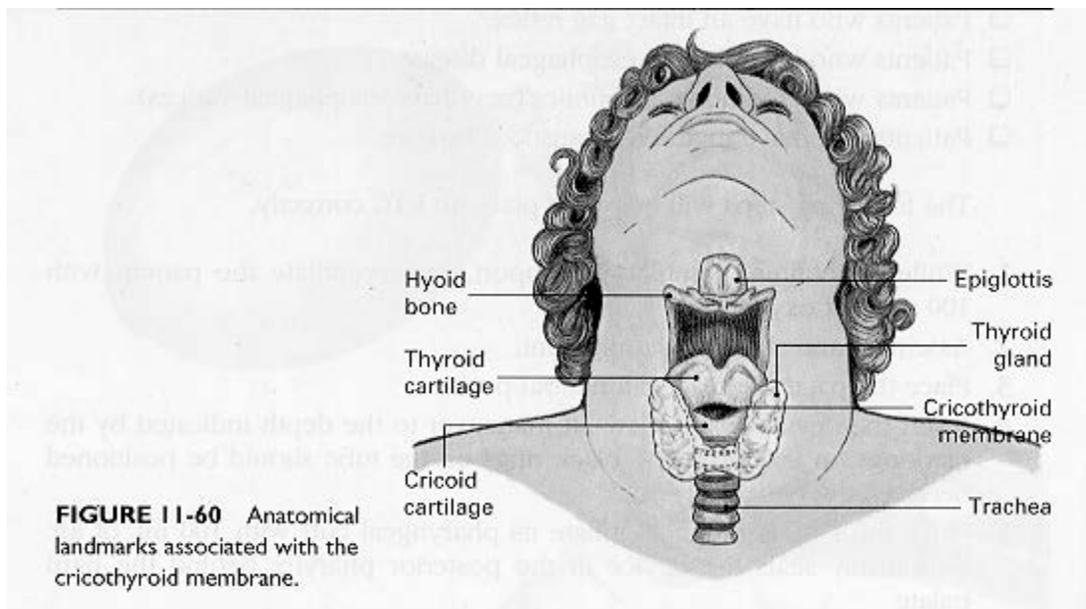


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## Procedure

1. Expose the neck.
2. Identify the cricoid membrane/ligament located between the cricoid cartilage and the thyroid cartilage.
3. Prep the skin, if time permits.
4. Puncture the cricothyroid membrane at a 90-degree angle with the catheter/syringe assembly.
5. Aspirate for air upon introducing the catheter/syringe.
6. Upon aspiration of air, redirect the catheter/syringe in a 45-degree angle (toward feet), and advance until the stopper meets the skin.
7. Remove the stopper.
8. Advance the catheter (**not the needle**) until the flange rests on the skin.
9. Remove the needle-syringe assembly.
10. Apply the strap.
11. Attach the connecting tube to the 15mm adaptor.
12. Attach a bag valve mask (BVM) to the other end of the connecting tube.
13. Ventilate the patient using the BVM.





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## AUTOPULSE DEVICE

### Indications

1. Age  $\geq$  16.
2. Cardiac Arrest.

### Contraindications

1. Traumatic Arrest.
  - A. Involving trauma to the abdomen and thorax

### Warning

1. If a malfunction occurs – revert to manual CPR as outlined by the American Heart Association.

### Compatibility

1. Defibrillation (Apply pads before securing CCA).
2. External Pacemaker (Apply pads before securing CCA).
3. Adult Intraosseous Infusion.

### Procedure

1. Start manual CPR as appropriate while equipment is being readied.
2. Apply monitor and provide dysrhythmia identification.
  - A. Defibrillate as needed.
  - B. Pace as needed.
3. Provide ventilates with a BVM.
  - A. Do not use current Impact Ventilator
4. Place patient on the AutoPulse.
5. Apply the Cardiac Compression Assembly (CCA).
6. Turn Power on.



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7. Follow prompts:
  - Press Green Button – CCA will adjust to patient.
  - Press Green Button Second Time – Compressions will begin.
8. Insure Intubation (Pause Device if Necessary).
9. Provide ALS Care, to the dysrhythmia(s) presented.
10. Secure AutoPulse to Backboard, when ready to transport.
11. Secure Patient to Backboard; do not apply any strap over the CCA.
12. Secure Backboard to Cot.

## **Cleaning**

1. Do not submerge platform or batteries.
2. Spray with Germicide Cleaner.
3. Allow proper contact time.
4. Wipe clean.

## **Returning the Unit to Service**

1. Remove and dispose of old CCA.
2. Charge batteries.
3. Clean platform and batteries.
4. Install the new CCA.
  - A. Do not force clip into the shaft.
  - B. Do not tighten to the platform.
5. Re-Install charged batteries.
  - A. One in the platform
  - B. One in the Blue Storage Bag.
6. Position AutoPulse Soft Stretcher under AutoPulse before placing in Blue Bag
7. Insure that a spare CCA is in the Blue Bag.
8. Insure that spare wire ties are in the Blue Bag.



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## BOUGIE INTUBATING STYLET

### Indications

1. Difficult airway with inability to visualize the glottic opening (vocal cords).
2. The epiglottis must be visible (Lehane & Cormack Grade III Laryngoscopic View).
3. 15 F stylet for endotracheal tubes 6.0 – 8.0 mm.
4. 10 F stylet for endotracheal tubes 3.0 - 6.0 mm.

### Physical Findings

#### Lehane & Cormack Grade III Laryngoscopic View



### Protocol

1. During laryngoscopy insert the bougie (*banana shaped*) with the 30-degree tip directed below the epiglottis.
2. Tactile confirmation of tracheal clicking will be felt as the distal tip of the bougie bumps against the tracheal rings.
3. If tracheal clicking cannot be felt, continue to gently advance the bougie until “hold up” is felt.



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4. Tracheal clicking and “hold up” are positive signs that the bougie has entered the trachea.
5. If no tracheal clicking or “hold up” is felt esophageal placement is assumed and the bougie should be removed and an alternative airway should be utilized.
6. When positive signs are felt, advance the bougie to a depth of approximately 25 cm so that the distal tip lies at least 2 to 3 cm beyond the glottic opening.
7. While holding the bougie securely and without removing the laryngoscope, advance the endotracheal tube over the proximal tip of the bougie.
8. Once the endotracheal tube has passed beyond the teeth, rotate the endotracheal tube 90 degrees counter clockwise (1/4 turn to the left) so that the endotracheal tube bevel does not catch on the arytenoids cartilage.
9. Advance the endotracheal tube to the proper depth so that the tip of the endotracheal tube lies in the mid-trachea.
10. Holding the endotracheal tube securely, remove the bougie.
11. Confirm endotracheal placement with capnometry/capnography, and chest auscultation.
12. Secure the endotracheal tube.



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## CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

### Introduction

Continuous Positive Airway Pressure (CPAP) works by “splinting” the airways with a constant pressure of air, which reduces the work of breathing. In CHF it forces the excess fluid out of the alveoli and interstitial space back into the vasculature as well as decreases venous return to the heart thereby lessening its workload. CPAP can also be a palliative intervention for patients with DNR orders due to the non-invasive nature of pressure support verse ventilatory support.

### Indications

1. Age > 16 years old.
2. Patient is awake and oriented.
3. Patient has the ability to maintain an open airway (GCS > 10).
4. Systolic blood pressure above 90 mmHg.

### Contraindications

1. Respiratory arrest.
2. Suspected pneumothorax.
3. Patient has a tracheostomy.
4. Patient is at risk for aspiration i.e.: vomiting, foreign body airway occlusion.
5. The patient is intubated. (The CPAPos device is not configured for use with ETT).

### Physical Findings

1. Acute Respiratory Distress of any etiology (CHF, COPD, Asthma)
  - A. ***INCLUSION CRITERIA (2 OR MORE OF THE FOLLOWING)***
    - i. Respiratory rate > 25 breaths per minute.
    - ii. Retractions, accessory muscle use or fatigue.
    - iii. SaO<sub>2</sub> < 94% at any time.



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- B. Lung exam could have wheezing, rales, or diminished breath sounds depending on etiology of respiratory distress.
2. Respiratory Failure in patient that have a DNR status.

## **Protocol**

1. Ensure that the patient is on continuous cardiac monitor and pulse oximetry.
2. Explain the procedure to the patient.
3. Ensure adequate oxygen supply and assemble CPAP mask, circuit, and device.
4. Assemble required equipment and personnel for RSI in the event the patient deteriorates or is unable to tolerate CPAP.
5. Turn CPAP adjustment knob clockwise to start airflow.
6. Place the mask over the mouth and nose.
7. Secure the mask with straps.
8. Set CPAP pressure to 10 cm H<sub>2</sub>O.
9. Check for air leaks and adjust mask if needed.
10. Do not break the mask seal to administer nitroglycerin (nitro-lingual) SL.
  - A. If nitrates are indicated utilize nitroglycerin paste (nitro-bid) per protocol.
11. Continue to coach patient to keep mask in place, however if the patient is experiencing increasing anxiety lorazepam (Ativan) 1-3 mg IV diluted with 0.9 % NS may be administered.
  - A. The goal of lorazepam (Ativan) is not deep sedation. The goal is to decrease anxiety enough so that the patient tolerates CPAP.
12. If the patient presents with brochospasms (wheezing) a nebulizer may be administered in-line with CPAP.
  - A. Place the T-Piece of the nebulizer between the circuit and the mask.
  - B. The nebulizer must have an independent oxygen source from CPAP to nebulize the medication.
13. Reassess patient's vital signs and response to CPAP every 5 minutes.
14. If the patient's status improves continue CPAP until the patient is transferred to the care of the receiving hospital.
15. If patient's status deteriorates discontinue CPAP and perform RSI.



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16. Notify destination hospital that CPAP has been used.
17. CPAP is only to be removed at the receiving hospital under the following circumstances.
  - B. Respiratory therapy is present and ready to transfer the patient to their equipment, or
  - C. The receiving ED PHYSICIAN is present and requests that CPAP be discontinued.



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## EMERGENCY USE OF CENTRAL VENOUS ACCESS DEVICE

### Indications

1. Emergent venous access when patient's life is in imminent danger or patient is in cardiorespiratory arrest, AND
2. A peripheral IV cannot be established after two attempts (attempts can include actual venipunctures or looking at two different sites to find a vein), AND
3. Patient has central venous access device (CVAD) present.

### Devices

1. Indwelling Catheter(s) - Venous access devices whose ports are Luer-locked or capped. The tip of the catheter is located in a large vein or superior vena cava. Available brands include Hickman, PICC Line, and Midline.
2. Implanted Ports - Single or double (oval) reservoir located under skin on chest or forearm. Access, by inserting a needle through skin into the rubber septum. The catheter tip is located in a large vein or superior vena cava. Available brands include Port-a-Cath.
3. Aphoresis or Hemodialysis Accesses
  - A. Indwelling Catheters - Large bore, short length double catheters (may have third tail or lumen). “Arterial” and “venous” lumens are actually side-by-side in subclavian, internal jugular, or femoral vein. Available brands include Quinton and Perma Cath.  
**CAUTION:** These devices contain high concentrations of heparin. It must be discarded prior to use.
  - B. Gortex Graft or AV Fistula - Natural or plastic connection between vein and artery usually located under skin on arm. The examiner may feel a “thrill” or auscultate a bruit. These sites have high back pressure due to arterialization of vessel.



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## **Procedure for accessing central venous access device**

1. Identify if the CVAD is accessible by standard prehospital equipment. (Implanted ports, AV fistulas, and grafts should be accessed by special, non-coring [Huber-type] needles).
2. Identify shut-off, clamps, caps, heparin/saline lock, etc., and clamp line if disconnecting or opening.
3. Access the device after cleansing with chloraprep or alcohol prep.
4. Aspirate with a 10 to 20 cc syringe until blood returns, but site may be functional without return. Only use venous access devices that have a blood return unless the patient or family can verify that the device is functional despite the lack of blood return.
5. Discard aspirated fluid.
6. Flush lumen or port with 10 cc saline using only a 10 cc syringe or larger, avoiding excessive pressure.
7. Establish IV connection, avoiding air entry.
8. Secure connections with luer lock or tape.
9. All subsequent injections should be given with a 10 cc syringe or larger.

## **Notes:**

1. Arterial bleeding will result if the needle is dislodged from a dialysis graft or fistula.
2. Dialysis fistulas and grafts (located under skin or arm) may have high back pressure and require positive pressure to infuse.
3. When attempting to insert a needle into a dialysis fistula, avoid the scar line or any lumpy areas in the graft or fistula. Follow the track marks that are present from previous use of the site for dialysis.



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## OROGASTRIC AND NASOGASTRIC TUBES

### Indications

1. To perform gastric decompression on any age patient after endotracheal intubation has been performed and placement verified.
2. To provide a route to administer activated charcoal for patients >16 years and with Glasgow Coma Scale of 15.

### Contraindications

1. Nasogastric tubes are contraindicated in the presence of head trauma, maxillofacial injury, or basilar skull fracture. The orogastric route should be utilized in these circumstances.
2. If the patient has known esophageal varices, the risk of inadvertent esophageal rupture and hemorrhage must be weighed with the benefit. Contact medical command for consult.
3. Esophageal stricture.
4. Penetrating neck trauma.

### Protocol

#### Nasogastric Placement for Awake Patients

1. Position alert patients in an upright or high Fowler's position.
2. Administer lidocaine 1% 20mg/1mL IN (atomized) into nare that will be utilized for nasogastric tube insertion.
3. Estimate the length of the tube needed to reach the stomach by measuring the tube from the nose to the tip of the earlobe and down to the xiphoid process. Mark the length with tape.
4. Instill phenylephrine HCL 0.25% or oxymetazoline 0.05%, two or three drops or sprays into both external nares. Early installation allows adequate time to effect vasoconstriction of the nasal mucosa.



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5. Administer benzocaine spray to the posterior pharynx. Benzocaine spray should be applied for approximately ONE second or less.
6. Lubricate the salem sump tube with 2% lidocaine jelly or 2% viscous lidocaine.
7. Insert the tube through the selected naris aiming down and back toward the posterior pharynx with the patient's head flexed forward and their chin toward the chest.
  - A. Pediatric sizes: refer to Broslow tape (we will carry 8F, 12F, 14F)
  - B. Adult size: 18F
8. When the tube reaches the nasopharynx, resistance may be felt. Apply gentle pressure downward to advance the tube. Try to rotate the tube to see whether it will advance. **DO NOT FORCE** the tube, and if resistance is still met remove the tube and attempt the other nare.
9. Advance the tube while instructing the patient to swallow until the predetermined depth marked on the tube is reached.
10. If the patient continually coughs and gags;
  - A. Check the posterior pharynx to see if the tube has coiled and if so, withdraw the tube.
  - B. Consider one additional dose of benzocaine to the posterior pharynx and reattempt insertion.

### **Nasogastric Placement for Sedated Intubated Patients**

1. Orogastric tube placement is preferred once orotracheal intubation has been performed. However if nasotracheal intubation has been performed, the patient may tolerate nasogastric tube placement better depending on their level of sedation.
2. Nasogastric tube placement can also be performed on an intubated patient if attempts at orogastric placement are unsuccessful.
3. Topical anesthetics as outlined in the nasogastric placement for awake patients may not be necessary if the patient has been given paralytics or benzodiazepines.
4. Measurement and insertion techniques are the same for both awake and sedated patients.



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## **Orogastric Placement**

1. Orogastric tube placement should only be used for endotracheally intubated patients once ETT placement has been verified.
2. Estimate the length of tube needed to reach the stomach by measuring the tube from the corner of the mouth to the earlobe and down to the xiphoid process. Mark the length with tape.
3. Lubricate the salem sump tube with 2% lidocaine jelly or water soluble lubricant.
4. Insert the tube through the oropharynx until the marked depth is reached.
  - A. Pediatric sizes: refer to Broslow tape (we will carry 8F, 12F, 14F)
  - B. Adult size: 18F
5. If the tube coils in the posterior pharynx direct laryngoscopy can be utilized to place the tube in the esophagus.

## **Verification of Placement for Naso/Orogastric tubes**

1. Verify tube placement by two or more of the following methods.
  - A. Attach capnometer to tube with a BVM adapter from an ETT. ETCO<sub>2</sub> should register zero.
  - B. Using a 60cc catheter tip syringe instill 30cc of air into tube and auscultate over epigastrium (left upper quadrant) for air sounds.
  - C. Aspirate for gastric contents and assess for cloudy, green, tan, brown, bloody, or off-white color contents consistent with gastric contents.
2. Secure tube with tape or commercially prepared adhesive.



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## **Gastric Decompression**

1. Once the placement of the salem sump tube has been verified begin gastric decompression in one of the following manners:
  - A. Attach the tube to portable suction.
  - B. Attach the tube to continual low suction, approximately 150 mm Hg using the onboard suction.
2. The blue air vent must remain patent to ensure proper sump function and to prevent damage to gastric lining during continuous suction.
3. If suction is not readily available connect the 60 cc syringe to the tube while keeping the air vent patent. This will allow the sump function of the tube to work until suction can be applied and also prevents gastric contents from leaking from tube.

## **Instillation of Activated Charcoal via Naso/Orogastric tubes**

1. Verify salem sump tube placement by 2 or more of the procedures outlined in the protocol just prior to instillation of charcoal.
2. Shake activated charcoal vigorously and dilute into sodium chloride or sterile water for a 1:1 solution to facilitate administration.
3. Use 60cc catheter tip syringe to withdraw the charcoal/saline mixture and inject contents into the naso/orogastric tube.

## **Salem Sump tube**





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## PATIENTS W/ PRE-EXISTING MEDICAL DEVICES / DRUG ADMINISTRATORS

### Historical Findings

1. Pre-hospital patient with a pre-existing physician ordered medical device or drug administration (“MDDA”) not covered in the provider’s scope of practice.
2. These may include but are not limited to: ventilatory adjuncts (CPAP, BiPAP), continuous or intermittent IV medication infusions (analgesics, antibiotics, chemotherapeutic agents, vasopressor’s, cardiac drugs), and non-traditional out-of-hospital drug infusion routes (subcutaneous infusaports, central venous access lines, direct subcutaneous infusions, self-contained implanted pumps).

### Physical Findings

1. Patient may have implanted adjuncts or other accompanying mechanical devices.

### Protocol

1. When encountering a patient who has medical treatments that an EMT-Paramedic has not been trained on it is the responsibility of the provider to determine the best course of treatment by utilizing (but not limited to) the following resources:
  - A. The patient themselves
  - B. The patient’s family
  - C. On-line Medical Control
  - D. MDDA product literature / company representative (in person or via telecommunication)
  - E. Other PT care staff such as MD, RN, LPN, CAN, etc.
  - F. Any other individual who has been trained in the specific care of the patient (i.e. Day Care Worker)



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2. Pre-existing MDDA functioning normally:
  - A. The EMT-Paramedic should provide usual care and transportation while maintaining the pre-existing MDDA.
3. Pre-existing MDDA **not** functioning normally:
  - A. Provider is to determine if it is in the patient's best interest to re-establish the treatment or allow the pre-existing MDDA to remain as found. The EMT-Paramedic is to take all reasonable steps to support the course of treatment decided upon.
4. The best course of treatment may include medication administrations outside the provider's normal operations and prior training.
  - A. The EMT-Paramedic is to determine the appropriate course of medical administration by utilizing available resources.
5. If appropriate transport any extra resources/persons with the patient
  - A. Some medications may not be safe for an EMT-P to continue to administer without accompaniment by appropriately trained personnel most likely from a treatment clinic. If no personnel will accompany the EMS crew, discontinue medication administration.  
(Ex: Chemotherapy)
  - B. If transporting a patient from the care of a higher level provider the EMT-Paramedic may, if comfortable, use on-scene training during transport without the accompaniment of the higher level provider (MD, RN). The EMT-Paramedic has the right to request the higher level provider accompany the patient during transport.

## **Notes:**

1. Under Ohio Scope of Practice EMT-Paramedics are listed as capable of "Medication administration (Protocol approved)." This protocol serves to provide this capability for patients with a pre-existing MDDA.
2. In the ever-evolving realm of medical care it is not practical to create specific guidelines for each individual pre-existing MDDA, the provider should utilize all resources necessary to assist with patient care.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *PROCEDURE PROTOCOLS*

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## RAPID GLUCOSE ASSAY PROCEDURE

### Indications

1. Any time a rapid blood glucose assay may improve the treatment of a patient.

### Procedure

1. Prepare equipment to obtain and test the blood sample. Be sure not to contaminate the test strip when inserting it into the glucometer.
2. Select a suitable site to obtain a capillary blood sample. ***ALL*** rapid blood glucose specimens **MUST** be taken from a fingertip. At no time should a venous blood sample be used for a rapid blood glucose assay.
3. Cleanse the site with alcohol and wipe dry with a 4 X 4 or clean cloth. Be sure test site is completely dry before doing the finger stick.
4. A blood sample must be collected within 3 minutes of inserting the test strip into the glucometer.
5. When the patient's finger has been stuck, hold end of test strip to the drop of blood until after the meter beeps.
  - A. Assure that an adequate amount of blood is available for testing.
  - B. The meter will beep only after the blood collection chamber has been filled.
  - C. Placing of the patient's hand below the level of their heart and squeezing of the fingertip may be required. Forceful squeezing of the fingertip will not adversely affect the result of the blood sample.

### Notes

1. It is very important that the patient's and care provider's hands are clean, including gloved hands, before a blood sample is obtained. If Oral Glucose or some other item (food, candy, beverages, etc.) has been given to the patient prior to EMS obtaining a rapid blood glucose assay, the patient's hand must be cleaned. Contamination of the puncture site by glucose or other form of sugar will result in a higher reading.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *PROCEDURE PROTOCOLS*

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## RAPID SEQUENCE INDUCTION (RSI)

### Historical Findings

1. Age  $\geq$  1 years old.
2. Critically ill or injured patient requiring an emergent definitive airway and/or invasive oxygenation and ventilatory support.

### Relative Contraindications

1. Any patient who could create a “*Can’t Intubate, Can’t Oxygenate*” scenario.
  - A. Laryngeal edema (epiglottitis, angioedema).
  - B. Patient entrapped with minimal access to airway.
  - C. Difficult airway anatomy that could make bag mask ventilation difficult or impossible.

### Absolute Contraindications For RSI Using Succinylcholine (Anectine)

1. History of malignant hyperthermia.
2. History of skeletal muscle myopathies:
  - A. Duchenne’s muscular dystrophy
  - B. Guillain-Barre syndrome
  - C. Multiple Sclerosis
  - D. Amiotrophic Lateral Sclerosis (ALS)
3. Evidence of acute hyperkalemia:
  - A. ECG in hyperkalemia:
    - i. Diffuse peaked T waves, Widened QRS
    - ii. Prolonged PR and QT interval
    - iii. Flat or isoelectric P waves
  - B. Dialysis patients who are overdue for dialysis treatment.
  - C. Patients recently discharged 5 days post burn or crush injury.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *PROCEDURE PROTOCOLS*

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## Physical Findings

1. Acute Respiratory Failure:
  - A. SpO<sub>2</sub> of <90%
  - B. ETCO<sub>2</sub> >50 mm Hg
  - C. Dyspnea, tachypnea
  - D. Accessory muscle use and fatigue
  - E. Altered mental status (irritability, lethargy)
2. Neurological Deficit: GCS score ≤ 8:
  - A. Significant head trauma with suspected traumatic brain injury (TBI)
  - B. Intracranial hemorrhage/stroke
  - C. Overdose
  - D. Status epilepticus (refractory to benzodiazepines)
3. Acute Airway Emergency:
  - A. Significant burns to the upper airway that are likely to cause airway compromise
  - B. Other trauma with potential to compromise airway (i.e. soft tissue trauma to the neck with expanding hematoma)

## Protocol

1. Establish a patent airway and **pre-oxygenate** all patients.
  - a. **ALL** patients should be placed on a nasal cannula for **passive apneic oxygenation**. **Passive apneic oxygenation** is accomplished by setting the oxygen flow rate through the nasal cannula to a minimum of 15lpm and leaving the cannula in place until intubation is accomplished.
  - b. Spontaneous breathing patients should be pre-oxygenated via non-rebreather mask at 15 lpm.
  - c. Patients requiring bag-mask ventilations due to hypoventilation and/or hypoxia **ONLY** should receive small tidal volumes to minimize gastric distention.
2. Place patient on continuous cardiac monitor, pulse oximeter, and capnography.
3. Complete a neurological exam including GCS score.



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4. **Prepare equipment** including suction, intubation adjuncts, rescue airways, and emergent cricothyrotomy kit.
5. Initiate IV access with a saline lock or 0.9% normal saline KVO.
  - A. If IV access is unsuccessful obtain IO access with EZ-IO device.
    - i. The **PREFERRED** site is the proximal humerus if feasible.
6. **Induction:**
  - A. Etomidate (Amidate) 0.3 mg/kg IV/IO if systolic B/P  $\geq$  100 mm/Hg  
**OR**
  - B. Ketamine (Ketalar) 1.5 mg/kg IV/IO  
**PREFERRED INDUCTION AGENT FOR ANY OF THE FOLLOWING:**
    - i. Status epilepticus refractory to benzodiazepines
    - ii. Respiratory failure with bronchospasm (asthma/COPD)**IF PATIENT IS HYPOTENSIVE: BP < 100mm/Hg**
  - A. Etomidate (Amidate) 0.15 mg/kg IV/IO  
**OR**
  - B. Ketamine (Ketalar) 0.75 mg/kg IV/IO
4. **Paralysis:**
  - A. Adult > 10 years: Succinylcholine (Anectine) 1.5 mg/kg IV/IO.
  - B. Pediatric < 10 years: Succinylcholine (Anectine) 2 mg/kg IV/IO.
8. **Paralysis if Succinylcholine is contraindicated for Adult & Pediatric:**
  - A. Rocuronium (Zemuron) 1 mg/kg IV/IO.
    - i. ***IF THERE IS ANY CONCERN ABOUT THE SAFETY OF SUCCINYLCHOLINE USE ROCURONIUM.***
9. Deliver oxygen via the nasal cannula placed on the patient in protocol step 1. The flow rate should be the maximum provided by the flow meter being used.
10. When patient is paralyzed, **perform endotracheal intubation** (approximately 45 seconds for succinylcholine, 60 seconds rocuronium).
11. If unable to intubate the patient after the first attempt, initiate 2 person bag-mask ventilations with a basic airway adjunct for 1 minute.
12. Consider utilizing the following for subsequent intubation attempts:
  - A. Video Laryngoscope
  - B. Bougie intubating stylet.



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- C. External laryngeal manipulation (**BURP** - **B**ackward, **U**pward, **R**ightward (patient's right), **P**ressure)
- D. Head elevation ear to sternal notch position. (*NOT IN TRAUMA*)
- 13. **Verify and prove tube placement** with visualization, auscultation and capnometry/capnography. Continually monitor capnometry/capnography.
- 14. **Secure** the endotracheal tube, note the depth in cm at the teeth, and apply soft restraints to prevent extubation.
- 15. **Post intubation analgesia and sedation:**
  - A. Adult Patients:
    - i. **ANALGESIA:** Fentanyl 50 mcg IV/IO if systolic B/P  $\geq$  100 systolic
      - 1. Dose may be every 5-10 minutes if systolic B/P remains  $\geq$  100 systolic
    - ii. **SEDATION:** Midazolam 2.5 mg IV/IO if systolic B/P  $\geq$  100
      - 1. Dose may be every 5-10 minutes if systolic B/P remains  $\geq$  100 systolic
    - iii. **IF HYPOTENSIVE/SHOCK:** Ketamine 25 mg IV/IO every 5-10 minutes while resuscitating the patient per the shock protocol.
  - B. Pediatric Patients:
    - i. **ANALGESIA:** Fentanyl 1 mcg/kg IV/IO if B/P stable per Broselow tape. Dose may be repeated in 5-10 minutes if B/P remains stable
    - ii. **SEDATION:** Midazolam (Versed) 0.1 mg/kg IV/IO if B/P stable per Broselow tape. Dose may be repeated in 5-10 minutes if B/P remains stable.
    - iii. **IF HYPOTENSIVE/SHOCK:** Ketamine (Ketalar) 0.5 mg/kg IV/IO. Dose may be repeated in 5-10 minutes if B/P remains stable
- 16. Post-intubation paralysis should generally be avoided.
  - A. However if required for airway stabilization, oxygenation or ventilation.
    - i. Rocuronium (Zemuron) 1 mg/kg IV/IO
- 17. If successful intubation has not been achieved after 3 attempts proceed to King LTD-S rescue airway insertion.



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18. If rescue airway insertion is unsuccessful, resume 2 person bag-mask ventilations with a basic airway adjunct.
19. If unable to oxygenate the patient utilizing the bag-mask procedure proceed to emergent cricothyrotomy.
20. If the patient shows clinical signs of impending herniation, refer to Protocol **T104.**



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *MEDICAL PROTOCOLS*



## RESTRAINT PROTOCOL

### Scope

1. This protocol is intended to address the need for medically indicated and necessary restraint. It shall not apply to regulate, or restrict in any way, operational guidelines adopted by a provider agency addressing use of force related to non-medical circumstances (i.e. civil disturbances, legitimate self-defense relative to criminal behavior).

### Physical Findings

1. Patient restraints are to be used only when necessary in situations where the patient is violent or potentially violent and may be a danger to themselves or others. EMS providers must remember that aggressive violent behavior may be a symptom of a medical condition such as but not limited to:

### Differential Diagnosis

1. Anemia	9. Hypoxia
2. Cerebrovascular accident	10. Infection (meningitis/ encephalitis)
3. Drug / Alcohol intoxication	11. Metabolic disorders
4. Dysrhythmias	12. Myocardial ischemia / infarction
5. Electrolyte imbalance	13. Pulmonary Embolism
6. Head Trauma	14. Seizure
7. Hypertension	15. Shock
8. Hypoglycemia	16. Toxicological ingestion

### Protocol

1. Patient health 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



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therapeutic measures. It is recognized that the evaluation of many patient parameters requires patient cooperation and thus may be difficult or impossible.

2. It is recommended to have Law Enforcement on scene.
3. Refer to Psychiatric Emergencies Protocol for aid in dealing with the combative patient.
4. The least restrictive means shall be employed.
5. Verbal de-escalation
  - A. Validate the patient's feelings by verbalizing the behaviors the patient is exhibiting and attempt to help the patient recognize these behaviors as threatening.
  - B. Openly communicate, explaining everything that has occurred, everything that will occur, and why the imminent actions are required.
  - C. Respect the patient's personal space (i.e. asking permission to touch the patient, take pulse, examine patient, etc.).

### **Physical Restraints**

1. All restraints should be easily removable by EMS personnel.
2. Restraints applied by law enforcement (i.e. handcuffs) require law enforcement officer to remain available to adjust restraints as necessary for the patient's safety. The policy is not intended to negate the need for law enforcement personnel to use appropriate restraint equipment to establish scene control.
3. To ensure adequate respiratory and circulatory monitoring and management, patients shall NOT be transported in a face down prone position.
4. Restrained extremities should be monitored for color, nerve, and motor function, pulse quality and capillary refill at the time of application and at least every 15 minutes.

### **Chemical Restraints**

1. Chemical restraints may be required before, after, or in place of physical restraints. Any patient > 15 years of age (age < 15 consult Statline) who



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continues to be a danger to themselves or others despite physical restraints, or those who present an extreme danger while attempting physical restraint, may be chemically restrained as follows.

- A. Depending on the patient's mental state administer midazolam (Versed) 5mg IM/IN for less combative patients and Ketamine (Ketalar) 4 mg/kg IM for excessively combative patients. Exposure and cleaning of skin is highly recommended but may not be feasible; injection through clothing and prior to skin cleaning is allowed if crew safety would be compromised.
  - i. If IV access is available and the blood pressure is  $\geq 100$  mmHg, administer midazolam (Versed) 1 mg IV titrated up to a max dose of 5 mg.
  - ii. If IV access is available and the blood pressure is  $\leq 100$  mmHg administer ketamine (Ketalar) 1 mg/kg *SLOW IV*.
- B. For patients who do not present an extreme danger but who do not have the capacity to refuse care and may need chemical restraint to facilitate treatment and transport, contact Medical Command for guidance.
- C. When able and safe, place patient on cardiac monitor, continuous pulse oximetry and waveform capnography.
- D. When able and safe, administer supplemental oxygen as needed to maintain saturation greater than 94%.
- E. When able and safe, check blood Glucose level.
- F. At no time shall a patient be left unattended after receiving chemical restraint.
- G. Any patient receiving chemical restraint must be attended to and transported by a paramedic.
- H. A repeat dose may be ordered by on-line medical command.
  - i. If the necessity for chemical restraint is thought to be due to an underlying medical condition and the initial dose of midazolam (Versed) or ketamine (Ketalar) is ineffective, consider RSI while weighing the risks and benefits of the specific clinical situation.



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- I. Pre-arrival notification is highly recommended so the receiving Emergency Department can be prepared for the safe transfer of a combative or violent patient.

### **Documentation of Restraints**

1. Patient restraint shall be documented on the run sheet and address any or all the following appropriate criteria:
  - A. That an emergency existed and the need for treatment was explained to the patient.
  - B. That the patient refused treatment or was unable to consent to treatment (such as unconscious patient).
  - C. Evidence of the patient's incompetence (or inability to refuse treatment).
  - D. Failure of less restrictive methods of restraint (if conscious, failure of verbal attempts to convince the patient to consent to treat).
  - E. Assistance of law enforcement officials with restraints, or orders from medical control to restrain the patient, or any exigent circumstances requiring immediate action, or adherence to system restraint protocols.
  - F. That the treatment and/or restraint were for the patient's benefit and safety.
  - G. The type of restraint employed (soft, leather, mechanical, chemical).
  - H. Any injuries that occurred during or after the restraint.
  - I. The limbs restrained ("four points").
  - J. Position in which the patient was restrained.
  - K. Circulation checks every 15 minutes or less (document findings and time).
  - L. The behavior and/or mental status of the patient before and after the restraint.



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## INFLUENZA VIRUS VACCINATION

### Introduction

This protocol is only authorized for state of Ohio Registered Nurses affiliated with Miami Township Fire & EMS.

### Historical Findings

1. Age  $\geq$  18 years.

### Indication

1. Active immunization against influenza disease caused by influenza virus subtypes A and B.

### Contraindications

1. Hypersensitivity to egg proteins or chicken proteins.
2. Hypersensitivity to any component of Flulaval (Thimerosal) or any previous influenza vaccine.
3. History of Guillain-Barre' syndrome.

### Protocol

1. Notify the employee that they must remain at the station for 15 minutes after the injection to be checked for possible reactions.
2. Advise the employee that we have a drug information sheet on the vaccine and that they may have a copy of the sheet if they desire.
3. Give each employee receiving the vaccine a "Influenza Vaccination Information Statement" in accordance with CDC.
4. Fill out an "Employee Flu Vaccination Record" sheet for each person vaccinated.
5. Verify employee has signed the "Permission to Vaccinate" section.



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6. Fill out the appropriate line of the “Flu Vaccination Roster” sheet.
7. Ask employee about any medical allergies as stated in the “Contraindications” section of this protocol.
8. Use a 3 cc syringe with a minimum 1” needle.
9. Agitate the vial before drawing out the vaccine.
10. Draw 0.5 mL of the vaccine from the vial.
11. Administer the 0.5 mL vaccine deep IM in the deltoid muscle.
12. Dispose of the syringe and needle in a sharps container.
13. Observe employees for 15 minutes for possible reactions. Note on roster whether the employee had a reaction.



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## SPINAL IMMOBILIZATION

The following policy and procedure is to be followed for all patients with potential or actual injury to any part of the spine. Airway and ventilation are paramount, and none of the guidelines listed below are intended to compromise or prevent maintenance of these vital functions.

### Indications

1. A patient should be immobilized if any of the following are present:
  - A. Significant multi-system trauma
  - B. Inability to conduct a reliable history and physical (i.e. presumed intoxication, language barriers, mental disability) and significant mechanism of injury.
  - C. Obvious neurological deficit

### Omission Criteria

1. If NONE of the above indications are present and if significant spinal trauma is NOT suspected and if the patient meets ALL of the following criteria, then spinal precautions are not needed:
  - A. Age >16, <64
  - B. Normal mental status
    - i. No signs of intoxication
    - ii. GCS 15
    - iii. Alert and oriented to person, place, time, events
  - C. No distracting injuries
    - i. Obvious fracture/dislocation
    - ii. Suspected fracture requiring splint
    - iii. Injury requiring administration of pain medication
  - D. No neurological deficit
  - E. No mid-line spine pain/tenderness on palpation of spinous processes



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2. Patients who do not meet all of these omission criteria may not need immobilization, based on provider judgment (examples: restrained 12 year-old in minor MVC without complaint, Spanish-speaking male with isolated ankle injury after fall).
3. Patients with diffuse neck pain not isolated to the cervical vertebrae should be immobilized with a cervical collar but a backboard is not indicated.

## **Procedure**

1. The following procedure is to be used to properly immobilize the patient when injury to the cervical spine is possible:
  - A. The neck must be maintained in a neutral position at all times by direct manual and/or mechanical means. **DO NOT APPLY TRACTION AT ANY TIME.**
  - B. While maintaining the neutral position, you may apply an **APPROVED** mechanical adjunct to further stabilize the neck prior to or upon placing the patient on a long immobilizer. The following devices are approved mechanical adjuncts for cervical spine immobilization:
    - i. Kendrick Extrication Device (KED), XP1, or equivalent
    - ii. Cervical Immobilization Device (CID)
    - iii. Rigid cervical collar properly fitted
  - C. As soon as practical, the patient will be placed supine on a long immobilizer. The following such devices are approved:
    - i. Scoop stretcher
    - ii. Long spine board (wood or equivalent radiolucent material)
    - iii. Stokes litter (high angle rescue only)
    - iv. Full body vacuum splint
  - D. Straps must also be placed across the patient's chest, pelvis, and legs to secure their body to the long immobilizer. **CAUTION:** It is **DANGEROUS** to secure the head if the **BODY** is allowed to move on the long immobilizer. This will subject the neck to unacceptable torque and bending. Airway secretions and vomitus are to be cleared using suction devices. If necessary, the patient may be log rolled



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together with the immobilization equipment for the purpose of airway maintenance.

- E. Once the patient is on the long immobilizer so they cannot slip around on it, lateral neck supports such as towel rolls, Headbed, or equivalent must be applied and the patient's head taped across the forehead and collar.
- 2. The following procedure is to be used to immobilize the thoracic and lumbar spine when injury to the cervical spine is highly unlikely:
  - A. Suspected cervical spine problems are to managed as above. The spine must be maintained in a neutral position at all times by direct manual and/or mechanical means. If the cervical spine has been cleared, either because of mechanism of injury isolated to the lower spine, such as direct trauma only to the lumbar spine, or because of other factors that make cervical spine injury extremely unlikely, then cervical immobilization is not necessary.
  - B. As soon as practical, the patient will be carefully placed on a long immobilizer. The following such devices are approved:
    - i. Scoop stretcher
    - ii. Long spine board (wood or equivalent radiolucent material)
    - iii. Stokes litter (high angle rescue only)
    - iv. Full body vacuum splint
  - C. The patient must be securely fastened to the long immobilizer with straps across the chest, pelvis, and legs to prevent any torque or twisting of any part of the spine. Airway secretions and emesis are to be cleared using suction devices. If necessary, the patient to be log rolled together with the immobilization equipment for the purpose of airway maintenance



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## TASER EMERGENCIES

### Historical Findings

1. History of being shot by a Taser.

### Physical Findings

1. Patient's level of consciousness is not altered. If there is alteration in level of consciousness, assess and treat for hypoglycemia and overdose per protocol.
2. If patient complains of chest pain, treat per the acute coronary syndrome protocol.

### Background & Significance

1. Subjects who have been subdued maybe combative. The primary reason for the Taser is for a subject who is unruly or combative.
2. If the patient is combative refer to the Psychiatric Emergency protocol, and the Restraint protocol.

### Protocol

1. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol.
2. Ensure the patient is adequately restrained per the Restraint protocol.
3. Obtain vital signs.
4. Carefully assess the patient's neurological status. The patient should be closely examined for signs of head injury and/or other injuries caused by a fall.
5. Ask about and look for signs of seizure activity following the Taser strike.
6. Immobilize the C-Spine if indicated.



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7. Place patient on EKG monitor and obtain a rhythm strip. If dysrhythmia is present, proceed to the appropriate protocol (if the taser itself did not cause the dysrhythmia, the most probable causes are stress, physical exertion, and/or drug/alcohol use).
8. **UNLESS PROBE IS EMBEDDED IN THE EYE** , Remove the Taser probe. The probe is a sterile modified #8 McGill and Wright fish hook, and will only penetrate ¼ of an inch. **If probe embedded in eye treat with EYE INJURY Protocol.**
9. Secure the probe by placing it in a patient medication bag. Give the probe to the Police Department.
10. Dress and bandage the wound.
11. Carefully document on the EMS report any injuries and/or medical problems, or lack thereof, related to the Taser strike. Also document older injuries that occurred prior to the Taser strike.
12. If the EMS is going to transport the patient, a police officer **MUST** accompany the crew and ride in the patient compartment of the ambulance to the hospital.
13. Monitor the patient frequently.
14. Notify the receiving hospital.



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## TENSION PNEUMOTHORAX DECOMPRESSION

### Indications

1. Treatment of tension pneumothorax is simple, but the complications of the procedure can be lethal. Diagnosis must be accurate and is not always easy. Field treatment is indicated when the life of the patient is in danger and treatment cannot be delayed until arrival at the hospital.
2. Field relief of a tension pneumothorax is indicated **ONLY** when the patient has progressive severe respiratory distress.
3. Cyanosis.
4. Decreased or absent breath sounds on the affected side.
5. Hypotension.
6. Hypotension can be detected by noting loss of radial pulses.
7. The patient may have distended neck veins.
8. Patient may have a tracheal shift away from the affected side.
9. If the patient is intubated, there should be increased difficulty in ventilating.
10. Usually there will be a loss of consciousness as well.

### Differential Diagnosis

1. Simple pneumothorax without tension.
2. Intubation of one of the main stem bronchi.
3. Hemothorax.
4. Missing lung on one side.
5. Cardiac tamponade.

### Complications

1. Hemorrhage from vessel laceration.
2. Creation of a pneumothorax if one was not already present.
3. Laceration of the lung.
4. Infection.



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## Procedure

1. Assess and secure the patient's airway and provide oxygen per the airway, oxygen and ventilation protocol.
2. Expose the entire chest.
3. Clean the affected side.
4. Prepare for the procedure:
  - A. Select appropriate device:
    - i. Adults: Cook Catheter Device or 10 gauge/3 inch Angiocath
    - ii. Pediatrics: 16 gauge/1.25 inch Angiocath
  - B. Attach *blue securing disk* to the needle/catheter assembly (if using Cook Catheter Device).
  - C. Attach syringe to the needle/catheter assembly, or simply use needle/catheter assembly alone.
5. Insert the needle/catheter assembly in one of two locations:
  - A. Over the top of the rib in the second or third intercostal space in the *midclavicular* line,  

**OR**
  - B. Over the top of the rib of the fifth or sixth intercostal space in the *midaxillary* line.
8. If a tension pneumothorax is present, then a rush of air will be heard or the plunger of the syringe will be easy to pull back.
9. Remove the needle from the catheter, leaving the plastic catheter in place.
10. Secure the *blue securing disc* with the wire tie, and then tape to the patient's skin (if using Cook Catheter Device).
11. Attach the stopcock and tubing to the catheter (if using Cook Catheter Device).
12. Attach the tubing to the *blue end* of the Heimlich Valve (if using Cook Catheter Device).
13. Continually reassess the patient's oxygenation and ventilation status.
14. Multiple needle decompressions may be required until chest tube placement.



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## TUBERCULIN SKIN TESTING

### Introduction

This protocol is only authorized for state of Ohio Registered Nurses affiliated with Miami Township Fire & EMS.

### Historical Findings

1. There are no age restrictions for TB testing.
2. The goal is to identify persons with LTBI, or active TB disease that would benefit from treatment.

### Indication

1. All Miami Township Fire & EMS personnel are recommended to have a TB skin test annually.

### Contraindications

1. Allergy to any component of Tubersol (polysorbate, phenol, PPD derivative).
2. Known tuberculin positive reactors (PPD convertors)
3. Persons with severe blistering tuberculin reactions in the past.
4. Persons with documented active tuberculosis or a clear history of treatment for TB infection or disease.
5. Persons with extensive burns or eczema.

### Deferral

1. Test should be deferred for patients with major viral infections or live-virus vaccination in the past month (i.e. MMR, oral polio, yellow fever, small pox,).



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### **Protocol**

1. Notify the employee that they must remain at the station for 15 minutes after the injection to be checked for possible reactions.
2. Advise the employee that we have a drug information sheet on the Mantoux tuberculin skin test and that they may have a copy of the sheet if they desire.
3. Fill out an "Employee Tuberculin Skin Test Record" sheet for each person tested.
4. Verify employee has signed the "Permission to Test" section.
5. Fill out the appropriate line of the "TB Test Roster" sheet.
6. Ask employee about any medical allergies as stated in the "Contraindications" section of this protocol.
7. Use a 1 cc tuberculin syringe with a 25 gauge needle.
8. Agitate the vial before drawing out the vaccine.
9. Draw 0.1 mL (5 tuberculin units) of the tubersol from the vial.
10. Administer the 0.1 mL test intradermal in the volar aspect of the forearm, avoiding tattoos, red or swollen areas and veins.
11. If performed properly, a definite pale bleb will rise at the needle point, about 10 mm (3/9") in diameter.
12. Dispose of the syringe and needle in a sharps container.
13. Observe employees for 15 minutes for possible reactions. Note on roster whether the employee had a reaction.
14. Inform the employee that he or she needs to return to have the test read in 48 to 72 hours.



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *PROCEDURE PROTOCOLS*

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## ADULT & PEDIATRIC INTRAOSSEOUS ACCESS UTILIZING THE VIDACARE *EZ-IO* DEVICE

### Physical Findings

1. Intraosseous access is indicated when intravenous fluids or medications are urgently required and peripheral IV access cannot be established reasonably under the following circumstances.
  - A. Examples include:
    - i. Cardio respiratory arrest
    - ii. Acute Respiratory Failure requiring RSI
    - iii. Hemodynamic instability (shock states requiring resuscitation)
    - iv. Neurological Deficit ( $GCS \leq 8$ ) requiring RSI
      1. Hypoglycemia is **NOT** an indication.
      2. Hyperglycemia (DKA, HHNC) can be if  $GCS \leq 8$ .
      3. Seizure is an indication if the patient is in status epilepticus and does not respond to initial treatment outlined in seizure protocol.
2. EZ-IO AD (*Adult*) is indicated for patients 40 kg (88 lbs) and greater.
3. EZ-IO LD (*Large adult*) is indicated for adult patients with excess tissue over the insertion site.
4. EZ-IO PD (*Pediatric*) is indicated for patients 3-39 kg (7-87 lbs).

### Contraindications

1. Fracture of the bone selected for insertion (*consider an alternative site*).
2. Excessive tissue at insertion site with the absence of anatomical landmarks.
3. Previous significant orthopedic procedures (*knee replacements, procedure with hardware near anatomic landmarks for insertion*).
4. Infection at the site selected (*consider alternative site*).
5. Recent previous unsuccessful IO insertion attempt in the same extremity.



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### *PROCEDURE PROTOCOLS*

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## Complications

1. Incorrect identification of landmarks.
2. A bent needle, which is more common with longer needles or a spinal needle.
3. Clogging of the needle with marrow, clot, or bone spicules, which can be avoided by frequent flushing of the needle or by continuous infusion.
4. Through-and-through penetration of both anterior and posterior cortices caused by excess force after the needle has penetrated the cortex, which renders the punctures useless because of fluid extravasation and which may potentially cause a compartment syndrome.
5. Subcutaneous or subperiosteal infiltration, caused by incomplete placement of needle or by a dislodged needle.
6. Fractures caused by excess force or by fragile bones (eg, marked osteoporosis or osteopenia, osteopetrosis, osteogenesis imperfecta), which allows leakage, extravasation, and potential compartment syndrome to occur.
7. Local infection (cellulitis and osteomyelitis are quite rare), with an incidence of less than 0.6% in a literature review of 4000 cases over 35 years (although the rate may increase with prolonged placement) and less than 3% in another large review.
8. Compartment syndrome secondary to fluid extravasation.
9. Local hematoma.
10. Pain.
11. Potential for growth plate injuries, although not reported in animals or humans.
12. Fat embolus, with rare reports in adult patients and not reported when an IO needle is placed in the tibia (rather than other sites such as the ilium or sternum).
13. Bone embolus, although not reported in humans.



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## Procedure

1. Locate the insertion site.
  - A. Proximal Tibia – 1 finger width medial to the tibial tuberosity.
  - B. Distal Tibia – 2 finger widths proximal to the medial malleolus, and positioned midline on the medial shaft.



Proximal Tibia



Distal Tibia

- C. Proximal Humerus:
  - i. Adduct the humerus and posteriorly locate the elbow, placing the patient's hand on their abdomen near the umbilicus.
  - ii. Palpate the midshaft of the humerus and continue palpating toward the proximal aspect of the humeral head.
  - iii. As you near the shoulder you will note a protrusion. This is the base of the insertion site.



Proximal Humerus

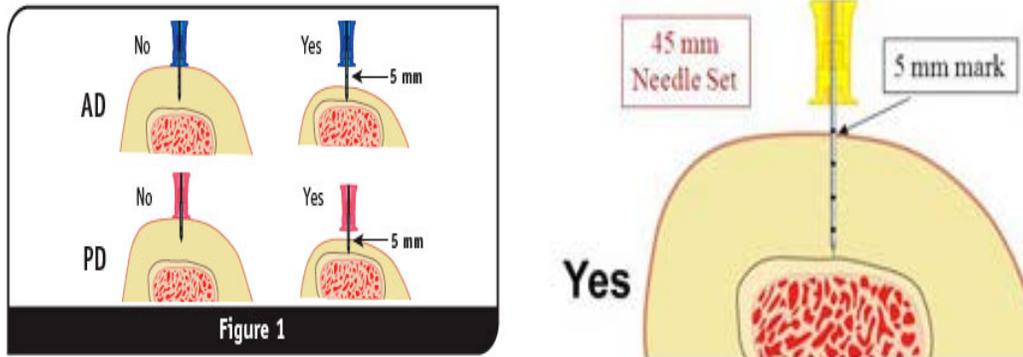
2. Cleanse the insertion site using aseptic technique (chloraprep, alcohol swab).
3. Prepare the EZ-IO driver and appropriate needle set:
  - A. EZ-IO AD (*Adult*) is indicated for patients 40 kg (88 lbs) and greater.
  - B. EZ-IO PD (*Pediatric*) is indicated for patients 3-39 kg (7-87 lbs).
4. Stabilize the insertion site.
5. Insert and gently guide the **powered** EZ-IO maintaining a 90-degree angle *until needle set tip touches bone.*



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6. Upon touching bone, verify at least 5 mm of the catheter is visible. <sup>Figure 1.</sup>  
A. The 5 mm mark is the proximal hash mark on the needle.



7. Continue powering the driver through the cortex of the bone ensuring that the driver is maintained at a 90-degree angle. (Allow the driver to do the work!)
8. **STOP** when the needle flange touches the skin or a “give” or “pop” is felt as the needle enters the medullary space.
9. Remove the power driver while securing the needle set.
10. Remove the stylet.
11. Attach a primed saline lock to the catheter hub’s luer lock.
12. Aspirate for blood and marrow.
13. With the exception of patients in cardiac arrest, administer lidocaine 2%:  
A. Adults  $\geq$  40 kg (88 lbs): 40 mg IO.  
B. Pediatrics 3-39 kg (7-87 lbs): 0.5 mg/kg IO
14. Flush the EZ-IO with normal saline:  
A. Adults  $\geq$  40 kg (88 lbs): 10 mL IO.  
B. Pediatrics 3-39 kg (7-87 lbs): 5 mL IO
15. Utilize a pressure bag for continuous infusion.
16. Flush all medication with appropriate age based flush as noted in line 14.
17. Dress the site and secure tubing with tape.
18. Monitor EZ-IO site for complications.



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AGE	0-3 m		6 m		9-24 m		3 y		6 y		8 y		10 y		12 y		14 y		
	Lbs	kg	Lbs	kg	Lbs	kg	Lbs	kg	Lbs	kg	Lbs	kg	Lbs	kg	Lbs	kg	Lbs	kg	
WEIGHT	Lbs	6-7	11	20	30	40	50	60	80	100									
	kg	3	5	10	15	20	25	30	40	50									
VITAL SIGNS	<b>Low Limit Systolic BP</b>		60-70	70	70-75	75-80	80	80	85	85	90								
	<b>Pulse</b>		100-180	100-180	90-160	80-140	70-130	70-130	60-120	60-120	60-120								
AIRWAY	<b>ET size</b>		3.0-3.5	3.5	4.0-4.5	5	5.5	6	6.5	7									
	Amiodarone (Cordarone <sup>®</sup> ) <sup>1</sup> - 5 mg/kg - IV/IO		15 mg	25 mg	50 mg	75 mg	100 mg	125 mg	150 mg	200 mg	250 mg								
Atropine - ET/IV/IO		0.1 mg	0.1 mg	0.2 mg	0.3 mg	0.4 mg	0.5 mg	0.6 mg	0.8 mg	1 mg									
Diphenhydramine (Benadryl) <sup>1</sup> - mg/kg IM/IV				10 mg	15 mg	20 mg	25 mg	30 mg	40 mg	50 mg									
Bicarbonate 4.2% - IV/IO		6 mL	10 mL																
Bicarbonate 8.4% - IV/IO				10 mL	15 mL	20 mL	25 mL	30 mL	40 mL	50 mL									
Dextrose 25% <sup>2</sup> - IV/IO		6 mL	10 mL	20 mL															
Dextrose 50% - IV/IO					15 mL	20 mL	25 mL	30 mL	40 mL	50 mL									
Epinephrine 1:10,000 - IV/IO		0.3 mL	0.5 mL	1 mL	1.5 mL	2 mL	2.5 mL	3 mL	4 mL	5 mL									
Epinephrine 1:1000 - ET		0.3 mL	0.5 mL	1 mL	1.5 mL	2 mL	2.5 mL	3 mL	4 mL	5 mL									
Epinephrine 1:1000 - Intramuscular (IM)			0.05 mL	0.1 mL	0.15 mL	0.2 mL	0.25 mL	0.3 mL	0.3 mL	0.3 mL									
Glucagon <sup>3</sup> - IM		0.5 mg	0.5 mg	0.5 mg	0.5 mg	1 mg	1 mg	1 mg	1 mg	1 mg									
Lidocaine 1% - 1 mg/kg - ET/IV/IO		3 mg	5 mg	10 mg	15 mg	20 mg	25 mg	30 mg	40 mg	50 mg									
Morphine Sulfate - 0.1 mg/kg - IV/IM					1.5 mg	2 mg	2.5 mg	3 mg	4 mg	5 mg									
Naloxone (Narcan <sup>®</sup> ) - ET/IV/IO/IM		0.3 mg	0.5 mg	1 mg	1.5 mg	2 mg	2 mg	2 mg	2 mg	2 mg									
Midazolam (Versed <sup>®</sup> ) - 0.1 mg/kg - IV/IM		0.3 mg	0.5 mg	1 mg	1.5 mg	2 mg	2.5 mg	3 mg	4 mg	5 mg									
IV/IO Fluid <sup>4</sup>	Normal Saline Bolus (20 mL/kg)	60 mL	100 mL	200 mL	300 mL	400 mL	500 mL	600 mL	800 mL	1 Liter									
DEFIBRILLATOR <sup>4</sup>	Round up to closest #	6 J	10 J	20 J	30 J	40 J	50 J	60 J	80 J	100 J									

<sup>1</sup> Mix 150 mg of Amiodarone in 100 mL of normal saline for a 1.5 mg/mL solution  
<sup>2</sup> Mix 1/2 amp of D50 (25 mL) with 25 mL of normal saline  
<sup>3</sup> One unit is equal to 1 mg  
<sup>4</sup> September 2009. Use of a Broselow tape also is acceptable for dosages.

## ADULT MEDICATION CHART

Medication Name	Protocol	Route	Dose
ACTIVATED CHARCOAL	M113	PO/G-tube	1gm/kg
ADENOSINE (ADENOCARD)	C106	IV/IO	6mg, 12mg, 12mg
ALCAINE (PROPARACAINE)	T108	Drops in Eye	1-2 drops
AMIDATE (ETOMIDATE)	S112	IV/IO	0.3 - 0.15 mg/kg
ALBUTEROL (PROVENTIL)	M102, M116, M117	NEBULIZER	2.5mg in 3.0ml NS
AMIODARONE (CORDARONE)	C101, C104, C105	IV/IO	150 - 300mg
ASA	M101	PO	324mg
ATROPINE SULFATE	C103, M110	IV/IO	0.5mg (max 3.0mg)
IPRATROPIUM (ATROVENT)	M102, M116, M117	NEBULIZER	500mcg in 2.5ml
BENADRYL (DIPHENHYDRAMINE)	M102, M104	IV/IM/IO	25 - 50mg
CARDIZEM (DILTIAZEM)	C106	IV/IO	10mg
CALCIUM GLUCONATE	C101, M113	IV/IO	1gm
CYANIDE	M113	IV	5gm
DEXTROSE	M104, M108, M112, M113, M118	IV/IO	
EPINEPHRINE	C101, C102, C103, M102, M103, M117	IV/IM//IO/ET	0.3 mg, 1 mg, 10 mcg
ETOMIDATE (AMIDATE)	S112	IV/IO	0.3 mg/kg
FENTANYL (SUBLIMAZE)	M114, T107, S112	IV/IN/IO/IM	25 - 50mcg (max 100)
GLUCAGON	C103, M102, M105, M108, M113	IM/IV/IO	1mg - 2mg
HYPERTONIC SALINE (3%)	T104	IV/IO	500ML
LIDOCAINE	C101, C104, C105, S108, S109,	IV/IO	0.5mg/kg (max 3mg/kg)
LORAZEPAM (ATIVAN)	M101, M107, M113, M114, M118, S106	IV/IM	1-3mg
MAGNESIUM SULFATE	C101, M113, M117, M118	IV/IO	2 - 4gm
MARK 1 KIT		Autoinjector	
ATROPINE SULFATE	M110	Autoinjector	OR - 0.1mg/ml PREFILLED
PRALIDOXIME CHLORIDE (2-PAMCL)		Autoinjector	
VALIUM (DIAZEPAM)		Autoinjector	OR - 5mg/ml
CIPROFLOXACIN	M110		500mg TABLETS
DOXYCYCLINE	M110	PO/IV	100 mg TABLETS
ERYTHROMYCIN	M110		500mg
GENTAMICIN	M110	IV/IO	40mg/ml
MORPHINE	M101, M114, T107	IV/IO/IM	1-5mg (max 10mg)
NARCAN	M113, M114	IV/IO/IN	0.5 - 2mg
NITROGLYCERIN PASTE	M101, M116	TOPICAL	1 inch
NITROGLYCERIN SPRAY	M101, M116	PO	1 spray
PEPCID (FAMOTIDINE)	M102	IV/IO	20mg
PITRESSIN (VASOPRESSIN)	C101, 102	IV/IO	40units
ROCURONIUM BROMIDE (ZEMURON)	S112	IV/IO	1mg/kg
SODIUM BICARBONATE	C101, M113	IV/IO	1mEq/kg
SOLU-MEDROL (METHYLPREDNISONE)	M102, M117	IV/IO	125mg
SUCCINYLCHOLINE (ANECTINE)	S112	IV/IO	1.5mg/kg
TRANEXAMIC ACID	T110	IV	1gm IN 100cc NS
VERSED (MIDAZOLAM)	C103, C104, M113, M118, S112, S113	IN/IV/IM/IO	1 - 5mg (max 5mg)
ZOFRAN (ONDANSETRON)	M101, M111, M114	IV/PO/IM/IO	4mg OR 1 Tab



# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO



## PRE HOSPITAL COMMUNICATION

<b>EMERGENCY DEPARTMENT</b>	<b>HOSPITAL BASE</b>	<b>NOTIFICATION NUMBER</b>	<b>FAX NUMBER</b>
ATRIUM MEDICAL CENTER	424-3924	424-3924	705-4149
BETHESDA NORTH	984-8375	865-1112	865-1408
BUTLER ED		863-8222	893-8321
CHILDREN'S (STAT LINE)	636-8008		636-4050
CHRIST		585-0783	585-0347
GOOD SAMARITAN	221-5818	221-5818	852-1415
JEWISH KENWOOD	686-3184	686-3204	686-3102
MERCY ANDERSON	231-3702	231-3702	624-4810
MERCY FAIRFIELD		870-7007	603-8606
POISON CONTROL	800-222-1222	800-222-1222	
UC AIRCARE		584-7522	
UNIVERSITY HOSPITAL	861-5128		584-2642
VETERANS		487-7070	487-6679
WEST CHESTER MED CENTER	298-8888	298-8888	298-8978

# MEDICAL ABBREVIATION LIST

PATIENT INFORMATION/CATEGORIES			
Chief Complaint	CC	Complains of	c/o
Date of Birth	DOB	Impression	IMP
History	Hx	Newborn	NB
History of Illness	HPI	Patient	Pt
Family History	FH	Physical Exam	Px
Medications	Meds	Signs and Symptoms	S/S
Past Medical History	PMH	Weight	Wt
Vital Signs	V/S	Year-old	y/o
BODY SYSTEMS			
Abdomen	Abd	Cardiovascular	CV
Central Nervous System	CNS	Ear, nose, and throat	ENT
Gastrointestinal	GI	Etiology	etiol
Gynecological	GYN	Genitourinary	GU
Respiratory	Resp	Obstetrical	OB
COMMON COMPLAINTS			
Abdominal Pain	Abd pn	Chest pain	CP
Dyspnea on exertion	DOE	Headache	H/A
Gunshot wound	GSW	Nausea/Vomiting	n/v
No apparent distress	NAD	Pain	pn
Shortness of breath	SOB		
PHYSICAL EXAM/FINDINGS			
Blood Pressure	BP	Apical	Ap
Cerebrospinal Fluid	CSF	Both Sides (bilateral)	bil
Cincinnati Stroke Scale	CSS	Breath Sounds	BS
Electrocardiogram	ECG/EKG	Bowel Movement	BM
Heart Rate	HR	Chest X-ray	CXR
Jugular Vein Distention	JVD	Diagnosis	Dx
Level of Consciousness	LOC	Expiratory	Exp
Laceration	Lac	Fracture	Fx
Nontender	NT	Glascow Coma Scale	GCS
Palpation	Palp	Inspiratory	Insp
Pulse	P	Pupils Equal & Reactive to Light	PEARL
Range of Motion	ROM	Respiratory Rate	RR
Rule Out	R/O	Range of Motion	ROM
Regular	reg	Temperature	T
		Unconscious	unc.
ANATOMY/LANDMARKS			
Abdomen	Abd	Antecubital	AC
Anterior/Posterior	A/P	Axillary	Ax
Cervical Spine	c-spine	Intercostal Space	ICS
Left Lower Lobe	LLL	Right Lower Lobe	RLL
Left Upper Lobe	LUL	Right Upper Lobe	RUL
Left Ventricle	LV	Right Ventricle	RV
Left Lower Quadrant	LLQ	Right Lower Quadrant	RLQ
Left Upper Quadrant	LUQ	Right Upper Quadrant	RUQ

# MEDICAL ABBREVIATION LIST

<b>DIAGNOSIS</b>			
Abdominal Aortic Aneurysm	AAA	Acute Myocardial Infarction	AMI
Adult Respiratory Distress Syndrome	ARDS	Alcohol	ETOH
Atherosclerotic heart disease	ASHD	Chronic Obstructive Pulmonary Disease	COPD
Cerebral Vascular Accident	CVA	Chronic Renal Failure	CRF
Congestive Heart Failure	CHF	Coronary Artery Bypass Graft	CABG
Coronary Artery Disease	CAD	Cystic Fibrosis	CF
Dead on Arrival	DOA	Delerium Tremens	DTs
Deep Vein Thrombosis	DVT	Diabetes Mellitus	DM
Dilation and Curettage	D&C	End Stage Renal Failure	ESRF
Foreign Body Obstruction	FBO	Hepatitis B Virus	HBV
Hiatal Hernia	HH	Hypertension	HTN
Inferior Wall Myocardial Infarction	IWMI	Insulin-dependent Diabetes Mellitus	IDDM
Intracranial Pressure	ICP	Irritable Bowel Syndrome	IBS
Mitral Valve Prolapse	MVP	Mass Casualty Incident	MCI
Multiple Sclerosis	MS	Motor Vehicle Crash	MVC
Otitis Media (Ear Infection)	OM	Non Insulin-dependent diabetes mellitus	NIDDM
Obstetrics	OB	Overdose	OD
Peptic Ulcer Disease	PUD	Pelvic Inflammatory Disease	PID
Pregnancies/Births (gravida/para)	G/P	Pulmonary Embolism	PE
Pregnancy Induced Hypertension	PIH	Sexually Transmitted Disease	STD
Transient Ischemic Attack	TIA	Tuberculosis	TB
Upper respiratory Infection	URI	Urinary Tract Infection	UTI
Veneral Disease	VD	Wolf-Parkinson-White Syndrome	WPW
<b>MEDICATION ADMINISTRATION/METRICS</b>			
Centimeters	cm	Drops	gtt(s)
Drops per Minute	gtts/min	End Tidal Carbon Dioxide	EtCO2
Every	q	Hour	hr
Gram	g, gm	Intramuscular	IM
Intraosseous	IO	Intravenous	IV
Intravenous Push	IVP	Joules	j
Keep Vein Open	KVO	Kilogram	kg
Pound	lb.	Liter	L
Liters per Minute	LPM	Microgram	mcg
Milliliter	mL	Milligram	mg
Milliequivalent	mEq	Millimeter	mm
Millimeters of Mercury	mmHg	Minute	min
Orally	PO	Subcutaneous	SQ
Sublingual	SL	To Keep Open	TKO

# MEDICAL ABBREVIATION LIST

TREATMENTS/DISPOSITION			
Advanced Cardiac Life Support	ACLS	Advanced Life Support	ALS
Against Medical Advice	AMA	Automated External Defibrillator	AED
Bag-valve Mask	BVM	Basic Life Support	BLS
Cardiopulmonary Resuscitation	CPR	Continuous Positive Airway Pressure	CPAP
Catheter	cath	Endotracheal Tube	ET
Do Not Resuscitate	DNR	External Cardiac Pacing	ECP
Estimated Time of Arrival	ETA	Normal Saline	NS
Nasal Cannula	NC	Nasogastric	NG
Nasopharyngeal Airway	NPA	Nothing by Mouth	NPO
Nonrebreather Mask	NRB	Oropharyngeal Airway	OA
Oxygen	O2	Treatment	Tx
Positive End-expiratory Pressure	PEEP	Therapy	Rx
MISCELLANEOUS DESCRIPTORS			
Amount	amt	Anterior	ant.
After	p	Approximate	≈
Alert and Oriented	A/O	As needed	prn
Body Surface Area	BSA	Change	Δ
Discontinue	d/c	Decreased	↓
Estimated	est	Emergency Department	ED
Every day	qd	Emergency Room	ER
Every Hour	qh	Four time a day	qid
Immediately	stat	Intensive Care Unit	ICU
Inferior Wall Myocardial Infarction	IWMI	Increased	↑
Inferior	inf.	Labor & Delivery	L & D
Medial	med.	Lateral	lat.
Moderate	mod.	Negative	-
Occasional	occ.	Not Applicable	n/a
Posterior	Post.	Superior	sup.
Prior to Arrival	PTA	Twice a Day	bid
Rule Out	R/O	Three time a day	tid
Warm and Dry	W/D	Unequal	≠
With	c	Unknown	unk
Without	S	Volume	vol
Zero	0		
CARDIOLOGY			
Atrial Fibrillation	AFF	Atrial Tachycardia	AT
Atrioventricular	AV	Bundle Branch Block	BBB
Complete Heart Block	CHB	Idioventricular Rhythm	IVR
Junctional Rhythm	JR	Normal Sinus Rhythm	NSR
Paroxysmal Atrial Tachycardia	PAT	Paroxysmal Supraventriculat Tach	PSVT
Premature Atrial Contraction	PAC	Premature Junctional Contraction	PJC
Premature Ventricular Contraction	PVC	Puleless Electrical Activity	PEA
Supraventricular Tachycardia	SVT	Ventricular Fibrillation	VF
Ventriculat Tachycardia	VT	Wandering Atrial Pacemaker	WAP





# MIAMI TOWNSHIP FIRE & EMS CLERMONT COUNTY, OHIO *RSI Protocol Worksheet*



### Absolute Contraindications Using Succinylcholine (Anectine) For Paralysis

1. History of malignant hyperthermia.
2. History of skeletal muscle myopathies: Duchenne’s muscular dystrophy, Guillain-Barre syndrome, Multiple Sclerosis, Amiotrophic Lateral Sclerosis (ALS)
3. Evidence of acute hyperkalemia:
  - a. ECG in hyperkalemia:
    - i. Diffuse peaked T waves, Widened QRS
    - ii. Prolonged PR and QT interval
    - iii. Flat or isoelectric P waves
  - b. Dialysis patients who are overdue for dialysis treatment.
  - c. Patients recently discharged 5 days’ post burn or crush injury.

### RSI Drug Reference Chart

		<u>Induction</u> BP ≥ 100		<u>Induction</u> BP ≤ 100		<u>Paralysis</u> Age > 10	<u>Paralysis</u> Age < 10	<u>Paralysis</u> Long Term	<u>Pediatric</u> Sedation Analgesia Hypotension
LBS	KG	Etomidate (0.3 mg/kg)	Ketamine (1.5 mg/kg)	Etomidate (0.15 mg/kg)	Ketamine (0.75 mg/kg)	SUX (1.5 mg/kg)	SUX (2.0 mg/kg)	Rocuronium (1 mg/kg)	Versed (1mg/kg) Fentanyl (1mcg/kg) Ketamine (0.5mg/kg)
10	5	2	8	1	4	10	10	10	5 / 5 / 3
20	9	4	14	1	7	10	20	10	9 / 9 / 5
30	14	4	21	2	11	20	30	10	14 / 14 / 8
40	18	6	27	3	14	30	40	20	18 / 18 / 9
50	23	8	35	3	17	40	50	20	23 / 23 / 12
60	27	8	41	4	20	40	60	30	27 / 27 / 18
70	32	10	48	5	24	50	70	30	32 / 32 / 16
80	36	12	54	5	27	60	80	40	36 / 36 / 18
90	41	12	62	6	31	60	80	40	41 / 41 / 22
100	45	14	68	7	34	70	90	50	45 / 45 / 23
125	57	18	86	9	43	90	120	60	50 / 50 / 25
150	68	20	102	10	51	100	140	70	50 / 50 / 25
175	80	24	120	12	60	120	160	80	50 / 50 / 25
200	91	28	137	14	68	140	180	90	50 / 50 / 25
225	102	32	153	15	77	160	210	100	50 / 50 / 25
250	114	34	171	17	86	170	230	120	50 / 50 / 25
275	125	38	188	19	94	190	250	130	50 / 50 / 25
300	136	42	204	20	102	210	280	140	50 / 50 / 25