PROTOCOLS

TABLE OF CONTENTS

INTRODUCTION TO THE PROTOCOLS

The following protocols are intended to give guidance to the Emergency Medical Responders (EMRs), Emergency Medical Technicians (EMTs), Advanced Emergency Medical Technicians (AEMTs), EMT Intermediates (EMT-I), Paramedics (EMT-P) & Registered Nurses (RNs) working under the auspices of Dufur Ambulance, Mid-Columbia Fire & Rescue, Wamic Rural Fire Protection District, Sherman County Ambulance, Southern Wasco County Ambulance, North Gilliam Medic, North Sherman County RFPD, Wasco County Search and Rescue and working under the auspices of Medcor at The Dalles jobsite and the Army Corps of Engineers at the John Day Dam site. They are not intended to eliminate or discourage consultation with Medical Control, nor to give authority for patient care outside of the State of Oregon Emergency Medical Service Provider scope of practice. Each EMS provider is expected to know their legal and personal limits. The RN designation in the protocols indicates the minimum level of care that RNs working in EMS can perform, however those with additional training may function to the level of their training as licensed with the State of Oregon EMS and Trauma Systems.

These protocols are also not intended, nor can they be expected, to cover every conceivable patient condition or situation that the EMS provider may encounter. Individual judgment must be used and if there is a question, the base Physician should be contacted before questionable treatment is instituted.

While the protocols are separated into EMR, EMT, AEMT, EMT-I, RN and EMT-P levels of care, all EMS providers should follow the guidelines for basic care before proceeding onto a higher level of care.

If treatment is given (or withheld) not in accordance with these written guidelines, the exceptions shall be documented on the prehospital care report.

All patient care and prehospital care reports are subject to review by the Supervising Physician and others as may be designated by the Supervising Physician. This review process is not intended to be punitive, but to ensure continuing high-quality patient care.

As Supervising Physician, I approve these protocols, and authorize the EMS providers affiliated with the above listed agencies to operate under them.

Any off duty EMT is authorized to function in all the areas listed above as long as they remain within their scope of practice and follow the appropriate treatment protocol.

_____ _____

Erin Burnham, MD — Date
Supervising Physician

As EMS Provider, I have read and understood these protocols and will operate within the scope of these protocols as a provider for the following agency:

_____

Agency

_____ _____

EMS Provider — Date

GENERAL ORDERS FOR ALL PATIENTS

NOTE:
❖ Universal precautions should be observed by all EMS providers

I. INITIAL ASSESSMENT

A. Establish responsiveness. If unresponsive:
B. Check for pulse. If no pulse, begin chest compressions. See **Cardiac Arrest** Protocol.

II. PRIMARY SURVEY

A. **Airway** - Identify and correct existing or potential airway obstructions while protecting C-spine in traumatized patients. See **Airway Management** Protocol.

B. **Breathing** - Identify and correct existing or potential compromising factors. Begin artificial or assisted ventilation as indicated. Include a brief chest examination on trauma patients.

C. **Circulation** - Control active bleeding.

D. **Disability** - Determine gross neurological function.

E. **Expose** - Disrobe patients as necessary to adequately assess and treat. In trauma, specifically examine the head, neck, chest and abdomen for life-threatening injuries, conditions, etc.

III. SECONDARY SURVEY

A. Perform a head-to-toe assessment. Obtain and record vital signs, including pulse, blood pressure, respiration, skin color, capillary refill, and level of consciousness (GCS or AVPU).
B. Obtain significant history from patient, family, or bystanders.
C. Repeat vital signs as indicated by patient condition. Repeat at least LOC, pulse, respiration's, blood pressure and pain level after medication administration.

IV. TREATMENT/RESUSCITATION

A. Treat all emergent problems in order of priority and according to protocols.
B. Check for patient POLST form for:
   a. Elderly in Adult Foster Care, Nursing Homes and living at home.
   b. Terminally ill
C. Reassure the patient and keep him/her informed of treatment.
D. Gloves and eye protection will be worn with all patient contact.
E. Masks will be worn when there is a possibility of exposure to airborne fluids.

IV. TRANSPORT

All patients should be evaluated, appropriately treated and prepared for transport without undue delay. While stabilization of medical emergencies should be attempted before transport whenever possible, on-scene time for major trauma patients should be kept to a minimum, preferably less than 10 minutes unless heavy extrication is required. If extended on-scene time is required, keep medical control informed periodically.

V. PATIENT REFUSAL OF CARE AND TRANSPORT

For patient refusal, refer to page 53 of the **PROCEDURES.**

AIRWAY MANAGEMENT - BVM & CPAP

NOTE:
- ❖ Proper airway management is the first priority of the EMS Provider
- ❖ Providers will wear eye protection when performing BVM ventilation or PEAD or SGA placement and during suctioning.
- ❖ Always stabilize the cervical spine when performing airway maneuvers in the trauma patient with suspected cervical spine injury

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Attempt to open the airway using head tilt-chin lift or jaw thrust maneuver.
B. Oropharyngeal (OPA) or nasopharyngeal (NPA) airways should be used for patients who are unable to maintain their own airway.
C. Have suction immediately available and use as needed to clear secretions.
D. Provide supplemental oxygen as indicated. All patients with altered mental status or respiratory distress should receive supplemental oxygen, preferably via non-rebreather mask. Titrate to maintain $SaO_2 \geq 95\%$.
   1. Low flow (2-4 L/min) via NC for patients with COPD.
   2. Moderate flow (4-6 L/min) via NC
   3. High flow (10-15 L/Min) via NRB or BVM
E. Bag-Valve-Mask (BVM) should be used when inadequate ventilation is present.
F. "Blow-by" oxygen (1 - 4 L/min) may be used for infants & toddlers who do not tolerate mask but require supplemental oxygen.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~EMT/AEMT/EMT-I/RN CARE~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

I. **CPAP** (Continuous Positive Airway Pressure)

NOTE:
- ❖ This is a method to decrease the work of breathing and increase the patient's oxygenation using pressure support.
- ❖ CPAP can be used as an alternative to PEAD or SGA placement or endotracheal intubation in selected patients with cardiogenic pulmonary edema, reactive airways disease and chronic obstructive pulmonary disease.
- ❖ CPAP can be used to optimize oxygenation prior to endotracheal intubation or PEAD or SGA placement

A. **INDICATIONS:** CPAP will be used in acute respiratory distress demonstrated by two or more of the following signs and symptoms.
   1. Retractions
   2. Accessory muscle use
   3. Tachypnea (respiratory rate > 25/min.
   4. Pulse oximetry reading < 90%
   5. Bibasilar or diffuse rales consistent with CHF & pulmonary edema

B. **CONTRAINDICATIONS:** If any of the following go to **Endotracheal Intubation** or **PEAD or SGA**.
   1. Respiratory or cardiac arrest
   2. Altered LOC
   3. Inability to maintain airway patency
   4. Major trauma, especially head injury with increased ICP or significant chest trauma.
   5. Signs and symptoms of pneumothorax.

REFER TO AIRWAY - CPAP PROCEDURE

AIRWAY MANAGEMENT - PEAD OR SGA & INTUBATION

II. **PEAD or SGA** (SupraGlottic Airway) PLACEMENT

- ❖ A PEAD or SGA can be used to secure an airway in an unconscious patient
- ❖ Once placed, it should not be removed until the patient's airway is protected by endotracheal intubation or the patient is conscious enough to protect his/her own airway.
- ❖ Vomiting is likely to follow removal of the PEAD or SGA

A. INDICATIONS:

1. A PEAD or SGA may be placed in unconscious patients with no gag reflex.

B. **CONTRAINDICATIONS:**

1. Conscious or semi-conscious patients
2. Intact gag reflex
3. Airway obstruction
4. Patients with known or suspected esophageal disease
5. Ingestion of caustic substances
6. Patients with known esophageal varices.

C. Placement of the PEAD or SGA will be confirmed by:

1. Auscultation of bilateral breath sounds
2. Absence of breath sounds over the stomach
3. Positive findings of End-Tidal CO_2 detector and/or capnography.

REFER TO AIRWAY MANAGEMENT - KING LT or IGEL PROCEDURE.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

III. **ENDOTRACHEAL INTUBATION**

- ✦ Non-paralytic intubation should be performed in a patient who is pulseless and apneic or cannot protect their airway due to altered mental status.
- ✦ Rapid Sequence Intubation (RSI) is the technique of administering paralytics to facilitate intubation and decrease the risk of hypoxemia and aspiration.
- ✦ RSI should be used when the EMT-P is unable to intubate without paralytic medications because of a clenched jaw or active gag reflex, combativeness or difficult airway problems due to head injury, altered mental status, OD or status epilepticus

A. INDICATIONS:

1. Airway obstruction
2. Patient needs intubation for airway protection (potential compromise due to burns)
3. Respiratory insufficiency not responding to respiratory support.
4. Apnea from any cause except severe hypothermia.
   (See Environmental Emergency Protocol)
5. Cardiac arrest.
6. Severe Traumatic Brain Injury (TBI) with GCS < 8
7. Unconscious or Altered Mental Status with Airway Compromise
8. Uncontrollable combative behavior in a trauma patient who is at risk of harming self

REFER TO AIRWAY MANAGEMENT - ENDOTRACHEAL INTUBATION PROCEDURE

B. CONTRAINDICATIONS:

1. Total upper airway obstruction
2. Total loss of facial/oropharyngeal landmarks
3. A surgical airway is indicated if above contraindications exist

REFER TO AIRWAY MANAGEMENT - CRICHOTHYROTOMY OR NEEDLE CRICHOTHYROTOMY PROCEDURE.
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IV. FOREIGN BODY AIRWAY OBSTRUCTION

~~~~~~~~~~~~~~~~~~~~~~~~~~~~EMR/AEMT/EMT/EMT-I/RN CARE~~~~~~~~~~~~~~~~~~~~~~~~~~~~

	Adult (Adolescent & older)	**Child** (1 year to adolescent)	**Infant** (Less than 1 year)
1	Ask "Are you choking?"	Ask "Are you choking?"	Confirm severe airway obstruction. Check for sudden onset of severe breathing difficulty, ineffective or silent cough, weak or silent cry.
2	Give abdominal thrusts/Heimlich maneuver or chest thrusts for pregnant or obese patients	Give abdominal thrusts/Heimlich maneuver	Give up to 5 back slaps and up to 5 chest thrusts
3	Repeat thrusts until effective or victim becomes unresponsive	Repeat thrusts until effective or victim becomes unresponsive	Repeat step 2 until effective or victim becomes unresponsive
	Victim becomes unresponsive		
4	Call for ALS backup		
5	Lower patient to floor. If unresponsive with no normal breathing, begin CPR		
6	Before you deliver breaths, look into mouth. If you see a foreign body that can be easily removed, remove it.		
7	Continue CPR until more skilled rescuers arrive		

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT-P CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. If BLS procedures are unsuccessful and the airway remains obstructed, visualize the airway with the laryngoscope and attempt to remove the obstruction using suction and/or Magill forceps.
2. If all other methods fail and the obstruction is in the upper airway, perform cricothyrotomy or needle jet insufflation.
3. Contact OLMC to inform them of a blocked airway with cricothyrotomy being preformed.

CARDIAC ARREST

NOTE: For infants and children, see ACLS - PEDIATRIC CARDIAC ARREST Protocol.

NOTE:
- ❖ High Performance Cardiopulmonary Resuscitation (HP-CPR) with minimal interruptions has been shown to result in increased survival from primary Cardiac Arrest. **All interruptions should be limited to ≤10 seconds**
- ❖ If cardiac arrest is witnessed **by EMS personnel**, proceed as quickly as possible to rhythm analysis and defibrillation if indicated.
- ❖ If unwitnessed arrest, perform 2 minutes of high quality CPR prior to initial rhythm analysis and defibrillation.
- ❖ To perform high quality CPR, compress to a depth of 2 - 2.5 inches, with full recoil at a rate of 100-120/minute using a metronome. Switch compressor at each rhythm check, with replacement hovering to minimize interruption time.
- ❖ If there is a history to suggest a different etiology such as trauma, drowning or respiratory arrest, initiate ventilatory support early.
- ❖ Airway interventions should not interrupt chest compressions
- ❖ Consider placing CCD (chest compression device) when short-staffed, patient having intermittent ROSC, or when moving patient to stretcher for transport.

Obtain History when possible, but do not delay CPR to obtain information:

A. Witnessed or unwitnessed collapse
B. Patient down time
C. Bystander CPR
D. DNR status
E. Previous medical history, medications and allergies
F. Potential causes:
  1. Airway obstruction
  2. Trauma
  3. MI
  4. CVA
  5. Electrocution
  6. Diabetes

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Establish that patient is unresponsive.
B. Check for pulse.
C. If no pulse, start compressions only CPR at 110 compressions/minute using metronome.
D. Call for AED & ALS backup.
E. As soon as AED is available, apply AED.
F. If unwitnessed arrest, perform CPR for 2 min.
G. If witnessed arrest, perform CPR until defibrillator is attached.
H. Analyze rhythm and defibrillate if indicated. (see AED Protocol). Resume chest compressions immediately after rhythm check. If shock advised, complete at least 30 chest compressions while unit is charging, before delivering shock. Resume compressions immediately after shock is delivered. If no shock advised, check for pulse, and resume chest compressions immediately if no pulse.
I. Apply high flow O_2 (15 L) via nasal cannula when 2nd rescuer arrives or during rhythm analysis
J. Continue CPR until perfusion is restored.
K. If patient has large amounts of secretions, suction as necessary to clear the airway
L. If patient has return of spontaneous circulation, follow ROSC Protocol.

CARDIAC ARREST
(Continued)

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

M. If patient has ROSC without spontaneous respiratory effort, or does not have ROSC after 6 minutes (3 cycles), place PEAD or SGA & proceed per PEAD or SGA instructions and initiate asynchronous ventilations at a 10:1 compression:ventilation ratio

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

N. After compressions have been initiated and defibrillator pads have been placed, establish a humeral or tibial IO. Do not delay access. Place IO if IV not immediately available)

O. If using a manual defibrillator, consider precharging the defibrillator 15 seconds before each rhythm check. Defibrillator Joule Settings:
1. **Physio Control Lifepak - 360j All shocks**
2. **Philips Heartstart MRX - 150 j All shocks**
3. **Zoll E/X-series - 200 j All shocks**

P. After 2 minutes of compressions, check cardiac rhythm and follow appropriate ACLS Algorithm.

Q. If no ROSC within 6 minutes (3 cycles) establish advanced Airway via PEAD or SGA with capnography. If sufficient personnel are available, advanced airway may be established earlier if it can be placed without interruption in CPR.

R. If Ventricular Fibrillation persists after 3 cycles and second set of pads available place 2nd pads in AP position. Perform next 2 shocks if indicated using AP position.. If still unsuccessful, and second defibrillator is available, consider double sequential defibrillation for 6th shock using both defibrillators simultaneously.

S. If patient does not have ROSC and has ETCO2 < 10 mmHg after ≥ 20 minutes of resuscitation, discontinue resuscitation efforts.

T. If patient has ROSC
1. Continue cardiac ECG Monitoring
2. Obtain 12-lead EKG if available
3. IV/IO, BSS, TKO or Saline lock
4. Titrate O_2 to maintain $SaO_2 \geq 95\%$
5. Initiate therapeutic cooling measures with chilled saline & icepacks in groin and axillae
6. Transport patient to nearest hospital, or contact aeromedical transport for transfer to closest cath lab if STEMI present.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

U. If no ROSC within 6 minutes (3 cycles), establish advanced airway via ET tube or PEAD or SGA with capnography. If sufficient personnel are available, advanced airway may be established earlier if it can be placed without interruption in CPR.
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V. Although IV/IO are more effective routes in cardiac arrest, if unable to establish IV or IO line, you can give the following down the ET tube:

NOTE:
- ALS backup should be called for in all Cardiac arrests
- In infants < 1 year of age, use infant pads with attenuator if available.
- Do not analyze or shock conscious patients even if AED is prompting you to do so

ETT DOSAGE	**Adults:**	**Pediatric < 6 years old**
Atropine	2 mg ETT	0.04 mg/kg ETT Minimum dose 0.1 mg
Epinephrine 1:1000	2 mg ETT	0.1 mg/kg ETT (0.1 ml/kg) NMT 2.5 mg For neonates, use 1:10,000 - see below
Epinephrine 1:10,000	————	Neonatal - 0.05 mg/kg (0.5 ml/kg) ETT
Lidocaine	3 mg/kg ETT	3 mg/kg ETT
Narcan	4 mg ETT	0.1 mg/kg ETT, NMT 2 mg

CARDIAC ARREST - WITH PREGNANCY (>22 WEEKS)

NOTE:

- ❖ If history of pregnancy with know gestational age, use dates provided by patient. If unclear dates, palpate abdomen. If fundal height (top of the uterus) is at or above the level of the umbilicus, assume gestational age ≥ 20 weeks and follow this protocol
- ❖ Early transport prior to achieving ROSC, especially if a mechanical CPR device is available.
- ❖ Alert the receiving facility early in order to have an OB team present upon arrival in the emergency department.
- ❖ Lidocaine is preferable (Class B in Pregnancy) to amiodarone (Class C in Pregnancy) in the setting of ventricular fibrillation or pulseless ventricular tachycardia.
- ❖ No adjustments need to be made to defibrillation energy settings.
- ❖ Immediately following defibrillation, resume the left lateral uterine displacement.
- ❖ If mechanical CPR is in place, continue the left lateral uterine displacement by tilting the backboard 30° to the left or by continuing manual displacement
- ❖ If ROSC is achieved continue left lateral uterine displacement by placing the patient in the left lateral decubitus position or by manually displacing the gravid uterus.
- ❖ High flow oxygen should be maintained in pregnant post-arrest patients.

Manage per appropriate cardiac arrest algorithm (VF / pulseless VT, asystole/PEA):

A. CPR with continuous manual left uterine displacement using the two handed method shown below.

AUTOMATED EXTERNAL DEFIBRILLATION

NOTE:
- ❖ The adult AED pads should be placed on any patient over 8 years old who is unconscious.
- ❖ The pediatric AED leads should be placed on patients <1 year to 8 years of age who are unconscious. (The adult pads may be used if the pediatric pads are unavailable.)

~~~~~~ **EMR/EMT CARE** ~~~~~~

If down time estimated at greater than 5 min, perform CPR for 2 minutes

C. If down time less than 5 min, perform CPR until AED is attached

1. Press "analyze"
2. Defibrillate if recommended
3. CPR for 2 minutes
4. Repeat steps 1 - 3
5. If "No shock' recommended, check pulse. Continue CPR if pulseless and support airway as needed.
6. If patient has return of spontaneous circulation, follow **ROSC Protocol.**

Precautions:
- ❖ Be sure patient is dry, not in a puddle of water.
- ❖ Remove medication patches prior to applying pads and defibrillating.
- ❖ Do not analyze with AED while doing CPR, moving the patient, or in a moving ambulance. During transport, the ambulance must pull to the side of the road and come to a complete stop before the patient is analyzed or shocked using the AED.
- ❖ AED may be used on patients with pacemakers or automatic implanted defibrillators, but do not place pads over these devices.

NOTE: For infants, it is recommended to use a manual defibrillator if available, with pediatric pads. If AED is only defibrillator available, use pediatric pads with an attenuator if available. If pediatric attenuator pads not available, use adult pads anteriorly/posteriorly.
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RETURN OF SPONTANEOUS CIRCULATION (ROSC)

NOTE: For infants and children, see ACLS - PEDIATRIC CARDIAC ARREST Protocol.

NOTE:
- ❖ If a patient has ROSC post-arrest, initiate post resuscitation care:

~~~~~~ EMR CARE ~~~~~~

A. Manage and support ABC's as necessary.
B. Titrate oxygen to maintain SaO_2 ≥95%.
C. If patient is unresponsive, initiate therapeutic cooling measures with icepacks in axillae, groin neck, & around head wrapped in a light towel. Target temperature 32 - 36°C
D. Prepare for transport if ALS arrival not eminent

~~~~~~ AEMT/EMT-I/RN CARE ~~~~~~

E. Optimize ventilation and oxygenation
  1. Maintain ETCO2 at 35 – 40 mmhg.
  2. Do not hyperventilate; start at 10-12 breaths/minute.
F. Treat hypotension (SBP < 90 mm HG)
  1. IV/IO bolus 1-2 L BSS
  2. If inducing hypothermia, use 4° C fluid
  3. If normotensive, TKO or Saline lock
G. Consider treatable causes: H's and T's.
  1. Continue cardiac ECG Monitoring
  2. Obtain 12-lead EKG if available
  3. If STEMI present, contact aeromedical transport for transfer to closest cath lab, or
  4. Transport patient to nearest hospital

~~~~~~ EMT-P CARE ~~~~~~

E. Treat refractory hypotension:
  1. Initiate Norepinephrine GTT @ 4 mcg/min, titrate to MAP ≥ 65 or BP > 90 Systolic. NMT 12 mcg/min.
  2. If unable to achieve MAP > 65, consider adding epinephrine for inotropy

- ❖ Epinephrine infusion Titrate 0.1- 0.5 mcg/kg per minute
  Mix 200 mcg in 50 mL NS (4 mcg/ml)
  Drip for 0.1 mcg/kg per minute:

Pt wt (lbs)	44	66	88	110	132	154	176	198	220	242
Pt wt (kg)	20	30	40	50	60	70	80	90	100	110
mcg/min	2	3	4	5	6	7	8	9	10	11
Microdrips	30	45	60	75	90	105	120	135	150	165

ACLS - VF/VT

Shockable rhythm (Ventricular Fibrillation/Pulseless Ventricular Tachycardia):

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

NOTE:
- ❖ **Use a Pit-Crew approach to assign incoming responders to designated positions**
- ❖ **Efforts should always be directed at high quality and continuous chest compressions with limited interruptions**
- ❖ **In general, continue resuscitation on scene for a minimum of 30 minutes. Cardiac arrests are best run at location the patient is found until ROSC or until resuscitation attempt ceases. Patient movement leads to low quality compressions, unless a mechanical CPR device is available.**
- ❖ Airway should be secured, mechanical compression device applied and IV/IO placed with minimal interruption to CPR.
- ❖ All medicines should be given during 2 minutes of CPR without interrupting chest compressions and should be followed by 10 ml NS flush.
- ❖ These instructions assume VF/pulseless VT. If rhythm changes, switch to the appropriate algorithm.

- ❖ Each Cycle of CPR done over 2 minutes includes:
  - Check Rhythm, CPR & CHARGE, CLEAR, Defibrillate – CPR x 2 minutes -
- ❖ Rhythm Check and pulse check simultaneously.
- ❖ Immediately resume CPR after defibrillation, rotating compressor each round.
- ❖ If VF/VT:
  - ➡ Defibrillate.
  - ➡ Resume CPR immediately for 2 minutes or 5 cycles after each defibrillation.
  - ➡ Give drugs immediately after defibrillation, at beginning of 2 minutes of CPR.
  - ➡ Prepare next drug while performing 2 minutes of CPR.
- ❖ If using a manual defibrillator, precharge defibrillator 15 seconds before rhythm check.

- ❖ Defibrillator Joule Settings:
  - ❖ Physio Control Lifepak - 360j All shocks
  - ❖ Philips Heartstart MRX - 150 j All shocks
  - ❖ Zoll E/X-series - 200 j All shocks

A. Initiate CPR.
  1. For unwitnessed arrest, give 2 min CPR while placing pads.
  2. For witnessed arrest with downtime < 5 minutes, perform CPR while placing pads.
  Check rhythm as soon as leads applied.
  Defibrillate as soon as rhythm is determined to be shockable rhythm - VF/VT.

B. **Check Rhythm – Defibrillate – CPR x 2 minutes**.

C. Establish IV/IO access. Prepare Epinephrine. Perform good CPR with capnography 20 mmhg or greater.

D. **Check Rhythm – Defibrillate – CPR x 2 minutes**.

E. **Epinephrine** 1:10,000 – 1mg IV/IO. Repeat every 3 – 5 minutes.
Prepare Amiodarone.

F. **Check Rhythm – Defibrillate – CPR x 2 minutes.**

G. **Amiodarone**[1] 300 mg IV/IO. Consider reversible causes.

H. Consider advanced airway with capnography after 3 rounds of CPR

I. Bring in 2nd defibrillator if available and place pads anterior/posterior

J. *Consider placement of mechanical compression backboard if available*

K. **Check Rhythm – Defibrillate x 1 through new monitor if available – CPR x 2 minutes. Simultaneously at each rhythm check monitor airway and capnography.**

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[1] If Amiodarone is not available, use Lidocaine, initial dose of 1-1.5 mg/kg IV/IO. Repeat if indicated at 0.5 to 0.75 mg/kg IV/IO over 5-10 min. intervals to a max. dose of 3 mg/kg.
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L. **Epinephrine** 1:10,000 – 1mg IV/IO every 3-5 minutes.
M. **Check Rhythm – Defibrillate x 1 through new monitor if available – CPR x 2 minutes.**
N. **Amiodarone** 150 mg IV/IO.
O. **Check Rhythm – Double sequential Defibrillate x 1 (2 defibrillators each set at max setting). If second defibrillator unavailable, defibrillate at max dose – CPR x 2 minutes.**
P. **Epinephrine** 1:10,000 – 1mg IV/IO every 3-5 minutes.
Q. **Check Rhythm – Repeat double sequential defibrillation until change in rhythm or ROSC.– CPR x 2 minutes.**
R. If patient has return of spontaneous circulation, follow **ROSC Protocol**.
S. Prepare patient for transport as soon as possible. If Lucas device is available, transport with device in place. Consider consultation with OLMC.

~~~~~~ **EMT-P CARE** ~~~~~~

T. For **Torsades de Pointes** give **Magnesium Sulfate –** 2 gm in 16 ml NS, LR, D5W IV/IO over 1-2 minutes.
U. If no response to amiodarone and no indication for magnesium sulfate, administer lidocaine 1-1.5 mg/kg IV/IO. Repeat if indicated at 0.5 to 0.75 mg/kg IV/IO over 5-10 min. intervals to a max. dose of 3 mg/kg.

Magnesium Sulfate Drip: Add 1gm of Magnesium to a 250 ml of BSS and run at 60 gtts/min through a macro drip set or a pump for 1 gm/hr.

- If patient appears malnourished, alcoholic or rhythm suggests **Torsades de Pointes**, give magnesium sulfate before other antidysrhythmics.
- If patient converts with magnesium, follow with magnesium sulfate 1 gm/hr gtt.
- Sodium bicarbonate, 1 mEq/kg should be given early if known or suspected cyclic anti-depressant overdose, or patients with possible hyperkalemia (eg. dialysis patients)

Amiodarone Rapid Infusion: Mix 150 mg Amiodarone in 50 ml LR or NS and administer at 75 gtts/min with macro bore set over 10 min. for 15 mg/min. infusion. (18 gtts/15 sec.)
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ACLS - ASYSTOLE/PEA

Non-shockable rhythm (Asystole/Pulseless Electrical Activity)

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

NOTE:

- ❖ Airway should be secured and IV/IO placed with minimal interruption to CPR.
- ❖ All medicines should be given during 2 minutes of CPR without interrupting chest compressions and should be followed by 10 ml NS flush.
- ❖ These instructions assume Asystole/PEA. If rhythm changes, switch to the appropriate algorithm.
- ❖ Each Cycle of CPR done over 2 minutes includes:

- Check Rhythm - CPR x 2 minutes -

- ❖ Rhythm Check and pulse check simultaneously.
- ❖ Immediately resume CPR after defibrillation, rotating compressor each round.
- ❖ If Asystole/PEA:
  - ➡ Resume CPR immediately for 2 minutes or 5 cycles.
  - ➡ Give drugs immediately at beginning of 2 minutes of CPR
  - ➡ Prepare next drug while performing 2 minutes of CPR
  - ➡ Confirm Asystole in two leads; increase gain to rule out fine VF; If any question of possible VF, defibrillate as per VF

A. Initiate CPR
   1. For unwitnessed arrest, give 2 min (5 cycles) CPR while placing pads.
   2. For witnessed arrest with downtime < 5 minutes, perform CPR while placing pads. Check rhythm as soon as leads applied.

B. **Check Rhythm – CPR x 2 minutes.**

C. Establish IV/IO access. Prepare Epinephrine. Perform good CPR with capnography 20 mmhg or greater.

D. **Epinephrine** 1:10,000 – 1mg IV/IO. Repeat every 3 – 5 minutes. In non-shockable rhythm, give epinephrine as soon as possible.

E. **Check Rhythm – CPR x 2 minutes.**

F. If **PEA**, administer **fluid challenge of 2 L BSS**.

G. Consider possible causes and treat as indicated:
   1. Hypovolemia: establish 2 large bore IV's/IO's. Run wide open up to 2 L BSS.
   2. Hypoxia: Ensure adequate ventilation
   3. Hyperkalemia: Albuterol, 1 unit dose (3 ml) nebulized
   4. Hypoglycemia: check blood sugar and treat as indicated.
   5. Hypothermia: (See **HYPOTHERMIA Protocol**)
   6. Tension Pneumothorax: perform unilateral or bilateral chest decompression
   7. Toxins, Tamponade, Thrombosis, Trauma

H. **Check Rhythm – CPR x 2 minutes.**

I. **Epinephrine** 1:10,000 – 1mg IV/IO.

J. Consider advanced airway with capnography after 3 rounds of CPR

K. **Check Rhythm – CPR x 2 minutes.**

L. If patient has return of spontaneous circulation, follow **ROSC Protocol**.

M. Continue resuscitation efforts for at least 20 minutes. Consider termination of resuscitation efforts in field if asystole continues after 20 minutes.
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ACLS - ASYSTOLE/PEA
(Continued)

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

N. Consider possible causes and treat as indicated:
  1. For hyperkalemia consider:
    a. Sodium Bicarbonate 1 - 2 amps IV/IO (50 mEq).
    b. Calcium gluconate 3 gram (30 mL) IV/IO over 10 minutes.
  2. Hydrogen Ion (acidosis): consider Sodium Bicarbonate 1 amp IV/IO (50 mEq).
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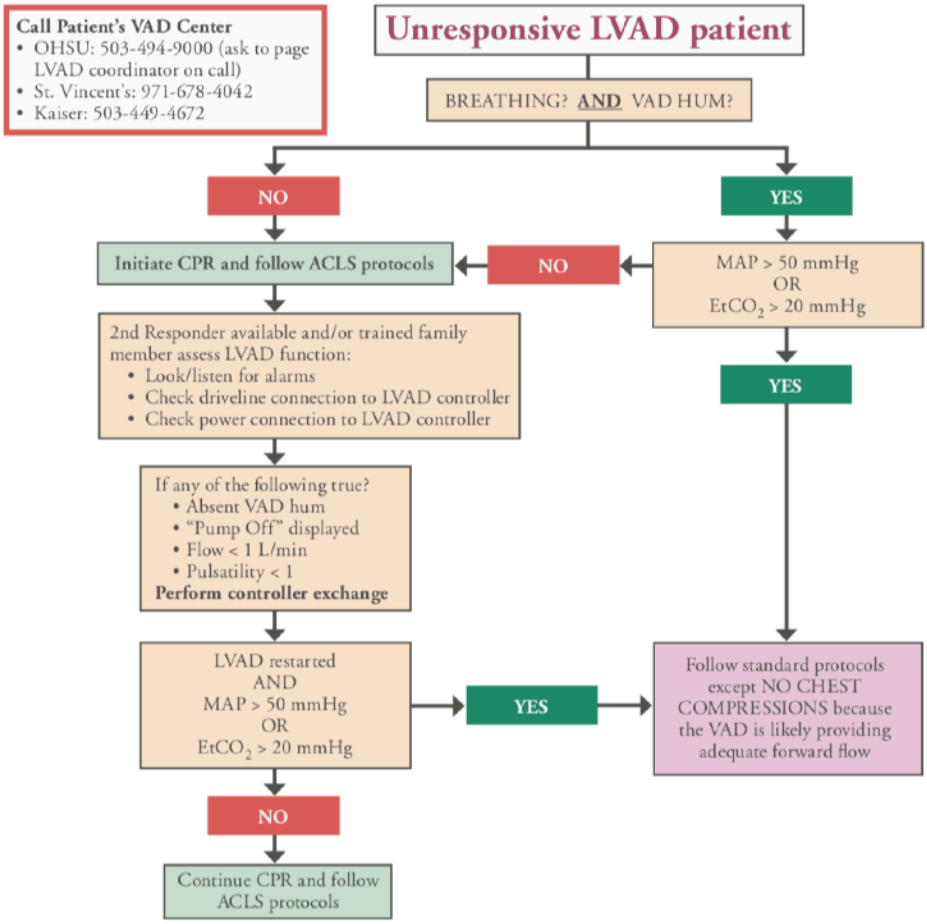
ACLS - UNRESPONSIVE LVAD PATIENT

NOTE:

- These protocols refers to an unresponsive patient with a Left Ventricular Assist Device (LVAD)
- For additional information regarding troubleshooting of LVAD, refer to *LVAD Troubleshooting* Procedure



ACLS - PEDIATRIC CARDIAC ARREST

PEDIATRIC CONSIDERATIONS:
AEMT/EMT-I/RN/EMT-P:
Cardiac arrest in children is often secondary to respiratory failure.
Ventilation may cause spontaneous return of cardiac function!

Ventricular Fibrillation and Pulseless Ventricular Tachycardia
*Follow adult cardiac arrest algorithm except as noted.
**Defibrillate in the following sequence: 2 joules/kg, 4 joules/kg and 4 joules/kg.

Substitute the following drug dosages.
1. ***Epinephrine 0.01 mg/kg IV/IO ((0.1 ml/kg) NMT 1 mg (10 ml 1:10,000 IV/IO).
2. ****Amiodarone 5 mg/kg IV/IO; MRx1 2.5 mg/kg
3. ***Lidocaine 1.0 mg/kg IV/IO up to 3 mg/kg.
4. ****Sodium bicarbonate 1 mEq/kg (1 ml/kg) IV/IO; 0.5 mEq/kg for subsequent doses.
5. ****Magnesium sulfate 25 mg/kg IV/IO NMT 2 gm

Asystole
1. ***Epinephrine every 3-5 minutes.

Pulseless Electrical Activity
1. ***Epinephrine every 3-5 minutes.
2. **Consider and treat other possible causes:**
   - **a.** ****Acidosis – consider sodium bicarbonate 1 mEq/kg (1 ml/kg) IV/IO.
   - **c.** *Cardiac Tamponade – immediate transport
   - **c.** ****Cyclic antidepressants – consider sodium bicarbonate 1 mEq/kg (1 ml/kg) IV/IO.
   - **d.** ****Hyperkalemia – consider sodium bicarbonate 1 mEq/kg IV/IO
   - **e.** *Hypothermia – see **Hypothermia** protocol
   - **f.** **Hypovolemia – fluid challenge.
   - **g.** *Hypoxia – oxygenate and ventilate
   - **h.** *Pulmonary Embolism – immediate transport
   - **i.** ****Tension Pneumothorax – needle decompression.
3. ***Consider therapeutic hypothermia (see ROSC Protocol)**

*=EMT ** = AEMT ***= EMT-I/RN **** = EMT-P

Table 1: Neonates – Immediate Postnatal Resuscitation - See p. 53-54

EMT	Drug	Indication	Dose
AEMT EMT-I RN/P	Dextrose, 12.5% (Dilute D_{50} by ½ with NS for D_{25}, then dilute by ½ for $D_{12.5}$)	Hypoglycemia	0.1 - 0.5 gm/kg IV/IO (0.4 - 2 ml/kg $D_{12.5}$)
EMT-I RN/P	Epinephrine 1:10,000	Bradycardia, Cardiac Arrest	0.01 mg/kg (0.1 ml/kg) IV/IO; 0.05 mg/kg (0.5 ml/kg) ETT

Table 2: Infants and Children

EMT	Drug	Indication	Dose
EMT-P	Adenosine	PSVT	0.1 mg/kg; 0.2 mg/kg IV/IO
EMT-I RN/P	Amiodarone	V-fib/ Pulseless V-tach: V-tach with pulse:	5 mg/kg IV/IO, MRx1 2.5 mg/kg 2.5 mg/kg IV/IO: Mix with 2 ml/kg of NS in Buretrol and infuse over 10 min.
EMT-I RN/P	Atropine	Bradycardia	0.02 mg/kg IV/IO; 0.04 mg/kg ETT May repeat dose once. Minimum dose: 0.1 mg (NMT adult dose.)
AEMT EMT-I RN/P	Dextrose, 25%	Hypoglycemia	0.1 - 0.5 gm/kg (0.4 -2 cc/kg) $D_{12.5}$ (or less) - Neonates, D_{25} (or less) -infants, children
EMT-I RN/P	Epinephrine 1:10,000	V-fib, low cardiac output, cardiac arrest, asystole, PEA	0.01 mg/kg (0.1 ml/kg) IV/IO
EMT-I RN/P	Epinephrine 1:1000 **ETT only**	Above indications without IV access	0.1 mg/kg ETT (0.1 ml/kg)
EMT-I RN/P	Lidocaine	Recurrent Ventricular Fibrillation, Stable VT	Bolus: 1.5 mg/kg (NMT 3 mg/kg) 3 mg/kg ETT Maintenance: 0.75 mg/kg q 10 min.
EMT-P	Midazolam (Versed)	Pacing – V-tach Seizures	IV/IO: 0.05-0.1 mg/kg, NMT 2.5 mg IM: 0.2 mg/kg to max 5 mg
EMT-P	Magnesium Sulfate	V-fib/ Pulseless V-tach, Torsades de Pointes	25 mg/kg IV/IO NMT 4 gm
All levels	Naloxone (Narcan)	Respiratory depression secondary to narcotics	0.1 mg/kg IV/IM/IO/IN– NMT 2 mg
EMT-P	Norepinephrine	Low cardiac output	0.1 - 0.15 mcg/kg/min IV/IO
EMT-P	Sodium Bicarbonate (Dilute by ½ with NS)	Metabolic acidosis, cyclic antidepressant OD, Hyperkalemia	1 mEq/kg (1ml/kg) IV/IO

ACLS - DYSRHYTHMIAS

NOTE:
- These protocols refers to spontaneously breathing and perfusing patients.
- If the patient is asymptomatic, dysrhythmias may not require treatment in the field.
- The following protocols for specific dysrhythmias assume basic care outlined in this protocol.

I. Patients with cardiac dysrhythmias should be classified as stable or unstable. An unstable patient is one who presents with (one or more) of these signs or symptoms:
- **A.** SBP < 100 mmhg
- **B.** Altered mental status
- **C.** Pale, cool, diaphoretic skin
- **D.** Chest pain
- **E.** Shortness of breath
- **F.** Feeling of impending doom
- **G.** Nausea & vomiting

II. Obtain the following history:
- **A.** Onset and duration of symptoms
- **B.** Is there associated chest pain or shortness of breath?
- **C.** History of cardiopulmonary disease
- **D.** Medications (especially cardiac and Viagra [erectile dysfunction agents])
- **E.** Recent illness or trauma
- **F.** Substance abuse history
- **G.** DNR status

~~~~~~ **EMR CARE** ~~~~~~

- **A.** If patient is unstable, call for ALS backup.
- **B.** Administer Oxygen
  - **1.** If SOB oxygen at 15 L/m non-rebreather mask
  - **2.** Without SOB oxygen 4-6 L/m NC
- **C.** If patient has associated chest pain, give 324 mg (4 baby) ASA.
- **D.** Place patient in position of comfort and reassure.
- **E.** Have AED ready for use and follow AED protocol.
- **F.** If patient has return of spontaneous circulation, follow **ROSC Protocol**.

~~~~~~ **EMT CARE** ~~~~~~

- **G.** Prepare for transport.
- **H.** If patient is unable to protect airway, establish airway via PEAD or SGA.

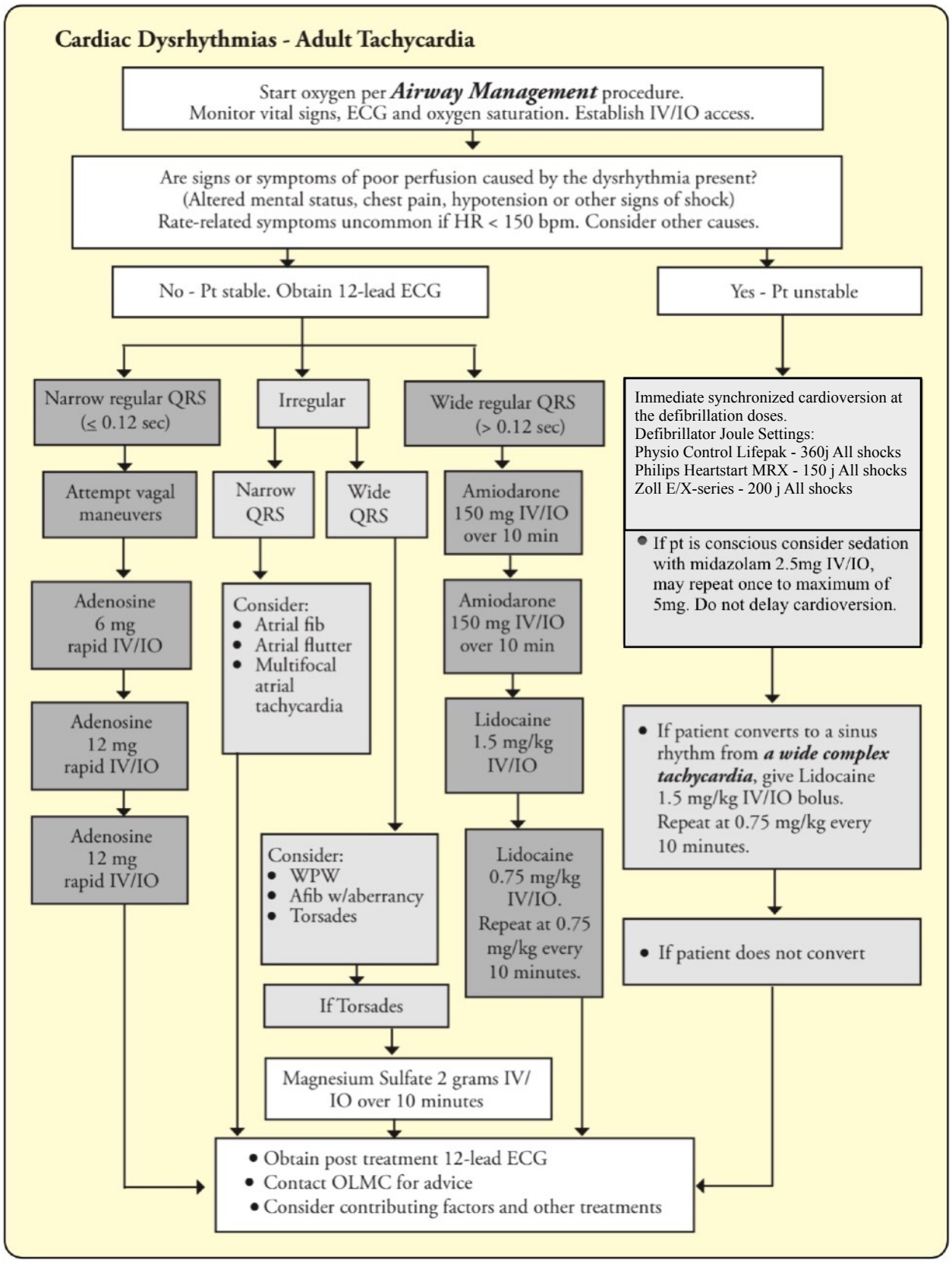
ACLS - DYSRHYTHMIAS
(Continued)

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

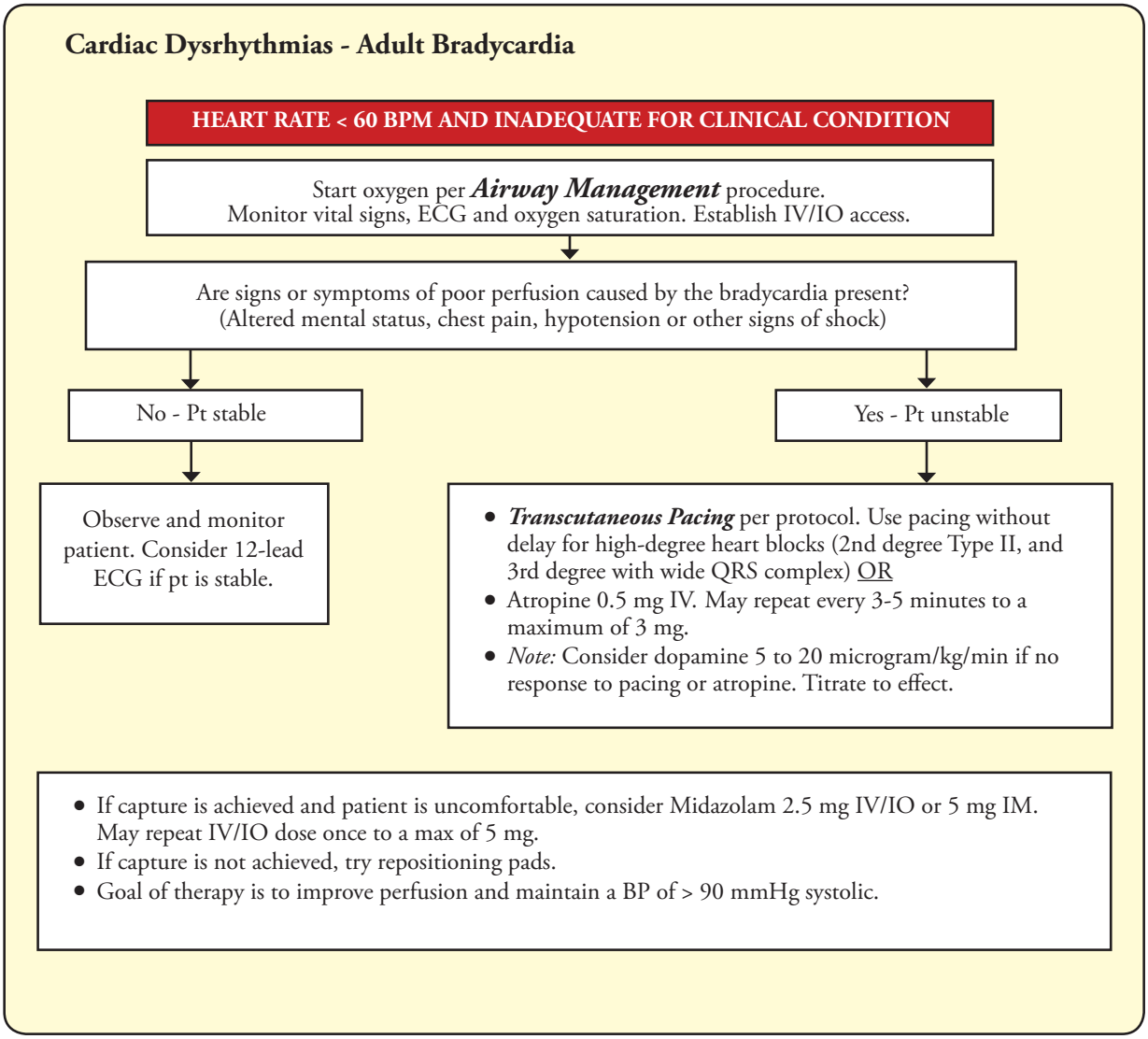
I. Place patient on cardiac monitor.
J. Establish IV, BSS, TKO.
K. If systolic pressure falls ≤ 100 mmHg, administer 250ml BSS bolus and repeat vitals. Rebolus with 250 mL BSS as indicated for SBP ≤ 100 mmHg
L. If patient is having associated chest pain, follow **CHEST PAIN Protocol**.
M. If patient is unable to protect airway, establish airway following **AIRWAY MANAGEMENT Protocol**

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~

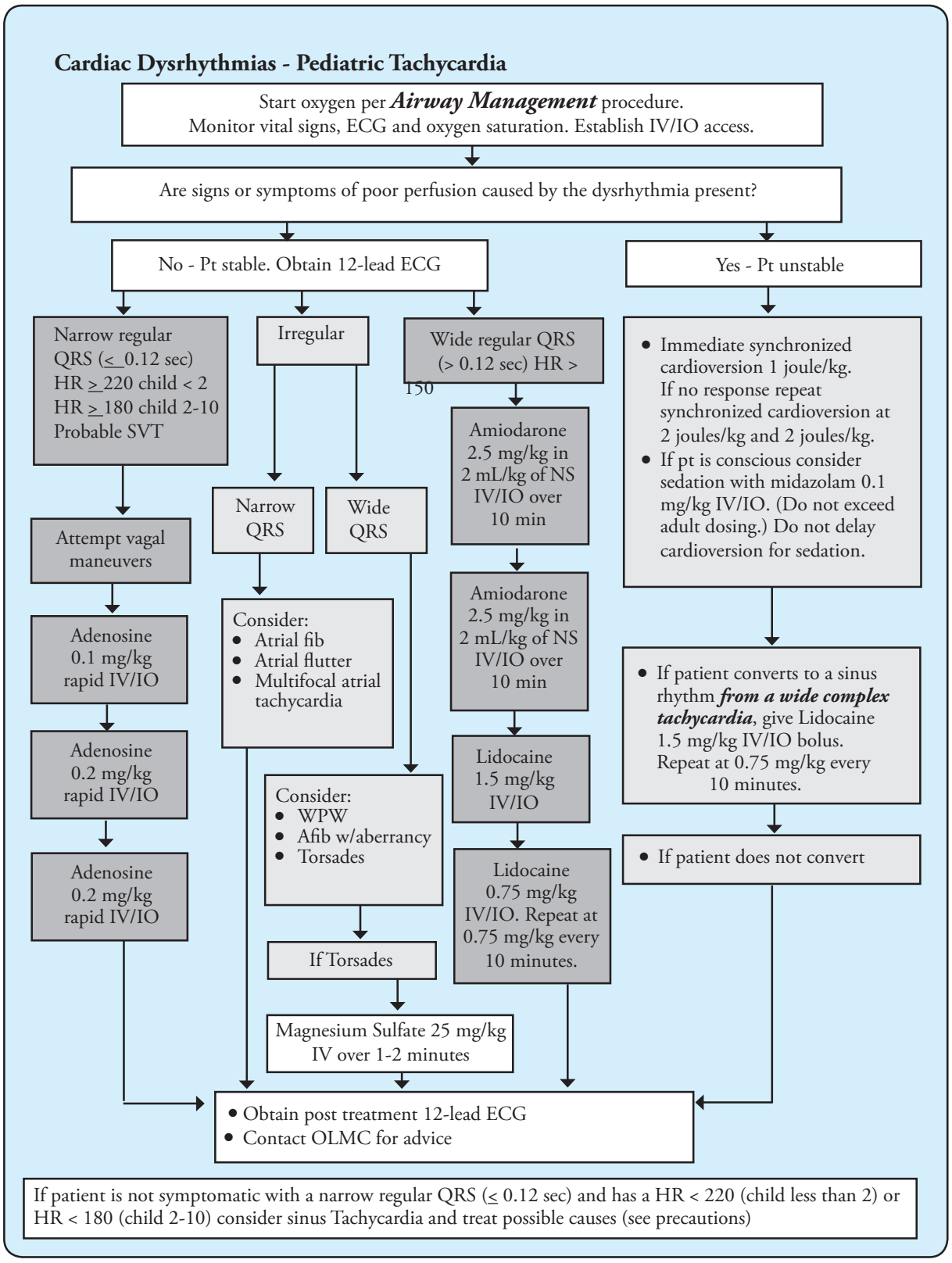
N. If patient is unable to protect airway, establish airway following **AIRWAY MANAGEMENT Protocol**
O. If patient is unstable, prepare for synchronized cardioversion if indicated. Consider premedicating with:
  1. Versed (midazolam) 2 - 5 mg IV/IM or
  2. Ativan (Lorazepam) 0.5 – 2.0 mg IV/IM/IO
P. If patient is stable, continue monitoring with frequent re-assessments.
Q. See appropriate dysrhythmia algorithm.


Cardiac Dysrhythmias - Adult Tachycardia
Start oxygen per Airway Management procedure.
Monitor vital signs, ECG and oxygen saturation. Establish IV/IO access.
Are signs or symptoms of poor perfusion caused by the dysrhythmia present?
(Altered mental status, chest pain, hypotension or other signs of shock)
Rate-related symptoms uncommon if HR < 150 bpm. Consider other causes.
No - Pt stable. Obtain 12-lead ECG
Yes - Pt unstable
Narrow regular QRS (≤ 0.12 sec)
Irregular
Wide regular QRS (> 0.12 sec)
Attempt vagal maneuvers
Narrow QRS
Wide QRS
Amiodarone 150 mg IV/IO over 10 min
Adenosine 6 mg rapid IV/IO
Consider:
Atrial fib
Atrial flutter
Multifocal atrial tachycardia
Amiodarone 150 mg IV/IO over 10 min
Adenosine 12 mg rapid IV/IO
Lidocaine 1.5 mg/kg IV/IO
Adenosine 12 mg rapid IV/IO
Consider:
WPW
Afib w/aberrancy
Torsades
Lidocaine 0.75 mg/kg IV/IO. Repeat at 0.75 mg/kg every 10 minutes.
If Torsades
Magnesium Sulfate 2 grams IV/IO over 10 minutes
Obtain post treatment 12-lead ECG
Contact OLMC for advice
Consider contributing factors and other treatments
Immediate synchronized cardioversion at the defibrillation doses.
Defibrillator Joule Settings:
Physio Control Lifepak - 360j All shocks
Philips Heartstart MRX - 150 j All shocks
Zoll E/X-series - 200 j All shocks
If pt is conscious consider sedation with midazolam 2.5mg IV/IO, may repeat once to maximum of 5mg. Do not delay cardioversion.
If patient converts to a sinus rhythm from a wide complex tachycardia, give Lidocaine 1.5 mg/kg IV/IO bolus. Repeat at 0.75 mg/kg every 10 minutes.
If patient does not convert

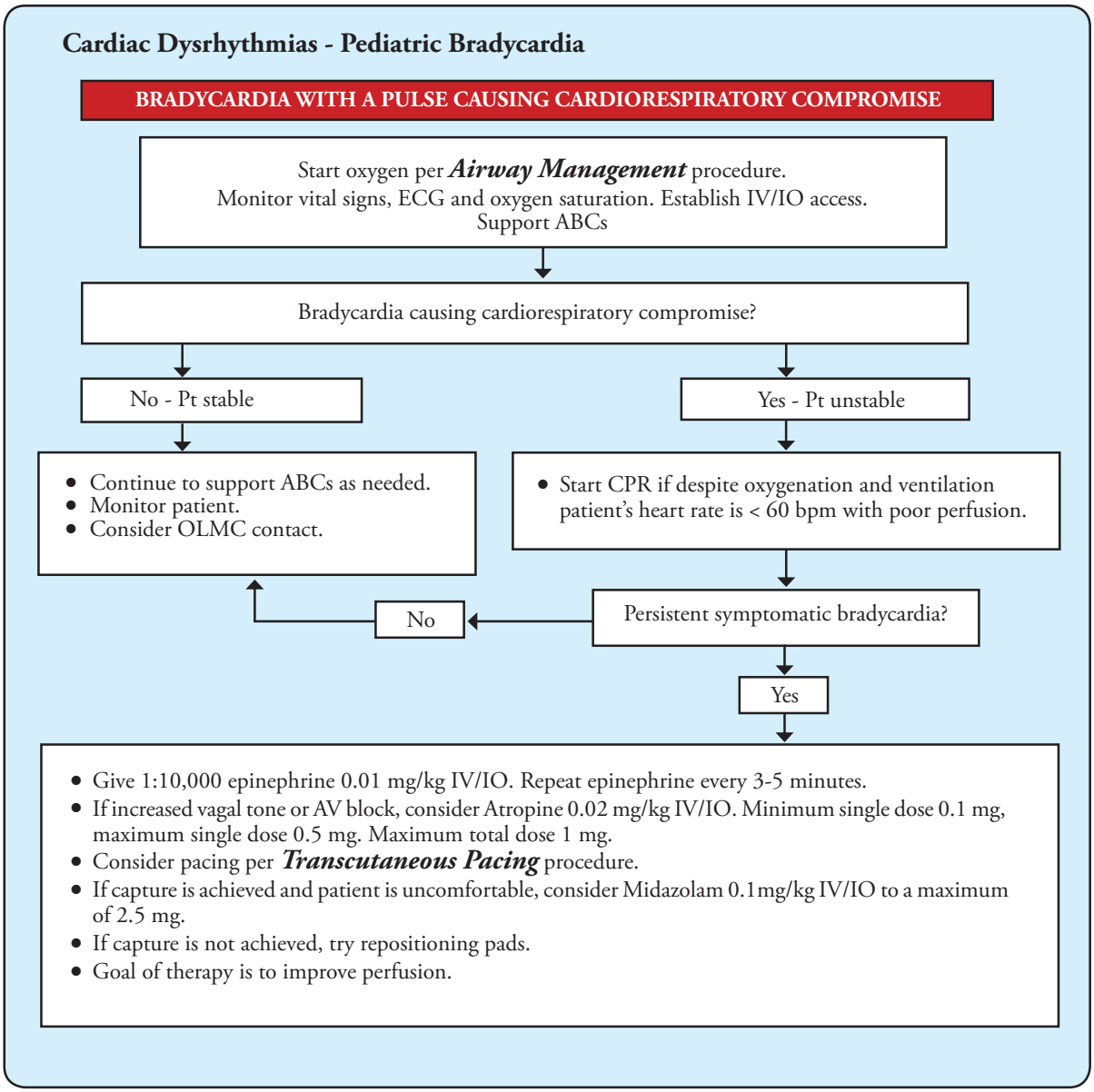
ACLS - ADULT BRADYCARDIA



ACLS - PEDIATRIC TACHYCARDIA



ACLS - PEDIATRIC BRADYCARDIA



ABDOMINAL PAIN

NOTE:
- ❖ Abdominal pain may be the first warning of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, perforated viscous, etc.)
- ❖ Since the bleeding is not apparent, you must think of volume depletion and monitor the patient closely to recognize shock.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR/EMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Start O2. Follow ***Airway Management*** protocol.
B. Place patient in comfortable position.
C. Do not allow the patient to eat or drink.
D. Obtain vital signs frequently

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~AEMT CARE~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. IV BSS TKO or Saline lock.
B. Administer fluid bolus if signs or symptoms of shock are present and B/P < 90 mmHg. See ***Shock*** protocol.
C. ECG Monitor.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT-I/RN/EMT-P CARE~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

D. Pain medications may be administered in non-traumatic abdominal pain

ACUTE ADRENAL INSUFFICIENCY

NOTE:
- ❖ Acute adrenal crisis is an immediately life-threatening emergency
- ❖ Acute adrenal insufficiency (crisis) can occur in the following settings:
  - ❖ During neonatal period (undiagnosed adrenal insufficiency)
  - ❖ In patients with known, pre-existing adrenal insufficiency (eg, Addison's disease)
  - ❖ In patients who are chronically steroid dependent (ie, taking steroids daily, long-term, for any number of medical conditions)
- ❖ Adrenal crisis can be triggered by any acute stressor (eg, trauma or illness), as well as by abrupt cessation of steroid use (for any reason).
- ❖ Signs/symptoms of adrenal crisis may include altered mental status, seizures, generalized weakness, hypotension, hypoglycemia or hyperkalemia.
- ❖ Notify hospital you are transporting known/suspected adrenal crisis patient

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Take thorough history of patient's steroid use/dependence, PMH
B. Maintain patent airway and support ventilation as required
C. Oxygen therapy, as needed
D. Frequently monitor and document vital signs and patient status

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

E. Check blood glucose
F. If blood glucose is <60: administer glucose solution orally if the patient is awake and able to protect own airway

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ AEMT/EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

G. Initiate IV
H. If blood glucose < 60 and the patient is unable to protect own airway, give IV Dextrose
I. Bolus with BSS to achieve target SBP of 90 mmHg
   1. Adult - give 500 ml fluid bolus. May repeat to maximum of 3 L NS
   2. Pediatric - 20 ml/kg up to 60 ml/kg
   3. Neonate - 10 ml/kg if less than 6 months old
J. Repeat fluid boluses if continued signs of shock and no signs of pulmonary edema.
K. Initiate ECG Monitoring
L. Obtain 12-lead EKG if available
M. Obtain IO access if indicated

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT-P CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

N. In patients with known/suspected adrenal crisis with signs of shock:
   1. Consider Decadron after MD Consult:
      Adult dose: 10 mg IV/IO/IM
      Pediatric dose: 0.05 mg/kg IV/IO/IM NMT 10 mg
   2. May administer patient's own steroid medicine if available with MD Consult
   3. Treat ECG findings of hyperkalemia - See Hyperkalemia Protocol.

ALLERGIC REACTIONS

NOTE:
- ❖ Allergic reactions may be caused by a variety of agents.
- ❖ The intensity of the reaction can range from minimal swelling to anaphylaxis and cardiovascular collapse.
- ❖ Management should be based upon the rapidity of the appearance and the severity of the reaction.

SIGNS/ SYMPTOMS OF ALLERGIC REACTIONS

May include: hives, dyspnea, swelling around mouth, face and/or tongue, hypotension, weak rapid pulse, flushed skin, tightness in the chest, wheezes and abdominal cramping.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Keep patient calm and provide reassurance that appropriate care is underway.
B. Evaluate ABC's and start Oxygen therapy.
C. Administer high flow oxygen for respiratory distress
D. Provide ventilatory assistance as needed.
E. Administer Epi Pen or Epi Pen Jr. as per directions.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

E. In the case of moderate to severe anaphylaxis (swelling of tongue, face, wheezing, stridor, or evidence of shock) give epinephrine 1:1,000 IM[1], 0.3 mg (adult), 0.2 mg (pediatric), 0.1mg (infant)[2]. All doses may be repeated once for a total of two doses. Contact OLMC for additional doses.[3]
F. If patient is wheezing or has poor air movement, administer nebulized Duoneb (or mix albuterol (1 unit dose) with Atrovent (1 unit dose)). Subsequent treatments shall be Albuterol, repeat as needed.
G. Prepare for immediate transport.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**AEMT CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

H. Start IV (BSS) enroute as needed
I. If B/P less than 90 mm/hg, follow **Shock** Protocol.
J. Monitor cardiac rhythm
K. If respiratory distress or stridor is present, consider epinephrine 3 ml of 1:1000 via nebulizer and consider intubation early.

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[1] When administering Epinephrine 1:1,000, IM is preferable to SQ route due to better blood flow during shock. SQ route is acceptable if IM access is limited, e.g: the morbidly obese.

[2] When using epinephrine 1:1000, the amount in mg is equal to the amount in ml (0.3mg = 0.3 ml). Use 1 ml syringe marked in 0.1 ml increments.

[3] If epinephrine is administered, indication must be documented.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

ALLERGIC REACTIONS
(Continued)

~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-I/RN/EMT-P CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~

L. Give Benadryl 25-50 mg IM/IV/IO for the adult dose; pediatric dose is 1mg/kg.
M. If the reaction is **severe**, give epinephrine (see table below)

Epinephrine Table	Adult	Child >10kg (22 lbs.)	Infant
1:1,000 IM	0.3-0.5 mg/0.3-0.5 ml	0.2 mg	0.1 mg
1:10,000 IV/IO or ET Tube	0.1-0.3mg/1-3ml or 0.5mg/5 ml via ET tube	0.01 mg/kg (0.1 ml/kg)	0.01 mg/kg (0.1 ml/kg)

Precautions:

- Epinephrine increases cardiac work and may precipitate angina or MI in susceptible individuals. Use with caution in patients > 50 years old.
- Common side effects include anxiety, tremors, palpitations, and headache, particularly with IV/IO administration.
- Epinephrine should not be given unless signs of cardiovascular collapse and/or significant respiratory distress are present.

Pediatric Considerations:

1. Mild:
   * a. Administer 1:1,000 epinephrine, 0.01 mg/kg (0.01 ml/kg) IM, NMT 0.3 mg (0.3 ml). May repeat once after 20 minutes, if needed for respiratory distress or persistent wheezing.
   EMT follow care listed page 11.
   *** b. If itching is severe, consider diphenhydramine 1 mg/kg IV/IO/IM, NMT 50 mg.
2. Severe:
   * a. Give epinephrine (1:1,000), 0.01 mg/kg (0.01 ml/kg) IM NMT 0.3 mg (0.3 ml).
   ** b. For diminished perfusion, administer 20 ml/kg, fluid bolus NS, IV/IO.
   *** c. Administer 1:10,000 epinephrine, 0.01 mg/kg (0.1 ml/kg) IV/IO NMT 0.1 mg (1 ml). Repeat every 5 minutes PRN respiratory distress or diminished perfusion.
   *** d. If child is intubated and there is no vascular access, give 1:1,000 epinephrine by ET, 0.1 mg/kg (0.1 ml/kg), flushed with 5 ml NS.
   * e. If wheezing is present, follow ***Respiratory Distress*** protocol.
   *** f. If itching is severe, consider diphenhydramine 1 mg/kg IV/IO or deep IM, NMT 50 mg

*=EMT ** = AEMT ***= EMT-I/RN **** = EMT-P
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ALTERED MENTAL STATUS

NOTE:
- ❖ This protocol defines the management of the emergency medical patient who has an altered mental status, i.e., decreased LOC, confusion, disorientation, coma.
- ❖ Care of the trauma patient is outlined in the appropriate trauma protocol.
- ❖ The intranasal administration of Narcan can reduce the risk of needle sticks while delivering effective medication levels.

I. Assessment - ABC's. Use GLASGOW COMA SCALE (GCS - page 90) or AVPU to categorize level of consciousness. **Check for Medic Alert tag.**

II. Differential diagnosis:

Cardiac event	Hyperglycemia	Drug Overdose
CVA	Hypoglycemia	Other
Postictal	Hyperthermia	
Shock	Hypothermia	

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Airway management has priority. Insert an oropharyngeal or nasopharyngeal airway and provide ventilatory assistance as appropriate.
B. Have suction immediately available. All patients with altered mental status should receive supplemental oxygen, preferably via non-rebreather mask or assisted ventilation.
C. If suspected hypoglycemia and patient is able to protect airway, give oral glucose.
D. If no response to above treatment or if respirations are depressed, administer 0.4 - 2.0 mg Naloxone Intranasally. Titrate to LOC & respiratory effort. Consider restraining patient before administration of Naloxone (Narcan). Rebolus at 0.4 - 2.0 mg as needed NMT 8 MG. (Pediatric dose 0.1 mg/kg NMT 2 mg.)
E. **BE PREPARED FOR PROJECTILE VOMITING AND HAVE SUCTION IMMEDIATELY AVAILABLE.**
F. ****DOCUMENT PATIENT'S RESPONSE TO MEDICATIONS****

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

G. If patient is obtunded, unable to protect airway and has no gag reflex, consider placing PEAD or SGA to secure airway.
H. Determine blood glucose levels (BGL) if time and patient condition permits.
I. If the BGL is <60, and patient is able to protect airway, give oral glucose paste.
J. If no response to above treatment or if respirations are depressed, administer 0.4 - 2.0 mg Naloxone IM/MAD. Titrate to LOC & respiratory effort. Consider restraining patient before administration of Naloxone (Narcan).
Rebolus at 0.4 - 2.0 mg as needed NMT 8 MG. (Pediatric dose 0.1 mg/kg NMT 2 mg).
K. If aggressive airway management is not required, place the unconscious patient on their side in the recovery position.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ AEMT/EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

L. Start IV enroute as needed.
M. If B/P less than 90 mm/hg, follow ***Shock*** Protocol
N. If glucose level is <60
   1. Give $D_{10}W$ 0.5 gms/kg in patent IV/IO. Repeat once after 10 minutes if needed.
   2. If unable to obtain IV, give Glucagon 1mg IM/SC.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ AEMT/EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

O. If no response to above treatment or if respirations are depressed, administer 0.4 - 2.0 mg Naloxone IV/IO/IM/MAD. Titrate to LOC & respiratory effort. Consider restraining patient before administration of Naloxone (Narcan). Rebolus at 0.4 - 2.0 mg as needed NMT 8 MG. (Pediatric dose 0.1 mg/kg NMT 2 mg.)
P. If glucose level is >300 and there is no evidence of pulmonary edema consider a fluid bolus.
Q. B/P < 90 mm/hg, consider a fluid bolus - 500 ml up to 60 ml/kg. If B/P >90 mm/hg, consider IV BSS TKO.
R. Monitor cardiac rhythm and vital signs frequently.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~EMT-P CARE~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

S. Consider intubation if GCS is <8.
T. Administer 100 mg of Thiamine IM/IV if history or presentation indicates either ETOH abuse or malnutrition.

PEDIATRIC CONSIDERATIONS:

A. Consider etiology and appropriate protocol: shock, toxic exposure, head trauma, (consider intentional injury), seizure.
B. **Vascular access
C. Rapid blood glucose determination.
D. If glucose is less than 60 mg/dl (less than 40 mg/dl for newborn):
   1. Give oral glucose to conscious patient.
   2. If no IV/IO established and airway protective reflexes are intact, give D_{50}, or other glucose containing substance, orally.
   3. **If IV/IO established, give D_{25}, 0.5 gm/kg (2 ml/kg) for infants and children < 10 kg, may repeat once. For neonates dilute D-25 to D-12.5, give 0.5 gm/kg (2 ml/kg).
   4. **If no IV/IO established and airway protective reflexes are not intact, give glucagon 0.02 mg/kg IM/IV/IO NMT 1 mg (1 ml).
   5. Repeat blood glucose determination and treat if it remains low.
E. *If mental status and respiratory effort are depressed, administer Narcan 0.1 mg/kg IV/IO/IM/SQ/SL/ET/MAD NMT 2 mg IV/IO. May repeat every 5 minutes with strong suspicion of opiate overdose, or if partial response is noted.

Do not give Narcan to newborns since it can precipitate withdrawal seizures

* = EMT ** = AEMT *** = EMT-I/RN **** = EMT-P

BURNS

NOTE:
- ❖ Defined here is the prehospital evaluation and management of major burns.
- ❖ Remember that age (infants and the elderly), underlying medical conditions, smoke inhalation and associated trauma can complicate the condition and care of the acutely burned individual.
- ❖ Evaluation of all major burns should include using the "Rule of Nines" to assess the extent of the burns.

I. GENERAL

~~~~~~ EMR/EMT CARE ~~~~~~

A. **Stop the Burning!**
   1. Remove the patient from the source of the burn if you can do so safely.
   2. Remove smoldering or hot clothing, bedding and restricting jewelry if it can be done without removing burned skin.
   3. In the case of an acid or chemical burn, brush any powder material from burn, then flush with water or Normal Saline. Note: Alkali burns (cement, anhydrous ammonia, lye) require flushing with large volumes of water until all the feeling of "soapiness" is gone.
   4. Wrap the disrobed patient in clean, dry sheets and/or dressings. Remember to wrap burned limbs and digits separately so that tissue does not become adherent.
   5. **DO NOT:**
      1. **Do not apply ice directly to the skin.**
      2. **Do not break blisters.**
      3. **Do not remove material that firmly adheres to burned skin.**
      4. **Do not use ointments, creams or sprays on any burn that will require further medical treatment.**
   7. For small burns (generally < 3%) water based burn gel may be applied to cool and soothe superficial or partial thickness burns.
   8. Conserve patient's body warmth with sheet/blankets (avoid cold/ice for large area burns).
   9. Elevate burned extremities.

B. Evaluate risk factors for airway compromise:
   1. Closed space fire
   2. Burns to face or singed nasal hairs/blackened rim of nares
   3. Hoarseness/inspiratory stridor
   4. Carbon deposits on tongue/oropharynx

C. If possibility of airway burn or closed space start O2, and follow Airway Management procedure.

D. Administer high flow oxygen to:
   1. Any burned patient with possible respiratory involvement.
   2. All suspected carbon monoxide poisonings.

E. Continually reassess the patient for signs of respiratory distress and treat early.

F. Remember that pulse oximeter readings may be falsely high in CO poisonings.

G. Give nothing by mouth (NPO).

H. **Look for Additional Trauma.** Injuries should be treated using other appropriate protocols.

~~~~~~**AEMT CARE**~~~~~~

I. If significant burn or respiratory distress:
   1. If shock syndrome is present and BP is less than 90 mm/Hg, follow Shock protocol.
   2. Start a minimum of one large bore IV-IO line. Start the line as far from the burn as possible, but if necessary, the IV/IO may be started through the burned tissue.

J. Initiate fluid resuscitation with 1 L BSS IV, wide open if pulmonary edema is <u>not</u> present; monitor lung sounds.

K. Cardiac Monitoring.

~~~~~~ **EMT-I/RN CARE**~~~~~~

L. If there is no respiratory compromise, pain relief may be managed with:
   1. Morphine Sulfate 2.0-5.0mg IV/IO/IM every 3-5 minutes PRN, NMT 20 mg
   2. Fentanyl - 25 - 50 mcg IV/IO/IM every 3-5 minutes PRN, NMT 200 mcg.
   3. Consult OLMC for additional dosage if needed

M. Monitor respiratory status closely

~~~~~~ **EMT-P CARE** ~~~~~~

N. If cyanide toxicity is suspected based on findings of smoke inhalation (soot in mouth, nose, oropharynx, etc.) and patient is comatose, in cardiac or respiratory arrest, or has persistent hypotension despite fluid resuscitation:
   1. Administer Cyanokit® 5 gram IV/IO as an infusion over 15 minutes and monitor for clinical response.
   2. Contact OLMC for advice regarding second 5 gram dose.
   3. If Cyanokit® is not available, then administer Sodium Thiosulfate 50 mL of 25% solution IV/IO over 10 - 20 minutes.
   4. Hydroxocobalamin (Cyanokit®) and sodium thiosulfate may be administered to the same patient but NOT simultaneously.

NOTE:
Consider intubation early in high risk patients. See ***Rapid Sequence Intubation*** Protocol.

II. ELECTRICAL BURNS

NOTE:
- **USE CAUTION: PROTECT YOURSELF!**

A. Electrical burns are frequently more severe than they appear; remember that deep injury is predominant.

B. All electrical burn patients should have cardiac monitoring and IV, BSS for drug route.
~~~~~~

III. CHEMICAL BURNS

NOTE:
- **USE CAUTION: PROTECT YOURSELF!**

A. Unless specifically advised otherwise, all chemicals should be washed with copious amounts of water.
B. Dry powder chemicals should be brushed off first, then flushed.
C. Caustic burns of the eye should be immediately rinsed with the cleanest water available.
D. If available, get MSDS for industrial chemicals; follow MSDS recommended procedure.
E. Contact poison control at 1-800-222-1222.

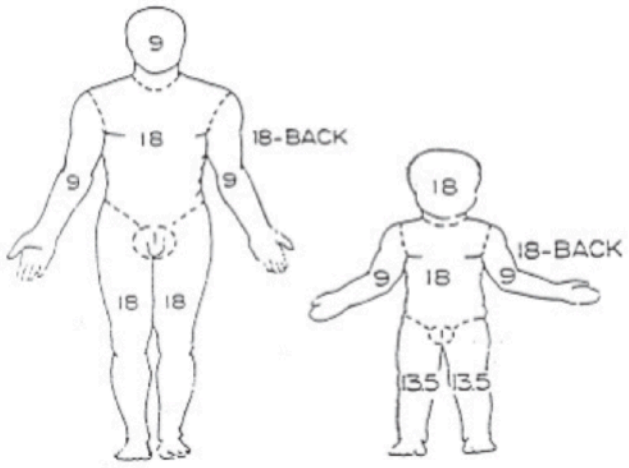
PEDIATRIC CONSIDERATIONS:
1. Consider child abuse in pediatric burns (especially burns that show a specific pattern such as partial immersion).
2. Fentanyl dose for children <40 kg: initial dose 1-2 mcg/kg, repeat 0.5- 1 mcg/kg every 3-5 minutes as needed, NMT 4 mcg/kg. If > 40 kg follow adult dosing.
3. Contact OLMC for further doses.

IV. Estimating Burn Area

A. Palm Size: The patients palm size represents approximately 1% of body surface, and may be used to estimate burn area of a patient.

B. **Rule of Nines:** In adults, most areas of the body can be divided roughly into portions of 9 percent, or multiples of 9. This division, called the "Rule of Nine's," is useful in estimating the percentage of body surface damage an individual has sustained in burn. In the small child, the head takes relatively more area. (See diagram below)

:



CHEST PAIN

NOTE:
- ❖ Non-traumatic chest pain in any patient ≥ 40 yo should be treated as cardiac in origin until proven otherwise, and should be considered in patients < 40 yo with typical symptoms.
- ❖ Chest pain associated with shortness of breath, diaphoresis, vomiting, previous cardiac disease, and/or hypotension has a frequent association with myocardial ischemia.
- ❖ For all patients with presumed cardiac chest pain, complete the Chest Pain/STEMI checklist and transfer paperwork with patient.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Place patient in position of comfort.
B. Administer supplemental oxygen via nasal cannula at 2 - 4 liters/minute. Titrate to SaO_2 ≥95%.
C. Give patient 4 (81 mg each) chewable baby aspirin (ASA) if the patient has not already taken ASA today and has no allergies to ASA or NSAIDS.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

D. Consider additional oxygen by mask if the patient is in respiratory distress, has an irregular pulse, a decreased level of consciousness or oxygen saturation of <95%.
E. Monitor Oxygen saturation.
F. EMT-Basics may assist a patient with his/her own nitroglycerin under the following circumstances:
   1. The Nitroglycerin is prescribed to the patient by his/her own doctor. The EMT **cannot** give a patient Nitroglycerin from the ambulance supply.
   2. The patient has taken less than 3 Nitroglycerin with this episode of chest pain.
   3. The patient is conscious and alert
   4. Blood pressure must be >100 systolic.

   If the chest pain persists and the above circumstances do not change, the EMT may assist the patient with up to a total of 3 Nitroglycerin: 0.4 mg SL q 5 min PRN NTE total 3 doses
G. If patient is unstable, or having persistent pain suspicious for acute coronary syndrome, call for intermediate backup.
H. If available, run 12-lead ECG strip for intercepting EMS unit or transmit to OLMC if so equipped.
I. Complete Thrombolytic Checklist. (See page 40).

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**AEMT CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

J. IV, Balanced Salt Solution TKO or saline lock.
K. Cardiac Monitor
L. For agencies with capability, perform 12-lead ECG.
   (Target is within 5 minutes of patient contact).
M. If machine reads:

*******ACUTE MYOCARDIAL INFARCTION******
or
*******MEETS ST ELEVATION MI CRITERIA******

Activate Lifeflight to initiate STEMI treatment. Consultation with OLMC is not required.

If still suspicious for MI, but EKG does not confirm, contact OLMC, speak directly with on duty physician and relay:
1. Leads with elevation
2. mm of elevation
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

3. Fax or email EKG to OLMC if possible.
4. If estimated transport time to closest medical facility exceeds 30 minutes, or if directed by OLMC, arrange for intercept with aeromedical transport.
5. Complete the STEMI checklist.

N. Check bilateral B/P if suspected dissecting aortic aneurysm.

O. Nitroglycerin 0.4 mg SL q 5 min PRN NTE 3 doses as long as systolic B/P>100 *and no history of erectile dysfunction meds in last 48 hours*.
1. Observe the patient closely for hypotension.
2. If IV attempt is unsuccessful, admin. NTG SL then reattempt IV.
3. If hemodynamically unstable an IO may be considered.
4. If systolic B/P remains >100 and chest pain continues, administer additional doses of nitroglycerin 0.4mg SL [1,2]
5. If the chest pain resolves with SL NTG, but SBP remains >160 mm Hg and/or the DBP is >100 mm Hg, consider application of 1" of nitropaste to ACW (anterior chest wall).

~~~~~~ **EMT-I/RN/EMT-P Care** ~~~~~~

P. Morphine: 1 - 2 mg every 5 minutes NMT 10 mg IV/IO for ischemic chest pain relief if systolic B/P remains >100.

Q. ST segment elevation greater than 1 mm in two or more contiguous leads:

I Lateral	aVR ?LMCA	V_1 Septal	V_4 Anterior
II Inferior	aVL Lateral	V_2 Septal	V_5 Lateral
III Inferior	aVF Inferior	V_3 Anterior	V_6 Lateral

Activate Lifeflight to initiate STEMI treatment. Consultation with OLMC is not required.

A. If Lifeflight is unavailable transport to local ER.

B. If no ST segment elevation or unable to determine, continue to treat per chest pain protocol and transport to local ER.

C. Consultation of OLMC ED physician may be utilized at any time if STEMI is a consideration.

D. If patient is allergic to MS consider equal 25 – 50 mcg Fentanyl IV/IO.

E. For hypotension/cardiogenic shock, see Shock protocol

Pediatric Patients:
- ✦ Consider Trauma or pleuritic causes
- ❖ Contact OLMC for advice if severe pain

[1] Nitroglycerin is indicated for the patient suspected to have cardiac chest pain. If the patient has chest wall tenderness (pain with palpation), or pain with inspiration or expiration (suspicious of chest wall or lung pain), consider not administering Nitroglycerin.

[2] Nitroglycerin may be given a total of three times at 3-5 minute intervals as long as the B/P remains >100, determined by obtaining vital signs after each administration.
~~~~~~

CEREBROVASCULAR ACCIDENT (CVA)/STROKE

NOTE:
- ❖ Cerebrovascular accidents (CVA or stroke) are relatively common neurovascular events, which can present with a range of neurologic signs and symptoms.
- ❖ Do not treat hypertension or administer aspirin to patients with suspected stroke
- ❖ This protocol does not apply to patients with traumatic brain injury. See **Trauma Protocol**

- ❖ Acute Stroke Interventions include Thrombolytics (TPA) which can be administered up to 4.5 hours from LKN (Last Known Normal), and interventional radiology for thrombectomy in LVO (Large Vessel Occlusion) stroke up to 24 hours after LKN
- ❖ The PPSS (Portland Prehospital Stroke Screen) is useful in assessing whether symptoms may be due to a stroke that would be eligible for thrombolytics if administered within 4.5 hours of the onset of symptoms.
- ❖ The C-STAT is used to determine if the stroke is due to LVO occlusion. These strokes cause severe and often debilitating symptoms, and may benefit from treatment by thrombectomy up to 24 hours after onset of symptoms.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Perform primary survey.
B. If patient has altered mental status, treat per Altered Mental Status Protocol.
C. Protect airway, as loss of gag reflex is common. If LOC is decreased and injuries don't contraindicate it, place patient on his/her side in the recovery position. If LOC is not decreased, patient can be kept in a seated position. Avoid laying patient flat if possible since this may increase risk of aspiration. Suction as required.
D. If hypoxemic, administer oxygen per nasal cannula 2-4 L/min. Titrate to SaO_2 ≥95%.
E. Assist ventilation as necessary.
F. Maintain verbal contact and be reassuring. Although the patient may not be answering, or may appear confused, he/she may comprehend what is happening.
G. Try to ascertain the time of onset acute change in neurologic changes or last known normal (LKN)
H. Protect affected limbs from injury.
I. Allow patient to seek position of comfort.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

I. Check blood glucose via finger stick. If BG level is <60, treat per Diabetic Emergency protocol. Avoid inducing hyperglycemia as this may worsen injury to brain.
J. Note and document changes in the patient's level of consciousness and vital signs.
K. Assess for signs of stroke:
    1. Perform PPSS (Portland Prehospital Stroke Screen) - see following pages
    2. If PPSS is positive, continue to C-STAT (Cincinnati Stroke Triage Assessment Tool) evaluation for LVO (Large Vessel Occlusion) stroke - see following pages
L. Obtain 12-lead EKG to look for signs of ACS

PPSS: Portland Prehospital Stroke Screen			
1. Age over 45 years	Yes	No	
2. No prior history of seizure disorder	Yes	No	Unknown
3. New onset of neurologic symptoms in last 24 hours	Yes	No	Unknown
4. Patient was ambulatory at baseline (prior to event)	Yes	No	Unknown
5. CBG between 60 & 400	Yes	No	Unknown
NEUROLOGICAL EXAMINATION	**Normal**	**Abnormal**	
FACIAL SMILE/GRIMACE (ask patient to smile/show teeth) **Normal:** both sides of face move equally well **Abnormal:** one side of face does not move as well as the other	Yes	Right	Left
ARM DRIFT (patient closes eyes and holds both arms out palms up) **Normal:** both arms move the same or do not move at all **Abnormal:** one arm does not move or drifts down compare to other	Yes	Right	Left
HAND GRIP (have patient squeeze both hands simultaneously) **Normal:** equal grip strength **Abnormal:** unequal grip strength	Yes	Right	Left
SPEECH (have patient repeat "*You can't teach an old dog new tricks"*) **Normal:** no difficulty repeating **Abnormal:** patient has difficulty finding words, speaks in long meaningless sentences, and/or cannot understand or follow simple verbal instructions	Yes	Difficulty with speech	
If questions 1-5 are all answered "Yes" or "Unknown" and at least 1 of the 4 neurological examination findings are abnormal the patient is considered to have a POSITIVE screen. **Continue to C-STAT evaluation on following page**			

C-STAT: Cincinnati Stroke Triage Assessment Tool		
	POINTS	**DEFINITION**
GAZE		Ask patient to follow an object with eyes to left and right
Normal	0	Both eyes track together in both directions
Abnormal	2	Unable to look in certain direction with both eyes
ARM WEAKNESS		Ask patient to hold arms in front at shoulder height
Normal	0	Can hold up arm(s) for 10 seconds
Abnormal	1	Cannot hold up arm(s) for 10 seconds
LEVEL OF CONSCIOUSNESS		LOC Questions - What month is it? How old are you? LOC Commands - Open your eyes. Make a fist.
Normal	0	Correctly answers both LOC questions OR follows both commands
Abnormal	1	Incorrectly answers at least one of two LOC questions AND does not follow at least one of two commands
*****C-STAT Positive is defined as a score ≥ 2*****		

M. Activate Stroke System if indicated for rapid transport to nearest comprehensive stroke center.

Time of Onset/LKN	PPSS	C-STAT	Action
0-4 hours	Positive	Positive or negative	Transport fastest mode (ground or air) to nearest ASRH
4-24 hours	Positive	Positive	Activate Aeromedical for transport to TSC
4-24 hours	Positive	Negative	Transport to nearest ASRH
Unknown onset, LKN < 24 hours	Positive	Positive	Activate Aeromedical Transport to TSC
Unknown onset, LKN < 24 hours	Positive	Negative	Transport to nearest ASRH
Any time of onset	Negative (but still have suspicion for CVA)	Positive or negative	Transport to nearest ASRH

ASRH = Acute Stroke Ready Hospital with CT and thrombolytic capability (e.g. MCMC, PHRMH)
TSC = Thrombectomy Capable Stroke Center (e.g. OHSU, PPMC, SCHC…)

N. Transport patient with head of bed elevated 15 - 30° to prevent aspiration.
O. Notify ED ASAP of inbound Stroke Alert

(Continued on following page)

P. Complete **Thrombolytic Checklist** if time permits (see following page)

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~

O. Start an IV of BSS, TKO or saline lock.
P. Monitor cardiac rhythm.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Q. Administer 100 mg Thiamine IM/IV/IO if history or presentation indicates either a history of ETOH abuse or malnutrition.

THROMBOLYTIC CHECKLIST

(Use for Chest Pain or Suspected CVA)
Patient Name: _____ EMS Run Number: _____
Age: _____ Date of Birth: _____ Sex: ____ M ____ F

Time of onset of symptoms: _____

Have you ever had thrombolytic therapy before? ____ Yes ____ No
If yes, when? _____

Do you have hypertension? ____ Yes ____ No

Have you ever been told you have an ulcer? ____ Yes ____ No

Have you ever had bleeding in your stomach or intestine? ____ Yes ____ No
If yes, when? _____

Have you ever had a stroke? ____ Yes ____ No
If yes, when? _____

Have you had any trauma to your head in the past 6 weeks? ____ Yes ____ No

Have you had surgery in the past 6 weeks? ____ Yes ____ No

Have you had any trauma in the past 6 weeks? ____ Yes ____ No

Do you have diabetes? _____
If yes, do you have retinopathy? ____ Yes ____ No

EMT Completing Form: _____

Unit: _____ Signature: _____

DIABETIC EMERGENCIES

NOTE:
- ❖ The EMT should check a blood glucose (BGL) analysis before beginning treatment if time and condition of patient allows.
- ❖ If a diabetic patient has altered mental status and the EMT is unable to determine whether or not the patient is hypo or hyperglycemic, the hypoglycemia protocol should be followed.
- ❖ Hyperglycemia may complicate or worsen a number of medical conditions (i.e., myocardial infarction, stroke)
- ❖ It is important to determine whether the patient may have taken an accidental or intentional overdose of insulin or oral hypoglycemic agent. If overdose suspected, attempt to document the name and amount of all medications involved and time of ingestion.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Administer oxygen 2 - 4 L/min via nasal cannula, titrate to SaO_2 ≥95%.
B. If the patient is unconscious but does not require aggressive airway care or ventilation during transport, place him/her in the recovery position; on side, knees drawn up, opposite arm under head. If the patient is conscious, transport in position of comfort.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

C. Check the patient's blood glucose level via finger stick.

I. **HYPOGLYCEMIA** --TREATMENT (BGL < 60)
A. If the patient is fully conscious, give oral glucose.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

B. Start a large bore IV, saline lock.
C. If the patient has a BGL < 60 **and altered mental status**, administer Dextrose IV/IO. **$D_{10}W$ solution is preferred,** (5 ml/kg or 0.5 gm/kg) but can give D_{50} (10 ml)[1] over 2-3 minutes in a patent, free flowing IV. **Precautions:** Extravasation of dextrose 50% will cause necrosis of tissue.
D. If the patient's condition does not improve, or improves but he/she does not become fully conscious, the dextrose may be repeated after 10 minutes if a second glucose level test shows the patient to be hypoglycemic.
E. If an IV cannot be established, administer 1 mg Glucagon IM for adults and 0.02 mg/kg pediatrics, NMT 1 mg.
F. Treat other medical/trauma conditions per protocol.

Pediatric:
For infants < 10 kg (birth to 1 year) with BGL < 40 and children 10 kg - 35 kg with BGL < 60 , give dextrose 10% (0.100 g/mL) 5 ml/kg, NTE 25 g.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT-P CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

G. Dextrose may precipitate Wernicke's encephalopathy in Thiamine deficiency patients. Administer 100 mg Thiamine IM/IV if history or presentation indicates either ETOH abuse or malnutrition.

---

[1]See Dextrose Medication sheet for alternative dosing of D5 or D10 dextrose solutions

NOTE:
- ❖ Once treated at the scene, the patient may not wish to be transported. The patient should be encouraged to allow ambulance transport, and if refused, should be encouraged to go to the emergency room or see their private physician. Document well.

DIABETIC EMERGENCIES
(continued)

II. **HYPERGLYCEMIA**--TREATMENT (BGL >300 AND SYMPTOMATIC)

NOTE:
- ❖ Signs and symptoms of DKA (Diabetic KetoAcidosis) or Hyperosmolar Coma can include altered mental status, rapid respirations, shortness of breath, blurred vision, fruity scented breath, nausea/vomiting and abdominal pain
- ❖ $ETCO_2$ values are often low in cases of metabolic acidosis such as diabetic ketoacidosis, primarily due to respiratory compensation.
- ❖ If concern for DKA, avoid intubation unless the patient cannot protect their airway or there is evidence of extreme fatigue with an inability to ventilate or oxygenate. If intubation becomes necessary, the ventilation goal should be to maintain pre-intubation $ETCO_2$ levels.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN/EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Start a large bore IV, balanced salt solution TKO. If B/P is < 90 mm/hg, systolic give 500 ml fluid challenge.
B. If BGL is > 300 and there is no evidence of pulmonary edema, consider a fluid bolus.
C. Apply and continuously monitor $ETCO_2$. If $ETCO_2$ is < 25, notify receiving hospital for potential of a patient in DKA.
D. Treat other medical/trauma conditions per protocol
~~~~~~~~~~~~~~~~~~~~~~~~~~~~

DROWNING/SUBMERSION

I. History
   A. Always consider head or neck injury.
   B. How long was patient submerged?
   C. Approximate water temperature?
   D. Associated Trauma. Did patient jump or dive?
   E. Pertinent medical history
      1. Seizure
      2. MI
      3. Diabetes
      4. Other
   F. Was SCUBA incident involved?

II. Physical Exam
   A. Vital signs. (If absent see Cardiac Arrest Protocol)
   B. Temperature to monitor for Hypothermia
   C. Breathing
      1. Respiratory distress - tachypnea, increased work of breathing
      2. Initial presence of crackles as sign of pulmonary edema
      3. Ronchi as sign of aspiration
      4. Monitor for changes during transport.
   D. Head or neck injury
   E. Neurologic Status: Record and monitor mental status continuously.

III. Treatment

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Clear airway
B. Unknown or traumatic event; stabilize neck prior to removing patient from water.
C. If conscious and no respiratory distress administer high flow oxygen.
D. If unconscious or respiratory distress perform positive pressure ventilation and prepare to aggressively suction
E. If patient is in cardiac arrest see Cardiac Arrest Protocol
F. Treat shock per Shock Protocol.
G. Treat hypothermia per Environmental Emergencies Protocol

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

H. If unconscious consider use of PEAD or SGA.
I. If patient is conscious and in severe distress, consider CPAP.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~

J. Establish large bore IV, 2 if possible.
K. Place monitor for ECG.
L. Treat dysrhythmia per ACLS Dysrhythmia Protocol

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT-P CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

M. Consider use of RSI protocol for intubation.
N. If patient is intubated place nasal gastric tube per protocol
O. For prolonged submersion, contact OLMC to consider termination of resuscitation

ENVIRONMENTAL EMERGENCIES

I. COLD INJURIES

A. Frostbite
1. Do not rub affected areas
2. Protect frostbitten areas from further damage.
3. Do not allow re-warming of affected tissue if there is any chance for refreezing. Major extremity frostbite should be re-warmed only at the hospital.

B. Hypothermia

NOTE:
❖ The severely hypothermic patient must be handled very gently.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. Perform primary survey and include temperature assessment if possible.
2. Alternative methods for determining respiratory status may be needed, such as holding polished metal or glass under the nostrils.
3. Monitor patient for 60 seconds before determining pulselessness.
4. Provide supplemental oxygen via non-rebreather mask or assisted ventilations.
5. Patient may appear to be lifeless and a pulse may not be felt. If ALS personnel are immediately available, establish EKG monitoring before beginning chest compressions. Support ventilation as necessary.
6. Begin passive external re-warming.
   b. Remove wet clothing.
   c. Dry the patient well.
   d. Wrap patient in warm, dry blankets.
   e. Give warmed humidified oxygen by mask if available.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

7. Start IV/IO of balanced salt solution and run wide open unless pulmonary edema is present.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT-P CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~

8. Intubate only if LOC is decreased with GCS ≤8. **Perform intubation gently.**
9. If body temperature is 86-92:
   a. Follow ALS protocols
   b. Do not repeat medication.
10. If body temperature is < 86:
   a. Intubate gently.
   b. Follow ALS protocols.
   c. Do not use drugs.
   d. Begin CPR only if no organized rhythm.
   e. Defibrillate only 3 times at 200 Joules biphasic, 360 Joules monophasic.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

II. HEAT INJURIES

A. Heat Exhaustion/Heat Cramps

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. Perform primary survey and include temperature assessment if possible.
2. Move patient to cool environment. Remove excess clothing, apply cool compress to extremities and forehead. Open windows, fan patient, etc. Do not cool the patient to the point of shivering.
3. Give cool liquids orally if the patient is fully conscious and alert.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN/EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

4. Apply cardiac monitor.
5. If patient is unable to take liquids orally or if signs of shock are present, start IV of balanced salt solution and run wide open. Monitor the patient for signs of pulmonary edema.

Firefighter Dehydration in the field treatment:
A firefighter who becomes dehydrated in the field may be administered up to 2 liter Normal Saline intravenously while vitals, LOC, cardiac monitoring and temperature are monitored. If no improvement is noted, transport immediately. If the patient remains stable, they are to be seen in the hospital emergency room for evaluation as soon as time permits.

B. Heat Stroke

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. Perform primary survey and include a temperature assessment if possible.
2. Manage airway as needed. Give oxygen by mask; increase oxygen if indicated by patient's respiratory status or SaO_2. Manual ventilation if indicated.
3. Move patient to cool environment. Remove excess clothing. Begin aggressive cooling measures including covering the patient with wet sheets, utilizing fans or open windows to circulate air and applying wrapped cold packs to axilla and groin.
4. If unconscious, treat per ***Altered Mental Status*** Protocol.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

5. Apply cardiac monitor.
6. Start IV/IO of Balanced Salt Solution.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT-P CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

7. Treat seizures as per the seizure protocol.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

EPISTAXIS (NOSEBLEED)

NOTE:
- ❖ It is difficult to determine amount of blood loss with epistaxis, bleed may be occurring posteriorly.
- ❖ Posterior epistaxis can be a true emergency requiring advanced ED techniques such as balloon tamponade or interventional radiology.
- ❖ Detailed medication hx should be obtained to include the use of NSAIDS, aniplatelets, or anticoagulants medications that may contribute to bleeding.
- ❖ For patients on home oxygen place the nasal cannula pointing into the patients mouth while the nares are compressed for active bleeding.

I. Physical Exam

A. Document previous episodes of epistaxis, recent trauma, duration of bleed, and noted quantity of bleeding.
B. Evaluate for posterior blood loss by examining the back of the throat.
C. Monitor vital signs closely watching for hypotension and tachycardia.
D. Be prepared for bloody emesis if patient has been bleeding into esophagus and stomach.
E. Do not delay transport with the hope it will self resolve. Often patients have already waited for some time to call for help.

II. Treatment

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR / EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Treat per "General orders for all patients" and use universal precautions.
B. Place patient in position of comfort and have them tilt head forward.
C. Compress nose with direct pressure or approved nose clamp device.
D. If signs of shock appear follow "Shock" protocol and call for ALS assistance.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

E. Establish large bore IV, 2 if possible. Follow shock protocol.
F. Bolus with BSS to achieve target SBP of 90 mmhg or MAP of 65 mmhg. Monitor for signs of pulmonary edema.
G. Place monitor for ECG.
H. Treat dysrhythmia per ACLS Dysrhythmia Protocol.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT-P CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

I. For persistent bleeding not controlled by direct pressure:
   A. Have patient blow nose to expel clots.
   B. Oxymetazoline hydrochloride (Afrin) 2 sprays to each affected nostril followed by direct pressure.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

FIREFIGHTER/EMT POISON OAK EXPOSURE

NOTE:
- ❖ The goal of this protocol is to review the current science for prevention and treatment of, and allow for early treatment after occupational exposure to poison oak (urushiol).
- ❖ Urushiol is the allergenic substance in poison ivy, poison oak, and poison sumac. Fifty percent of people will react to this when contacted. Most children over the age of eight years are sensitized, but allergic responsiveness appears to wane with age.
- ❖ Exposure to bruised or broken plant parts allows the toxic oil to contact skin, fingernails, clothing, pets, tools, or other objects. Intact plant parts generally do not cause dermatitis. However, plants are easily damaged by rubbing, rain, or dry fall weather.
- ❖ Poison ivy dermatitis is a classic type IV hypersensitivity (cell-mediated) allergic reaction. The allergens quickly penetrate the epidermis, where they are taken up and processed by cells, provoking an allergic response.
- ❖ Intense pruritus (itching) and erythema (redness) are the most common signs. Patients then develop papules or plaques, vesicles, and/or bullae, (small or large blisters) often arranged in characteristic linear or streak-like configurations where a portion of a plant has made contact with the skin
- ❖ Symptoms develop within 4 to 96 hours after exposure and peak between 1 and 14 days New lesions can present up to 21 days after exposure in previously unexposed individuals. Lesions present in different locations at different times after exposure based upon the amount of urushiol present and the skin thickness of the involved areas. This can give the impression that the poison ivy is spreading from one region to another. Blister fluid is not antigenic or contagious, however.
- ❖ Left untreated, the dermatitis usually resolves in one to three weeks.
- ❖ The most common complication is secondary bacterial infection of the skin

~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR/EMT/AEMT/EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~

A. The most important and effective treatment for poison ivy dermatitis is identification and avoidance of toxic plants and related allergens
B. Barrier creams are topical preparations that are applied prior to exposure to a contact allergen in an attempt to prevent the development of dermatitis. Organoclay compounds (Ivy Block) appear to be more effective barriers than other preparations. These have to be washed off and reapplied frequently (every 4 - 8 hours)
C. After a known exposure, patients should remove any contaminated clothing and gently wash the skin with mild soap and water as soon as possible. Fingernails should be washed carefully to remove resin that may remain under the nails. Vigorous scrubbing is not useful and can exacerbate impending dermatitis.
D. Clothing, tools, or other items that may have come in contact with the oleoresin also should be washed with warm, soapy water prior to reuse.
E. An oil-removing compound (eg. Goop), topical surfactant (eg. Dial ultra dishwashing soap) or chemical inactivator intended to prevent urushiol dermatitis (eg. Tecnu) may all be useful in removing the oil from the skin if applied within 8 hours of exposure, before the rash has developed. These may still be helpful after rash has developed to remove urushiol that hasn't been taken up by skin cells, but once urushiol is taken up by cells, these are no longer effective.
F. Topical symptomatic therapy — Soothing measures such as oatmeal baths and cool, wet compresses are anecdotally helpful. Topical treatment with compounds containing menthol and phenol (calamine lotion) may also provide symptomatic relief. Topical astringents such as aluminum acetate (Burow's solution) or aluminum sulfate calcium acetate (Domeboro) used under occlusion may be useful to dry weeping lesions.
G. A soap mixture of ethoxylate and sodium lauroyl sarcosinate surfactants (Zanfel) appears to provide benefit in reducing duration and severity of reaction.
H. Topical antihistamines, anesthetics containing benzocaine, and antibiotics containing neomycin or bacitracin should be avoided because of their own allergenic potential.

I. Superpotent topical corticosteroids, such as clobetasol propionate 0.05% cream, are the only topical corticosteroids that can influence the course of poison ivy dermatitis. Low & intermediate potency topical corticosteroids are of little use. High-potency topical corticosteroids should generally not be used on thin skin such as the face, genitals, or intertriginous areas, (groin and armpits) due to the potential for these agents to cause skin atrophy and other adverse effects. However, use of superpotent corticosteroids, even under occlusion, for up to a week on severely involved areas poses little threat for permanent atrophy.
J. Patients with severe dermatitis, particularly involving the face or genital region, may require systemic corticosteroids. EMT's may benefit from contacting their PCP for prescription for oral prednisone (started at a dose of approximately 1 mg/kg/day with maximum initial dose 60 mg/day then tapered over two weeks) which can be dramatically beneficial for the miserable patient. Rebound dermatitis occurs commonly if too short a course is used, but rarely occurs after 2 weeks of treatment.
K. Exposed personnel should contact their doctor early for treatment with topical or systemic corticosteroids if moderate or severe symptoms occur.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

L. Intramuscular injection of corticosteroids is a treatment option for patients who cannot tolerate or comply with administration of oral corticosteroids.
M. Decadron 10 mg IM/PO on Day 1 can be given to a firefighter with severe dermatitis, particularly involving the face or genital region. For severe reactions, a second dose of Decadron 6 mg IM/PO can be administered on Day 3, followed by Decadron 4 mg IM/PO on Day 5.
N. The IM formulation of decadron can be taken orally. Decadron is readily absorbed orally, and peak plasma time is 1-2 hours with oral formulation. IM absorption is variable and can take up to 8 hours to reach peak plasma concentration.
O. Firefighter/EMTs who are given IM/PO Decadron should be counseled prior to treatment regarding the risks of adverse effects (AEs) of systemic steroid use. AEs include skin thinning and purpura, Cushingoid appearance and weight gain, sleep disturbance, and mood changes. Mood disorders, cognitive changes, and, rarely, psychosis may occur in patients on higher doses. Hyperglycemia or new-onset diabetes mellitus is more common in patients with preexisting diabetes or who is already at risk of diabetes (pre-diabetic). Osteoporosis, increased fracture risk, osteonecrosis, myopathy, and, in children, effects on skeletal development and growth. Immunosuppression with increased risk of infection. Patients receiving moderate- to high-dose glucocorticoids should not receive immunization with live virus vaccines. The adverse effects (AEs) of glucocorticoids are usually dose-dependent, and many of the AEs increase with greater duration of therapy.
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GYNECOLOGICAL EMERGENCIES

NOTE:
- ❖ Gynecological emergencies described here are limited to those not involving pregnancy or childbirth.
- ❖ Refer to Obstetric protocols for emergencies involving pregnancy/childbirth.

I. Rape
   A. No need to examine, especially the vagina.
   B. Be sensitive to patients' fears; have female present if possible during treatment and transport.
   C. Don't allow the patient to wash, douche or go to the bathroom
   D. Transport gently and quietly unless patient's injuries indicate the need for more aggressive care.
   E. The EMT doesn't need to investigate the incident; limit questioning to that needed to determine your course of treatment.
   F. DOCUMENT WELL WHAT IS SAID AND WHAT IS SEEN.

II. Vaginal bleeding (other than during pregnancy/childbirth)
   A. Treat for shock/potential shock if indicated. (See **Shock** protocol.)
   B. Treatment may include oxygen, and IV therapy. (See **Shock** protocol.)
   C. Do not insert anything into the vagina; pads may be applied to the vaginal opening to absorb blood.
   D. Be sure and ask the patient about the possibility of being pregnant.

HEREDITARY ANGIOEDEMA

NOTE:
- ❖ Hereditary Angioedema (HAE) is a rare but potentially life threatening condition
- ❖ This protocol applies only to patients who have known diagnosis of HAE and have a supply of ecallantide (Kalbitor) in their possession that can be administered by EMT-P.

I. **Background:**
   A. HAE is a hereditary condition caused by low levels of the plasma protein C-1 inhibitor (C1-INH).
   B. Deficiencies of C1-INH allow unchecked activation of biochemical systems including the classic complement pathway and plasma kallikrein. This results in recurrent episodes of swelling in the hands, feet, face, gastrointestinal tract, genitals and larynx (throat) that can last from two to five days.
   C. Symptoms of potentially life-threatening HAE attacks include:
      1. Dizziness or fainting
      2. Hoarse voice or laryngitis
      3. Throat swelling
      4. Lip, tongue or facial swelling
      5. Shortness of breath
      6. Whistling or wheezing when breathing
   D. These symptoms do not respond to medications such as benadryl, epinephrine or steroids that are used to treat allergic angioedema.
   E. Medications used to treat these attacks involve administration of C1-INH concentrate (Berinert) or blockage of kallikrein.
   F. Ecallantide (Kalbitor) is a kallikrein inhibitor that can be effective in treating life threatening HAE. Potentially serious hypersensitivity reactions, including anaphylaxis have occurred in 3% of patients treated with ecallantide. These reactions occurred within the first hour after dosing. Symptoms of serious reaction may include chest discomfort, flushing, pharyngeal edema, pruruitus, rhinorrhea, sneezing, nasal congestion, throat irritation, urticaria, wheezing and hypotension. Other reactions include pruritus (5%), rash (3%) and urticaria (2%).

II. **Prehospital care of patients with HAE involves monitoring and emergent management of acute airway obstruction.**

~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT/AEMT/EMT-I/RN CARE**~~~~~~~~~~~~~~~~~~~~~~~~

   A. If evidence of airway compromise, follow AIRWAY PROTOCOL.
   B. Monitor vital signs and oxygen saturation.
   C. Transport immediately to closest medical facility
   D. Consider EMT-P intercept for unstable patient or prolonged patient transport times (>30 minutes)

~~~~~~ **EMT-P CARE** ~~~~~~

   E. If patient has signs & symptoms of laryngeal edema, administer ecallantide (Kalbitor)
      1. Three 10 mg (1 mL) subcutaneous injections should be given a minimum of 2” apart, in non-effected area - eg. thigh, arm, abdomen
      2. A second dose can be given in 2 hours if symptoms have not resolved.
   F. Monitor closely for signs of anaphylaxis or serious allergic reaction to ecallantide.
   G. If allergic reaction to ecallantide is noted, follow ALLERGIC REACTIONS protocol.
   H. Transport to closest medical facility to monitor for signs of serious allergic reaction

HYPERKALEMIA

NOTE:
- ❖ Treatment will usually be based on patient history with findings of weakness, bradycardia and hypotension.
- ❖ Renal failure (acute or chronic) may elevate blood potassium levels (hyperkalemia)
- ❖ Dialysis patients who have missed dialysis are the most likely patients to develop hyperkalemia
- ❖ Other patients who are predisposed to hyperkalemia are those who have muscular dystrophy, paraplegia/quadriplegia, crush injury, or patients who have sustained serious burns > 48 hours.

I. General Care - Treat per GENERAL ORDERS FOR ALL PATIENTS.
   A. Obtain pertinent history including past medical history, medications and allergies, trauma, most recent dialysis/missed dialysis
   B. Signs and symptoms of hyperkalemia may include bradycardia, hypotension, weakness, weak pulse, and shallow respirations. This may progress to pulseless arrest with PEA/Asystole
   C. If patient is unconscious/not able to provide history, examination of chest wall, abdomen and forearms for a dialysis catheter or fistula can help raise suspicion of hyperkalemia
   D. If you suspect hyperkalemia based on history, obtain a 12-lead ECG.
      ECG changes that may be present with hyperkalemia include:
      1. Peaked T waves.
      2. Lowered P wave amplitude or no P waves.
      3. Prolonged P-R interval (> 0.20 seconds).
      4. Second degree AV blocks.
      5. Widened QRS complex.

II. TREATMENT - If symptomatic hyperkalemia is suspected based on history and physical findings:

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT/AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

   A. Administer albuterol by nebulizer (2.5 mg in 3 ml) MR up to 4 doses total (10 mg)
   B. Call for ALS intercept

~~~~~~ **EMT-P CARE** ~~~~~~

   C. Administer 10% calcium gluconate 3 gram IV/IO slowly over 10 minutes in a proximal port or large vein.
   D. If no change in rhythm following calcium administration and transport time is prolonged, consider alternate therapy:
      1. Glucose and regular insulin if available and advised by OLMC contact.
      2. Sodium bicarbonate 50 mEq IV

NOTE:
- ❖ DO NOT mix sodium bicarbonate solutions with calcium preparations. Slowly flush remaining calcium gluconate from the catheter prior to administering sodium bicarbonate.

PEDIATRIC CONSIDERATIONS:
A. In a pediatric patient with a pulse, calcium gluconate dose is 10 mg/kg (0.1 ml/kg) IV/IO over 10 mins NMT 10 ml
B. For PEA/Asystole, calcium gluconate dose is 50 mg/kg (0.5 ml/kg) IV/IO over 10 mins

HYPERTENSIVE EMERGENCY OR CRISIS

NOTE:
- ❖ Hypertensive emergency or crisis is defined as hypertension in conjunction with end organ injury, such as pulmonary edema, neurologic deficit, chest pain, or coma.
- ❖ Rapid lowering of the blood pressure is not indicated and may in some cases be harmful
- ❖ Treatment is aimed at producing moderate decrease in BP, not in normalizing BP

I. General Care

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Administer oxygen via nasal cannula at 4 liters per minute.
B. Increase oxygen delivery if patient has respiratory distress, decreased level of consciousness, irregular pulse, or if SaO_2 <95%.
C. Transport patient with the head elevated.
D. If patient has chest pain, follow Chest Pain Protocol
E. If patient has neurologic deficits, follow CVA Protocol
F. If patient is short of breath, follow Respiratory Emergencies Protocol

~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN/EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

G. Cardiac Monitor
H. IV, BSS TKO or initiate a saline lock
I. If SBP remains >160 mm Hg and/or the DBP is >100 mm Hg: Nitropaste - 1" to ACW (Can give SL ntg if nitropaste unavailable)

HYPERTENSIVE EMERGENCY/AUTONOMIC DYSREFLEXIA (AD)

NOTE:
- ❖ Autonomic dysreflexia is an acute, life-threatening syndrome of uncontrolled sympathetic discharge that occurs in patients with spinal cord injury at T6 or higher.
- ❖ This results in increased blood pressure, often accompanied by severe headache
- ❖ AD is under-recognized and difficult to treat even in a hospital setting.

II. Autonomic dysreflexia (AD)

A. Common causes:
1. Bladder - distended, spasming, UTI, stones, urinary catheter insertion
2. Bowel - constipation, fecal impaction, gaseous distension, rectal irritation
3. Skin - ingrown toenail, burns, pressure area, tight clothing
4. Other - any irritating stimulus, i.e.. fracture, menstrual cramping, intercourse, labor

B. Common Signs and Symptoms:
1. Sudden hypertension (20 - 40 mmHg increase above patients normal BP)
2. Headache
3. Bradycardia
4. Flushing/blotching of skin above the spinal injury level
5. Profuse sweating above the spinal injury level
6. Chills without fever
7. Nasal congestion
8. Blurred vision (2° dilatation of pupils)
9. Shortness of breath, sense of apprehension or anxiety
10. Irritability or combative behavior (especially in patients with impaired cognitive or communication skills.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Ask patient or caregiver if they suspect a cause.
B. Elevate patients head and lower legs. Keep head elevated while moving to cot.
C. Loosen any constrictive clothing such as an abdominal binder or compressive stocking.
D. Check urinary catheter for kinks, plugs or overfull bag.
E. Monitor BP every 5 minutes.
F. Apply oxygen as needed.
G. Avoid pressing over the bladder.
H. Transport patient to nearest hospital.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN/EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

I. Cardiac Monitor
J. IV, BSS TKO or initiate a saline lock.
K. If SBP > 150 with above measures, apply 1” of nitropaste to ACW (anterior chest wall).
L. Continue to monitor BP frequently.

NAUSEA / VOMITING

NOTE:
- ❖ Protect patients airway at all times.
- ❖ Assess for complaint of chest pain, pregnancy, abdominal pain or trauma, diarrhea, head trauma, medications and allergies. orthostatic vital signs if indicated and evaluate for evidence of vomiting blood or bile, or signs of shock

~~~~~~ EMR/EMT CARE ~~~~~~

A. Have suction ready and available
B. If possible, place patient in position of comfort.
C. If patient is on back board, roll patient and backboard onto side.
D. Consider offering patient an isopropyl alcohol swab or other aroma therapy and allowing the patient to self-administer by inhalation. Emphasize slow deep inhalation. May be repeated up to 2 times (total of 3 administrations)
E. Monitor vital signs as possible.

~~~~~~ AEMT CARE ~~~~~~

F. Consider IV, BSS TKO or saline lock.
G. Consider bolus with BSS in patients exhibiting signs of dehydration to achieve target SBP of ≥ 90 mmHg
   1. Adult - give 500 ml fluid bolus. May repeat to maximum of 3 L NS
   2. Pediatric - 20 ml/kg up to 60 ml/kg
   3. Neonate - 10 ml/kg if less than 6 months old

~~~~~~ EMT-I/RN CARE ~~~~~~

H. Administer anti-emetic:
   1. Zofran (ondansetron):
      4 mg IM or slow IV over 2 min or
      4 mg Zofran (odt) quick dissolving tablet placed on tongue.
      Repeat in 10 min if no relief, NMT 8 mg

~~~~~~ EMT-P CARE ~~~~~~

I. If no relief of nausea after 10 minutes may administer:
   1. Haloperidol 1.25 mg IV/IM - If the patient states that ondansetron was not effective for them in the past, or suspicious of cannabis hyperemesis syndrome, consider Haloperidol first. **OR**
   2. Droperidol (Inapsine) 0.625 mg IV/IO. (0.625 mg = 0.25 ml)

SEE FOLLOWING PAGE FOR PEDIATRIC DOSING

PEDIATRIC DOSAGES:

***Ondansetron (Zofran)

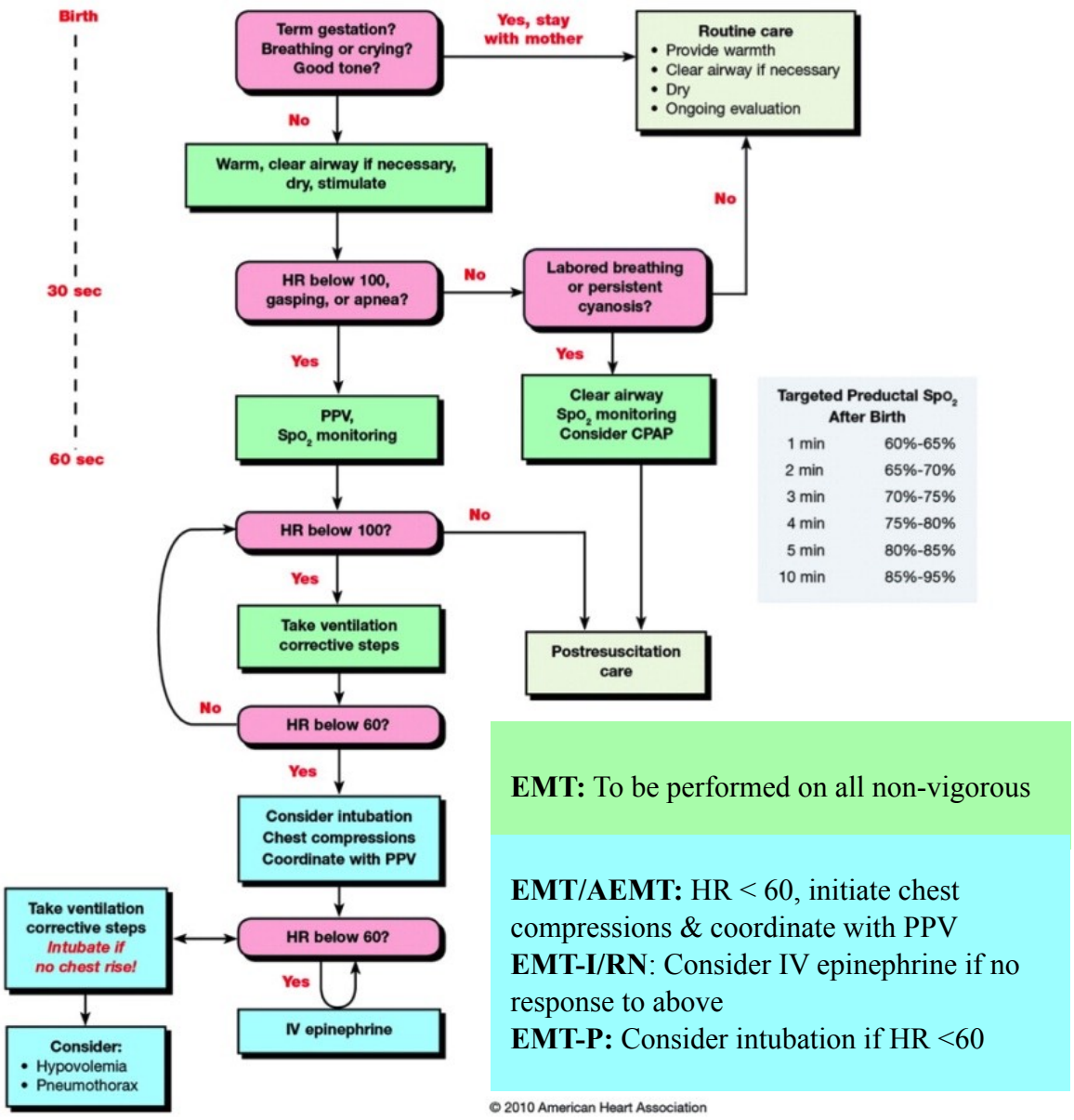
1. If ≥ 2 years of age
   4 mg ondansetron (Zofran) orally dissolving tablet or
2. If 6 months - 2 years of age
   2 mg ondansetron (Zofran) orally dissolving tablet
3. If >2 months of age
   0.1 mg IV/IO/IM to max dose of 4 mg
4. If < 2 months of age, do not give ondansetron

***EMT-I/RN/EMT-P

NEONATAL RESUSCITATION

NOTE:

- ❖ Only about 10% of newborns require some kind of assistance, and only 1% need major resuscitative efforts to survive
- ❖ An infant may need resuscitation if intrapartum risk factors for asphyxia are present (prolapsed cord, painful bleeding, prolonged rupture of membranes, maternal fever, multiple births, abnormal presentation, maternal hypo / hypertension or seizure).
- ❖ **Do not use Atropine in neonatal resuscitation.** Bradycardia in the newborn is usually a result of asphyxia and will reverse with appropriate resuscitation.
- ❖ If available, use an ECG to monitor baby's heart race to determine response to resuscitation.
- ❖ If infant remains depressed despite appropriate resuscitation, **check blood glucose**.



EMT: To be performed on all non-vigorous

EMT/AEMT: HR < 60, initiate chest compressions & coordinate with PPV
EMT-I/RN: Consider IV epinephrine if no response to above
EMT-P: Consider intubation if HR <60

** Epinephrine 1:10,000 - 0.01 mg/kg = (0.1 ml/kg) IV/IO

Meconium Aspiration:

Meconium-stained amniotic fluid may indicate fetal distress and increases the risk that the baby will require resuscitation after birth. Previously the Neonatal Resuscitation Guidelines recommended routine endotracheal intubation and suction for non-vigorous babies born through meconium-stained amniotic fluid. **Routine intubation is no longer recommended** because current research does not demonstrate a benefit from this practice.

- **Meconium-stained fluid and a vigorous newborn:**
  *If the baby is vigorous with good respiratory effort and muscle tone, the baby may stay with the mother to receive the initial steps of newborn care. Simply use a bulb syringe to gently clear meconium-stained secretions from the mouth and nose.
- **Meconium-stained fluid and a non-vigorous newborn:**
  *If the baby has depressed respirations or poor muscle tone, use a bulb syringe to clear secretions from the mouth and nose.
  *If the baby is not breathing or the heart rate is less than 100 bpm after the initial steps of resuscitation are completed, proceed with PPV and proceed with routine resuscitation
  ****Consider intubation if infant's heart rate is < 60 bpm. Intubation will not be required for all infants who are depressed and have passed meconium.
  ****If the baby's condition has not improved and you have not been able to achieve chest movement despite all the ventilation corrective steps and a properly placed endotracheal tube, there may be thick secretions obstructing the airway. A meconium aspirator may be used to suction the trachea:
  1. Attach the endotracheal tube to a meconium suction adapter (or use a specially designed meconium aspiration catheter/Endotracheal tube such as a neovac type device)
  2. Apply suction for 3-5 seconds and continue as the tube is slowly withdrawn
  3. Repeat as necessary until the airway has been cleared sufficiently to achieve effective ventilation.

  *=EMT ** = AEMT ***= EMT-I/RN **** = EMT-P

OBSTETRIC EMERGENCIES

NOTE:
- ❖ Obstetric emergencies are those, which are directly related to pregnancy, labor and immediate postpartum care.
- ❖ External perineal exam should be performed when appropriate, but no vaginal exam should be performed.

HISTORY:

A. Estimated gestational age (EGA)
B. Estimated due date. (EDC)
C. Last menstrual period (LMP)
D. Previous pregnancies (gravida x).
E. Number of births, include any fetus carried longer than 20 weeks, even if "born dead" (para x, includes each of twins, triplets, etc.)
F. If previous births, were they natural births or C-sections?
G. Were there any complications with previous pregnancies or deliveries?
H. If currently under medical care and by whom.
I. When did she last see her physician?
J. Any known problems with this pregnancy.
K. Any recent trauma.
L. Last oral intake

I. NORMAL CHILDBIRTH

NOTE:
- ❖ Labor and delivery is rarely an event requiring active intervention by EMS personnel. Calm, supportive care is usually all that is required.

~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Place patient in L. lateral decubitus position
B. Administer Oxygen

~~~~~~EMT CARE~~~~~~

C. Use sterile or clean technique
D. If the patient is about to deliver, remove clothing from the mother's lower body.
E. The EMT should wear eye protection and sterile gloves.
F. Place a sterile sheet under the patient's buttocks with patient in semi-fowler's position.
G. Delivery may be considered imminent if contractions are consistent and < 2 minutes apart, the mother feels a need to move her bowels, or if crowning is occurring. If the mother says the baby is coming, believe her.
H. Guide and control, but do not retard or hurry delivery.
I. When head is delivered, check for cord around baby's neck, and gently remove if found.
J. Suction mouth, then nose, with bulb syringe after head is delivered.
K. When body is delivered, keep infant level with perineum.
L. Clamp and cut umbilical cord.
M. Assess and treat ABC's. Follow Neonatal Resuscitation Protocol if indicated.
N. Dry infant with sterile towel. If child does not need treatment, place next to skin on mother's chest for transport. Cover both with a clean, dry blanket to maintain warmth.
O. Document APGAR findings at time of birth and five minutes later.
P. Gently massage mothers' lower abdomen to encourage uterine contraction and prevent excessive bleeding.

APGAR Scoring

Score	0	1	2
Appearance:	Blue, pale	Body pink, extremities blue	Completely pink
Pulse:	Absent	Slow (< 100)	≥ 100
Grimace:	No response	Grimace	Cough or sneeze
Activity:	Limp	Some flexion of extremities	Active motion
Respirations:	Absent	Slow, irregular	Good, crying

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ AEMT/EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Q. Establish IV, BSS, TKO.
R. Treat mother for shock per shock protocol
S. Place monitor
T. Monitor for signs of eclampsia and treat per Eclampsia protocol

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT-P CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

U. If bleeding is heavy to moderate give 500 ml fluid challenge
V. If bleeding is severe, and mother shows signs of shock, consider
    1. Oxytocin - Dose: 10 USP units (20 mg) IM.
W. Transport
    1. Monitor vital signs of mother and infant en route.
    2. Do not delay transport to deliver the placenta.

II. ABNORMAL CHILDBIRTH

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. GENERAL
    1. Transport immediately.
    2. Administer high flow Oxygen to the mother.
    3. Elevate the mother's hips or place her in a knee-chest position for transport.
    4. Contact OLMC for advice.

B. PROLAPSED CORD:
    1. With a gloved hand, gently push the baby up the vagina enough to relieve the pressure the baby's head exerts on the cord.
    2. DO NOT ATTEMPT TO PUSH THE CORD BACK
    3. Assess for the presence of pulse in the umbilical cord.
    4. Cover the exposed cord with a moist dressing.

(continued on next page)

C. BREECH PRESENTATION (buttocks first)

1. If delivery is imminent, prepare the mother as usual and allow the buttocks and trunk to deliver spontaneously, then support the body while the head is delivered.
2. As the body delivers, the head may become lodged in the cervical opening. If the head does not deliver within 1-2 minutes of the body being delivered, the EMT should insert two fingers of a gloved hand into the vaginal opening, providing an airway for the baby.
3. Transport in the knee chest position or with hips elevated.
4. Notify the hospital as early as possible.

D. LIMB PRESENTATION

1. A limb presentation is an indication for immediate transport to the hospital. Delivery should not be attempted in the field.
2. Place the mother in knee-chest position or with hips elevated.

III. COMPLICATIONS NOT ASSOCIATED WITH DELIVERY

A. VAGINAL BLEEDING DURING PREGNANCY
1. Treat for shock as needed
2. Transport patient in a position of comfort (if treatment needs don't contraindicate) or on her left side with her knees bent.
3. Use trauma pads to absorb the bleeding, but do not place anything inside the vagina.
4. Evaluate for potential emergency delivery

B. PLACENTA PREVIA
1. Definition: The placenta is implanted on the uterine wall near or covering the opening (os) of the uterus
2. Presentation:
   a. May not be painful
   b. May cause severe vaginal bleeding, but the blood may be contained inside the uterus.
3. Treatment:
   a. Treat for shock as needed.
   b. Transport patient in a position of comfort if treatment needs don't contraindicate or on her left side with her knees bent.
   c. Use trauma pads to absorb bleeding, but do not place anything inside the vagina.

C. ABRUPTIO PLACENTA
1. Definition: The placenta tears away from the wall of the uterus
2. Presentation:
   a. Abdominal pain
   b. May cause severe vaginal bleeding, but the blood may be contained inside the uterus.
3. Treatment:
   a. Treat for shock as needed.
   b. Transport patient in a position of comfort if treatment needs don't contraindicate or on her left side with her knees bent.
   c. Use trauma pads to absorb bleeding, but do not place anything inside the vagina.

(continued on next page)

D. ECTOPIC PREGNANCY:
   1. Definition: Attachment of the fertilized egg is outside of the uterus. This may be in the fallopian tubes, the ovaries or the pelvic cavity.
   2. Presentation:
      a. Abdominal pain
      b. Vaginal bleeding (may or may not be present)
      c. Shock may occur if ruptured
      d. Usually occurs in 1st trimester, and patient may not be aware of pregnancy
   3. Treatment:
      a. Oxygen, cardiac monitor and emergency transport
      b. Treat for shock as needed.
      c. Use trauma pads to absorb bleeding, but do not place anything inside the vagina

E. SPONTANEOUS ABORTION:
   1. Definition: Expulsion of the products of conception from the uterus before the fetus is viable.
   2. Presentation:
      a. Abdominal pain
      b. Vaginal bleeding
      c. Shock may occur if ruptured
   3. Treatment:
      a. Oxygen, cardiac monitor and emergency transport
      b. Treat for shock as needed.
      c. Use trauma pads to absorb the bleeding, but do not place anything inside the vagina.
   4. Transport any fetal tissue to the hospital with mother.

IV. TRAUMA DURING PREGNANCY:

NOTE:
- ❖ Treat the mother first. The best way to keep fetus viable is to keep mother viable.
- ❖ All pregnant trauma patients should be transported.

A. Standard trauma care including:
   1. Oxygen
   2. Cardiac monitor
   3. Treat for shock as indicated
   4. Transport patient in a position of comfort if treatment needs don't contraindicate or on her left side with her knees bent.
   5. If vaginal bleeding occurs, use trauma pads to absorb the bleeding, but do not place anything inside the vagina.
   6. Evaluate for potential emergency delivery

(continued on next page)

V. ECLAMPSIA/PRE-ECLAMPSIA

A. Definition:
   1. Hypertension ± seizures which may occur in second half of pregnancy or immediate post-partum period.
   2. Also known as Toxemia of Pregnancy.

B. Presentation - may include any of following:
   1. Hypertension
   2. Edema
   3. Headache
   4. Visual disturbance
   5. Seizures
   6. Hyperreflexia
   7. RUQ abdominal pain

C. Treatment:

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. Oxygen, cardiac monitor and emergency transport
2. Treat for shock as needed.
3. An ALS crew should transport any patient having a seizure during a pregnancy. Call for intercept if available.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

4. Start large bore IV, two (2) if possible.
5. Rapid transport with early notification to OLMC

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

6. Magnesium:
   a. Indicated in patient with seizures and hypertension in late pregnancy
   b. 4 gm (40 ml of 10% solution) IV/IO over 4 minutes
7. Benzodiazepines:
   a. Indicated for:
      i. Seizures refractory to magnesium bolus
      ii. Patient with known seizure disorder
      iii. Primary treatment if IV/IO access is unavailable
   b. Versed (midazolam) 2 - 5 mg IV/IM/IO, repeat in 5 min PRN NMT 10 mg.
   c. Ativan (lorazepam) 0.5 – 2.0 mg IV/IM slow push, repeat in 5 min NMT 4.0 mg.
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PAIN CONTROL

NOTE:
- ❖ This protocol is aimed at controlling acute, non-cardiac pain.
- ❖ With the exception of patients who are terminally ill, patients with chronic or frequently recurring pain should not be treated with narcotics in the prehospital setting. Contact OLMC if you have questions.
- ❖ For presumed cardiac pain, see the Chest Pain Protocol.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR/EMT/AEMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. If not contraindicated, place the patient in the position of comfort.
B. Splint and immobilize suspected fractures
C. **Use non-pharmacological pain management whenever possible (i.e., hot/cold pack, elevation, padding, wound care, therapeutic calming and communication).**

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Do not administer narcotic pain medications if any of the following are present:
- ❖ Respiratory distress or O2 saturation of < 90%
- ❖ Altered mental status
- ❖ Systolic blood pressure of < 100 mm/Hg
- ❖ Abdominal pain from traumatic injury

D. Have Narcan (naloxone) immediately available and be prepared to assist ventilations if respiratory depression occurs.
E. Use reduced dosage in elderly.
F. Determine location of pain and severity using numeric scale (1-10) or Faces scale.
G. Obtain a full set of vital signs and pain scale rating prior to and after each administration of pain medication.
H. Pain levels greater than 4/10 can be treated as follows:
   1. Ketorolac - consider for Acute flank/abdominal pain likely secondary to kidney stone or musculoskeletal pain without significant trauma or bleeding. See med sheet for dosing and contraindications
   2. Morphine 2.0 mg IV/IO/IN every 3-5 minutes titrated to pain NMT10 mg
   3. Fentanyl (Sublimaze) 25 - 50 micrograms IV/IM/IO/IN (1 mcg/kg). Repeat with 25-50 micrograms every 3-5 minutes PRN NMT 200 micrograms.
      CAUTION: Fentanyl is approximately 80 times more potent than morphine.
I. Call OLMC for approval if adequate pain control is not achieved with maximum dosage.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT-P CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

J. For isolated hip injuries and back spasms, consider a combination of opioid or non-opioid pain reliever along with 0.5-1.0 mg Ativan (lorazepam) or 1.0 – 2 mg Versed (midazolam), NMT 10 mg MS and 1.0 mg Ativan (lorazepam) or 10 mg MS and 2 mg Versed (midazolam).
K. For severe pain uncontrolled by above measures, Ketamine *Adults* 25 mg IV/IO slow push or 50 mg IM

PEDIATRIC DOSAGES:
A. Fentanyl (Sublimaze) 1 microgram/kg IV/IM/IO/IN. May repeat with 0.5-1 microgram/kg every 3-5 minutes PRN NMT 4 micrograms/kg. Do not exceed adult dosing.
B. For children under 20 kg morphine 0.1mg/kg IV/IO/IM. May repeat every 3-5 min. For children over 20 kg, refer to adult dosages. Do not exceed adult dosing.
C. Ketamine 0.3 mg/kg NMT 25 mg IV/IO over 60 seconds. (*Not approved for use for pain control in patients < 15 yo) ****

PATIENT RESTRAINT - PHYSICAL RESTRAINT

NOTE:
- ❖ Restraint is used to protect the safety of patients and responders.
- ❖ Patient restraint should be utilized only if the patient is exhibiting behavior that is a danger to self or others based on an assessment using the Broset checklist.
- ❖ These patients may include but are not limited to the following:
  1. Alcohol and drug intoxicated patients
  2. Psychiatric emergencies
  3. Combative, head injury patients

~~~~~~~~~~~~~~~~~~~~~~~~~EMR/EMT/AEMT/EMT-I/RN CARE~~~~~~~~~~~~~~~~~~~~~~~~~

I. Physical Restraint

Before applying restraints the Senior EMT must assure that there is adequate manpower available to complete the task safely. If law enforcement or additional manpower is needed, call for assistance prior to attempting restraint procedures. **Do not endanger yourself or your crew.**

A. Assessment: Perform the Broset Violence Assessment Checklist:

Broset Violence Assessment Checklist:	
Confusion	1 point
Irritability	1 point
Boisterousness	1 point
Verbal Threats	1 point
Physical Threats	1 point
Attacks on objects	1 point

Score 0 = Low risk of violence
Score 1-2 = Moderate risk of violence **(preventative measures should be taken)**
Score ≥ 3 = High risk of violence **(physical restraint is required)**

B. Procedure: Use the minimum level of physical restraints required to accomplish patient care and ensure safe transportation (soft restraints or gurney straps may be sufficient).

C. If full restraint indicated:
   1. Place patient face up on backboard, NOT PRONE. Closely monitor the patient's respiratory status.
   2. Secure ALL extremities to backboard. Try to restrain lower extremities first using restraints around both ankles. Next, restrain the patient's arms at his/her sides.
   3. If necessary, utilize cervical spine precautions (tape, foam bags, etc.) to control violent head or body movements.
   4. Secure the backboard onto gurney using additional straps if necessary. Secure additional straps to the upper part of the gurney to avoid restricting the wheeled carriage.
   5. Evaluate the patient's respiratory and cardiac status to ensure that no airway compromise exists. Monitor SaO_2 if possible.
   6. DO NOT tighten chest straps to the point that they restrict breathing.
   7. Once applied, physical restraints should be left in place throughout transport unless removal is necessary for patient treatment. As with application, the restraints should not be removed until there is adequate manpower available to handle the patient.

D. Consider and treat medical causes of combativeness (hypoxia, head injury, hypoglycemia…).

NOTE:
- ❖ Sedative agents may be used to provide a safe method of restraining the violently combative patient who presents a danger to themselves or others and to prevent the violently combative patient from further injury while secured by physical restraints.

II. Chemical Restraint

~~~~~~ **EMT-P CARE** ~~~~~~

A. Assess the possibility of using physical restraints first. (See **Patient Restraint - Physical Restraint Protocol**)
B. Obtain Initial Richmond Agitation Sedation Score (RASS)

Richmond Agitation Sedation Scale (RASS)

Score	Term	Description
+4	Combative	Overtly combative and violent; immediate danger to EMS
+3	Very agitated	Aggressive; verbally and physically uncooperative towards EMS
+2	Agitated	Frequent non-purposeful movement; agitated when touched or moved
+1	Restless	Anxious but movements not aggressive or dangerous to EMS or self
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained awakening (eye opening/eye contact) to voice (≥ 10 seconds)
-2	Light Sedation	Briefly awakens with eye contact to voice (< 10 seconds)
-3	Moderate sedation	Movement or eye opening to voice (but no eye contact)
-4	Deep sedation	No response to voice but movement or eye opening to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

C. Quickly attempt to determine if the patient's agitation is related to substance abuse, alcohol withdrawal, medical or psychiatric problem.
D. As soon as possible to safely do so, consider and treat medical causes of combativeness (hypoxia, head injury, hypoglycemia…).
E. If immediate threat (RASS +3 or +4), administer:
   1. Droperidol 5 mg IM. May repeat once in 10 minutes **OR**
   2. Ketamine - 5mg/kg IM for likely medical or substance abuse **OR**
   3. Midazolam 5 mg IM or Lorazepam 2 mg IM **PLUS** haloperidol 5 mg IM **PLUS** Benadryl 25 mg IM if likely psychiatric issue **OR**
   4. If IV/IO available, can titrate up to:
      a. Droperidol 2.5 mg IV/IO. May repeat once in 10 minutes **OR**
      b. Ketamine 1 - 2 mg/kg IV/IO **OR**
      c. Midazolam 2.5 - 5 mg IV/IO or Lorazepam 1-2 mg IV/IO **AND/OR**
      d. Haloperidol 2 - 5 mg IV/IO **PLUS** Benadryl 25 mg IV/IO
~~~~~~

F. If RASS is ≤2,
   1. Likely psychiatric disorder, consider offering:
      a. Olanzapine ODT 10 mg oral dissolving tablet **OR**
      b. Haloperidol 5 - 10 mg IV/IO/IM
      c. Droperidol 2.5 mg IV or 5 mg IM.
   2. If high likelihood of substance abuse, alcohol withdrawal or post-ictal state, titrate:
      a. Midazolam (Versed) 2 - 10 mg IM/IV/IO/IN
      b. Lorazepam (Ativan) 0.5 – 2.0 mg IM/IV/IO, slow push NMT 4.0 mg
G. Document time of administration and indications for chemical restraint.
H. Establish IV if not already available.
I. Prepare for and frequently monitor for possible side effects including:
   1. Hypotension
   2. Tachycardia
   3. Respiratory depression.
J. If unable to achieve adequate sedation with initial medication, and additional agent is required, titrate cautiously, and monitor very closely for side effects and be prepared to manage airway if needed.
K. Haloperidol may induce Torsades de Pointes in patients with history of prolonged QT or patients taking other QT-prolonging drugs. Monitor patient's ECG and obtain 12-lead if possible. If prolonged QT is present (> 500 msec), contact OLMC
L. Repeat RASS score every 10 minutes and at patient hand off to hospital. Goal is RASS score of 0 to -1.
M. If inadequate response with initial treatment, titrate additional medication every 10 minutes to effect as needed. Haloperidol is preferred for patients with known psychiatric disorders. Benzodiazepines are preferred for patients who are known or suspected to be under the influence of stimulants or other intoxicants, who are in withdrawal, or who are postictal. However if inadequate response to initial treatment, may titrate the following:
   1. Midazolam (Versed) 2 - 10 mg IV/IO or
   2. Lorazepam (Ativan) 0.5 – 2.0 mg IM/IV/IO, slow push NMT 4.0 mg or
   3. Haloperidol 5 - 10 mg IV/IO/IM

Pediatric Dosing:
Midazolam: 1mg/kg IV/IO to a max single dose 5 mg or
2 mg/kg IM/IN to a max single dose of 10 mg ****
*Call OLMC for additional midazolam or other medications

*=EMT ** = AEMT ***= EMT-I/RN **** = EMT-P

POISONING

NOTE:
- ❖ Consider your personal safety! Consider patient decontamination!
- ❖ If the airway/ventilation status of the overdose patient is compromised, consider intubation early except in aspirin overdose when intubation should be avoided unless absolutely necessary. (Paramedics see **Rapid Sequence Intubation** protocol)
- ❖ Refer to other protocols as appropriate.
- ❖ There are multiple classes of oral hypoglycemics, some of which may cause hypoglycemia in overdose. If intentional overdose, bring to ER. If accidental overdose of 1or 2 tablets, home monitoring may be reasonable. Contact Oregon Poison Control: 1-800-222-1222

I. ASSESSMENT
   A. ABC's
   B. Determine product and route of exposure (topical, inhalation, ingestion, injection, etc.). Bring containers and/or product with patient to the hospital if possible.
   C. Establish time of incident or exposure.
   D. Determine or estimate amount of exposure or ingestion.
   E. Establish patient's medical history.
   F. Evaluate severity of patient condition and estimate potential changes.

II. MANAGEMENT
   A. GENERAL
      1. After brief assessment, treat according to appropriate protocol (eg. Coma, Respiratory, Shock).
      2. Contact OLMC or Poison Control at 1-800-222-1222.

   B. TOPICAL EXPOSURE (e.g., alkalis, acids, cyanides, hydrocarbons, caustics, pesticides).

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

PROTECT YOURSELF, WEAR PERSONAL PROTECTIVE EQUIPMENT

1. Wash the contaminated area with large amounts of water. Dry powder agents must be brushed off before washing (see burn protocol).
2. Remove patient's clothing as appropriate **while** washing. Clean patient thoroughly; hair, ears, groin, umbilical area, fingernails, and toenails--but do not abrade skin. Continue flushing for at least 10 minutes.
3. Eyes: Flush continuously and gently with saline or water using a large pouring vessel or an IV bag and administration set for a minimum of 15 minutes. Flushing may continue during transport.
4. Persons handling contaminated patients should take appropriate precautions to protect self, such as disposable gloves, apron or turnouts.
5. Put all contaminated clothes, sheets etc., in a plastic bag, label and transport with patient.
6. Notify the receiving hospital that you are transporting a decontaminated patient. Give them as much pertinent information about the containment and exposure as possible.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

5. Consider starting a large bore IV if:
   a. A large area of skin affected, start IV and treat as per burn protocol.
   b. Organophosphates are involved, start an IV and EKG monitoring.

C. CARBON MONOXIDE (CO) EXPOSURE

NOTE:
- ❖ CO is a colorless, tasteless, odorless gas that competitively inhibits O_2 binding with hemoglobin (Hgb) leading to reduction of O_2 carrying capacity.
- ❖ Toxicity results from hypoxia and inhibition of cellular respiration
- ❖ Patients may present with mild symptoms (e.g. headache, dizziness, nausea) to severe symptoms (e.g. cardiac ischemia, coma, syncope, seizures, loss of consciousness)
- ❖ High flow oxygen can displace CO from the O_2 binding sites
- ❖ Administration of CPAP has been shown to significantly decrease CO-Hgb half-life
- ❖ Hyperbaric Oxygen (HBO) is also used for treatment of severe CO toxicity, but transport should not be delayed to divert to an HBO capable facility since there are few facilities in the PNW with capability to administer HBO and hours/treatment availability is limited

1. Place all suspected CO poisoning patients on CPAP with high flow O2.
2. Apply NRB with nasal cannula if contraindications to CPAP or if patient does not tolerate CPAP.
3. Measure CO level with SpCO monitor when possible. All symptomatic patients or patients with CO reading ≥ 15 should be transported to the nearest hospital.
4. Treat symptoms per appropriate protocol (e.g. 12-lead ECG for suspected cardiac ischemia.)
5. If cyanide poisoning is also suspected, consider obtaining SpCO, if possible, before administration of Cyanokit® since the latter will interfere with the carboxyhemoglobin monitor.

III. INGESTIONS - General Care

A. Contact OLMC or Poison Control at 1-800-222-1222.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. ACTIVATED CHARCOAL, may be administered on the order of medical control or if advised by Poison Control.
   a. Adults----------50gm PO
   b. Pediatric---------1gm/kg PO NMT 50 gm

   Activated charcoal is not effective in the treatment of poisoning from mineral acids, strong bases, fluoride, iron, lithium, potassium, methanol, ethanol or ethylene glycol.

CONSIDER FURTHER INFORMATION FROM TABLE OF TOXIDROMES Page 76.

Pediatric Considerations:
1. Consider possibility of neglect or abuse.
2. Determine blood glucose and follow *Altered Mental Status* Protocol.
* 3. Activated charcoal dose is 1 gm/kg NMT 50 gm.
4. Naloxone dose is 0.1 mg/kg, max 2 mg per dose.
** 5. IV/IO Atropine dose, per OLMC, may be very high in children that have orally ingested organophosphate poisons.

*=EMT ** = AEMT ***= EMT-I/RN **** = EMT-P
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IV. SPECIFIC TREATMENTS OR ANTIDOTES FOR SYMPTOMATIC OVERDOSES:

A. ASPIRIN OR ACETAMINOPHEN:
   1. Activated Charcoal **(EMT)**
      a. If it is less than two hours since ingestion, administer 1 gram/kg
      b. If ingestion involves more than just aspirin and/or acetaminophen contact OLMC for use of activated charcoal.
   2. Avoid intubating aspirin overdoses unless absolutely necessary. If intubation becomes necessary, the ventilation goal should be to maintain pre-intubation EtCO2 levels.

B. BETA BLOCKER:
   1. Consider epinephrine drip at 2 – 10 mcg/min. Titrate to MAP of >65 or HR >50 bpm. **(EMT-P)**
   2. If significant hypotension or bradycardia, call OLMC for consideration of glucagon

C. CALCIUM CHANNEL BLOCKER:
   1. Calcium gluconate, 1-3 g slow IV/IO over 5-10 minutes. **(EMT-P)**
   2. If significant hypotension or bradycardia, call OLMC for consideration of glucagon

D. CHLORINE INHALATION:
   1. Albuterol - 2.5 mg nebulized. **(EMT)**
   2. Dexamethasone - 10 mg IV/IO/IM/PO. **(EMT-P)**
   3. Sodium bicarbonate 8.4% - 2.5 ml via nebulizer. **(EMT-P)**

E. CYANIDE:
   1. Hydroxycobalamin (Cyanokit) is preferred treatment **(EMT-P)**
      a. Adult dose: 5 grams (2 vials) IV, IO over 15 minutes
      b. Children: 70 mg/kg IV, IO over 15 minutes
      c. May repeat dose over 15 minutes to 2 hours NMT 10 grams after OLMC contact.
   2. (Amyl Nitrite can be given if Cyanokit is not available, one capsule (0.3ml) inhale for 30 seconds of every minute.)

F. NERVE AGENTS (GA, GB, GC, GFO, VX): Use Mark I Autoinjector Kit
   1. Atropine 2 mg IM **(EMT)**
   2. Pralidoxime chloride 600 mg IM **(EMT)**
   3. Treat seizures with benzodiazepines per seizure protocol **(EMT-P)**

G. OPIATES: if respirations are depressed:
   A. Naloxone administer 0.4 - 2.0 mg Intranasally. **(EMR)**
   B. Narcan (naloxone) 0.4-2.0 mg IV/IO/IM/SQ/SL/ET Repeat pen NMT 8 mg **(EMT:EMT-P)**
   C. See Altered Mental Status Protocol.

H. ORGANOPHOSPHATES/INSECTICIDES:
   1. Atropine - 2 mg via autoinjector **(EMT)**
   2. Atropine IM/IV/IO **(AEMT:EMT-P)**
      a. Adult dose 2.0 mg;
      b. Children 0.01 - 0.02 mg/kg (0.1-0.2 ml/kg).
      c. Repeat every 5 - 10 minutes until symptoms subside.
   3. Contact OLMC.
   4. Strongly consider HAZMAT activation.

I. TRICYCLIC ANTIDEPRESSANTS:
   1. Sodium bicarbonate - 1 mEq/kg IV/IO for severe arrhythmia's (wide complex tachycardias). **(EMT-P)**
   2. Treat seizures with benzodiazepines per Seizure protocol.
   3. Treat hypotension per Shock protocol.

POISONING
TABLE OF TOXIDROMES

Special Precautions:

1. Inhalation poisoning, **SLUDGE** symptoms (salivation, lacrimation, urination, defecation, gastrointestinal symptoms and emesis), or acid/alkali exposure may be dangerous to rescuers.
2. Do not attempt to neutralize acids or alkalis.

Table 1 Toxidromes:

Toxidrome	***Examples***	***Clinical Features***	***Antidotes***
Sympathomimetic	Cocaine Methamphetamine	Agitation Diaphoresis Hypertension Hyperthermia Tachycardia	Benzodiazapine
Opioid	Heroin Hydromorphone Methadone Oxycodone	Depressed Mental Status Hypoventilation Constricted pupils	Naloxone (Narcan)
Cholinergic (Anti-cholinesterase)	Pesticides • Carbamates • Organophosphates Nerve agents	Muscarinic * Nicotinic ** Central *** (see below)	Atropine Pralidoxime (HAZMAT, OLMC)
Sedative-Hypnotic	Barbiturates Benzodiazepines GHB	Depressed Mental Status Hypotension Hypothermia	Supportive Therapy (NO antidote)
Cardiotoxic Drugs	Beta-blockers Calcium Channel Blockers	Bradycardia Conduction issues Hypotension	Glucagon (OLMC) Calcium (OLMC)
Anticholinergic	Atropine Jimson Weed Scopolamine Diphenhydramine	Delirium Hyperthermia Tachycardia Warm Dry Skin	Physostigmine (ED)
Sodium Channel Blockade	Tricyclic Antidepressants Anti-arrhythmics • Type 1A agents (quinidine, Procainamide) • Type 1C agents (Flecainide, propafenone)	Altered Mental Status Hypotension Seizures Wide-Complex Tachycardia	Sodium Bicarbonate (OLMC)

**Muscarinic symptoms:*
Diarrhea
Urination
Miosis
Bradycardia, Bronchospasm
Bronshorrhea
Emesis
Lacrimation
Salivation, Secretions
Sweating

***Nicotinic symptoms:*
Mydriasis
Tachycardia
Weakness
Hypertension
Hyperglycemia
Fasciculations

****Central symptoms:*
Confusion
Convulsions
Coma

RATTLESNAKE BITES

NOTE:
- ❖ Approximately 25% of rattlesnake bites are dry bites with no envenomation.
- ❖ Most envenomations result in only localized reactions.
- ❖ Prehospital care of patients who have sustained rattlesnake envenomation is supportive.
- ❖ Although still marketed, snakebite extraction kits have been shown to be ineffective and are likely to cause harm to the patient.
- ❖ Oral suctioning of venom is not indicated and may contribute to secondary infection.
- ❖ Subjective findings may include localized pain at site of bite, metallic or rubber taste, thirst, blurry vision, weakness, dizziness or lightheadedness.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. STAY CALM and reassure the victim.
B. Make sure the responsible snake(s) have been appropriately contained and out of danger of inflicting more bites.
C. Lay patient flat and avoid excessive movements.
D. If patient has to walk out, proceed as calmly as possible avoiding unnecessary exertion to help slow circulation of venom.
E. Remove any tourniquets which are causing limb ischemia.
F. Remove any constrictive clothing, jewelry or watches.
G. Clean the wound, control bleeding and apply a clean dressing.
H. Immobilize the bitten extremity at or below the level of the heart.
I. Document the estimated time of envenomation.
J. Assess the area around the bite for evidence of fang marks or localized reaction which is evidenced by edema and/or erythema. If localized is reaction is visible, mark and time the proximal edge of reaction.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~EMT CARE~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

K. Closely monitor vital signs and assess for hypotension.
L. Transport immediately and rapidly.
M. Frequently reassess area around bite for evidence of localized reaction. Mark and time edge of advancing edema/erythema if present.
N. Call for intercept if patient is demonstrating signs of significant envenomation or shock.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ AEMT/EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

O. Establish IV, BSS, TKO.
P. Place monitor.
Q. Treat for shock per shock protocol.
R. Treat pain as indicated.

DO NOT:
- ❖ Incise the wound
- ❖ Apply suction if not already in place
- ❖ Apply tourniquets, ice, electricity or heat
- ❖ Attempt to catch, kill or handle live or dead snakes
- ❖ Remove previously placed devices or venous tourniquets if not causing limb ischemia

RESPIRATORY EMERGENCIES

NOTE:
- ❖ Recognition and treatment of airway and respiratory dysfunction assumes priority over all other conditions in the initial evaluation and treatment of the patient in the field.
- ❖ Excessive oxygen administration is not helpful and may be harmful to the patient. In general, titrate O2 to SaO2 ≥95%.
- ❖ If patient feels short of breath, and has SaO2 ≥95%, you may administer O2 to improve patient comfort, but at no more than 2L via NC

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

I. **GENERAL**

A. Support the head and neck as appropriate to patient's condition. Perform head and or jaw maneuvers as required and appropriate to patient's condition to secure and maintain a patent airway.

B. Supply supplemental oxygen at concentrations appropriate to the patient's condition. Use mouth-to-mask or bag-valve-mask with supplemental oxygen to ventilate patient's who are apneic or have inadequate respirations.

C. Use oral or nasal airways to facilitate airway maintenance. Soft nasal airways may be lubricated with water soluble ointment.

D. Suction the oropharynx as needed to remove secretions, blood and / or vomitus.

II. **UPPER AIRWAY OBSTRUCTION (FOREIGN BODY) SEE AIRWAY PROTOCOL**

A. Follow current AHA guidelines for foreign body airway obstruction.

III. **ASTHMA/BRONCHOSPASM/COPD**

Severity Assessment:

	Mild	**Moderate**	**Severe**
Short of breath when	Walking	Talking	At rest
Able to speak	In sentences	In phrases	In words
Heart Rate	<100	100-120	>120
Respiratory Rate	Elevated	Elevated	>30
Lung Sounds	End expiratory wheezes	Full expiratory wheezes	Wheezes in both phases
Accessory muscle use	Not usually	Common	Usually
Alertness	Possibly agitated	Usually agitated	Usually agitated

A. Transport in the most comfortable position; typically with the head elevated.

B. Supplemental oxygen via nasal cannula or mask.

C. The COPD patient may be sensitive to oxygen flows greater than 2-4 liters per minute. Do not withhold oxygen from any patient in respiratory distress, but if more O_2 is given to the COPD patient be prepared to manage respiratory depression or respiratory arrest.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

D. If patient is wheezing or has poor air movement, administer nebulized albuterol (1 unit dose). May repeat in 10 minutes if inadequate response.
Contact OLMC for additional dosing considerations.

E. Duoneb (Mix Albuterol and Atrovent) for initial dose if already taking albuterol treatments or inadequate response to treatment.

F. If available and patient still has severe distress, consider CPAP.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

D. Cardiac Monitor.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

1. Epinephrine – With upper airway Stridor, consider 1-1,000 (3 mg nebulized).
   Use with caution if patient is 50 years or older or has history of heart disease. Consider OLMC consult before administration.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

F. For severe COPD or moderate to severe asthma, based on the Severity Assessment, administer
   1. Dexamethasone 10mg IV/IO/IM/PO.

G. If not responding to above measures, consider the following in adults:
   1. Magnesium - in prolonged transport time with severe asthma, consider magnesium sulfate
      a. Adults: 2 gm (10% - 20 ml) IV/IO over 10 - 20 min
      b. Pediatric: 25 - 50 mg/kg IV/IO over 10 - 20 min NMT 2 gm
   2. Epinephrine
      0.1 - 0.5 mg SC/IM of 1:1000 solution or
      0.1 - 0.25 mg IV/IO of 1:10,000 solution or
      1 mg ET of 1:10,000 solution

Asthma Pediatric Considerations:

1. ****In children 6 months to 6 yrs. With audible stridor at rest, give 3 ml epinephrine 1:1,000 via nebulizer. May repeat in 20 minutes.
2. **The usual cause of respiratory arrest in children with croup, epiglottitis or laryngeal edema is exhaustion, not complete obstruction. If the child with suspected upper airway compromise deteriorates, you may still be able to ventilate the child with a BVM. Only attempt intubation if you cannot ventilate with a BVM.
3. ** Avoid IV/IO access if possible.
4. Administer 0_2 [**or nebulized medications]** through a familiar object, (e.g., place tubing through the bottom of a paper cup held close to the child's face by the parent or caregiver.
5. * Do not dilute or reduce the dose of albuterol. Indication and dosage is the same as for adults.
6. ** If needed, the second treatment may be Albuterol/Atrovent mix or Duoneb the same as adult dosage.
7. ****Consider Dexamethasone 0.6 mg/kg (NMT10mg) in patients with asthma.
8. ***For severe bronchospasm not responding to above consider:
   Epinephrine 0.01 mg/kg 1:10,000 IV/IM/IO (0.1 ml/kg).

* = EMT   ** = AEMT   *** = EMT-I/RN   **** = EMT-P
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IV. CONGESTIVE HEART FAILURE / PULMONARY EDEMA

~~~~~~ EMR CARE ~~~~~~

A. Transport in the most comfortable position that allows appropriate treatment, typically sitting upright, possibly with feet dangling.
B. Supplemental oxygen via nasal cannula or mask. Consider high flow oxygen via non-rebreather mask if hypoxia (SaO2 <92%) is present or SaO2 is <95% despite O2 via NC.
C. Assist patients having severe breathing difficulty with BVM at 100% FIO2 / 15 l/min.
D. When possible, titrate down O2 to maintain SaO2 ≥95%

~~~~~~ EMT CARE ~~~~~~

E. If available and patient still has severe distress, start patient on CPAP and monitor breathing.
F. Consider Duoneb or Albuterol (1 unit dose) nebulized if wheezing is present

~~~~~~ AEMT ~~~~~~

E. IV BSS TKO or Saline Lock.
F. Cardiac ECG Monitor.
G. In addition to above, consider:
   1. Nitroglycerin (Nitrostat) 0.4 mg SL q 5 min PRN NTE 3 doses.
   2. CPAP. (BVM assisted breathing if CPAP not available.)
H. If the above measures fail, and patient has signs of impending respiratory failure, consider PEAD or SGA.

~~~~~~ EMT-I/RN CARE ~~~~~~

I. In addition to above, consider:
   1. Lasix (furosemide) 20 - 40 mg IV/IO[1] should be given only if SBP is > 100 and patient has signs or symptoms of volume overload: (eg. Recent weight gain, peripheral edema, hepatomegaly, JVD).

~~~~~~ EMT-P CARE ~~~~~~

J. Administer Captopril 12.5 mg SL
   NOTE: Captopril may be given simultaneously with NTG.
K. If the above measures fail, and patient has signs of impending respiratory failure, consider endotracheal intubation.

ADVANCED AIRWAY TECHNIQUES: CPAP, PEAD or SGA AND ENDOTRACHEAL INTUBATION

See ***Airway*** and ***Rapid Sequence Intubation*** protocols.

[1] If patient currently taking Lasix, give 40 mg IV.
If patient has not been on Lasix, give lower dose of 20 mg IV.

V. RESPIRATORY INFECTION WITH RESPIRATORY COMPROMISE

NOTE:
- ❖ Most respiratory infections are viral in origin and can be easily transmitted from person to person by droplet spread. EMTs should always wear PPE (surgical mask, gloves and eye protection) when caring for any patient with fever and/or respiratory infection symptoms.
- ❖ Sudden Acute Respiratory Infection (SARI) is defined as an acute respiratory illness with history of fever or measured temperature ≥38 C° and cough; onset within the last ~10 days; and requiring hospitalization.
- ❖ Some viruses carry higher risk of progression to serious infection such as SARI, with increased morbidity and mortality. Examples include Influenza, SARS, MERS, Coronavirus
- ❖ The absence of fever does NOT exclude viral infection, especially in extremes of age or patients with underlying immunocompromise or who have taken fever lowering medications.
- ❖ EMS should attempt early recognition of patients with SARI, especially in the setting of known epidemic of viral illness such as SARS, MERS, Coronavirus
- ❖ Airborne precautions (including N-95 mask) should be initiated when performing an aerosol generating procedure such as endotracheal intubation, cardiopulmonary resuscitation, non-invasive ventilation and manual ventilation before intubation, which are known to increase risk of transmission. Airborne precautions should also be initiated when using nebulizers which may increase risk of aerosolization.
- ❖ For specific instructions for screening patients and description of contact, droplet and airborne precautions see: VIRUS INFECTION (EBOLA AND SARI): PATIENT EVALUATION PROCEDURE.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

C. If patient has known fever or respiratory symptoms, EMT's should wear surgical mask, gloves and eye protection **prior to** evaluating patient.
D. If possible, have the patient wear a medical mask to further reduce risk of transmission
E. Infection control measures including contact and droplet protection should be initiated immediately when SARI is suspected.
F. Administer supplemental oxygen if needed via nasal cannula or mask. Consider high flow oxygen via non-rebreather mask if hypoxia (SaO2 <92%) is present or SaO2 is <95% despite O2 via NC.
G. Assist patients having severe breathing difficulty with BVM at 100% FIO2 / 15 l/min. Initiate Airborne Precautions in patients with suspected SARI.
H. When possible, titrate down O2 to maintain SaO2 ≥95%

~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT/AEMT/EMT-I/RN/EMT-P CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~

I. If respiratory distress is mild to moderate, and patient has wheezing, consider treatment with Albuterol MDI and chamber to minimize aerosolization of secretions.
J. If severe distress or patient does not respond to MDI, a Duoneb Treatment can be administered. Initiate Airborne Precautions in patients with suspected SARI.
K. Recent studies have shown early administration of corticosteroids (Dexamethasone) results in survival benefit and improved outcomes in patients with COVID-19 who have severe illness requiring oxygen or airway interventions. Consider administering Dexamethasone 10 mg IV or PO in confirmed COVID-19 patients with severe respiratory distress.

SEIZURES

NOTE:
- The goal of seizure management is to identify and treat any immediately reversible causes, to prevent injury from seizure activity, and to stop prolonged seizures (status epilepticus).
- Initial history and physical assessment should identify potentially reversible causes such as:
  - Fever
  - Anoxia/hypoxia
  - Hypoglycemia (history of diabetes?)
  - Poisoning
  - Cardiac dysrhythmias
  - Toxemia in third trimester pregnancy

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. AIRWAY, BREATHING, CIRCULATION.
B. Protect patient from injury.
C. Oxygen via nasal cannula or mask depending on patient's level of consciousness.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

D. Check blood glucose levels and treat if indicated.
E. Basic care for the patient with prolonged seizures or with 2 or more seizures without a period of consciousness between (status epilepticus) is early and rapid transport to the hospital.
F. Check temperature.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ AEMT/EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

If seizure is persistent, recurrent, or if patient has prolonged postictal period:

H. IV BSS TKO or Saline lock.
I. ECG Monitor.
J. Medications may include (depending on the etiology of the seizure):
   1. Dextrose, $D_{10}W$ 0.5gm/kg (obtain glucose level first if possible). Flush the IV line after administration.
   2. Narcan (naloxone) 0.4 - 2.0 mg IV/IO/IM/SQ/SL/ET titrated to respirations and LOC NMT 8 mg.
      (Pediatric dose 0.1 mg/kg NMT 2 mg.)

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMT-P CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

   3. Versed (midazolam) 2 – 5 mg IV/IO/IM/IN
      May repeat in 5 min NMT 10 mg total
   4. Ativan (lorazepam), 0.5 – 2.0 IV/IO/IM slow push
      May repeat in 5 min NMT 4.0 mg total
   5. Thiamine, 100 mg IV / IM before dextrose administration if patient shows signs of malnutrition or if there is a history of ETOH abuse.

J. If status epilepticus is present, consider early intubation. If intubation is hampered by seizures that have been uncontrolled by other measures, consider rapid sequence intubation.

NOTE: New onset seizures in any patient needs medical evaluation.

See following page for special pediatric considerations

Pediatric Considerations:

In pediatric patients, seizures may be caused by high fever. Febrile seizures are generally found in children between the ages of 1 & 6. The patients may have a history of recent illness and fever, and they will likely be tachycardiac with flushed, warm skin upon you arrival. The seizures are usually short in duration. For suspected febrile seizures:

1. Gently support head of child to avoid head trauma.
2. Initiate passive cooling measures: unbundle child, apply cool moist compresses
* 3. Be prepared to support ventilation and oxygenation through BVM [**** or **ET intubation]** and manual ventilation.
* 4. Determine blood glucose and follow ***Altered Mental Status*** protocol.
** 5. Venous access as needed.
**** 6. Administer midazolam (Versed) 0.05- 0.1 mg/kg IV/IO to maximum initial dose of 2.5 mg. MR in 5 minutes NMT 5 mg IV/IO..
Ativan (Lorazepam) may be used 0.1 mg/kg IV/IO. For IV/IO dilute 1:1 in NS.
**** 7. If no IV/IO access, administer midazolam (Versed) 0.2 mg/kg IM/IN to a maximum of 5 mg. May repeat in 5 minutes NMT 10 mg IM/IN.
8. Contact OLMC for additional medication after administering initial and one repeat of medication.

* = EMT ** = AEMT *** = EMT-I/RN **** = EMT-P

SEPSIS

- **Sepsis is when a patient has an infection plus signs of end-organ hypo-perfusion.**
- **Early identification and aggressive fluid resuscitation can improve survival in patients with septic shock & may decrease time to administration of antibiotics in the ED**
- **When patient is identified as possibly septic, initiate Code Sepsis: Rapid treatment and transport and early notification to Emergency Department staff**

See following page for special pediatric considerations

Sepsis should be considered in patients with the following risk factors:

- Recent infection/treatment with antibiotics
- Recent hospitalization/surgery
- Conditions likely associated with chronic immunosuppression:
  - Steroid use
  - Transplant
  - HIV/AIDS
  - Cancer treatment

Signs & symptoms which may occur with serious infection include:

- Rigors (shaking chills)
- Respiratory symptoms including coarse breath sounds.
- Abdominal pain; urinary symptoms.
- Severe vomiting/diarrhea.
- Unusual headache, neck/back pain.
- Unusual rashes/bruising/mottling.

Initiate Code Sepsis with Temp > 100.4 or < 96.8 (> 38 or <36°C) & any of following:

- Pulse > 90
- SBP < 90
- Respiratory Rate > 20
- GCS < 13
- ETCO2 < 32 mmHG

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Assess and support ABC's
B. Obtain vital signs every 5-10 minutes to monitor for shock. Assess temperature early.
C. Passive cooling if temperature > 101
D. Oxygen therapy - titrate to SaO2 ≥ 95%

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

E. Place monitor.
F. Transport immediately and rapidly. Notify hospital of positive Sepsis screen.
G. Call for intercept if patient is demonstrating signs or symptoms of shock.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

H. Establish IV, BSS rapid fluid bolus of 1 - 2 Liter NS to achieve SBP > 90.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

I. If SBP < 90 after 2 LNS, consider initiating vasopressor therapy to achieve SBP≥ 90 or MAP ≥ 65
   1. Norepinephrine 4 - 12 mcg/min IV/IO, titrate upward 2 mcg/min increments
   2. Epinephrine 2 - 10 mcg/min IV/IO, titrate upward 2 mcg/min increments
J. Early intubation and mechanical ventilation should be considered for patients with persistent hypotension, and/or signs of shock despite above measures.

Pediatric Considerations:

1. Initiate Pediatric Code Sepsis with fever & infection if patient has:
   a. Poor perfusion
   b. Ill appearance
   c. Altered Mental Status
   d. Any of following abnormal VS:

Pediatric Sepsis Vital Signs

Age	T	P	R	Systolic BP
0m–3m	<36 >38	<80 >205	<30 >60	<60
3m–1y	<36 >38.5	<75 >190	<30 >60	<70
1y–6y	<36 >38.5	<60 >140	<22 >35	<70 + 2 x age
6y–10y	<36 >38.5	<60 >140	<18 >30	<70 + 2 x age
10y–18y	<36 >38.5	<60 >100	<12 >16	<90

Hypoglycemia - treat if:
BGL < 60 mg/dl in Child (1 year to puberty)
BGL < 40 mg/dl in Infant (Birth to 1 year)
Pediatric Dextrose Dosage
❖Oral: 0.5 g/kg orally if patient can protect airway
❖Newborn: Dilute to dextrose 12.5% (0.125 g/mL); give 4 to 8 ml/kg.
❖Age > 1 year: Dilute to dextrose 25% (0.25 g/mL); give 2 ml/kg.

* = EMT ** = AEMT *** = EMT-I/RN **** = EMT-P

SHOCK

NOTE:
- Shock is the body's inability, regardless of the cause, to provide every part of the body with sufficient perfusion of blood and oxygen to carry out normal function.
- Signs and symptoms of inadequate perfusion include:
  - Altered mental status
  - Syncope
  - Marked thirst
  - Clammy skin / delayed capillary refill
  - Tachycardia
  - Hypotension

I. GENERAL MANAGEMENT

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ EMR/EMT CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Maintain patent airway and support ventilation as required.
B. Administer high flow supplemental oxygen, via non-rebreather mask.
C. Provide ventilatory assistance as indicated.
D. If the patient does not have a head injury or cardiogenic shock, place in head down (Trendelenburg) position.
E. If cardiogenic shock, difficulty breathing or head injury is present and patient condition permits, use the modified trendelenburg, with feet elevated 20-25 degrees and head also elevated approximately 15 degrees.
F. Treat suspected cause.
G. Frequently monitor for worsening condition and document vital signs and patient status

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ AEMT/EMT-I/RN CARE ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

G. Start 2 large bore IV's if possible.
H. If unable to establish IV, place IO and infuse fluids with 60 ml LL syringe or pressure infusion.
H. Bolus with BSS to achieve target SBP of ≥ 90 mmHg or MAP ≥ 65 mmHg
   1. Adult - give 500 ml fluid bolus. May repeat to maximum of 3 L NS
   2. Pediatric - 20 ml/kg up to 60 ml/kg
   3. Neonate - 10 ml/kg if less than 6 months old
I. Repeat fluid boluses if continued signs of shock and no signs of pulmonary edema.
J. ECG Monitor.

NOTE:
- In general, patients in shock should be treated as above.
- In patients with suspected cardiogenic shock with pulmonary edema, give fluids cautiously and monitor closely for signs of pulmonary edema.
- In trauma patients with significant blood loss, allow "permissive hypotension" unless there are signs of CHI. Target SBP of 70 - 90 mmHg
- If patient has signs of CHI, target MAP ≥ 65 or SBP ≥ 90 to maintain cerebral perfusion pressure.
- For additional interventions based on class of shock see below

See following pages for special pediatric considerations

II. **ANAPHYLACTIC SHOCK (See also *Allergic Reactions* Protocol)**

~~~~~~ **EMR/EMT CARE** ~~~~~~

A. Keep patient calm and provide reassurance that appropriate care is under way.
B. Oxygen by NRM or assist ventilations with BVM and 100% oxygen.

~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~

C. In the case of moderate to severe anaphylaxis:
    1. Epinephrine 1:1,000 SQ, 0.3mg (adult); pediatric dose 0.2mg; infant dose 0.1mg or
    2. Use Epi Pen or Epi Pen Jr.
    3. Adult and pediatric dosage may be repeated once after 5 minutes PRN.
    4. Contact OLMC for any additional doses.

~~~~~~ **EMT-P CARE** ~~~~~~

D. If reaction is severe, may give epinephrine 1:10,000 IV in increments of 0.3 - 0.5 mg (3.0 - 5.0 ml). Pediatric dose 0.01 mg/kg (0.1ml/kg)) at 5 minute intervals PRN.
E. If respiratory distress/stridor is present, consider intubation early.
F. Benadryl (diphenhydramine HCL) 25-50 mg IM/IV.

III. **CARDIOGENIC SHOCK (See also *Chest Pain* Protocol)**

~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~

A. IV Balanced salt solution TKO or saline lock; limit fluids
B. May consider bolus of 500ml BSS in hypotensive patient if patient appears hypovolemic and no signs of pulmonary edema are present.
C. If patient is having chest pain, treat per *Chest Pain* Protocol
D. If EKG shows signs of ST elevation MI, **Activate Lifeflight** to initiate STEMI treatment. Consultation with OLMC is not required.

~~~~~~ **EMT-P CARE** ~~~~~~

E. Consider Norepinephrine 4 - 12 mcg/min IV/IO, titrate upward 2 mcg/min increments to MAP $\geq$ 65 or BP $\geq$ 90 Systolic.
F. Treat dysrhythmias per ACLS protocol.

IV. **HYPOVOLEMIC / HEMORRHAGIC SHOCK**

~~~~~~ **AEMT/EMT-I/RN/EMT-P CARE** ~~~~~~

A. In trauma, do not over-resuscitate. Allow “permissive hypotension”. Bolus with BSS to achieve target SBP of 70 - 90 mmHg
B. If patient is hypovolemic from GI losses, consider boluses of 500 - 2000 mL BSS to achieve MAP $\geq$ 65 or BP $\geq$ 90 Systolic. Monitor for signs of pulmonary edema.

~~~~~~ **EMT-P CARE** ~~~~~~

C. If unable to achieve target BP, Norepinephrine 4 - 12 mcg/min IV/IO, titrate upward 2 mcg/min increments
~~~~~~

V. **NEUROGENIC SHOCK**

~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT/AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Protect the spine.

~~~~~~ **EMT-P CARE** ~~~~~~

B. Consider intubation if GCS is less than 8.
C. Consider fluid bolus.
    A. In trauma patient with blood loss and no signs of CHI, allow "permissive hypotension". Bolus with BSS to achieve target SBP of 70 - 90 mmHg.
    B. If patient has signs of CHI, target MAP ≥ 65 or BP ≥ 90 Systolic to maintain cerebral perfusion pressure.

VI. **SEPTIC SHOCK**

~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT/AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Bolus 1-3 L of BSS. Goal to achieve MAP ≥ 65 or BP ≥ 90 Systolic

~~~~~~ **EMT-P CARE** ~~~~~~

B. If unable to achieve target BP after 2L NS, Consider Norepinephrine 4 - 12 mcg/min IV/IO, titrate upward 2 mcg/min increments

Pediatric Considerations:

1. Determine blood glucose early in pediatric patients with possible Sepsis.
* 2. Correct hypoglycemia (see below)
** 3. Obtain vascular access. Administer fluid bolus 20 ml/kg. IV/IO over 10 minutes. May repeat boluses up to 60 ml/kg.
4. Re-check VS frequently
5. If suspected allergic reaction, follow ***Anaphylaxis and Allergic Reaction*** protocol.
6. Determine blood glucose and follow ***Altered Mental Status and Coma*** protocol.

****7. If suspected Cardiogenic or distributive shock, consider norepinepehrine after (total of) 20 ml/kg fluid bolus.

****8. If VS do not normalize after (total of) 60 ml/kg fluid boluses, consider norepinephrine.

Fluid challenge is 10 ml/kg for newborns, see *Neonatal Resuscitation* protocol.

* = EMT ** = AEMT *** = EMT-I/RN **** = EMT-P

NOTE:
- ❖ This protocol is designed to give the EMT guidance in treating the trauma patient and entering patients into the trauma system.
- ❖ The seriously injured trauma patient should receive spinal and airway stabilization before transport, but transport of the multi-system patient should not be delayed for full assessments, IV's, limb splinting, etc.
- ❖ On-scene time with the multi-system patient should be less than 10 minutes and treatment on scene should be limited to spinal and airway stabilization.

I. SPINAL STABILIZATION

A. For actual or suspected penetrating trauma of the spine, then spinal stabilization is indicated.
B. For patients who are awake and alert and who do not have neurological deficits, spinal precautions can be maintained by application of a rigid cervical collar and securing the patient firmly to the EMS stretcher in position of comfort. This may be most appropriate for:
   1. Patients who are found to be ambulatory at the scene
   2. Patients who must be transported for a protracted time, in particular inter-facility transfers.
C. Backboards are not required for spinal stabilization, but may be useful in some extrications.
   1. Pad backboards whenever possible.
   2. The use of vacuum mattress or inflatable backboard pad is encouraged.
D. For blunt trauma with mechanism for spinal cord injury, then if any of the following are answered "yes":

Spinal Stabilization Criteria (SIC)	Yes	No
Altered mental status or loss of consciousness		
Significant mechanism of injury, such as high speed motor vehicle crash, axial loading, rollover motor vehicle crash, fall from greater than standing height		
Evidence of intoxication		
Distracting injury, such as significant fracture or laceration		
Neurological deficit		
Midline spine pain (subjective)		
Midline spine tenderness (objective)		
EMT suspects spinal cord injury based on mechanism, history or exam findings.		
Pain with active neck rotation or active ROM of neck rotation limited to < 45º		

If any answer is "yes" then spinal stabilization indicated.

NOTE:
- ❖ If the patient is > 5 months or otherwise obviously pregnant, place a pillow or blanket roll under the right side of the backboard to help move the fetus to the left. Otherwise, the fetus can lay on the inferior vena cava and impede blood return to the heart.

II. TRAUMA SYSTEM CRITERIA

NOTE:
- ❖ EMT'S will activate the trauma system whenever a patient falls within the state trauma system criteria. (See Trauma System Entry Procedure)
- ❖ Early notification will allow more time for the hospital to prepare for the patient.
- ❖ If there is a question as to whether or not to activate the system, contact OLMC.

III. TRAUMA PATIENT WRIST BANDS

Any patient who is entered into the Oregon Trauma System (either alert or activation) will be given a Trauma Band. The number on the trauma band will be entered on the pre-hospital report in the space provided.

IV. TREATMENT

NOTE:
- ❖ Treatment of minor trauma should follow traditionally accepted guidelines of care (i.e., splinting suspected fractures, controlling bleeding, etc.)
- ❖ The following protocols apply specifically to major or multi-system trauma patients and, except for airway and breathing control and spinal stabilization, treatment should be done en route to avoid extended on-scene times.

~~~~~~ EMR CARE ~~~~~~

A. Evaluate scene for safety and ensure safety of rescue personnel.
B. Maintain spinal precautions. See above Spinal Stabilization Protocol.
C. Evaluate ABC's and start Oxygen therapy. Airway control with spinal stabilization.
D. Check breathing - examine for and treat open chest wounds, flail chest, and significant rib fractures as indicated. Administer oxygen at 10 l/m or greater by non-rebreather mask. Consider assisting ventilation's with BVM.
E. Check pulse -- control hemorrhage with direct pressure using a sterile dressing.
F. When possible, disrobe the patient to determine extent of injuries. Remember that the trauma patient is susceptible to hypothermia.
G. If suspected pelvic fracture, apply pelvic splint or pelvic immobilization device.
H. Perform fracture immobilization per protocol.
I. Prevent hypothermia.
J. Activate Trauma System ASAP if patient meets criteria.
K. Extricate, if necessary. Prepare for immediate transport.

~~~~~~ EMT CARE ~~~~~~

L. Consider PEAD or SGA placement if not contraindicated. See PEAD or SGA Procedure
M. Consider Tourniquet placement for uncontrolled bleeding. See Tourniquet Procedure.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~

N. Start two large bore (#14 or 16) IV's or IO's enroute.[1] Fluid resuscitate with BSS if indicated, in challenges of 20 ml/kg for children or 500 ml for adults.[2]
   1. Patients may be harmed by overaggressive fluid resuscitation.
   2. Maintain systolic BP ≥ 90 mm/Hg in patients with severe head injury.
   3. Maintain SBP 70-90 mm/Hg in patients with suspected thoracic, abdominal, or pelvic hemorrhage.

O. Consider pain management as per the **Pain Control Protocol**.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Intubate as indicated by the absence of respiration's or compromised airway.
B. Paramedics may decompress tension pneumothorax by placing a large bore catheter in the second intercostal space, mid-clavicular line.
C. Perform bilateral chest decompression in patients with witnessed trauma arrest.
D. Consider TXA for hemorrhage shock - see **Trauma - Hemorrhage Control Protocol**

[1] More than two IV's can be established if the patient is in shock and ABC's are being taken care of. Do not delay transport to start IV's. Volume expander fluid = Balanced Salt Solution.

[2] Maximum fluid resuscitation is 40ml/kg unless physician order to exceed that amount is received

TRAUMA - AMPUTATION

NOTE:
- ❖ Obtain the key history: Time of amputation, mechanism of injury, current medications, bleeding tendencies, problems with any prior surgery.
- ❖ Key Physical Findings: Excessive bleeding, partial amputation, attachment, neurovascular status, and last oral intake.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Control bleeding
B. Administer Oxygen
C. Remove gross contamination and dress stump
D. Treat for shock as per shock protocol
E. Place amputated part in dry plastic bag or wrap in plastic. Place bag in ice water.
F. Keep amputated part dry.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**AEMT CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

G. Establish large bore IV / IO, two if possible and treat per shock protocol.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-I/RN/EMT-P CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~

H. Consider pain management as per the **Pain Control Protocol**.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~

TRAUMA - CRUSH INJURY

NOTE:
- ❖ Compression injury results in a slow, simple compression of a group of muscles leading to ischemic damage.
- ❖ Crush substances can be released into the blood resulting in hemodynamic collapse.
- ❖ Be prepared for rapid decline and cardiac arrest in patients that are released from crush injuries.

I. Mechanism of Injury:

A. Crush injuries cause cellular damage that can result in the release of myoglobin from muscles. This can cause rhabdomyolysis which in turn can result in kidney failure.
B. Loss of normal circulation can result in acidosis and other metabolic derangements.
C. Traumatic asphyxia occurs when pressure is applied to the chest limiting respirations and resulting in CO2 retention, poor oxygenation, and an increase in venous pressure.

II. Signs & Symptoms:

A. Syncope or near syncope, altered mental status, or unconsciousness
B. Visual disturbances
C. Hypotension and signs of shock
D. Arrhythmias including peaked T-waves and QRS prolongation
E. Discoloration or mottling of skin near affected area
F. Loss of pulses in affected extremities

III. Management:

~~~~~~ EMR CARE ~~~~~~

A. If patient is unconscious, place in supine position.
B. If patient is in cardiac arrest, place supine on long back board and begin CPR.
C. Evaluate ABC's and start high flow oxygen via NRM.
D. Airway control with spinal immobilization if indicated. Follow **AIRWAY MANAGEMENT** Protocol.
E. Remove all restrictive dressings (clothing, jewelry, etc.).
F. Monitor distal pulse, motor and sensation in involved extremities
G. Rapid transport to the closest medical facility.

~~~~~~ EMT CARE ~~~~~~

N. If crush injury duration exceeds 20 minutes, consider treatment for possible hyperkalemia.
   1. **Albuterol** (1 unit dose) nebulized. May repeat prn

~~~~~~ AEMT CARE ~~~~~~

O. Start a minimum of one large bore (#14 or 16) IV's enroute.
P. Minimal IV fluid unless patient is hypotensive. BSS if indicated, in challenges of 20 ml/kg for children or 500 ml for adults. Titrate fluid to systolic B/P $\geq$ 90 and improved signs of skin perfusion and mental status.
Q. Monitor EKG

~~~~~~ EMT-I/RN CARE ~~~~~~

R. Consider pain management as per the **Pain Control Protocol**.

~~~~~~ EMT-P CARE ~~~~~~

S. Additional treatment for possible hyperkalemia due to crush injury may include:
   1. **Calcium Gluconate** - 1gm IV/IO slow push
   2. **Sodium Bicarbonate** – 1 Amp 50 ml (50mEq) IV/IO slow push. May repeat x 2 PRN.
   3. **Lasix** 40 mg IV slowly.

TRAUMA - FRACTURES AND DISLOCATIONS

NOTE:
- ❖ Patient may have fracture without loss of function.
- ❖ At a multiple injury scene, fractures have low priority
- ❖ Do not give narcotic pain medications to trauma patients with head or abdominal injuries.
- ❖ Pelvic fractures may be associated with severe shock

I. History:

A. History of trauma
B. Mechanism of injury
C. Time of last oral intake.

II. Physical Findings:

A. Localized pain, tenderness
B. Swelling, discoloration
C. Angulation, deep lacerations, exposed bone fragments
D. Crepitus
E. Loss of function, limitation of motion, guarding
F. Quality of distal pulses, sensation and motion

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR/EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

III. Management:

A. Assure airway, breathing, circulation, control hemorrhage
B. Vital signs
C. C-spine precautions.
D. Check distal neuro/vascular status
E. Splint
   1. Axial stabilization as needed
   2. Splint joint above and below fracture
   3. Splint where it lays unless compromised neuro or vascular status, then move to anatomical position.
   4. Apply axial traction as needed using Sager or other traction splint for suspected femur fracture. (Note - this is not to be used for suspected hip or pelvic fracture)

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN/EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

F. Establish large bore IV, two (2) if possible.
G. Consider pain management as per the **Pain Control Protocol**

PEDIATRIC CONSIDERATIONS:

1. Small children may require extra padding under the shoulders.
2. Fentanyl dose for children***:
   - **a.** < 40 kg: initial dose 1 mcg/kg, repeat with 0.5-1 mcg/kg every 3-5 minutes, NMT 4 mcg/kg.
   - **b.** > 40 kg use adult dosing.

***= EMT-I**

TRAUMA - HEMORRHAGE CONTROL

NOTE:
- ❖ Be prepared for rapid decline in children and infants
- ❖ Note approximate blood loss on scene and include in PCR when possible
- ❖ Alcohol intake and anti-coagulation or anti-platelet medications may make bleeding difficult to control.

I. Mechanism of Injury:

A. Consider blood loss from external bleeding along with potential internal bleeding that may accompany an injury

II. Signs & Symptoms:

A. Syncope or near syncope, altered mental status, or unconsciousness
B. Hypotension and signs of shock
C. Arterial bleeding will be bright red and more difficult to control
D. Document pulses, sensation, and motion before and after wound care or splinting.

III. Management:

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Evaluate ABC's and administer O2 if indicated (SPO2 <95%).
B. Apply direct pressure with a clean dressing to any active bleeding wound and attempt to control bleeding. Direct pressure to the proximal artery may be necessary.
C. Elevate the area of the bleed to above the level of the heart when possible
D. Clean open wounds with sterile water or normal saline if bleeding is controlled.
E. Dress the injury site with clean and dry gauze, dressing, and/or Band-aid. Coban, Kerlix, or tape may be used to secure the gauze or other dressing. Do not apply Kerlix, Coban, or other securing material directly to the wound bed.
F. Document the control of bleeding, pulse/motor/sensory assessment, and patient response both before and after dressing the wound.
G. Rapid transport to the closest medical facility. If the patient is requesting a dressing but refusing transport, assure all bleeding has been controlled prior to dressing the wound.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

H. If direct pressure and elevation do not control the bleeding move immediately to:
   1. Tourniquet - for hemorrhage of an extremity. See **TOURNIQUET PLACEMENT** Procedure.
   2. Hemostatic Dressing - for junctional bleeding (buttock, pelvis, axilla, neck, face, or scalp). See **HEMOSTATIC AGENT** Procedure.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

I. Start a minimum of one large bore (#14 or 16) IV's enroute.
J. IV fluid BSS if indicated. Unless patient has associated traumatic brain injury (TBI), allow permissive hypotension with traumatic bleeding.
   1. Without TBI, titrate fluids to MAP >65, systolic between 70-90
   2. With TBI, titrate fluids to SBP >100

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMT-P CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

K. If there is evidence of active hemorrhage with Systolic BP < 70 mmHg, administer Tranexamic Acid (TXA) 2 gram IV in 100 - 250 ml over 10 min if time of injury is ≤ 3 hrs.
L. Monitor EKG.
M. If unable to achieve target B/P, Norepinephrine 4-12 mcg/min IV/IO titrate upward 2 mcg/min increments

TRAUMA - NEUROLOGIC

NOTE:
- ❖ This protocol covers the usual considerations in management of the known or suspected head or spinal injury patient and is to be used in conjunction with other applicable Trauma Protocols.
- ❖ Most neurologic trauma is associated with other system trauma and should be assessed and managed in light of all known or suspected injuries.
- ❖ **Assume that all head injuries have associated spinal injuries** and stabilize appropriately prior to transport.
- ❖ Hypotension in a closed head injury should be assumed to have another cause. Remember that spinal injuries can result in hypotension when no obvious source of bleeding is found.

I. Management strategy:

A. ABC's with spinal stabilization
B. Neurologic assessment (GCS or AVPU)
C. Prevent or reduce increasing intracranial pressure
D. Prevent further spinal cord injury

II. Management:

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **EMR CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

A. Evaluate ABC's and start Oxygen therapy. Consider assisting ventilation's with BVM.
   1. Follow Respiratory and Trauma Protocols as indicated. Do not hyperventilate patient.
B. Maintain spinal precautions.
   1. Maintain manual stabilization of the neck while the torso is secured to the board **BEFORE** securing the head.
   2. Transport using a backboard along with an extrication collar, head stabilizers and tape, ties or straps to maintain axial control of spinal column.
   3. Always use padded backboard or vacuum mattress to prevent pressure ulcerations.
C. All neurological trauma patients should be evaluated using GCS or AVPU at 5 minute intervals.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**EMT CARE**~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

D. If unable to maintain airway, consider PEAD or SGA placement.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ **AEMT/EMT-I/RN CARE** ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

E. Start two large bore (#14 or 16) IV's/IO's enroute, BSS.[1]
F. Give fluid resuscitation, if indicated, in challenges of 20 ml/kg for children or 500 cc for adults[2]
G. Titrate fluid to systolic B/P of 100 and improved skin signs.[3]

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[1] More than two IV's can be established if the patient is in shock and ABC's are being taken care of. Do not delay transport to start IV's.

[2] Maximum fluid resuscitation is 60cc/kg unless physician order to exceed that amount is received.

[3] Some patients may need a higher systolic B/P than 100mHg to improve their status.
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~~~~~~ EMT-P CARE ~~~~~~

H. Consider intubation if unable to protect airway.
I. For moderate to severe blunt or penetrating head trauma occuring less than 2 hours PTA: If available, administer 2 grams IV/IO Tranexamic Acid (TXA) slowly over 10 minutes if all the following indications are met:

1. Age > 15 (or > 50 kg if age unknown)
2. GCS between 4 and 12 with reactive pupils

Contraindications to TXA:
- Any chest compressions (manual or mechanical)
- Patients with a clinical concern for:
  - Epilepsy, seizures
  - MI, stroke, PE, DVT
  - Renal failure, dialysis
  - Known or suspected pregnancy
  - Drowning, hanging, or burns > 20% TBSA
- Other procoagulant drugs (e.g. KCENTRA) already administered

TRAUMA - SUSPENSION TRAUMA

NOTE:
- ❖ Vertical entrapment without the ability to be placed supine may result in Orthostatic Intolerance
- ❖ Patients suspended in fall arrest harness for protracted period of time are at risk.
- ❖ Whenever possible, avoid laying patient flat or immobilizing in supine position.

I. Mechanism of Injury:

A. With vertical suspension for greater than 10 minutes, blood pools in legs.
B. Lack of blood flow to brain leads to syncope and cerebral ischemia
C. Loss of normal circulation results in acidosis and other metabolic derangements.
D. Although evidence for this is limited, rapid deterioration might ensue if the patient is laid supine.
E. Patients may sustain significant injuries during the fall (eg. head injuries, spinal cord injuries, pelvis fractures, chest or abdominal injuries) that may cause hypotension and may contraindicate treating the patient in sitting position.
F. If patient is unconscious or in cardiac arrest, they should be placed supine to improve cerebral perfusion.
G. Patients cannot be transported in a helicopter in sitting position, but should attempt to elevate the head unless this is contraindicated.

II. Signs & Symptoms:

A. Syncope or near syncope
B. Altered mental status or unconsciousness
C. Visual disturbances
D. Loss of pulses in feet; pain in the legs
E. Hypotension and signs of shock
F. Arrhythmias including peaked T-waves and QRS prolongation

III. Management:

~~~~~~ **EMR CARE** ~~~~~~

A. Coordinate rescue and harness release with rescue personnel.
B. Maintain body temperature during rescue if possible.
C. **If suspended for greater than 10 minutes and patient is conscious, avoid laying patient flat or immobilizing in supine position unless other injuries necessitate supine positioning.**
D. Lower the patient down on rope. Do not let the patient's feet touch the ground. Keep patient with thighs horizontal and head and torso vertical.
E. For C-spine immobilization, place KED behind patient for support.
F. Cut away Fall Arrest Harness before securing KED. Secure abdomen straps, then leg straps with head immobilized last.
G. Patient should remain in sitting or semi-sitting position for at least 30 minutes following release from harness if possible.
H. If patient is unconscious, place in supine position.
I. If patient is in cardiac arrest, place supine on long back board. Begin CPR.
J. Evaluate ABC's and start high flow oxygen via NRM.
K. Airway control with spinal stabilization if indicated.Follow **AIRWAY MANAGEMENT** Protocol.
L. Treat other injuries following Trauma Protocols.
M. Rapid transport to the closest medical facility.

~~~~~~ **EMT CARE** ~~~~~~

N. If crush injury duration exceeds 20 minutes, consider treatment for possible hyperkalemia.
   1. **Albuterol** (1 unit dose) nebulized. May repeat prn

~~~~~~ AEMT CARE ~~~~~~

O. Start a minimum of one large bore (#14 or 16) IV's enroute.
P. Minimal IV fluid unless patient is hypotensive. BSS if indicated, in challenges of 20 ml/kg for children or 500 ml for adults. Titrate fluid to systolic B/P of 100 and improved signs of skin perfusion and mental status.
Q. Monitor EKG.

~~~~~~ EMT-I/RN CARE ~~~~~~

R. Consider pain management as per the **Pain Control Protocol**.

~~~~~~ EMT-P CARE ~~~~~~

S. Additional treatment for possible hyperkalemia due to crush injury may include:

1. **Calcium Gluconate** - 1gm IV/IO slow push
2. **Sodium Bicarbonate** – 1 Amp 50 ml (50mEq) IV/IO slow push. May repeat x 2 PRN.
3. **Lasix** 40 mg IV slowly.

SAFE TRANSPORTATION OF CHILDREN IN AMBULANCES
[EMR, EMT, AEMT, EMT-I, RN, EMT-P]

NOTE:
- Safe transportation of children in ambulances is very important.
- This protocol will serve as a guideline to the safe transportation of children in an ambulance.
- These are a limited set of circumstances that may not fit every situation.

I. CRITERIA FOR TRANSFER
   A. This protocol applies to every EMS response resulting in the need to transport pediatric patients who are of an age/weight that require the use of a child safety device from the scene of an emergency. Pediatric patients that do not require a child safety device should be transported following the same procedure as adult patients.
   B. This protocol is based on recommendations, as published by the National Highway Traffic Safety Administration (NHTSA), for the transportation of children in five possible situations:
      1. The transport of a child who is not injured or ill.
      2. The transport of a child who is ill and/or injured and whose condition does not require continuous and/or intensive medical monitoring or intervention.
      3. The transport of an ill or injured child who does require continuous and/or intensive monitoring or intervention.
      4. The transport of a child whose condition requires spinal motion restriction and/or lying flat, refer to Spinal Precautions Procedure
      5. The transport of a child or children who require transport as part of a multiple patient transport (newborn with mother, multiple children, etc.)

II. PROCEDURE
   A. The child's age and weight shall be considered when determining an appropriate restraint system. Child seat models offer a wide range of age/weight limits, so each individual device must be evaluated to determine the appropriateness of use.
   B. When possible, and with the exception of a minor vehicle crash (e.g. "fender-bender"), avoid transporting children in their own safety seats if the seat was involved in a motor vehicle crash. Use of the child's own seat can be considered if no other restraint systems are available and the seat shows no visible damage/defect.
   C. Transportation of a child in any of the following ways is not allowed under normal circumstances:
      1. Unrestrained;
      2. On a parent/guardian/other caregiver's lap or held in their arms;
      3. Using only horizontal stretcher straps, if the child does not fit according to cot manufacturer's specifications for proper restraint of patients;
      4. On the multi-occupant bench seat or any seat perpendicular to the forward motion of the vehicle, even if the child is in a child safety seat.
   D. For infants and newborns, be sure to maintain body heat.

III. SITUATION SPECIFIC GUIDELINES

A. Transport of an uninjured/not ill child
   1. Transport child in a vehicle other than a ground ambulance using a properly-installed, size-appropriate child restraint system.
   2. Transport in a size-appropriate child seat properly-installed in a forward-facing seat. Preferred location is a second row seat, but if this is not available child can be transported in the front passenger seat with the airbags off.
   3. Transport in a size-appropriate child seat properly-installed on the rear-facing EMS provider's seat.
   4. Consider delaying the transport of the child (ensuring appropriate adult supervision) until additional vehicles are available without compromising other patients on the scene. Consult medical control if necessary.

B. Transport of an ill/injured child not requiring continuous intensive medical monitoring or interventions
   1. Transport child in a size-appropriate child restraint system secured appropriately on the cot.
   2. Transport child in the EMS provider's seat in a size-appropriate restraint system.
   3. Transport in a size-appropriate child seat properly-installed on the rear-facing EMS provider's seat.

C. Transport of an ill/injured child whose condition requires continuous intensive monitoring or intervention.
   1. Transport child in a size-appropriate child restraint system secured appropriately to the cot.
   2. With the child's head at the top of the cot, secure the child to the cot with three horizontal straps and one vertical strap across each shoulder. If assessment/ intervention requires the removing of restraint strap(s), restraints should be re-secured as quickly as possible.

D. Transport of an ill/injured child who requires spinal motion restriction or lying flat.
   1. Secure the child to a size-appropriate child restraint. When appropriate, use Cervical Collar, and secure child to the cot.
   2. If the child is already secured to a spine board, ensure padding is added as needed and secure to the cot (i.e.: extrication prior to arrival of transporting ambulance). (See Spinal Precautions protocol).

E. Transport of a child or children requiring transport as part of a multiple patient transport (newborn with mother, multiple children, etc.)
   1. If possible, for multiple patients, transport each as a single patient according to the guidance provided for situations 1 through 4. For mother and newborn, transport the newborn in an approved size-appropriate restraint system in the rear-facing EMS provider seat with a belt-path that prevents both lateral and forward movement, leaving the cot for the mother.
   2. Consider the use of additional units to accomplish safe transport, remembering that non-patient children should be transported in non-EMS vehicles, if possible.

SAFE TRANSPORTATION OF CHILDREN IN AMBULANCES
(Continued)

3. When available resources prevent meeting the criteria for situations A through D for all child patients, transport using space available in a non-emergency mode, exercising extreme caution and driving at a reduced speed.
4. Note: Even with childbirth in the field, it is NEVER appropriate to transport a child held in the parent/guardian/caregiver's arms or on a parent/guardian/caregiver's lap.[1]

[1] Protocol Source/References: National Highway Traffic Safety Administration. (2012). Working group best-practice recommendations for the safe transportation of children in emergency ground ambulances. https://www.nasemso.org/Committees/STC/documents/NHTSA-Safe-Transportation-of-Children- in-Ambulances-2012.pdf

VIRAL ILLNESS/COVID-19 PROTOCOL
[EMR, EMT, AEMT, EMT-I, RN, EMT-P]

PURPOSE:

The following advisory is an emergency amendment to the 2020 NoCEMS Protocols in the context of the ongoing COVID-19 pandemic outbreak and is in force as of March 30, 2020. This advisory is an overlay to existing patient care protocols and applies to the management of patients diagnosed with or suspected of having COVID-19 or an influenza illness (ILI) based on dispatch information, patient location, context (care facility, etc.), ongoing outbreak epidemiology, and provider obtained history, judgment and other information.

PROCEDURE:

High Risk Patients, Procedure Questions and Situational Awareness

1. Does the patient have a fever, cough, or respiratory distress?
2. Is the patient or facility suspected to have COVID-19?
3. Has the patient had prior contact with a known COVID-19 patient?
4. Is the patient from a high-risk facility (Assisted Care, AFH, Nursing home, clinic, jail)?
5. Could the patient require aerosol-generating procedures?

If the answer is “yes” to any of the above questions, the patient is a high risk patient and could be considered a potential COVID-19 patient and considerations for PPE, treatment and procedure modifications should be made as indicated below.
In addition to the above, consider patient with the following signs or symptoms at risk for COVID-19:

SYMPTOMS	SIGNS
Fever (observed or reported)**	Tachypnea (RR > 24/min)
Shortness of breath**	Tachycardia (HR > 100/min)
Cough**	Hypoxia (SpO_2 < 94%)
URI symptoms with sore throat, rhinorrhea	Hypotension (MAP < 65mmHg or SPB < 90 mmHg)
Chest pain	
Confusion	
Headache	
Fatigue/Myalgia (muscle aches)	
Anorexia, loss of taste or smell	
Nausea, vomiting, diarrhea	
**primary symptoms	

A. **Universal Patient Care Protocol**

1. Wear appropriate PPE for the appropriate patient and situation.
2. Review information provided by dispatch and request additional information from dispatch as needed.
3. Although no longer strictly relevant, the patient should be questioned about a history of recent travel or contact with a known COVID-19 patient.
4. If possible, consider using reporting party (RP) phone number to communicate and obtain more information before entering a scene.
5. If possible, establish communication with the patient, family member(s) or caretaker(s), while maintaining at least 6 feet of distance.
6. If possible, have the patient move to an open area.
7. Equipment and bags (including drug boxes) should be kept >6 feet (or as far away from) the patient as possible.
8. Ensure proper provider donning/doffing for high-risk encounters/procedures. Ideally doffing should be done with a buddy to watch and ensure no personal contamination.
9. PIC should ensure or designate the role to an on-scene provider, that personnel are maintaining proper PPE and distancing themselves as much as possible from patient. If possible, personnel should stay out of the same room as the patient, if not actively providing hands-on care.
10. If possible, all patients who are not already wearing mask should be given a simple surgical/medical mask to wear over their mouth and nose.
11. If agencies have the capability to utilize remote technology (video - either onsite or remote context e.g. FaceTime, Skype, etc.) to initially screen and assess a patient, this can be considered.
12. When possible and safe, limit the number of personnel exposed to any known or potentially COVID-19 infected person. If safe for patient care, one provider should initially assess a patient.
13. When entering a care facility, including adult foster care homes, with known COVID-19 patients, consider the facility to be a high-risk area for both providers and patients and personnel exposure should be limited as feasible. Appropriate PPE should be worn inside the facility. EMS personnel are encouraged to ask facility staff to bring patients (wearing a simple mask) to a central area near the facility entrance for initial EMS evaluation.

PPE

1. For patient encounters with known or suspected COVID-19 infection, minimum PPE will include gloves, eye protection (goggles preferred), and mask (N95 or greater if available). Consider gown or coveralls if in physical contact with patient.
2. **If high-risk aerosolizing procedures are being performed, airborne-precautions and PPE must be used. This means, the above PPE with the addition of gowns and N95 or higher respiratory protection.**

HIGH-RISK AEROSOLIZING PROCEDURES	HIGH-RISK PPE REQUIREMENTS (required for anyone within 6 feet of the
Bag-Valve-Mask Ventilation	Gloves
Endotracheal Intubation	Eye Protection
Supraglottic Airway Placement	Highest Available Respiratory Protection
Nasal and Oral Airway Placement	Gown
Non-Invasive Positive Pressure	
Nebulized Treatments	
Suctioning	

B. Patient Transport Instructions

1. Contact the receiving facility as soon as possible and advise them that you have a patient needing isolation, if available. Do not enter the ED or other patient care area until directed by the ED staff. This may include alternate locations within the facility such as temporary shelters and treatment areas.
2. Family members and contacts of patients with possible COVID-19 shall not ride in the transport vehicle except for pediatric patients or other vulnerable or special needs patients.
3. Isolate the driver from the patient compartment if possible; if unable, the driver should wear appropriate mask and eye protection.
4. During transport, vehicle ventilation settings in both compartments should be on non-recirculated mode. Open the outside air vents in the driver area and turn on the ventilation fans to the highest setting.
5. If possible, place patient in yellow emergency blanket to minimize contamination of the ambulance.

TREATMENT:

A. Cardiac Arrest Protocol

1. All cardiac arrest patients are high-risk and high-risk PPE should be worn.
2. See airway management instructions and ETI guidance.

B. Respiratory Distress Protocol

4. Airborne precautions (high-risk PPE) are needed for any aerosol generating procedures as defined previously.
5. All personnel in the room with a patient receiving any high-risk procedures should use appropriate high-level PPE before treatment is initiated.
6. If using a nasal cannula or NRB, a simple mask should be applied over this equipment on a patient's face if possible to reduce droplet spread.

7. Nebulized meds should be used as a last resort - consider other appropriate treatments first. A patient with severe respiratory distress and wheezing can still receive nebulized treatments. Perform treatments on scene and outside if possible. Nebulizer treatments should not be performed during transport.
8. If available, use an albuterol Metered Dose Inhaler (MDI) in lieu of nebulizer treatments. If patient has their own MDI, consider bringing it with you for use in route. 4 puffs of an albuterol MDI is equivalent to 1 nebulized treatment; if available, use a spacer.
9. Instead of nebulized treatments for asthma, consider Epinephrine (0.3mg - 0.5 mg Epi 1:1000 IM every 5 minutes, repeated once). Consider using lower doses (0.1 - 0.3 mg IM) for patients > 40 years old or with known coronary artery disease.
10. Early administration of corticosteroids (Dexamethasone) has been shown to result in survival benefit and improved outcomes in patients with COVID-19 who have severe illness requiring oxygen or airway interventions. Consider administering Dexamethasone 10 mg IV or PO in confirmed COVID-19 patients with severe respiratory distress.
11. When treating for suspected CHF, IV NTG bolus may be preferred over CPAP/BiPaP to decrease exposure risk to providers from COVID-19 possible patients.
12. BVMs should be equipped with Viral/HEPA filters, as available.
13. Maximize area ventilation during these procedures as able: open doors, use exhaust fans, etc.

C. General Airway Management

1. The most experienced provider should assume control of airway management in known or suspected COVID-19 patients.
2. The use of SGAs is considered a continuously aerosolizing procedure.
3. When using a BVM, a viral/HEPA filter must be placed between the mask and the bag, if available.

D. Non-Invasive Positive Pressure Ventilation (CPAP/BiPaP)

1. This is an aerosolizing procedure and should be considered when performing advanced airway management and donning appropriate PPE. Attempt to minimize the performance of this procedure to only when necessary for respiratory distress.
2. When used in a potential COVID-19 patient a viral/HEPA filter should be placed between mask and the device if available.
3. **DO NOT** discontinue CPAP/BiPAP upon entering the ED.

E. Advanced Airway Management

1. If advanced airway management is needed in a possible COVID-19 patient, the most experienced provider on-scene is encouraged to be the person in charge of the airway.
2. Preferred pre-oxygenation method is with a BVM with proper facemask-seal with viral/HEPA filter. Consider DSI as the preferred method of intubation if unable to achieve proper preoxygenation levels. If no issue with preoxygenation, RSI can be used.
3. Do not squeeze BVM bag before intubation attempt but hold facemask with good two-handed technique with PEEP set at 5-10 cmH_2O until initiating advanced airway attempt to maximize recruitment of alveoli.
4. Ensure viral/HEPA filter is attached to BVM before intubation attempt, if available.

5. Intubation with video laryngoscopy (VL) and bougie is strongly preferred over direct laryngoscopy (DL). This is to maximize the distance from patient and limit exposure.
6. Endotracheal intubation is preferred over PEAD or SGA.
7. If a patient responds to supplemental oxygen with SpO_2 levels above 90% (and can maintain adequate airway) defer advanced airway management and notify the hospital of a potential need for airway management upon arrival.
8. After intubation, make sure that you have the viral/HEPA filter in place on the BVM, as able, to attach to the tube. Inflate the cuff before bagging the patient.
9. Confirm tube placement using standard verification methods, including $EtCO_2$ waveform capnography.

F. Suctioning

6. Suctioning is an aerosolizing procedure and should only be considered after donning appropriate PPE.
7. Attempt to minimize the performance of this procedure. Use only when necessary to maintain adequate ventilation and oxygenation.

G. Medication Routes of administration

1. Intranasal administration of medications is an aerosolizing procedure and therefore should be avoided when it is possible to administer medications via other routes.
2. Intranasal administration should only be considered in a COVID-19 PUI after donning appropriate PPE for aerosolized procedures.

2022 PROTOCOL REVISIONS

Protocol	Changes	Page #	Date of Change
ACLS - ASYSTOLE/PEA	Calcium Gluconate Dosing changed to correspond to MEDS	17	1/16/2022
Acute Adrenal Insufficiency	Pediatric dose of dexamethasone decreased to 0.05 mg/kg IV/IM	29	1/16/2022
Altered Mental Status	Pediatric Glucagon Dose changed as per MEDS	32	1/16/2022
Chest Pain	EKG interpretation moved into EMT-I section	37	1/16/2022
Diabetic Emergencies	Hypoglycemia - updated pediatric dosage to be consistent with Glucose Medication Sheet	44	1/16/2022
Diabetic Emergencies	Hyperglycemia: Added in note of symptoms, monitoring of ETCO2 with notification to receiving hospital of suspected DKA. Removed paramedic section (since all the treatments are in the AEMT scope)	45	1/16/2022
Hyperkalemia	New Hyperkalemia Protocol	54	1/16/2022
OB: Eclampsia/ pre-eclampsia	Magnesium dose updated to 4 gm (40 ml of 10% solution) IV/IO over 4 minutes as per MEDS	65	1/16/2022
Poisoning	4. CO - new protocol with CPAP or NRB/NC	71	1/16/2022
Poisoning	1. aspirin and acetaminophen - avoid intubating	72	1/16/2022
Poisoning	2. B-blocker OD - epi drip	72	1/16/2022
Poisoning	3. CCB - 1-3 G Ca gluconate	72	1/16/2022
Poisoning	5. Chlorine Inhalation - nebulized sodium bicarbonate	72	1/16/2022
Poisoning	6. Organophosphate - Strongly consider hazmat activation	72	1/16/2022
Airway Management	PEAD replaced by PEAD or SGA throughout document		1/16/2022