ESSENTIAL LIFE SUPPORT

General EMS Principals

Initial Medical Care

The Initial Medical Care is the starting point for all protocols and should be followed at the appropriate level of care for the patient care provider. With the exception of COMBITUBE[tm] and defibrillation, all Emergency Medical Technician – Basic level treatment is to be initiated en route to the receiving facility unless there is a delay transport, or it is otherwise specified in the protocol.

A. Emergency Medical Technician – Basic

- Establish airway and support, maintain C-spine control if trauma related; start with BLS airway including positioning and placement of oral or nasal airway and assist with a bag valve mask.
- Initiate high-flow oxygen therapy on all patients with signs of shock or with shortness of breath. Nasal cannula for non-traumatic or medical patient PRN.
- Control external bleeding. Obtain vital signs every 5 minutes on unstable patients and 15 minutes on stable patients, note skin condition and auscultate lung fields. Refer to shock protocol for any patient with physical findings consistent with shock.
- Assist patient with own medication if appropriate (BLS). This refers specifically to nitro (if BP > 100), epinephrine pens, and metered dose inhalers.
- Splint suspected fractures and dislocations as appropriate and control external bleeding.
- Restrain to protect the patient from self-injury and from injuring others.
- Basic will only be allowed to perform skills to which level they are endorsed with: Basic Monitoring, Basic/Airway, IV/IO, and Basic Medication.

B. Emergency Medical Technician – Intermediate '85

- Establish airway and support, maintain C-spine control if trauma related; start with BLS airway including positioning and placement of oral or nasal airway and assist with a bag valve mask. Endotracheal intubation via oral means. If unable to intubate after max of 3 attempts, proceed to use COMBITUBE[tm]. Both treatment with, and documentation of, end tidal CO_2 detector is required on all patients who are intubated. If potential for cervical spine trauma, use in-line immobilization technique.

- Initiate high-flow oxygen therapy on all patients with signs of shock or with shortness of breath. Nasal cannula for non-traumatic or medical patient PRN.
- Control external bleeding. Obtain vital signs every 5 minutes on unstable patients and 15 minutes on stable patients, note skin condition and auscultate lung fields. Refer to shock protocol for any patient with physical findings consistent with shock.
- Restrain to protect the patient from self-injury and from injuring others.
- Splint suspected fractures and dislocations as appropriate and control external bleeding.
- Start IV using NORMAL SALINE/LACTATED RINGERS with appropriate needle size.
- Monitor ECG as needed.
- Except where noted, care defined after "**Contact Medical Control**" may be performed if contact with Medical Control cannot be facilitated. Medical Control may be contacted at any point in any algorithm.

C. Emergency Medical Technician – Intermediate '99

- Establish airway and support, maintain C-spine control if trauma related; start with BLS airway including positioning and placement of oral or nasal airway and assist with a bag valve mask. Endotracheal intubation via oral means. If unable to intubate after max of 3 attempts, proceed to use COMBITUBE^{tm}. Both treatment with, and documentation of, end tidal CO_2 monitor is required on all patients who are intubated. If potential for cervical spine trauma, use in-line immobilization technique.

- Initiate high-flow oxygen therapy on all patients with signs of shock or with shortness of breath. Nasal cannula for non-traumatic or medical patient PRN.
- Control external bleeding. Obtain vital signs every 5 minutes on unstable patients and 15 minutes on stable patients, note skin condition and auscultate lung fields. Refer to shock protocol for any patient with physical findings consistent with shock.
- Restrain to protect the patient from self-injury and from injuring others.
- Splint suspected fractures and dislocations as appropriate and control external bleeding.
- Start IV using NORMAL SALINE/LACTATED RINGERS with appropriate needle size.
- Monitor ECG as needed.
- Except where noted, care defined after "**Contact Medical Control**" may be performed if contact with Medical Control cannot be facilitated. Medical Control may be contacted at any point in any algorithm.

D. Emergency Medical Technician – Paramedic

- Establish airway and support, maintain C-spine control if trauma related; start with BLS airway including positioning and placement of oral or nasal airway and assist with a bag valve mask. Endotracheal intubation via oral, nasal, or digital means. If unable to intubate after max of 3 attempts, proceed to use COMBITUBE^{tm}. Both treatment with, and documentation of, end tidal CO_2 monitoring is required on all patients who are intubated. If unable to maintain by any other method (either BLS or ALS), Paramedics may perform a surgical cricothyrotomy and retrograde intubations. If potential for cervical spine trauma, use in-line immobilization technique.
- Restrain to protect the patient from self-injury and from injuring others.
- Splint suspected fractures and dislocations as appropriate and control external bleeding.
- Start IV using NORMAL SALINE/LACTATED RINGERS with appropriate needle size.
- Monitor ECG as needed.
- Except where noted, care defined after "**Contact Medical Control**" may be performed if contact with Medical Control cannot be facilitated. Medical Control may be contacted at any point in any algorithm.

NOTE: THE EMT-INTERMEDIATE '85 CAN WORK AT THE SCOPE OF:

- **Emergency Medical Technician - Basic / Monitoring / Airway**
- **Emergency Medical Technician - Basic/ IV and IO**
- **Emergency Medical Technician - Basic/ Endotracheal Intubation**

AIRWAY MANAGEMENT

INTRODUCTION:

The airway is the first priority in the care of the emergency victim. Without proper airway and oxygenation, further resuscitative efforts are most always futile.

I. OXYGEN ADMINISTRATION:

A. Indications:

1. Should be given for any condition that results in a decrease of normal tissue perfusion:
   a. Compromised cardiac function; heart attack, angina, congestive failure, chest pain, etc.
   b. Compromised pulmonary function; pneumonia, respiratory failure, inhalation injuries, pulmonary embolus, pneumothorax, etc.
   c. Trauma and shock.
   d. Toxins like carbon monoxide, cyanide, hydrogen sulfide, etc.
   e. All other suspected causes.

B. Precautions:

1. The COPD patient. Oxygen may decrease the respiratory drive. DO NOT withhold oxygen from this patient, be prepared to assist ventilations, if needed. Initial oxygen flow should be NO greater than 2 LPM.
2. Oxygen administration to a patient who is not breathing or who has an insufficient respiratory rate is a waste of oxygen. He/she must also be supported in his/her respirations.
3. DO NOT use a facemask at flow rates below 8 LPM.

Delivery Systems:	Flow Rate:	Percent O_2
1. Nasal Cannula (N.C.)	1-6 LPM	24% - 44%
2. Simple Mask	8-15 LPM	35% - 60%
3. Nonrebreather	10-15 LPM	90% -100%
4. Bag-Valve-Mask	12-25 LPM	40% -100%
5. Venturi Mask	Variable High Flow	Variable O_2
6. DEMAND VALVE IS NOT RECOMMENDED.		

C. Plan:

1. In most cases oxygen can adequately be delivered using a nasal cannula starting at rates of 4-6 LPM.
2. If available, use oxygen saturation (O_2 sat.) monitors to more adequately deliver the proper amount of oxygen to the patient.
   a. Remember to treat the patient, not the monitor.
   b. Cold extremities may lead to abnormally low O_2 saturation readings.
   c. CO poisoning will lead to incorrect O_2 saturation readings.
   d. Nail polish will not allow proper O_2 saturation readings; try turning the finger probe sideways.

3. It is optimal (except in the chronic lung patient) to keep O_2 sat greater than 90%. The EMT may choose alternate O_2 delivery devices to ensure that the O_2 sat is maintained.
4. The chronic lung patient may require lower O_2 sat (mid to upper 80's) as optimal O_2 sat. As always DO NOT withhold oxygen if the patient needs it.

II. AIRWAY ADJUNCTS:

Historical Data:

1. Determine respiratory distress:
   a. Normal adult rate - 10-18/min.
   b. Normal child rate - 16-30/min.
   c. Normal infant rate - 20-40/min.
   d. Normal newborn rate - 30-60/min.
2. Is airway obstructed?
3. Predisposing conditions:
   a. Chronic lung disease,
   b. Infection,
   c. Toxins,
   d. Heart disease,
   e. Trauma,
   f. Metabolic,
   g. Neurologic,
   h. Allergic.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER A, EMT Basic:

1. Determine respiratory distress.
2. Open airway:
   a. Head tilt/chin lift preferred EXCEPT in trauma.
   b. Jaw thrust or chin lift in trauma.
3. If obstructed, follow BLS protocol to relieve obstruction (see page 12).
4. Administer oxygen appropriate to individual situations. (See specific sections i.e.; burns, asthma, etc.)
5. Monitor the adequacy of ventilation (chest rise, breath sounds, and skin color), and if still inadequate assist:
   a. Mouth-to-mouth.
   b. Mouth-to-mask. (Preferred Method)
   c. Bag-valve-mask. (EMT B and above)
6. Suction as needed.
7. Oropharyngeal airway may be inserted to improve and maintain open airway.
   a. Choose the right size (measure from teeth to angle of mandible).
   b. Patient must be unconscious.
8. Nasopharyngeal airway may be inserted:
   a. Choose the right size (measure from nares to angle of mandible).
   b. Insert along floor of nose.

B. EMT Basic Airway:

9. Combi-Tube should be used when:
   a. You cannot ventilate the patient by other means.
   b. Contraindicated when:
      - The patient is breathing.
      - The patient has a gag reflex.
      - Airway obstruction.
      - Caustic ingestion.
      - Patient is less than 4 feet tall.
      - Age less than 8.

C. EMT Basic Intubation, EMT Intermediate:

10. Endotracheal tube should be used when:
    a. You cannot ventilate the patient adequately with conventional methods (mouth-to-mouth, mouth-to-mask, bag-valve-mask).
    b. Trauma patient who <u>initially presents</u> apnic with no response to stimuli:
       1) Must use in-line stabilization.
    c. The patient is unable to protect his or her own airway (coma, areflexia, cardiac arrest, etc.).
    d. You need prolonged artificial ventilation.
11. Technique:
    a. Have all equipment ready at hand: laryngoscope, blades, tubes, suction.
    b. Choose the correct tube size:

Age	Weight	ET Tube	Suction
Newborn	3.5 Kg	3.5(no cuff)	6-8 Fr
6 months	7 Kg	4.0(no cuff)	8 Fr
1 year	10 Kg	4.0/4.5(no cuff)	8 Fr
2 years	12 Kg	4.5/5.0(no cuff)	8 Fr
3 years	14 Kg	5.0(cuff)	10 Fr
4 years	16 Kg	5.0/5.5(cuff)	10 Fr
5 years	18 Kg	5.5/6.0(cuff)	10 Fr
6 years	21 Kg	6.0/6.5(cuff)	10-12 Fr
7 years	24 Kg	6.5(cuff)	10-12 Fr
8 years	27 Kg	6.5	12 Fr
9 years	28 Kg	6.5	12 Fr
10 years	30 Kg	7.0	12-14 Fr
Adult Female	50 Kg	7.0-8.0	12-14 Fr
Adult Male	70 Kg	7.0-8.5	12-14 Fr

    c. Suction and clear the airway.
    d. Hyperventilate patient with bag-valve-mask.
    e. Insert laryngoscope, visualize cords and intubate, (not more than 15 seconds).
    f. Check for breath sounds bilaterally.
    g. Inflate cuff (if applicable) and check for breath sounds again.
    h. If available, attach to capnometry and monitor CO_2, or use an esophageal detector device.
    i. If unsuccessful, resume bag-valve-mask and repeat steps c-h only <u>TWICE</u>.

12. Nasotracheal intubation: (EMT-Intermediate or above)
    a. Alternative in trauma with suspected C-spine injury.
    b. Contraindicated with maxillofacial trauma and/or apnea.
    c. Insert along floor of nose and advance as patient inhales.
    d. Once in, follow steps f-h above

D. EMT Paramedic:

13. Cricothyrotomy
    a. Should be considered when:
        - Massive facial trauma,
        - Failed oral or nasal intubation or you cannot ventilate by other means.
        - Massive oral hemorrhage,
        - Obviously unstable C-spine.
    b. Should not be used in:
        - Penetrating neck injuries with hematoma,
        - Severe burns unless last resort.
    c. Technique:
        - Prepare neck with aseptic technique,
        - Locate cricothyroid membrane,
        - Make horizontal incision into membrane,
        - Insert appropriate size Shiley tube and secure,
        - Check for breath sounds,
        - The Peri-Trach Kit may be used in place of this traditional method.
14. Needle cricothyrotomy can be used as a temporary airway if other methods fail:
    a. Use aseptic technique,
    b. 14-gauge or larger angiocath,
    c. Insert through cricothyroid membrane and direct 45^{o} caudally,
    d. When air is aspirated, advance catheter and remove needle,
    e. Connect to Y tubing and ventilate with high flow O_2 15-30 LPM one (1) second in - four (4) seconds out.
15. Retrograde intubation (alternative oral intubation):
    a. Prepare neck with aseptic technique,
    b. Locate cricothyroid membrane,
    c. Insert needle and direct cephalad at 45^{o},
    d. When air is aspirated, advance guide wire and pull through mouth,
    e. Insert ET tube over guide wire and advance into trachea,
    f. Check for breath sounds,
    g. Remove guide wire and ventilate.

E. CCEMTP, RN:

16. Paralytics (succinylcholine):
    a. Consider paralytics when other measures of airway control have failed and the patient's underlying condition mandates airway control. (ex. combative head trauma patient with signs of increased intracranial pressure and physiologic deterioration.)
    b. Contact medical control.
    c. RSI procedure:
        1) Have all equipment ready, including alternative airway devices,
        2) Consider premedication with atropine 0.5 mg IV, Versed 1-3 mg IV, Fentanyl 100mcg IV

3) Administer succinylcholine 1.5 mg/kg IV or Vecuronium 0.1 mg/kg IV
4) Intubation as above and secure the tube. (See transport protocol)

PROCEDURE FOR:

INTRAVENOUS INFUSION THERAPY

The EMT Basic IV, EMT Intermediate, EMT Paramedic, and RN are directed to start a peripheral intravenous infusion as indicated by patient's condition. The arm is the site of choice. If the arm cannot be used, the saphenous vein in the leg may be accessed. If the IV cannot be started in the arm or leg, and the patient's condition is life threatening, cannulation of the external jugular vein may be attempted. Unless there are compelling factors, no more than 2 or 3 attempts will be made to start an IV. IVs should be started with an over-the-needle catheter, whenever possible. A butterfly may be an alternative.

1. Skin Prep:
   Swab the skin over the vein with a Betadine swab, then once with alcohol.

2. Accepted IVs include:
   a. Saline Lock.
   b. Lactated Ringers.
   c. Normal Saline.

3. Saline Lock:
   Once IV access is obtained, the catheter should be capped and flushed with 3 cc normal saline.
   Saline and/or heparin will be added after arrival in the Emergency Room.

4. Under almost all circumstances, except possibly the cardiac patient and the diabetic patient, IV access should be performed en route to minimize scene time.

5. Interosseous access is acceptable if other methods fail (PING sternal access, EZ IO)

NOTE

DISCONTINUE the infusion if the infusion infiltrates, i.e., the tissue around the vein cannulation site becomes swollen or sore.

SLOW the rate of infusion to 10 drops per minute if the patient develops increasing shortness of breath.

USE CAUTION when starting an intravenous infusion on patients younger than 8 years old, or smaller than 80 pounds. Pay special attention to the infusion rate and the possibility of circulatory overload.

Attempts at starting intravenous infusion therapy SHOULD NOT interfere with either basic or advanced life support measures or cause excessive delay in transporting the patient to a definitive care facility.

All patients who have intravenous lifelines initiated SHOULD BE observed for dysrhythmias and treated per standing orders.

IV SOLUTION RECOMMENDATIONS

SITUATION	SALINE-LOC	NS	LR
Anaphylaxis			kvo
Asthma (adult)			100/hr
Asthma (child)			kvo
Burns, chemical			kvo
Burns, electrical			100/hr
Burns, thermal			X
Cardiac, arrest	X		
Cardiac, chest pain/possible MI	X		
CHF	X	Dopamine drip	
COPD/Emphysema	X		
CVA	X		
Drowning/near drowning			kvo
Frostbite			100/hr warm
Heat cramps			100/hr
Heat exhaustion.			100/hr
Heat stroke			100/hr
Hyperglycemia			100/hr
Hypertensive crisis	X		
Hypoglycemia	X	(check with Medical Control for solution)	
Hypothermia			W/O warm
OB, breech			100/hr
OB, delivery			100/hr
OB, eclampsia			kvo
OB, heavy bleeding shock			W/O
OB, heavy bleeding			100/hr
OB, placental delivery			100/hr
Poisoning, CO	X		
Poisoning, lime	X		
Poisoning, OD			100/hr
Respiratory Distress	X		
Seizure disorders	X		
Shock			100/hr
Shock, BP<100			W/O
Trauma, abdominal			100/hr
Trauma, extremity			100/hr
Trauma, general			100/hr
Trauma, head			100/hr
Trauma, spinal			100/hr
Trauma, thoracic			100/hr
Unconscious adult	X		

PROCEDURE FOR:

OBTAINING BLOOD SAMPLE

A. INDICATION:

1. Patient who is unconscious for an unknown reason.

2. Patient who is a suspected diabetic.

B. PROCEDURE:

EMT Basic-IV, EMT Intermediate, EMT Paramedic, RN:

1. After you have put the catheter in the vein, use a 5 or 10 cc syringe to draw **at least** 5 cc of blood. Once you have drawn the blood sample...

2. Hook up your IV solution and release the tourniquet. After you have secured the IV and it is running...

3. Put a 19-gauge needle on the syringe with the blood in it, insert the needle into the rubber stopper of the blood tube. Allow the tube to fill itself. On the side of each blood tube is a label. The information that is to be on the label is:
   a. Name of patient.
   b. Date blood was drawn.
   c. Time blood was drawn.
   d. Your initials.

   It is IMPORTANT that all of the above information be on the blood tube when you bring the patient into the Emergency Room.

4. Document on your run report that you drew a baseline blood sugar.

C. PRECAUTIONS:

1. In order to obtain an accurate baseline blood sugar, it is very important to draw your blood sample before connecting your IV line into your catheter. An infusion of D_{50}, D_5W, or any other fluid into the catheter will alter the test results, making the blood sample unusable.

2. Be sure to wear rubber gloves when obtaining blood sample! Also, follow guideline page 88 "Universal Precautions - Personal Protective Equipment".

PROCEDURE FOR:

GLUCOMETER

The indiscriminate administration of glucose should be avoided as new evidence shows it may be detrimental to neuronal function and recovery.

First Responder- Monitoring, EMT B-Monitoring, EMT Intermediate, EMT Paramedic, RN:

1. Obtain a blood sample, either from the IV initiation or the finger stick procedure after adequate prep with Betadine swab followed by alcohol wipe.

2. Place drop on the chem strip.

3. Take reading off glucometer.

4. If reading is less than 60, administer glucose per protocol.

CPR/Rescue Breathing	Adult and Older Child	Child (~1yr old)	Infant (<1 yr old)	Newborn
Establish unresponsiveness, Activate EMS				
Open Airway (Head tilt, chin lift)	Head tilt-chin lift (if trauma present, use jaw thrust)	Head tilt-chin lift (if trauma present, use jaw thrust)	Head tilt-chin lift (if trauma present, use jaw thrust)	Head tilt-chin lift (if trauma present, use jaw thrust)
Initial	2 effective breaths at 2 sec/breath	2 effective breaths at 1 to 1 ½ sec/breath	2 effective breaths at 1 to 1 ½ sec/breath	2 effective breaths at 1 sec/breath
Subsequent	12 breaths / min (approx)	20 breaths / min (approx)	20 breaths / min (approx)	30 - 60 breaths/min (approx)
Foreign body airway obstruction	Abdominal thrusts	Abdominal thrusts	Back blows or chest thrusts (no abdominal thrusts)	Back blows or chest thrusts (no abdominal thrusts)
Check for Circulation	Pulse Check (carotid)	Pulse Check (carotid)	Pulse Check (Brachial)	Pulse Check (umbilical)
Compression Landmarks	Lower half of Sternum	Lower half of Sternum	Lower half of Sternum (1 finger's width below intermammary line)	Lower half of Sternum (1 finger's width below intermammary line)
Compression Method	Heel of one hand, other hand on top	Heel of one hand	2 fingers or 2 thumb-encircling hands for 2-rescuer trained providers	2 fingers or 2 thumb-encircling hands for 2-rescuer trained providers
Compression Depth	1 ½ -2 in (4-5 cm)	One third to one half the depth of the chest	One third to one half the depth of the chest	One third depth of the chest for newborn
Compression Rate	~100/min	~100/min	≥100/min	~ 120 events/min (90 compressions / 30 breaths)
Compression – ventilation ratio	15:2 (1 or 2 rescuer, unprotected airway) 5:1 (2 rescuers, protected airway)	5:1 (1 or 2 rescuers)	5:1 (1 or 2 rescuers)	3:1 (1 or 2 rescuers)

Comparison Across Age Groups of Resuscitation Interventions

MEDICAL EMERGENCIES

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ABDOMINAL PAIN

Historical Data:

1. Abdominal pain can be caused by numerous etiologies. Some can be life threatening such as ruptured ectopic pregnancy and abdominal aneurysm.
2. Take a careful history:
   a. Time of onset,
   b. Nature and level of pain (i.e.: constant, intermittent, sharp, dull, burning, 1-10),
   c. Previous history of pain,
   d. Menstrual history,
   e. Medications,
   f. Self administered remedies,
   g. Bowel function,
   h. Urinary function,
   i. Vomiting.
3. Last meal.
4. Don't forget possible referred pain.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor:

1. Allow patient to assume position of comfort.
2. Physical: Look - Listen - Feel.
3. O_2 4-6 LPM per nasal cannula (2 LPM if COPD).

B. FIRST RESPONDER A, EMT Basic:

4. Transport in position of comfort.
5. Be alert for shock.

C. EMT Basic- IV, EMT Intermediate:

6. Establish IV access of LR at 100 cc/hr.

D. EMT Intermediate:

7. Consider a second line if exam indicates.
8. Consider morphine sulfate, 2-4 mg IVP, repeat to a total of 15 mg.
   Pediatric dosage: 0.1-0.2 mg/kg.
9. Consider Fentanyl 25-100 mcg slow IVP (over 2-3 min).
   Pediatric dosage: 1-2 mcg/kg.
10. **Contact Medical Control for one or more of the following.**
    a. If a patient presents with altered mental status for any reason, orders for MS for pain control must be received from Medical Control.
    b. Repeat pain medication beyond the above limits at MD discretion.

E. EMT Paramedic, CCEMTP, RN:

11. Consider Phenergan 25 mg IV for adults with nausea.

ANAPHYLAXIS

Historical Data:

1. Take careful history:
   a. Medications,
   b. Food,
   c. Toxins,
   d. Insects,
   e. Medic Alert Tags.
2. Check for associated symptoms like chest pain, paresthesia.
3. Patients usually show the following symptoms in **any** combination:
   a. Hives, itching, flushing,
   b. Wheezing, respiratory collapse,
   c. Pharyngeal edema, trouble swallowing,
   d. Hypotension, tachycardia, dizziness,
   e. Loss of consciousness, seizures,
   f. Vomiting, cramping, diarrhea.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, FIRST RESPONDER A:

1. Vital signs.
2. Open and protect airway.
3. Position of comfort.
4. High flow O_2
5. Attach to AED if indicated.

B. EMT Basic:

6. May assist patient with his own medication including epinephrine auto-injector.

C. EMT Basic IV

7. Start a peripheral IV(s) as necessary, with NORMAL SALINE/LACTATED RINGERS solution (en route). May adjust rate in accordance with BP and medical control.

D. EMT Basic Intubation:

8. If respiratory collapse - intubate and ventilate.

E. EMT Basic Medication:

9. Consider Epi-Pen if indicated
10. Epinephrine:
    Adult 0.3 - 0.5 cc 1:1000 SQ or IM
    Child 0.01 cc/kg 1:1000 SQ or IM
11. Benadryl:
    Adult 25-50 mg IM or PO
    Child 1.0 mg/kg IM or PO
12. Albuterol nebulizer .5 cc/2 cc NS adult or child for respiratory distress.

G. EMT Intermediate:

13. Epinephrine:
    Adult 0.3 - 0.5 cc 1:1000 SQ or IM or
    5-10 cc 1:10,000 IV- (PROFOUND HYPOTENSION OR RESPIRATORY DISTRESS)
    Child 0.01 cc/kg 1:1000 SQ or IM
    may repeat doses every 15 minutes.

14. Benadryl:
    Adult 25-50 mg IM or IV (or p.o.)
    Child 1.0 mg/kg IM or IV (or p.o.)

H. EMT Paramedic, CCEMTP, RN:

15. Solu-Medrol: if cleared with Medical Control
    Adult 125 mg IV Child 5 mg/kg IV
16. Pepcid 20 mg IV

CARDIOVASCULAR MEDICAL EMERGENCIES

I. CARDIAC ARREST:

Missoula Area EMS has adopted and will follow the American Heart Association's approved CPR and dysrhythmia algorithms.

A. FIRST RESPONDER, FIRST RESPONDER Monitor, FIRST RESPONDER A:

1. Establish pulselessness.
2. Begin CPR.
3. Attach AED if indicated and Heart Saver certified.

B. EMT Basic:

4. May attach AED and follow protocol (page 23).

C. EMT Basic Airway

5. Utilize a COMBITUBE as needed.

D. EMT Basic IV

6. Start a peripheral IV(s) as necessary, with NORMAL SALINE or LACTATED RINGERS en route.

E. EMT Basic Intubation

7. Establish advanced airway as needed.

F. EMT Intermediate

8. Treat cardiac arrest rhythm per specific protocol.
9. Consider Contact to Medical Control.

G. EMT- Paramedic

10. Treat cardiac arrest rhythm per specific protocol.
11. Consider nasogastric tube placement for gastric distention only after intubation.
12. Consider Contact to Medical Control.

II. CHEST PAIN: SUSPECTED MYOCARDIAL ISCHEMIA:

Historical Data:

1. There are numerous causes of chest pain and no hard, fast rules. **ALWAYS EXPECT THE WORST.**
2. Possibilities include, but are not limited to:
   a. Angina, myocardial infarction.
   b. Pleurisy, pneumonia, pulmonary embolus, pneumothorax.
   c. Chest wall pain.
   d. Esophageal pain, gastric pain, gallbladder.
   e. Aneurysm.
3. Take a careful history including:
   a. Past episodes,
   b. Time of onset and what they were doing,
   c. Type and intensity of pain (sharp, dull, 1-10, etc.),
   d. Location of pain,
   e. Radiation of pain.
4. Associated symptoms:
   a. Shortness of breath,
   b. Diaphoresis,
   c. Nausea and vomiting.
5. Medication and allergy history.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, FIRST RESPONDER A:

1. Vital signs and general appearance.
2. Secure airway and assess lung sounds.
3. Make patient comfortable.
4. O_2 4-6 LPM per nasal cannula (2 LPM if COPD).
5. CPR as needed.
6. Attach to AED if indicated and Heart Saver certified.

B. EMT Basic:

7. Attach to AED and treat dysrhythmias per protocol.

C. EMT Basic- Airway

8. Utilize a COMBITUBE as needed.

D. EMT Basic- IV

9. Start a peripheral IV(s) as necessary, with NORMAL SALINE or LACTATED RINGERS en route.

E. EMT Basic - Intubation

10. Establish advanced airway as needed.

F. EMT Basic- Medication:

11. May administer nitro 1/150th gr SL tablet or 1 spray SL x 1, if systolic > 100
12. Aspirin 160 mg p.o. if no contraindications IE. active ulcer distress, bleeding disorders, or blood thinners.

G. EMT Intermediate:

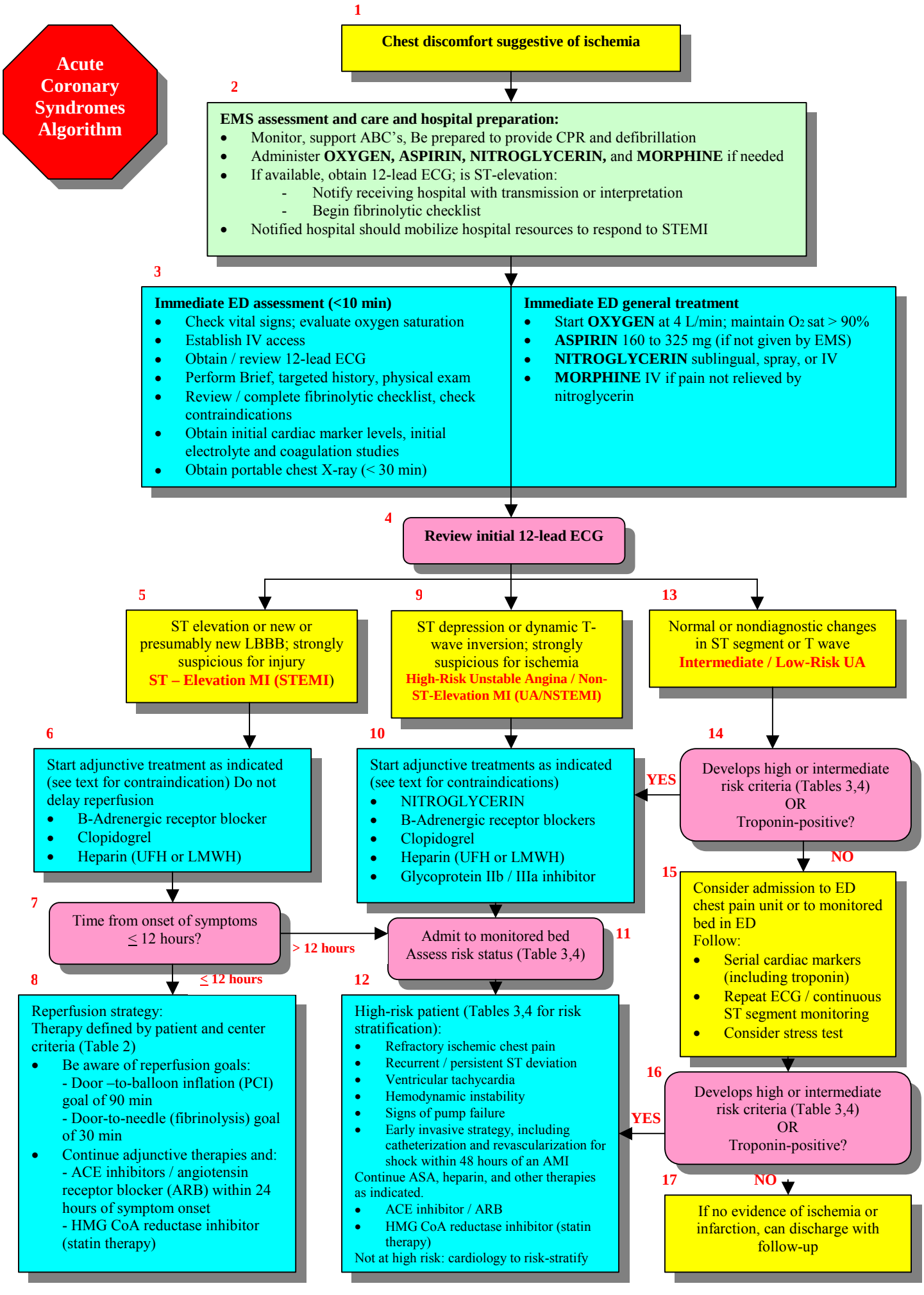
14. Follow treatment algorithm.

H. EMT Paramedic:

15. Perform 12 lead EKG and transmit to ER.
16. Morphine sulfate 2.0 - 5.0 mg IV every 5 minutes up to 20 mg.
17. Follow all approved ACLS algorithms and chest pain algorithm.

I. EMT Paramedic Medication, CCEMTP, RN:

18. Intravenous nitroglycerine per medical control.
19. Consider Lovenox 1 mg/kg SQ per medical control.


Acute Coronary Syndromes Algorithm
1
Chest discomfort suggestive of ischemia
2
EMS assessment and care and hospital preparation:
• Monitor, support ABC's, Be prepared to provide CPR and defibrillation
• Administer OXYGEN, ASPIRIN, NITROGLYCERIN, and MORPHINE if needed
• If available, obtain 12-lead ECG; is ST-elevation:
- Notify receiving hospital with transmission or interpretation
- Begin fibrinolytic checklist
• Notified hospital should mobilize hospital resources to respond to STEMI
3
Immediate ED assessment (<10 min)
• Check vital signs; evaluate oxygen saturation
• Establish IV access
• Obtain / review 12-lead ECG
• Perform Brief, targeted history, physical exam
• Review / complete fibrinolytic checklist, check contraindications
• Obtain initial cardiac marker levels, initial electrolyte and coagulation studies
• Obtain portable chest X-ray (< 30 min)
Immediate ED general treatment
• Start OXYGEN at 4 L/min; maintain O2 sat > 90%
• ASPIRIN 160 to 325 mg (if not given by EMS)
• NITROGLYCERIN sublingual, spray, or IV
• MORPHINE IV if pain not relieved by nitroglycerin
4
Review initial 12-lead ECG
5
ST elevation or new or presumably new LBBB; strongly suspicious for injury
ST – Elevation MI (STEMI)
9
ST depression or dynamic T-wave inversion; strongly suspicious for ischemia
High-Risk Unstable Angina / Non-ST-Elevation MI (UA/NSTEMI)
13
Normal or nondiagnostic changes in ST segment or T wave
Intermediate / Low-Risk UA
6
Start adjunctive treatment as indicated (see text for contraindication) Do not delay reperfusion
• B-Adrenergic receptor blocker
• Clopidogrel
• Heparin (UFH or LMWH)
10
Start adjunctive treatments as indicated (see text for contraindications)
• NITROGLYCERIN
• B-Adrenergic receptor blockers
• Clopidogrel
• Heparin (UFH or LMWH)
• Glycoprotein IIb / IIIa inhibitor
14
Develops high or intermediate risk criteria (Tables 3,4) OR Troponin-positive?
YES
NO
7
Time from onset of symptoms ≤ 12 hours?
> 12 hours
11
Admit to monitored bed
Assess risk status (Table 3,4)
15
Consider admission to ED chest pain unit or to monitored bed in ED
Follow:
• Serial cardiac markers (including troponin)
• Repeat ECG / continuous ST segment monitoring
• Consider stress test
8
≤ 12 hours
Reperfusion strategy:
Therapy defined by patient and center criteria (Table 2)
• Be aware of reperfusion goals:
- Door –to-balloon inflation (PCI) goal of 90 min
- Door-to-needle (fibrinolysis) goal of 30 min
• Continue adjunctive therapies and:
- ACE inhibitors / angiotensin receptor blocker (ARB) within 24 hours of symptom onset
- HMG CoA reductase inhibitor (statin therapy)
12
High-risk patient (Tables 3,4 for risk stratification):
• Refractory ischemic chest pain
• Recurrent / persistent ST deviation
• Ventricular tachycardia
• Hemodynamic instability
• Signs of pump failure
• Early invasive strategy, including catheterization and revascularization for shock within 48 hours of an AMI
Continue ASA, heparin, and other therapies as indicated.
• ACE inhibitor / ARB
• HMG CoA reductase inhibitor (statin therapy)
Not at high risk: cardiology to risk-stratify
16
Develops high or intermediate risk criteria (Table 3,4) OR Troponin-positive?
YES
NO
17
If no evidence of ischemia or infarction, can discharge with follow-up

III. CONGESTIVE HEART FAILURE/PULMONARY EDEMA:

Historical Data:

1. Patients may have a previous history, however, it may also be seen in the massive MI.
2. Take a careful history including presence of chest pain.
3. Take a careful medication history.
4. Symptoms usually include:
   a. Shortness of breath.
   b. Dyspnea on exertion.
   c. Orthopnea.
   d. Paroxysmal nocturnal dyspnea.
   e. Increased BP.
5. Signs include:
   a. Noisy, wet-sounding respirations.
   b. Diaphoresis.
   c. Air hunger.
   d. Neck vein distension.
6. Other causes of pulmonary edema include:
   a. Drugs: Heroin, Darvon, and Doriden.
   b. Toxic inhalations.
   c. High altitude.
   d. Near-drowning.
   e. Neurogenic pulmonary edema.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, FIRST RESPONDER A:

1. Allow the patient to assume position of comfort (usually sitting).
2. Vital signs.
3. High flow O2.
4. If pulseless, attach to AED if Heart Saver certified.

B. EMT Basic:

5. If pulseless, attach to AED and follow protocol.

C. EMT Basic- IV:

6. Establish IV access (saline lock).

D. EMT Basic- Airway

7. Establish a Combitube if indicated.

E. EMT Basic- Intubation

8. Intubate if clinically indicated

F. EMT Basic- Medication:

9. Nitroglycerine 1/150 gr SL every 5 minutes x 3 if BP systolic is greater than 100.

G. EMT Intermediate:

10. Lasix 40-80 mg IV.
11. Morphine sulfate 2 mg IV every 5 minutes, up to 10 mg.
12. Treat dysrhythmias per ACLS protocol.

H. EMT Paramedic Medication, CCEMTP, RN:

12. Dopamine drip 400 mg/500 cc D_5W, start at 2.0 - 5.0 micrograms/kg/min. per order from Medical Control.
13. NTG drip and titrate to effect per medical control.

IV. HYPERTENSIVE CRISIS:

Historical Data:

1. BP greater than 200 systolic or 130 diastolic usually requires no emergent treatment.
2. Most hypertensive situations have few symptoms, however, when the patient has one or more of the following, intervention is needed:
   a. Sudden, severe headache and/or signs of a CVA.
   b. Acute MI or chest pain.
   c. Pulmonary edema.
   d. Known aneurysm.
3. Take a careful drug history.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, FIRST RESPONDER A, EMT Basic:

1. Vital signs.
2. O_2 4-6 LPM per nasal cannula (2 LPM if COPD).
3. Assist ventilations as needed.
4. Attach to AED if indicated.

B. EMT Basic- IV:

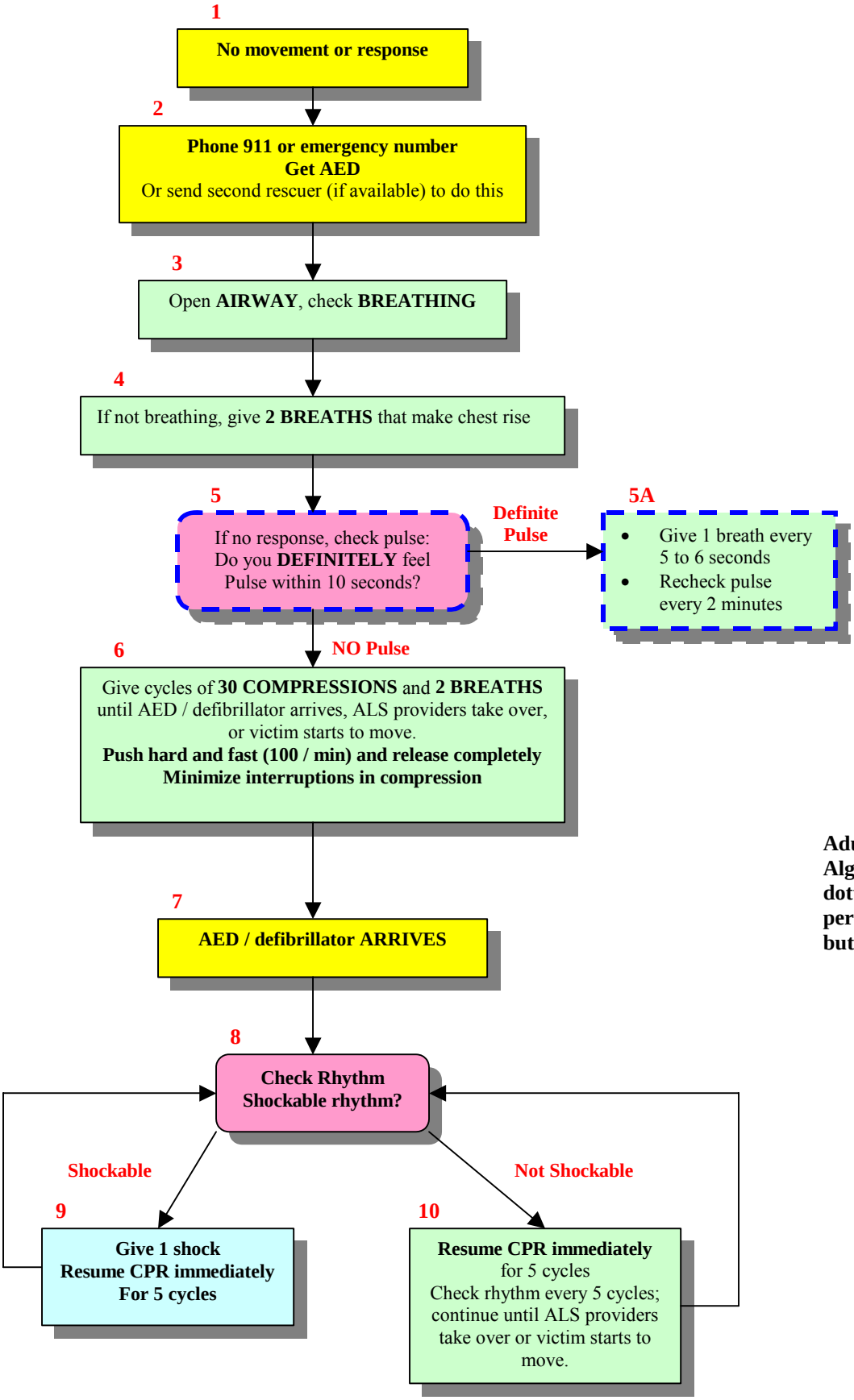
5. Establish IV access (saline lock)

C. EMT Intermediate:

6. Contact Medical control for possible medication orders.

D. EMT Paramedic, RN:

7. Lasix 40-80 mg IV if signs of pulmonary edema.
8. NTG 1/150 gr SL q5min x 3 or IV NTG per medical control.
9. Be prepared for seizures.



ADULT BLS HEALTHCARE PROVIDER ALGORITHM

Adult BLS Healthcare Provider Algorithm. Boxes bordered with dotted lines indicate actions or steps performed by the healthcare provider but not the lay rescuer.

PULSELESS ARREST ALGORITHM

1

PULSELESS ARREST
- BLS Algorithm: Call for help, give CPR
- Give **oxygen** when available
- Attach monitor/defibrillator when available

2

Check rhythm
Shockable rhythm?

Shockable

Not Shockable

3

VF / VT

4

Give 1 shock
- Manual biphasic: device specific (typically 120 to 200 J)
  Note: If unknown, use 200 J
- AED: device specific
- Monophasic; 360 J

Resume CPR Immediately

5

Give 5 cycles of CPR*

Check rhythm
Shockable rhythm?

NO

Shockable

6

Continue CPR while defibrillator is charging
Give 1 shock
- Manual biphasic: device specific (same as first shock or higher dose)
  Note: if unknown, use 200 J
- AED: device specific
- Monophasic: 360 J

Resume CPR immediately after the shock
When IV / IO available, give vasopressor during CPR (before or after the shock)
- **Epinephrin 1 mg IV / IO**
  Repeat erery 3 to 5 min
  or
- May give 1 dose of **vasopressin** 40 U IV / IO to replace first or second dose of epinephrine

7

Give 5 cycles of CPR*

Check rhythm
Shockable rhythm?

NO

Shockable

8

Continue CPR while defibrillator is charging
Give 1 shock
- Manual biphasic: device specific (same as first shock or higher dose)
  Note: if unknown, use 200 J
- AED: device specific
- Monophasic: 360 J

Resume CPR immediately after the shock
Consider **antiarrhythmics**; give during CPR (before or after the shock)
amiodarone (300 mg IV / IO once, then consider additional 150 mg IV/IO once) or
Lidocaine (1 to 1.5 mg/kg first dose, then 0.5 to 0.75 mg/kg IV / IO, maximum 3 dose or 3 mg/kg)
Consider **magnesium**, loading dose 1 to 2 g IV / IO for Torsades de pointes

After 5 cycles of CPR,* go to Box 5 above

9

Asystole / PEA

10

Resume CPR immediately for 5 cycles
When IV / IO available, give vasopressor
- **Epinephrine** 1 mg IV / IO
  Repeat every 3 to 5 min
  or
- May give 1 dose of vasopressin 40 U IV / IO to replace first or second dose of epinephrine

Consider **atropine** 1 mg IV / IO
For Asystole or slow PEA rate
Repeat every 3 to 5 min (up to 3 doses)

Give 5 cycles of CPR*

11

Check rhythm
Shockable rhythm?

Not Shockable

Shockable

12

- If Asystole, go to Box 10
- If electrical activity, check pulse. If no pulse, go to Box 10
- If pulse present, begin postresuscitation care

13

Go to Box 4

During CPR

- **Push hard and fast (100/min)**
- **Ensure full chest recoil**
- **Minimize interruptions in chest compressions**
- **One cycle of CPR: 30 compressions then 2 breaths; 5 cycles ≈ 2 min**
- **Avoid hyperventilation**
- **Secure airway and confirm tube placement**

*** After an advanced airway is placed, rescuers no longer deliver "cycles" of CPR. Give continous chest compressions w/out pause for breaths. Give 8 to 10 breaths/min, check rhythm every 2 min.**

- **Rotate compressors every 2 min with rhythm checks**
- **Search for and treat possible contributing factors**
  - **Hypovolemia**
  - **Hypoxia**
  - **Hydrogen ion (acidosis)**
  - **Hypo-/hyperkalemia**
  - **Hypoglycemia**
  - **Hypothermia**
  - **Toxins**
  - **Tamponade, cardiac**
  - **Tension pneumothorax**
  - **Thrombosis (coronary or pulmonary**
  - **Trauma**

BRADYCARDIC ALGORITHM

1

BRADYCARDIC
Heart rate <60 bpm and is
Inadequate for clinical conditions

2

- Maintain patent **airway**; assist **breathing** as needed
- Give **oxygen**
- Monitor ECG **(identify rhythm)**, blood pressure, and oximetry
- Establish IV access

3

Signs or symptoms of poor perfusion caused by the bradycardis?
(eg, acute altered mental status, ongoing chest pain, hypotension or other signs of shock)

Adequate Perfusion

4A

Observe / Monitor

Poor Perfusion

4

- **Prepare to transcutaneous pacing;** use without delay for high-degree block (type II second-degree block or third-degree AV block)
- Consider **atropine** 0.5 mg IV while awaiting pacer, May repeat to a total dose of 3 mg. If ineffective, begin pacing
- Consider **epinephrine** (2 to 10 µg/min) or **dopamine** (2 to 10 µg/kg per minute) infusion while awaiting pacer or if pacing ineffective.

5

- Prepare for **transvenous pacing**
- Treat contributing causes
- Consider expert consultation

Reminders

- If pulseless arrest develops, go to Pulseless Arrest Algorithm
- Search for and treat possible contributing factors:

– **H**ypovolemia
– **H**ypoxia
– **H**ydrogen ion (acidosis)
– **H**ypo-/hyperkalemia
– **H**ypoglycemia
– **H**ypothermia
– **T**oxins
– **T**amponade, cardiac
– **T**ension pneumothorax
– **T**hrombosis (coronary or pulmonary)
– **T**rauma (hypovolemia, increased ICP)

TACHYCARDIA ALGORITHM

1

TACHYCARDIA With Pulses

2

- Assess and support ABC's as needed
- Give **OXYGEN**
- Monitor ECG (Identify rhythm), blood pressure, oximetry
- Identify and treat reversible causes

3 — **Is patient stable?**
Unstable signs include altered mental status, ongoing chest pain, hypotension or other sings of shock.
Note: rate-related symptoms uncommon if heart rate < 150 / min

Symptoms Persist

Unstable → **4**

4 — **Perform immediate synchronized cardioversion**
- Establish IV access and give sedation if patient is conscious; do not delay cardioversion
- Consider expert consultation
- If pulseless arrest develops, see Pulseless Arrest Algorithm

Stable → **5**

5
- **Establish IV access**
- **Obtain 12-lead ECG** (when available or rhythm strip

Is ORS narrow (<0.12 sec)?

Narrow → **6**

Wide (≥ .12 sec) → **12**

6 — **NARROW QRS; Is Rhythm Regular?**

Regular → **7**

- Attempt vagal maneuvers
- Give **ADENOSINE** 6 mg rapid IV push. If no conversion give 12 mg rapid IV push may repeat 12 mg dose once

8 — **Does rhythm convert?**
Note: Consider expert consultation

Converts → **9**

If rhythm converts, probable reentry SVT (reentry Supraventricular Tachycardia):
- Observe for recurrence
- Treat recurrence with ADENOSINE or longer acting AV nodal blocking agents (eg. DILTIAZEM, B-blockers)

Does Not Convert → **10**

If rhythm does NOT convert, possible atrial flutter, ectopic atrial tachycardia, or junctional tachycardia:
- Control rate (eg. DILTIAZEM, B-blockers; used B-blockers with caution in pulmonary disease or CHF)
- Treat underlying cause
- Consider expert consultation

Irregular → **11**

Irregular Narrow-Complex Tachycardia
Probable atrial fibrillation or possible atrial flutter or MAT (multifocal atrial tachycardia)
- Consider expert consultation
- Control rate (eg. Diltiazem, B-blockers; use B-blockers with caution in pulmonary disease or CHF)
- Treat underling cause
- Consider expert consultation

12 — **WIDE QRS; Is Rhythm Regular?**
Expert consultation advised

Regular → **13**

If ventricular tachycardia or uncertain rhythm
- AMIODARONE 150 mg IV over 10 min Repeat as needed to maximum dose of 2.2 g/24 hours
- Prepare for elective synchronized cardioversion

If SVT with aberrancy
- Give ADENOSINE (go to Box 7)

Irregular → **14**

If atrial fibrillation with aberrancy
- See irregular Narrow – Complex Tachycardia (Box 11)

If pre-excited atrial fibrillation (AF + WPW)
- Expert consultation advised
- Avoid AV nodal blocking agents (eg. ADENOSINE, DIGOXIN, DILTIAZEM, VERAPAMIL)
- Consider antiarrhythmic (eg. AMIODARONE 150 mg IV over 10 min)

If recurrent polymorphic VT, seek expert consultation

If torsades de pointes give MAGNESIUM (load with 1-2 g over 5-60 min, then infusion)

*Note: If patient becomes unstable, go to Box 4

During Evaluation
- Secure, verify airway and vascular access when possible
- Consider expert consultation
- Prepare for cardioversion

Treat contributing factors:
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypoglycemia
- Hypothermia
- Toxins
- Tamponade, cardiac
- Tension pneumothorax
- Thrombosis (coronary or pulmonary)
- Trauma (hypovolemia)

DIABETIC EMERGENCY

Introduction:
Diabetes may develop because the body loses its ability to metabolize glucose. This may be from a lack of insulin or a resistance to insulin as in obesity. Whichever of these possible causes is the actual one can be traced to a lack of enough insulin.
There are two major types of diabetes mellitus:

1. Type 1 - Insulin dependent diabetes mellitus. It accounts for 5-10% of all diabetic cases. It usually occurs before the age of 30, although sometimes it develops late in life. This is insulin deficiency.
2. Type 2 - Non-insulin dependent diabetes mellitus. 90-95% of diabetics fall into this category. It tends to develop later in life than type 1; however, it can be seen in the young. This is usually insulin resistance.

Due to a neglected diet, failure to take insulin, infection, or other reasons, diabetic complications can present in two ways:

1. Hyperglycemia.
2. Hypoglycemia.

I. HYPERGLYCEMIA:

Historical Data:

1. Definition: Insufficient insulin supply that results in increased blood sugar levels and possibly ketones. Ketones are acids, which may cause acidosis.
2. Hyperglycemia progresses gradually over 12-48 hours.
3. Signs and Symptoms:
   a. Exaggerated air hunger/deep, rapid respirations.
   b. Sometimes acetone odor (fruity odor) on breath (ketones).
   c. Weak rapid pulse.
   d. Skin is warm, dry and flushed.
   e. Blood pressure is low and sometimes falling.
   f. Decreased level of consciousness occurs gradually.
   g. Nausea and vomiting.
   h. Excessive thirst.
   i. Frequent abdominal pain.
   j. Patients look extremely ill.
4. Ask recent diet history.
5. Current medications and doses.
6. Recent illness, pregnancy.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish and maintain airway.
2. O_2 4-6 LPM per nasal cannula (2 LPM if COPD).
3. Vital signs.
4. Maintain body heat.
5. If pulseless, attach to AED and follow protocol.

B. FIRST RESPONDER Monitor, A, EMT Basic EMT Basic Monitoring

6. Check Glucometer glucose.
7. If glucose is over 500 initiate ALS response and call Medical Control.

C. EMT Basic IV:

8. Establish IV normal saline 1000 cc/hr. Obtain blood sample per protocol.
9. Contact Medical Control.

D. EMT Intermediate, Paramedic, CCEMTP, RN:

10. Contact Medical Control for orders.

DIABETIC EMERGENCIES

II. HYPOGLYCEMIA:

Historical Data:

1. Definition: Abnormal low level of glucose in the blood. Normal glucose values are 80-120 milligrams per 100 milliliters of blood. Hypoglycemia reactions occur when glucose levels fall below 60.
2. Commonly seen in the insulin dependent diabetic who:
   a. May have taken excess insulin.
   b. Has not eaten.
   c. Has exercised strenuously.
3. Hypoglycemia occurs rapidly (30-60 minutes).
4. Signs and Symptoms:
   a. Normal or shallow respirations.
   b. No breath odor.
   c. Pulse is weak and rapid.
   d. Skin is cold, clammy and pale.
   e. BP usually normal.
   f. Weakness and fatigue.
   g. Intense hunger.
   h. Tremors.
   i. Headache, irritable, bizarre behavior.
   j. Seizures.
   k. Coma in severe cases.
5. Ask recent diet history.
6. Current medications and doses.
7. Recent illness, pregnancy.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish and maintain airway.
2. O_2 4-6 LPM per nasal cannula (2 LPM if COPD).
3. Vital signs.
4. Maintain body heat.
5. May give oral glucose if patient is conscious and low blood sugar is suspected.
6. Attach to AED if indicated.

B. FIRST RESPONDER Monitor, A, EMT Basic, EMT Basic- Monitor

7. Test Glucometer glucose. May give oral glucose if less than 60 if conscious.

C. EMT Basic IV:

8. Establish IV saline lock. Initiate D-5-W 500 cc over 30 minutes, and retest glucose.
9. Call Medical Control for further solution orders.

D. EMT Basic- Medications

10. You may give 1 mg Glucagon IM or intranasal if unable to use the oral route or unable to establish.

E. EMT Intermediate, EMT Paramedic, RN:

11. Determine glucose and if less than 60, give 50 cc of 50% dextrose IV (may give oral glucose if conscious).
12. Consider thiamine 100 mg IVP for known alcoholics. Follow ACLS protocol.

COLD EMERGENCIES

I. FROSTBITE/FROSTNIP:

Historical Data:

1. Actual freezing injury.
2. Especially ears, nose, cheeks, fingers, toes.
3. Note environmental temperature and wind chill.
4. Note length of exposure.
5. Presence of numbness, pain, paresthesia.
6. Underlying medical problems.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Remove all wet clothing and replace with warm, dry.
2. Take vital signs and body temperature and treat as per hypothermic protocol.
3. Protect injured areas from pressure, trauma and friction. **DO NOT** rub, break blisters, allow patient to use involved area.
5. **DO NOT** allow limb to thaw if there is a chance of refreezing.

B. FIRST RESPONDER Monitor

6. Determine glucose and treat per protocol

C. FIRST RESPONDER A, EMT-Basic, EMT Monitor

7. If less than 60 minutes from hospital, transport immediately.
8. If more than 60 minutes use warm water bath 106^{o}F. (Must maintain warm baths once started, otherwise DO NOT.) Transport immediately.
9. Warm humidified high flow O_2.

D. EMT Basic IV

10. Establish IV warm normal saline @ 200 cc/hr.

E. EMT Intermediate, Paramedic, RN:

11. May use morphine 2-5 mg IV for pain.

COLD EMERGENCIES

II. HYPOTHERMIA:

Historical Data:

1. Note environmental temperature.
2. Length of exposure.
3. Be aware of possible trauma, preexisting medical conditions.
4. Take careful drug history.
5. Be alert for alcohol or drug ingestion, carbon monoxide.
6. Shivering stops below 89°F.

Prep for Transport and Treatment:

A. FIRST RESPONDER,:

1. Remove from cold and take vital signs and body temperature (always check carotid or femoral pulse).
2. Replace all wet, cold clothes with warm, dry ones.
3. Warm humidified high flow O_2.
4. Check for other injuries.
5. **Handle all hypothermic patients with care;** rough handling may precipitate ventricular fibrillation.
6. Aggressive sustained CPR if body temperature is greater than 87° F. No CPR if less than 87° F and signs of life are present.
   NOTE: Hot packs to groin and armpits are of little value and not recommended.
7. Assist ventilations with bag-valve-mask as needed.
8. If pulseless attach to AED and follow protocol.

B. FIRST RESPONDER Monitor, A, EMT Basic:

9. Determine glucose and treat per protocol.

C. EMT Basic Monitor:

10. For V Fib or pulseless V Tach:
    a. If body temperature less than 87°F, defibrillate up to a total of 3 shocks (200J, 300J, 360J); if not successful, rapid transport.
    b. If body temperature greater than 87°F, defibrillate per ACLS protocol.

C. EMT Basic Airway:

11. If apneic but pulse present:
    a. If body temperature greater than 87°F, may use Combitube.
    b. If body temperature less than 87°F, bag-valve-mask.
12. If apneic and pulseless, insert Combitube and follow ACLS.

D. EMT Basic IV:

13. Establish IV, warm normal saline 500 cc/hr, monitor for fluid overload.

E. EMT Basic Intubation:

14. If apneic but pulse present:

a. If body temperature is greater than 87°F, may intubate.
b. If body temperature is less than 87°F, bag-valve-mask.

15. If apneic and pulseless, intubate and follow ACLS.

D. EMT Intermediate, Paramedic, CCEMTP, RN:

16. May use ACLS drugs if greater than 87°F. Be aware that IV medications will probably be ineffective if temp <87°F and should not be given except as below.
17. Give one (1) amp D_{50} (if indicated by Glucometer) and 2 mg Narcan to the unconscious victim.
18. Thiamine, 100 mg IV.

DROWNING/NEAR DROWNING

Historical Data:

1. Time of submersion.
2. Water temperature.
3. Age of victim.
4. Circumstances of submersion (alcohol, drug ingestion, heart disease, seizures, etc.).
5. Associated trauma.
6. Remember, physiologic changes from fresh and salt water rarely if ever, affect the patient's chemistries or hematocrit. Assume a normal underlying physiologic state and treat with aggressive airway management and exposure considerations.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Remove from water.
2. Check for pulse, BP, respirations.
3. If no pulse, BP, respirations, open and clear airway and begin sustained and aggressive CPR.
4. Warm humidified high flow O_2.
5. Obtain temperature.
6. Apply warm, dry blankets.
7. Attach to the AED and follow protocol.

B. FIRST RESPONDER Monitor, A, EMT Basic:

8. Determine glucose and treat per protocol.

C. EMT Basic Monitor:

9. For V Fib or pulseless V Tach:
   a. If body temperature less than 87°F, defibrillate up to a total of 3 shocks (200J, 300J, 360J).
   b. If body temperature greater than 87°F, defibrillate per ACLS protocol.

D. EMT Basic Airway:

10. If apneic but pulse present:
    a. If body temperature greater than 87°F, may use Combitube.
    b. If body temperature less than 87°F, bag-valve-mask.
11. If apneic and pulseless, insert Combitube and follow ACLS.

E. EMT Basic IV:

12. Establish IV, warm normal saline 500 cc/hr, monitor for fluid overload.

F. EMT Basic Intubation:

13. If apneic but pulse present:
    a. If body temperature greater than 87°F, may intubate.
    b. If body temperature less than 87°F, bag-valve-mask.
14. If apneic and pulseless, intubate and follow ACLS.

G. EMT Intermediate, Paramedic, CCEMTP, RN:

15. May use ACLS drugs if greater than 87^{o}F. Be aware that IV medications will probably be ineffective if temp $<87^{o}$F and should not be given except as below.
16. Give one (1) amp D_{50} (if indicated by Glucometer) and 2 mg Narcan to the unconscious victim.
17. Thiamine, 100 mg IV.

HEAT EMERGENCIES

I. HEAT CRAMPS:

Historical Data:

1. Symptoms include:
   a. Muscle pain and spasm usually in lower extremities and abdomen.
   b. Usually associated with exercise.
   c. Pulse rapid.
   d. Skin pale and moist.
2. Environmental temperature need not be hot (over 90°F).
3. Patient usually alert and oriented.
4. Note any medications/alcohol intake.
5. Note allergies.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER A, EMT B:

1. Move patient to a cool environment.
2. Take vital signs and body temperature. If greater than 104°F, see III.
3. Maintain airway and administer O_2 4-6 LPM per nasal cannula (2 LPM in COPD).
4. If a patient is not nauseated, they may be given 1-2 glasses water or Gatorade.

B. EMT Basic IV:

5. If patient is nauseated, or altered conscious, establish IV normal saline at 100 cc/hr.

C. EMT Intermediate, Paramedic, RN:

6. May treat arrhythmias per ACLS protocol.

HEAT EMERGENCIES

II. HEAT EXHAUSTION:

Historical Data:

1. Symptoms include:
   a. Skin pale, clammy with profuse perspiration.
   b. Headache.
   c. Dizziness.
   d. Weakness.
   e. Nausea.
   f. Syncope.
   g. Rapid, weak pulse
   h. Shallow, fast respirations.
2. Body temperature is usually normal or slightly increased.
3. Environment is usually hot (over 90^{o}F).
4. Note any medications/alcohol.
5. Note allergies.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Move to cool environment.
2. Take vital signs and body temperature. If temperature is >104^{o}F, see III.
3. Maintain airway and administer O_2 4-6 LPM per nasal cannula (2 LPM in COPD).
4. Remove clothing except undergarments and sponge with tepid water (less than 100^{o}F).
5. Cold packs to groin and axilla.

B. EMT Basic IV:

6. Establish large-bore IV, normal saline at 200 cc/hour. Fluid rate may be adjusted in accordance with vital signs and medical control.

C. EMT Intermediate, Paramedic, CCEMTP, RN:

7. Treat arrhythmias per ACLS protocol.

HEAT EMERGENCIES

III. HEAT STROKE:

Historical Data:

1. **Extreme medical emergency.**
2. Symptoms include:
   a. Hot, dry, flushed skin
   b. Headache
   c. Dizziness
   d. Mental confusion
   e. Unconsciousness
   f. Temperature 104°F or greater
   g. Pulse greater than 120
   h. Low blood pressure/narrow pulse pressure
   i. Seizures.
3. Many patients have preexisting medical conditions.
4. Take careful drug and alcohol history.
5. Note allergies.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Open and maintain airway. Give high flow O_2.
2. Remove to cool environment.
3. Take vital signs and body temperature.
4. Remove clothing and begin tepid sponging (water temp less than 100°F).
5. Cold packs to head, neck, armpits, ankles, and groin.

B. EMT Basic Airway:

6. Establish a dual lumen airway if indicated.

C. EMT Basic IV:

7. Establish IV normal saline, large bore, at 200 cc/hr. Fluid rate may be adjusted in accordance with vital signs and medical control.

D. EMT Basic Intubation:

8. Intubate if no gag reflex.

C. EMT Intermediate, Paramedic, CCEMTP, RN:

9. May treat arrhythmias per ACLS protocol.
10. For seizure:
    a. Adult: Valium 5 - 10 mg IV.
    b. Adult: Ativan 1.0 - 4.0 mg IV
    c. Children: Ativan 0.1 mg/kg IV up to a maximum of 4.0 mg.

NEUROLOGICAL EMERGENCIES

I. C.V.A.:

In an effort to rapidly recognize and enhance recovery in patients suffering from CVA, the following protocol should be followed in the approach to the patient presenting with classic signs and symptoms. Any patient presenting with these signs and symptoms should be considered a candidate and rapidly transported to a Stroke Center for enrollment in the Stroke Program or the nearest hospital. There is a 3-hour time window that is acceptable for t-PA.

The following are the signs and symptoms suggestive of stroke, which should alert pre-hospital personnel for rapid evaluation and transport:

1. Abrupt onset of hemiparesis or monoparesis (one-sided weakness).
2. Sudden decline in level of consciousness.
3. Cataclysmic headache.
4. Acute dysphagia and/or dysarthria.
5. Sudden loss of vision in one or both eyes or loss of vision in half of the visual field.
6. Double vision.
7. Ataxia.
8. Weakness in all four extremities.
9. Loss of sensation in half of the body.

Historical Data:

1. Take a careful history.
   a. Onset of symptoms.
   b. Previous history of CVA.
   c. Seizure disorders.
   d. Diabetes, thyroid disease, hypertension.
   e. Any trauma.
   f. Any toxins like alcohol, carbon monoxide.
2. Careful vital signs.
3. Does the patient have a headache?
4. Medication history.
5. Stroke score.

Physical Assessment and Preparation for Transport:

A. FIRST RESPONDER:

1. Establish and maintain an airway.
2. Apply high flow O_2.
3. Have the patient rest quietly with the head slightly elevated at about 30^o.
4. Initiate rapid transport to the nearest hospital.

B. FIRST RESPONDER Monitor, A, EMT Basic EMT Basic Monitor:

5. Determine glucose and if less than 60 treat according to protocol.

C. EMT Basic Airway:

6. Establish and maintain a dual lumen airway as indicated.

D. EMT Basic IV

7. Establish an IV saline lock and draw blood to be evaluated at the hospital.

E. EMT Basic Intubation:

8. Intubate if patient's condition indicates.

F. EMT Intermediate, Paramedic, CCEMTP, RN:

9. Evaluate for possible t-PA candidate.
10. Be cognizant of seizure possibility and treat according to protocol.
11. Thiamine: 100 mg IV if suspected alcoholism.
12. Narcan: 2.0 mg IV.
13. Follow ACLS protocol.

SUSPECTED STROKE ALGORITHM

NINDS TIME GOALS

1

Identify signs of possible stroke

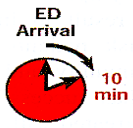
2

Critical EMS assessments and actions

- Support ABC's; give OXYGEN if needed
- Perform prehospital stroke assessment (Table 1 & 2)
- Establish time when patient last known normal (Note: therapies nay be available beyond 3 hours from onset)
- Transport; consider triage to a center with a stroke unit if appropriate; consider bringing a witness, family member, or caregiver
- Alert hospital
- Check glucose if possible

3

Immediate general assessment and stabilization



- Assess ABC's, vital signs
- Provide OXYGEN if hypoxemic
- Obtain IV access and blood samples
- Check glucose; treat if indicated
- Perform neurologic screening assessment
- Activate stroke team
- Order emergent CT scan of brain
- Obtain 12-lead ECG

4

Immediate neurologic assessment by stroke team or designee

- Review patient history
- Establish symptom onset
- Perform neurologic examination (NIH Stroke Scale or Canadian Neurologic Scale)

5

Does CT scan show any hemorrhage?

Hemorrhage

No Hemorrhage

6

Probable acute ischemic stroke; consider fibrinolytic therapy

- Check for fibrinolytic exclusions (Table 3)
- Repeat neurologic exam: are deficits rapidly improving to normal?

7

Consult neurologist or neurosurgeon; consider transfer if not available

8

Patient remains candidate for fibrinolytic therapy?

Not a Candidate

9

Administer ASPIRIN

Candidate

10

Review risk / benefits with patient and family: If acceptable –

- **Give tPA**
- **No anticoagulants or antiplatelet treatment for 24 hours**

11

- Begin stroke pathway
- Admit to stroke unit if available
- Monitor BP; treat if indicated (Table 4)
- Monitor neurologic status; emergent CT if deterioration
- Monitor blood glucose; treat if needed
- Initiate supportive therapy; treat comorbidities

Pre-hospital Stroke Screening Scale

1. Patient name: _____

2. Hx/info take from: ☐ Patient ☐ Family ☐ Other

3. Time last seen normal/baseline and awake: *time* ____: ____ *date* ____/ ____/____

	Screening Criteria	YES	UNKNOWN	NO
4	Age >45?			
5	No history of seizures or epilepsy			
6	Symptom duration less than 3 hrs			
7	Patient is not wheelchair bound or bedridden at baseline			
8	Glucose between 80 and 400			
9	Failed one test on Cincinnati Stroke Scale (facial droop, arm drift, abnormal speech)			

ALL YES? → Call receiving hospital to alert for potential stroke patient

Cincinnati Pre-hospital Stroke Scale

This test is used to assess a patient's facial muscles, arm movement and speech function. Abnormality in any one strongly suggests stroke.

- The patient is asked to show teeth or smile
  - **Normal** – both sides of face move equally well
  - **Abnormal** – one side of face does not move as well as the other side

- The patient is asked to repeat a simple phrase, such as "You can't teach an old dog new tricks"
  - **Normal** – patient uses correct words with no slurring
  - **Abnormal** – patient slurs words, uses the wrong words or is unable to speak
- The patient is asked to close both eyes and hold both arms straight out for 10 seconds
  - **Normal** – both arms move the same or both arms do not move at all
  - **Abnormal** – one arm does not move or one arm drifts down

NEUROLOGICAL EMERGENCIES

II. SEIZURE DISORDERS:

Historical Data:

1. Careful history is very helpful.
   a. Past seizure history.
   b. Current meds and compliance.
   c. Allergies.
2. Always consider:
   a. Head trauma, child abuse.
   b. Hyper-/hypoglycemia, electrolyte problems.
   c. Overdose.
   d. Drug/alcohol withdrawal.
   e. Toxins.
   f. CVA, tumors.
   g. Eclampsia.
   h. Fever, infection.
3. Check for associated injuries.

Physical Assessment and Preparation for Transport:

A. FIRST RESPONDER,:

1. Apply high flow O_2.
2. Protect the patient.
3. Do not force anything into the patient's mouth.
4. If unconscious and not seizing, you may insert an oral airway.
5. If known glucose <60 and conscious you may administer oral glucose.

B. FIRST RESPONDER Monitor, A, EMT Basic, EMT Basic Monitor:

6. Glucometer glucose. If < 60 treat per protocol.

C. EMT Basic IV:

7. Establish IV access (saline lock), draw blood for lab.

D. EMT Basic Intubation:

8. Intubate if indicated.

E. EMT Intermediate, EMT Paramedic:

9. Use IV glucose if indicated
10. Consider Narcan: 2.0 mg IV.
11. Valium: 5-10 mg IV for adult.
12. Ativan: 1.0 - 4.0 mg IV for adult.
    0.1 mg/kg IV to maximum of 4.0 mg for children

13. Thiamine 100 mg IV if suspected alcoholic

G. EMT Paramedic Medication, CCEMTP, RN:

14. Dilantin or fosphenytoin per medical control.

NEUROLOGICAL EMERGENCIES

III. UNCONSCIOUS ADULT:

Historical Data:

1. Very often bystanders and the scene can give many clues:
   a. Pill bottles.
   b. Alcohol/drugs.
2. Check for trauma.
3. Consider diabetes, CVA, heart disease, overdose, trauma, or infection.
4. Check for allergies and med alert tags.
5. Bring all medicine bottles with you.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish airway and assist ventilations as needed.
2. O_2 100% nonrebreather.
3. Careful vital signs.
4. CPR as needed.
5. May use AED if Heart Saver certified.

B. FIRST RESPONDER Monitor, A, EMT Basic:

6. Determine Glucometer glucose and notify oncoming EMS.
7. If pulseless, attach to AED and follow protocol.

C. EMT Basic Airway:

8. Establish dual lumen airway, if indicated.

D. EMT Basic Monitor:

9. Check Glucometer and treat per protocol.

E. EMT Basic Intubation:

10. Intubate if indicated.

F. EMT Basic IV:

11. Establish IV (saline lock), draw blood for lab.

G. EMT Intermediate, EMT Paramedic, CCEMTP, RN:

12. IV glucose if indicated by Glucometer.
13. Narcan: 2.0 mg IV:
    a. May repeat in 2 mg increments up to 10 mg if suspected OD.
14. Follow ACLS protocol.
15. Thiamine: 100 mg IV if suspected alcoholism

POISONING AND OVERDOSE

Historical Data:

1. History is of utmost importance.
   a. Bring all empty bottles.
   b. Note all surrounding chemicals.
   c. Note surrounding plants.
2. Ask bystanders, family, friends, and have them come to the hospital if they have information.
3. Was the ingestion intentional?
4. Check for needle tracks.
5. When was the ingestion?
6. Has vomiting occurred?
7. Common signs and symptoms:
   a. Corrosive Poisons - Acids/Alkali:
      1. Signs of burning or searing on the mouth and lips.
      2. Difficulty talking and swallowing.
      3. Symptoms of hypovolemic shock.
   b. Hydrocarbons:
      1. Respiratory distress, wheezing choking.
      2. Abdominal pain.
      3. Convulsions, coma.
      4. Dysrhythmias.
      5. Hypoglycemia.
   c. Pesticides:
      1. Respiratory distress.
      2. Severe GI symptoms; vomiting, nausea.
      3. Lethargy.
   d. Plants:
      1. Nausea, vomiting, diarrhea.
      2. Hypotension, bradycardia.
   e. Medications:
      Symptoms vary drastically depending on what is ingested. Patient's condition may change rapidly.

Prep for Transport and Treatment:

A. FIRST RESPONDER,:

1. Open and maintain airway.
2. O_2 4-6 LPM per nasal cannula (2 LPM in COPD).
3. Vital signs.
4. CPR if needed.
5. If a skin toxin is present irrigate with massive amounts of water for 10 minutes.
6. If an eye toxin is present irrigate with massive amounts of water for 15 minutes.
7. May use AED if Heart Saver certified.

B. FIRST RESPONDER Monitor, A

8. Determine glucose level and follow protocol.

C. EMT Basic:

9. Consider administration of charcoal per medical control.

D. EMT Basic Airway:

10. Establish Combitube if indicated.

E. EMT Basic IV:

11. Establish IV lactated Ringer at 100 cc/hr.

F. EMT Basic Intubation:

12. Intubate if clinically indicated

G. EMT Intermediate, Paramedic, CCEMTP, RN:

13. If coma is present:
    a. Check Glucometer and follow protocol.
    b. Narcan 2 mg IV.
    c. Consider thiamine 100 mg IV if alcoholic.
14. Treat dysrhythmias per ACLS protocol.
    a. In tricyclic antidepressant overdose with ventricular dysrhythmia, try sodium bicarb 1 mEq/kg IV one time then proceed with ACLS protocol.
15. In cyanide poisoning and/or hydrogen sulfide gas, administer cyanide kit at the site.
16. Organophosphate (pesticide/insecticide) poisoning
    If patient demonstrates the following:
    a. Bradycardia, hypotension.
    b. Dyspnea, bronchorrhea.
    c. Respiratory collapse.

    Atropine: 2.0-5.0 mg IV every 10 minutes as needed
    0.02 mg/kg IV child, minimum dose is 0.1 mg IV.

CARBON MONOXIDE POISONING

Historical Data:

1. Make note of the surroundings i.e.; closed room, garage, running engine, wood stove, gas heater, etc.
2. Ventilate the area so you don't become toxic.
3. Signs and symptoms include:
   a. Severe headache/roaring in ears.
   b. Confusion.
   c. Vomiting and incontinence.
   d. Convulsions and coma.
   e. Bounding pulse, dilated pupils, cyanosis, and cherry red lips.
4. **WARNING**: O_2 sat measurements are not accurate indicators of oxygen content of blood in the CO poisoning patient.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Remove patient from exposure to environment and protect yourself.
2. Open and stabilize airway.
3. O_2 100% nonrebreather mask.
4. CPR as needed.
5. May use AED if indicated and treat per protocol.

B. EMT Basic Airway:

6. Establish Combitube if indicated

C. EMT Basic IV:

7. IV saline lock.

D. EMT Basic Intubation:

8. Intubate if clinically indicated.

E. EMT Intermediate, Paramedic, CCEMTP, RN:

9. Follow ACLS protocol.

LIME POISONING

Historical Data:

1. This is a corrosive alkaline and may cause severe burns.
2. Concentrations are important to know.
3. Avoid self-contamination.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Move patient to a safe environment.
2. Remove contaminated clothing.
3. Irrigate eyes with copious amounts of water.
4. Irrigate skin with copious amounts of water.
5. DO NOT try to neutralize.
6. O_2 4-6 LPM per nasal cannula (2 LPM in COPD).

B. EMT Basic IV:

7. Establish a saline lock.

C. EMT Basic Intubation:

8. Intubate if indicated.

D. EMT Intermediate, Paramedic, CCEMTP, RN:

9. Treat per ACLS protocol.

PSYCHIATRIC EMERGENCIES

Historical Data:

1. Many patients have a past history.
2. Bystanders may help with history.
3. Take a careful medication history:
   a. Consider overdose or noncompliance.
4. Consider possible organic causes like: brain tumor, drug ingestion, hypo- or hyperglycemia, etc.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic, Intermediate:

1. Protect yourself and others, including the patient.
2. One person should assume control and be the contact person.
3. Speak calmly and quietly and listen to what the patient has to say.
4. If patient is violent or refuses transport, contact law enforcement.
5. Use restraints only if necessary to protect yourself or others, including the patient.
6. Always maintain an easy exit route for yourself and patient.

B. EMT Paramedic, CCEMTP, RN:

7. May consider Ativan 2 mg IV or IM for agitated behavior.
8. May consider Haldol 2-5 mg IM for agitated behavior.

RESPIRATORY EMERGENCIES

I. ASTHMA:

Historical Data:

1. Very often patients have a long history of asthma.
2. Take a careful drug history including recent doses.
3. Consider the differential:
   a. Bronchitis.
   b. Pneumonia.
   c. COPD.
   d. Congestive heart failure.
   e. Pulmonary edema.
   f. Anaphylaxis.
4. Check for drug allergies.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Make the patient comfortable.
2. O_2 4-6 LPM per nasal cannula (2 LPM in COPD).
3. Assist ventilation if necessary.
4. Monitor O2 saturations.

B. EMT Basic Airway:

5. Establish Combitube if clinically indicated.

C. EMT Basic IV:

6. Establish IV normal saline at 100 cc/hr in adult (K.O. in children).

D. EMT Basic Intubation:

7. Intubate if necessary.

E. EMT Basic Medication, EMT Intermediate:

8. Albuterol MDI 2 puffs every 15 minutes as needed.
9. Nebulizer:
   a. Adult 0.5 cc albuterol/2 cc NS (primary choice), may repeat q 15 minutes as needed.
   b. Child 0.25 - 0.5 cc albuterol/2 cc NS (maximum 0.5 cc).
   c. Adult DuoNeb unit dose nebulizer x 1

F. EMT Paramedic, CCEMTP, RN:

9. Solu-Medrol: Per Medical Control
   a. Adult 125 mg IV.
   b. Child 1 mg/kg. IV.
10. Terbutaline for cardiac patient:
   a. Adult 0.25 mg SQ.

II. COPD/EMPHYSEMA:

Historical Data:

1. Patients usually have a long history of breathing problems.
2. Take a careful drug history.
3. Consider the differential:
   a. Asthma.
   b. Pneumonia.
   c. Congestive heart failure.
   d. Pulmonary edema.
   e. Pulmonary emboli.
   f. Pneumothorax.
4. Symptoms include:
   a. Air hunger, pursed lip breathing.
   b. Circumoral and nail bed cyanosis.
   c. Barrel chest.
   d. Distant breath and heart sounds.
   e. Wheezes, rales and rhonchi.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Make the patient comfortable.
2. O_2 4-6 LPM per nasal cannula (2 LPM in COPD).
3. Assist ventilation if necessary.
4. Monitor O2 saturations.

B. EMT Basic Airway:

4. Establish Combitube if clinically indicated.

C. EMT Basic IV:

5. Establish IV normal saline at 100 cc/hr in adult (K.O. in children).

D. EMT Basic Intubation:

6. Intubate if necessary.

E. EMT Basic Medication, EMT Intermediate:

7. Albuterol MDI 2 puffs every 15 minutes as needed.
8. Nebulizer:
   a. Adult 0.5 cc albuterol/2 cc NS (primary choice), may repeat q 15 minutes as needed.
   b. Child 0.25 - 0.5 cc albuterol/2 cc NS (maximum 0.5 cc).
   c. Adult DuoNeb unit dose nebulizer x 1.

F. EMT Paramedic, CCEMTP, RN:

9. Solu-Medrol: Per Medical Control
   a. Adult 125 mg IV
   b. Child 1 mg/kg. IV

III. OTHER RESPIRATORY DISTRESS:

Historical Data:

1. Very often a patient's history gives you the diagnosis.
2. Ask about:
   a. Fever or chills.
   b. Productive cough.
   c. Character of onset.
   d. Associates pain, like leg pain.
   e. Previous history including heart disease.
   f. Recent medications.
3. Consider the following:
   a. Pneumonia: fever, chills, and productive cough.
   b. Pulmonary embolus: sudden onset, tachypnea, tachycardia, bed stricken patient, leg pain, and post-orthopedic patient.
   c. Pneumothorax: sudden onset after trauma or coughing, upper back pain, chest pain, snoring history, absent breath sounds.
   d. Epiglottitis: fever, sore throat, hoarseness, and stridor.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Make patient as comfortable as possible.
2. O_2 4-6 LPM per nasal cannula.
   2 LPM in COPD or Venturi mask 35%.
3. Vital signs.
4. Assist ventilations if necessary.

B. EMT Basic IV:

5. Establish IV access.

C. EMT Basic Intubation:

6. Intubate if clinically indicated

D. EMT Basic Medication, EMT Intermediate:

7. Albuterol MDI 2 puffs every 15 minutes as needed.
8. Nebulizer:
   a. Adult 0.5 cc albuterol/2 cc NS (primary choice), may repeat q 15 minutes as needed.
   b. Child 0.25 - 0.5 cc albuterol/2 cc NS (maximum 0.5 cc).
   c. Adult DuoNeb unit dose nebulizer x 1.

E. EMT Paramedic, CCEMTP, RN:

9. Consider cricothyrotomy in epiglottitis.
10. Needle chest if signs of tension pneumothorax (see chest trauma).

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

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OBSTETRICAL EMERGENCIES

Historical Data:

1. When contractions started.
2. How frequent are contractions.
3. Due Date
4. Previous pregnancy history.
5. Problems with prior pregnancies or deliveries:
   a. Placenta previa.
   b. Abruptio placenta.
   c. Breech.
6. Prenatal care including:
   a. Obstetrician.
   b. History of diabetes or toxemia.
   c. History of bleeding.
   d. Blood type.
   e. Ultrasound.
7. Have membranes ruptured.

Prep for Transport and Treatment:

A. FIRST RESPONDER, Monitor, A, EMT Basic, Intermediate, Paramedic, RN:

1. Obtain vital signs on mother and infant:
   a. If hypertensive or seizing, see X. (In this section)
   b. If heavy vaginal bleeding or shock, see VIII and IX. (In this section)
2. Time and feel contractions.
3. If mother feels like pushing, check:
   a. Bulging perineum; crowning.
   b. If the above is present, see Delivery I.
4. If no signs of emergent delivery, transport.

I. DELIVERY:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Use a sterile technique.
2. Reassure mother.
3. As mother pushes, use gentle counter pressure on infant's head.
4. When head delivers, ask mother to stop pushing, suction infant's mouth, then nose; check and reduce nuchal cord.
5. If unable to reduce nuchal cord, double clamp and cut.
6. Deliver the anterior shoulder (if unable, see shoulder dystocia III).
7. Deliver posterior shoulder and body.
8. Suction infant and double clamp umbilical cord 8-10" from abdomen. Cut cord between clamps.
9. Dry infant off; check Apgar at 1 minute and 5 minutes, see XI. KEEP INFANT WARM.
10. Recheck vital signs and transport to hospital.

B. EMT Basic IV:

11. Establish IV LR en route at 100 cc/hour.

C. EMT Paramedic, CCEMTP, RN:

12. Post delivery, add 20 Units of Pitocin to IV unless allergic to the drug.

II. BREECH DELIVERY:

Frank - Buttocks First
Footling - Feet First

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. The rule of delivery is to wait and not force delivery.
2. If breech, apply high flow O_2.
3. Transport immediately.
4. If buttocks have delivered, assist mother by supporting the infant. DO NOT PULL!
5. With contractions, have mother push. Deliver the anterior shoulder then the posterior shoulder. Rotate the infant if necessary to help deliver shoulders. Check for nuchal cord.
6. To deliver the head, rotate the infant so the back is anterior. Insert one index finger in the infant's mouth to flex the head. Have assistant apply gentle fundal pressure with contractions and deliver the head.
7. If unable to deliver, maintain infant airway and alert the hospital.

B. EMT Basic IV:

8. IV LR at 100 cc/hour.

C. EMT Paramedic, CCEMTP, RN:

9. Post delivery, add 20 Units of Pitocin to IV unless allergic to the drug.

III. SHOULDER DYSTOCIA:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. If shoulders are stuck, insert two fingers against anterior shoulder and rotate infant 90^{o}. If still unable to deliver shoulder, rotate to 180^{o}.
2. If still unable, try to deliver the posterior arm.
3. If still unable, notify hospital and transport **immediately**.
4. Apply high flow O_2.

B. EMT Basic IV, Intermediate, Paramedic, CCEMTP, RN:

5. IV LR 100 cc/hour.

IV. PROLAPSED CORD:

A. FIRST RESPONDER, Monitor, A, EMT Basic, Intermediate, Paramedic, CCEMTP, RN:

1. Place mother in Trendelenburg or knee-chest position.
2. Obtain vital signs on mother and child.
3. Apply high flow O_2.
4. Insert gloved hand into vagina and push presenting part OFF the cord.
5. Transport immediately with hand in place and notify hospital.

V. ARM PRESENTATION:

A. FIRST RESPONDER, Monitor, A, EMT Basic, Intermediate, Paramedic, CCEMTP, RN:

1. Obtain vital signs on mother and infant.
2. Place mother in Trendelenburg.
3. Apply high flow O_2.
4. Transport immediately and notify hospital.

VI. MULTIPLE BIRTHS:

A. FIRST RESPONDER, Monitor, A, EMT Basic, Intermediate, Paramedic, CCEMTP, RN:

1. Always be alerted for this possibility.
2. Follow appropriate protocol.

VII. PLACENTAL DELIVERY:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Never pull the cord and always allow it to proceed naturally. Signs include:
   a. Anterior firm uterus.
   b. Gush of blood.
   c. Lengthening cord.
2. Mother may have the urge to push.
3. Save the placenta and transport to hospital.

B. EMT Basic IV:

4. Establish an IV of LR at 100 cc/hour.

C. EMT Paramedic, CCEMTP, RN:

5. Add 20 units Pitocin to the IV.

VIII. HEAVY BLEEDING DURING LABOR:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT B:

1. Be aware of possible causes (previa, abruptio) and get careful history.
2. Take vital signs of mother and infant.
3. Apply high flow O_2.
4. Trendelenburg if signs of shock.
5. Notify hospital and transport immediately.

B. EMT Basic IV:

6. Establish a large bore IV LR en route and run at 100 cc/hour. (Notify medical control if shock is present for higher rates.)

C. EMT Intermediate, Paramedic, CCEMTP, RN:

7. Consider a second line.

IX. HEAVY VAGINAL BLEEDING POST PARTUM:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Normal blood loss is 500 cc.
2. Check vital signs.
3. Apply high flow O_2.
4. If signs of shock present, use steep Trendelenburg.
5. Massage lower abdomen firmly.
6. Notify hospital and transport immediately.

B. EMT Basic IV:

7. Establish a large bore IV en route of LR at 100 cc/hour. (Notify medical control if shock is present for higher rates).

C. EMT Intermediate

8. Consider a second line.

D. EMT Paramedic, CCEMTP, RN:

9. Pitocin 20 Units to the IV.

X. TOXEMIA:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Be suspicious if patient has:
   a. Positive history of increased BP during her pregnancy.
   b. Blood pressure systolic 140/ diastolic 90.
   c. Swollen face, hands or feet.
   d. Any seizure activity.
2. Apply high flow O_2.
3. Be prepared for possible seizures.
4. Notify hospital and transport immediately.

B. EMT Basic IV:

5. Establish an IV of normal saline at K.O.

C. EMT Intermediate

6. Treat seizure per protocol
   Valium: 5-10 mg IV for adult.
   Ativan: 1.0 - 4.0 mg IV for adult.

D. EMT Paramedic, CCEMTP, RN:

6. $MgSO_4$ (per medical control)
   a. Usual dose is 4 gm of 10% $MgSO_4$ IVP slowly over 20 minutes.
   b. Add 40 gm of 50% $MgSO_4$ to 1000 cc LR or NS.
      1) 1 gm = 25 cc/hr.
      2) 2 gm = 50 cc/hr.
      3) 3 gm = 75 cc/hr.

XI. PRETERM LABOR:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Obtain a careful obstetrical history.
2. Vital signs.
3. Apply high flow O_2.
4. Allow the patient to assume position of comfort.

B. EMT Basic IV:

5. Establish an IV of LR at 200 cc/hr.

C. EMT Paramedic, CCEMTP, RN:

6. $MgSO_4$ (per medical control):
   a. Usual dose is 4 gm of 10% $MgSO_4$ IVP slowly over 20 minutes.
   b. Add 40 gm of 50% $MgSO_4$ to 1000 cc NS or LR.
      1) 1 gm = 25 cc/hr.
      2) 2 gm = 50 cc/hr.
      3) 3 gm = 75 cc/hr.
7. Terbutaline .25 mg SQ (per medical control):

Apgar Score

Rating	0	1	2
Appearance	Pale or blue	Body pink blue extremities	Pink all over
Pulse	Absent	<100	>100
Grimace	None	Grimace	Cry
Activity	Limp	Some flexion	Spontaneous movement
Respirations	Absent	Hypoventilation Gasping	Vigorous Cry

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PEDIATRICS

INTRODUCTION:

Advanced pediatric life support has evolved into a specialty all its own. The emergency care of children requires careful consideration of their size and certain pathophysiologic mechanisms not encountered in the adult.

This section of protocol will address specific problems encountered in pediatric resuscitation, and review doses and specific diseases unique to children.

The treatment protocols are based on the standards set forth in the Pediatric Advanced Life Support Course accepted by A.C.E.P. and A.A.P.

Pediatric VS and Airways

Age	*Blood Pressure*	*Awake HR*	*Sleeping HR*	*Respiratory Rate*
0-30 days	60-90/20-60	85-205	80-160	30-60
1 mo – 1 yr	80-105/45-65	100-190	75-160	20-50
2 yrs – 6 yrs	95-110/50-70	60-P140	60-90	20-30
6 yrs – 10 yrs	95-115/55-75	60-140	60-90	20-26
10 yrs – 18 yrs	110-128/60-80	60-100	50-90	16-20

Pediatric Airways

Age	*Blade*	*ETT Size*	*Distance at Lip*	*Suction Catheter*
		$\frac{\text{Age (years)}}{4} + 4$	3 x ETT size	2 x ETT size
Preterm	Straight 0	2.5 – 3.0 uncuffed	8	5 - 6
Term infant	Straight 0-1	3.0 – 3.5 uncuffed	9 - 10	6 - 8
6 months	Straight 0-1	3.5 – 4.0 uncuffed	10.5 - 12	8
1 year	Straight 1 – 1.5	4.0 –4.5 uncuffed	12 – 13.5	8
2 years	Straight 1.5 – 2	4.5 uncuffed/ 4.0 cuffed	13.5	8
4 years	Straight 1.5 – 2	5.0–5.5 uncuffed/4.5 cuffed	15	10
6 years	Straight 2	5.5 uncuffed/ 5.0 cuffed	16.5	10
8 years	Straight or curved 2	6.0 cuffed	18	12
10 years	Straight or curved 2	6.5 cuffed	19.5	12
12 years	Curved 3	7.0 cuffed	21	12
Adolescent	Straight or Curved 3	7.0-8.0 cuffed	21	12

Notes: Some sick infants will do better with cuffed tubes to prevent significant airleak – size ½ down, if small cuffed tubes available. Refer to Browselow tape for equipment if in doubt.

INTRAVENOUS ACCESS

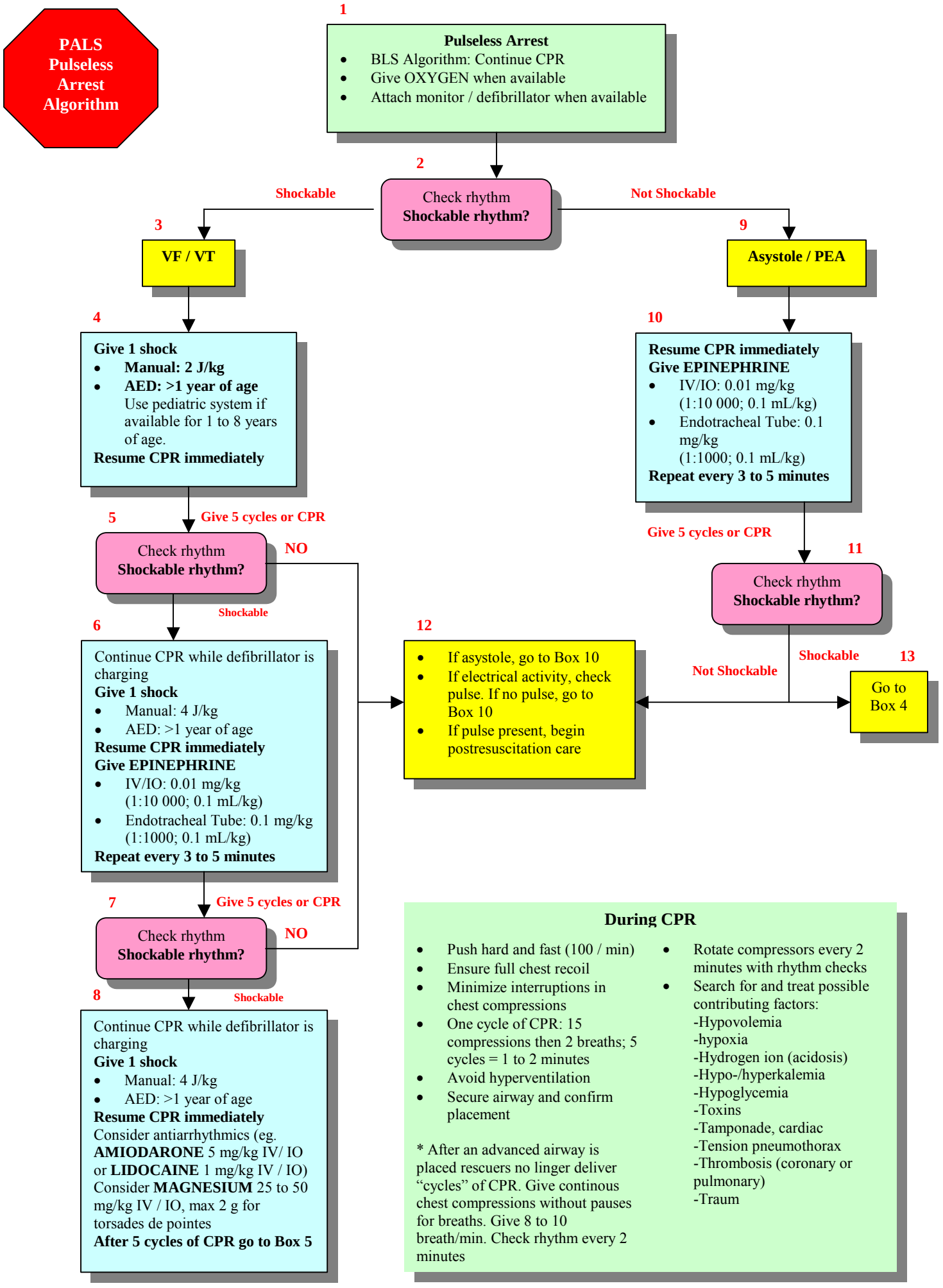
The EMT I, P, and RN are directed to start a peripheral intravenous infusion as indicated by patient condition. This can be an extremely difficult task in the pediatric patient. The following sites may be tried:

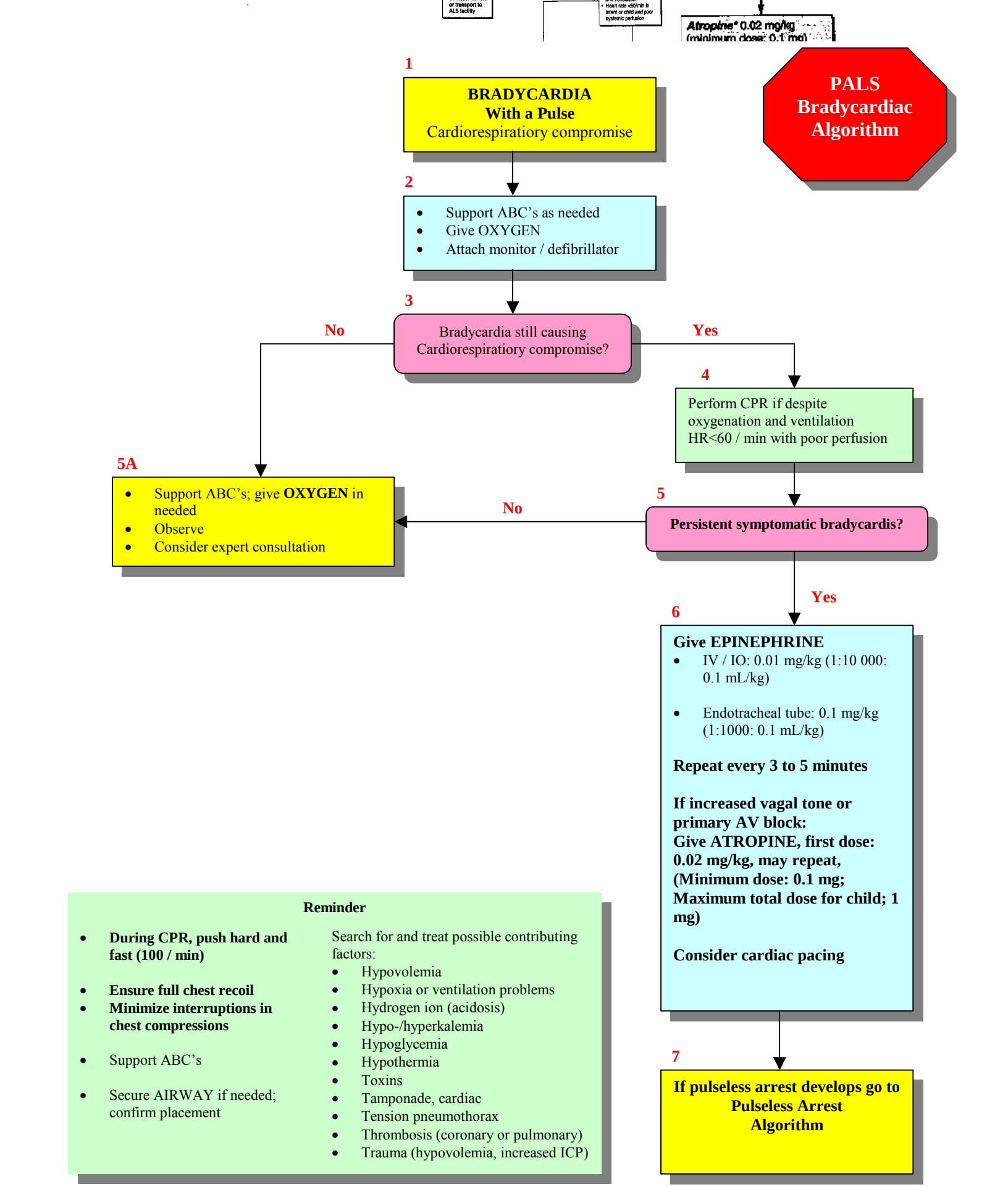
First Choice:	Antecubital, distal forearm, hand, saphenous vein (see IV Protocol)
Second Choice:	Intraosseous Infusion
Third Choice:	Percutaneous Central Access - femoral, external jugular (see IV Protocol)

INTRAOSSEOUS ACCESS

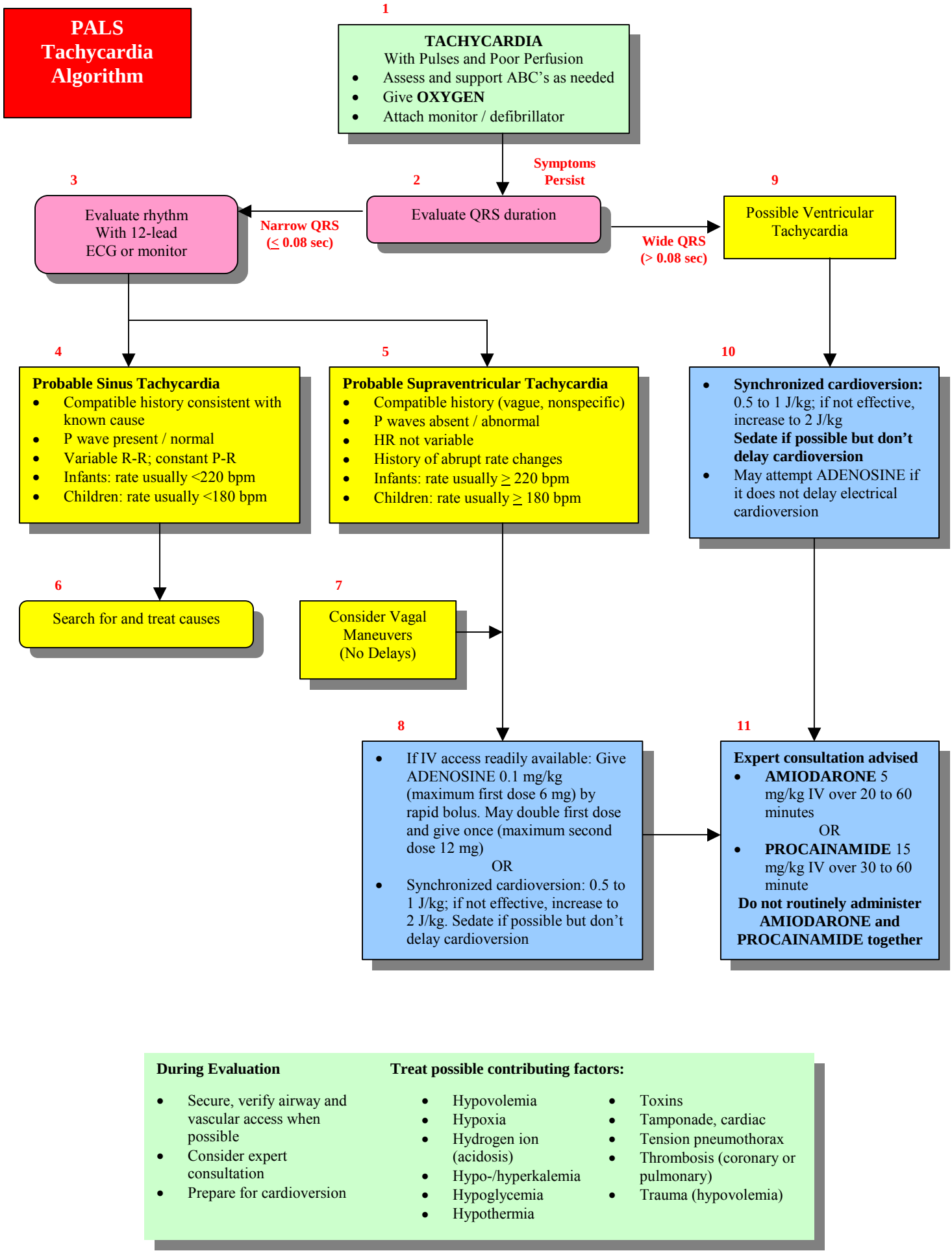
Site -

1. Anterior tibia 1-2 cm distal to the tibial tuberosity.
2. Cleanse the site 3 times with Betadine.
3. Insert bone marrow needle through the skin and advance it firmly through the cortex of the bone at 90^{o}.
4. You will feel a soft pop once it passes through the cortex.
5. Attach IV solution and fluid should flow freely without evidence of subcutaneous infiltration.


PALS Pulseless Arrest Algorithm
1
Pulseless Arrest
BLS Algorithm: Continue CPR
Give OXYGEN when available
Attach monitor / defibrillator when available
2
Check rhythm
Shockable rhythm?
Shockable
Not Shockable
3
VF / VT
9
Asystole / PEA
4
Give 1 shock
Manual: 2 J/kg
AED: >1 year of age
Use pediatric system if available for 1 to 8 years of age.
Resume CPR immediately
10
Resume CPR immediately
Give EPINEPHRINE
IV/IO: 0.01 mg/kg (1:10 000; 0.1 mL/kg)
Endotracheal Tube: 0.1 mg/kg (1:1000; 0.1 mL/kg)
Repeat every 3 to 5 minutes
5
Give 5 cycles or CPR
Check rhythm
Shockable rhythm?
NO
Shockable
Give 5 cycles or CPR
11
Check rhythm
Shockable rhythm?
6
Continue CPR while defibrillator is charging
Give 1 shock
Manual: 4 J/kg
AED: >1 year of age
Resume CPR immediately
Give EPINEPHRINE
IV/IO: 0.01 mg/kg (1:10 000; 0.1 mL/kg)
Endotracheal Tube: 0.1 mg/kg (1:1000; 0.1 mL/kg)
Repeat every 3 to 5 minutes
12
If asystole, go to Box 10
If electrical activity, check pulse. If no pulse, go to Box 10
If pulse present, begin postresuscitation care
Not Shockable
Shockable
13
Go to Box 4
7
Give 5 cycles or CPR
Check rhythm
Shockable rhythm?
NO
8
Shockable
Continue CPR while defibrillator is charging
Give 1 shock
Manual: 4 J/kg
AED: >1 year of age
Resume CPR immediately
Consider antiarrhythmics (eg. AMIODARONE 5 mg/kg IV/ IO or LIDOCAINE 1 mg/kg IV / IO)
Consider MAGNESIUM 25 to 50 mg/kg IV / IO, max 2 g for torsades de pointes
After 5 cycles of CPR go to Box 5
During CPR
Push hard and fast (100 / min)
Ensure full chest recoil
Minimize interruptions in chest compressions
One cycle of CPR: 15 compressions then 2 breaths; 5 cycles = 1 to 2 minutes
Avoid hyperventilation
Secure airway and confirm placement
* After an advanced airway is placed rescuers no linger deliver "cycles" of CPR. Give continous chest compressions without pauses for breaths. Give 8 to 10 breath/min. Check rhythm every 2 minutes
Rotate compressors every 2 minutes with rhythm checks
Search for and treat possible contributing factors:
-Hypovolemia
-hypoxia
-Hydrogen ion (acidosis)
-Hypo-/hyperkalemia
-Hypoglycemia
-Toxins
-Tamponade, cardiac
-Tension pneumothorax
-Thrombosis (coronary or pulmonary)
-Traum


Atropine* 0.02 mg/kg
PALS Bradycardiac Algorithm
1
BRADYCARDIA With a Pulse
Cardiorespiratiory compromise
2
Support ABC's as needed
Give OXYGEN
Attach monitor / defibrillator
3
Bradycardia still causing Cardiorespiratiory compromise?
No
Yes
4
Perform CPR if despite oxygenation and ventilation HR<60 / min with poor perfusion
5A
Support ABC's; give OXYGEN in needed
Observe
Consider expert consultation
No
5
Persistent symptomatic bradycardis?
Yes
6
Give EPINEPHRINE
IV / IO: 0.01 mg/kg (1:10 000: 0.1 mL/kg)
Endotracheal tube: 0.1 mg/kg (1:1000: 0.1 mL/kg)
Repeat every 3 to 5 minutes
If increased vagal tone or primary AV block:
Give ATROPINE, first dose: 0.02 mg/kg, may repeat,
(Minimum dose: 0.1 mg;
Maximum total dose for child; 1 mg)
Consider cardiac pacing
7
If pulseless arrest develops go to Pulseless Arrest Algorithm
Reminder
During CPR, push hard and fast (100 / min)
Ensure full chest recoil
Minimize interruptions in chest compressions
Support ABC's
Secure AIRWAY if needed; confirm placement
Search for and treat possible contributing factors:
Hypovolemia
Hypoxia or ventilation problems
Hydrogen ion (acidosis)
Hypo-/hyperkalemia
Hypoglycemia
Hypothermia
Toxins
Tamponade, cardiac
Tension pneumothorax
Thrombosis (coronary or pulmonary)
Trauma (hypovolemia, increased ICP)

PALS Tachycardia Algorithm

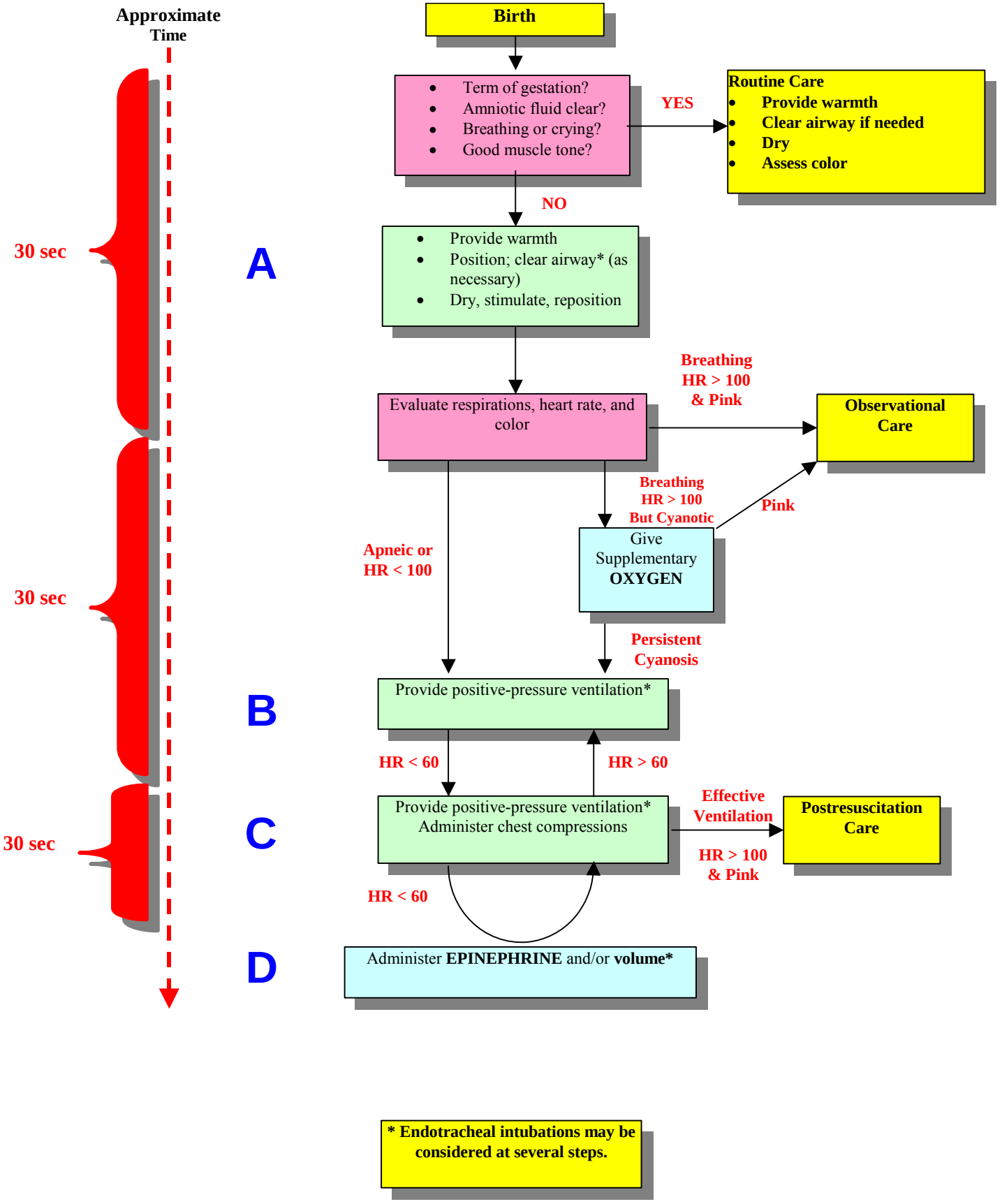


During Evaluation

- Secure, verify airway and vascular access when possible
- Consider expert consultation
- Prepare for cardioversion

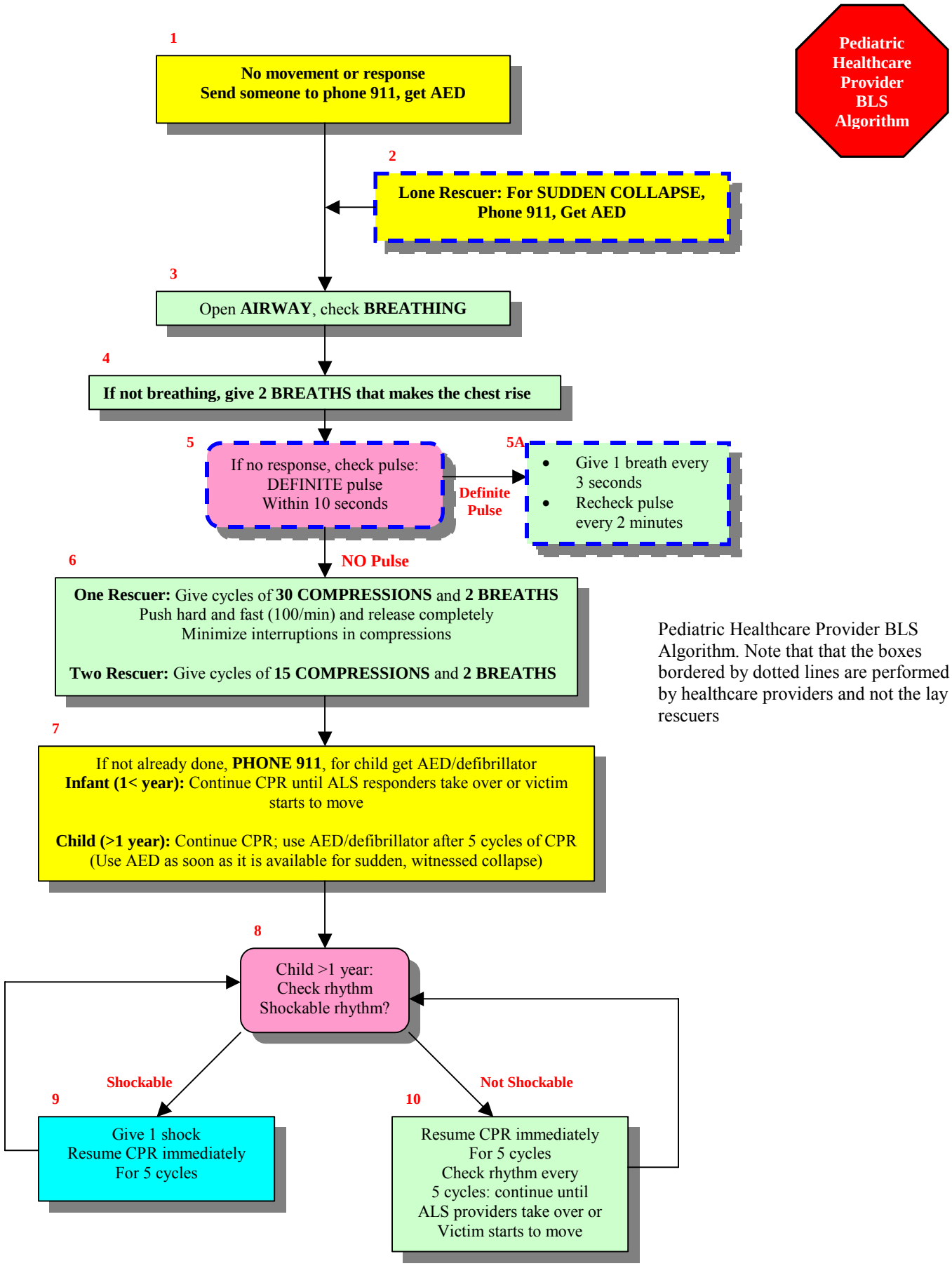
Treat possible contributing factors:

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



*** Endotracheal intubations may be considered at several steps.**

NEONATAL FLOW ALGORITHM



Pediatric Healthcare Provider BLS Algorithm. Note that that the boxes bordered by dotted lines are performed by healthcare providers and not the lay rescuers

Drug	Dose	Supplied*	Remarks (see text)
Epinephrine Hydrochloride	0.01 mg/kg (0.1 ml/kg)	1:10,000 (0.1 mg/ml)	Most useful drug in cardiac arrest.
Sodium Bicarbonate	1 mEq/kg (1 ml/kg)	1 mEq/ml (8.4% soln)	Infuse slowly and **only** when ventilation is adequate.
Atropine Sulfate	0.02 mg/kg (0.2 ml/kg)	0.1 mg/ml	Minimum dose of 0.l mg (1 ml); use for bradycardia after assessing ventilation.
Glucose	1-4 ml/kg	250 mg/ml (25% soln)	May be very important in infants.
Calcium Chloride	20 mg/kg (0.2 kg/kg)	100 mg/ml (10% soln)	Use only for hypo-calcemia, calcium blocker overdose, hyperkalemia, or hypermagnesemia; give slowly. Very caustic
Naloxone	0.01 mg/kg (0.025 ml/kg)	0.4 mg/ml	Larger doses may be necessary and are safe. May be repeated at 3-5 minute intervals.
Furosemide	1-2 mg/kg (0.1-0.2 ml/kg)	10 mg/ml	No more than 4 mg/kg
Lorazepam	0.1 mg/kg	2 mg/ml	May cause respiratory depression.
Midazolam	0.05 mg/kg	1 mg/ml	May cause respiratory depression
Phenytoin	10-20 mg/kg (0.2-0.4 ml/kg)	50 mg/ml	Push no more than 1 mg/kg/min.
Lidocaine Hydrochloride	1 mg/kg	10 mg/ml(l%) 20 mg/ml(2%)	May be bolused at 5-minute intervals up to 3 times; then begin infusion.
Amiodarone	5 mg/kg	50 mg/ml	May be repeated.

* Concentration listed is either the form available in pre-filled syringes or the most commonly used concentration.

DRUGS USED IN PEDIATRIC CARDIOPULMONARY RESUSCITATION AND POST-RESUSCITATION STABILIZATION

DRUG	PREPARATION FOR INFUSION mg dose =	DOSAGE EQUIVALENTS	DOSE
Dobutamine (40 mg/ml)	6 x weight in Kg is added to D_5W to make 100 ml	l ml/hr delivers l µg/kg/min	Begin with 10 µg/Kg/min of 20 µg/kg/min.
Dopamine (40 mg/ml)	6 x weight in Kg is added to D_5W to make 100 ml	l ml/hr delivers l µg/Kg/min	Begin with 5-10 µg/kg/min. Titrate to desired effect to max. of 20 µg/Kg/min.
Epinephrine 1:10000 l mg/ml	0.6 x weight in Kg is added to D_5W to make 100 ml	l ml/hr delivers 0.l µg/Kg/min	May begin with 0.1 µg/Kg/min. Titrate to desired effect up to 1 µg/Kg/ min.
Isoproterenol 1:5000 .2 mg/ml	0.6 x weight in Kg is added to D_5W to make 100 ml	l ml/hr delivers 0.1 µg/Kg/min.	Begin with 0.1 µg/Kg/min. Titrate to desired effect up to 0.5 µg/Kg/ min.
Lidocaine 20 mg/ml	Add 120 mg to total 100 ml D_5W	20 µg/Kg/min= l ml/Kg/hr	Begin with 20 µg/kg/min. Max. is 50 µg/Kg/min.
Nitroprusside 50 mg vial of powder	Add 30 mg to total 50 ml D_5W	l µg/Kg/min= l ml/Kg/hr	Begin with 0.5 µg/Kg/min. Slowly titrate to desired effect Max. of 10 µg/kg/min.

PEDIATRIC DIABETIC KETOACIDOSIS

Historial Data:

1. Most common pediatric endocrine disorder.
2. Mortality approaches 10%.
3. Symptoms include weight loss, polyuria, polydipsia, weakness, vomiting, abdominal pain, infection, and fruity breath odor.
4. Physical signs include tachycardia, tachypnea, dehydration, fever, and mental status changes.
5. Take medication history including insulin dose, compliance.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT B:

1. Establish an airway.
2. O_2 100% nonrebreather.
3. Assist ventilations as needed.

B. EMT I:

4. Establish an IV of normal saline at 4 ml/kg/hr.
5. If signs of shock persist give a bolus of 10-20 ml/kg.

D. EMT P AND RN:

6. Use Glucometer to confirm diagnosis.
7. Maintain blood pressure with fluids.
8. Do not over-hydrate!

PEDIATRIC HYPOGLYCEMIA

Historical Data:

1. Commonly seen in insulin-dependent diabetic.
2. Occurs rapidly (30-60 min).
3. Symptoms include: shallow respirations, weak rapid pulse, cold clammy skin, weakness, seizures, and coma.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER A:

1. Establish and maintain airway.
2. O_2 4-6 LPM per nasal cannula.
3. Vital signs.
4. Maintain body heat.
5. May give oral glucose if glucose is known and < 60 and patient is conscious.

B. FIRST RESPONDER Monitor, EMT Basic, EMT Basic Monitor, EMT Basic Medication:

6. Glucometer glucose.
7. Follow hypoglycemic protocol.

C. EMT I, EMT P, RN:

8. Intubate if necessary.
9. Establish IV saline lock. Obtain blood sample per protocol.
10. If glucose less than 60, give:
    a. 0.5 mg Glucagon IM or intranasal if <20 kg or 1 mg Glucagon IM or intranasal if > 20 kg
    b. 2 ml/kg 25% Dextrose IV
11. Neonates 2 ml/kg of $D_{10}W$ IV.
12. Follow ACLS protocol.

RESPIRATORY DISTRESS

This section will cover CROUP and EPIGLOTTITIS.

Asthma, anaphylaxis and upper airway obstruction are covered under general medical emergencies.

Historical Data:

1. Stridor, hoarseness, drooling, and muffled voice are signs of upper airway disease.
2. Think croup, tracheitis, epiglottitis, and foreign-body.
3. EPIGLOTTITIS (Very Uncommon):
   a. Age 2-7 years,
   b. Rather sudden onset,
   c. High fever,
   d. Severe dysphagia,
   e. Very toxic in appearance,
   f. Drooling, sitting upright.
4. CROUP:
   a. Usually in infant and toddlers,
   b. More gradual onset, preceding URI,
   c. Low grade fever,
   d. Varying grades of respiratory distress.

Prep for Transport and Treatment

A. FIRST RESPONDER:

1. Above all **do not** agitate the child.
2. Provide high flow O_2.
3. Allow child to assume the position of comfort.

B. FIRST RESPONDER A, EMT Basic, I:

4. Transport rapidly.

C. EMT P, RN:

5. Have emergency airway equipment ready including a 14-gauge needle for cricothyrotomy.
6. If respiratory arrest occurs, try once to intubate then proceed directly to needle cricothyrotomy.
7. Epinephrine aerosol per medical control; (2 ml of 1:1000 epi in 1 ml NS, or .1-.3 cc of racemic epi in 2 cc NS)
8. May repeat treatment in 15 minutes if needed.
9. Consider Decadron .6 mg/kg IM X1 if available.

PEDIATRIC SEIZURE

Historical Data:

1. Etiologies:
   a. Febrile: usually occurs in children 6 months to 6 years.
      1) Usually associated with a rapid rise in temperature.
      2) Usually generalized, but not always.
      3) Usually less than 5 minutes.
   b. Traumatic: always consider trauma as a cause.
   c. Genetic: take a careful history for previous seizures.
   d. Toxins: consider drug and/or toxin ingestion.
   e. Infectious: consider meningitis encephalitis or brain abscess.
   f. Tumors.
   g. Anorexia.
   h. Metabolic disorders.
2. Determine if it is focal or generalized.
3. Determine the length of time.
4. Consider medication compliance.
5. Allergies.

Prep for Transport and Treatment:

A. FIRST RESPONDER,:

1. Establish and protect the patient's airway.
   a. **Do Not** force anything in the child's mouth.
2. Protect the patient from injury.
3. Apply O_2 100% nonrebreather.
4. Assist ventilations if needed.
5. Check for temperature and remove clothing if febrile.
6. CPR if needed.

B. FIRST RESPONDER Monitor, A, EMT Basic, EMT Basic Monitor:

7. Check Glucometer glucose and treat per protocol.

C. EMT I, EMT P, CCEMTP, RN:

8. Intubate if indicated.
9. Establish IV access and obtain a blood sample.
10. Maintain a saline lock.
11. Perform Glucometer glucose and treat per protocol (if less than 60, give l.0 ml/kg of 25% glucose IV).
12. Narcan: 0.01 mg/kg IV.
13. Ativan: 0.1 mg/kg IV - max dose 4 mg IV.
14. Midazolam 0.05 mg/kg IV or IM. May repeat once in 15 minutes at 0.025 mg/kg if no response.

PEDIATRIC SHOCK

Shock is a clinical syndrome that results from failure of the cardiovascular system to deliver sufficient oxygen and other nutrients to meet the metabolic demands of the body tissues.

Historical Data:

1. Pediatric patients have excellent compensatory capabilities so hypotension occurs late.
2. Inspection is the most critical element:
   a. Tachycardia, tachypnea and irritability occur early.
   b. Look for pallor and slow capillary refill (greater than 5 seconds), cool distal extremities. (Occurs late)
   c. Clouded sensorium disorientation, confusion, hallucinations, and inappropriate affect. (Occurs late)
3. Acceptable blood pressure is calculated using systolic pressure = 80 + (age x 2).
4. Upper limits of pulse and respirations:

AGE	RESP. RATE	PULSE
Infant	40	160
Toddler	30	140
School Age	25	120
Adolescent	20	110

5. Consider the types of shock:
   a. Hypovolemic - most common form caused by hemorrhage, burns, dehydration.
   b. Septic - caused by increased vascular permeability.
   c. Cardiogenic - poor cardiac output.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER A, EMT Basic:

1. Open and maintain airway.
2. 100% O_2 per nonrebreather mask.
3. Assist ventilations as needed.
4. Begin CPR if indicated.
5. Place in Trendelenburg position.
6. Control any active bleeding with direct pressure.
7. Obtain temperature

B. EMT I:

8. Intubate child if indicated.
9. Obtain IV access per protocol. Check glucose and treat per protocol.
10. Give a bolus of lactated Ringers of 20 cc/kg.

C. EMT P, RN:

11. If no response or partial response, repeat bolus.
12. If in septic shock or cardiogenic shock by history and physical exam, may try dopamine at 10 µg/kg/min.
13. If blood pressure responds maintain IV at 4 cc/kg/hr.

PEDIATRIC TRAUMA
Children Are Not Simply Small Adults!

I. INTRODUCTION:

Children have many anatomical and physiologic differences from adults. The basic principles of trauma care, however, are the same for adults and children, but the EMS attendant must pay particular attention to the following differences. This section will not go into detail as to the specific traumatic injuries because these are well outlined in the trauma section of this manual.

Historical Data:

1. Trauma accounts for over 50% of children deaths in U.S.
2. A child's head occupies a larger total relative body surface area, and accounts for a great percentage of morbidity and mortality.
3. A child's neck is shorter with less musculature and more cartilaginous tissue and is subject to greater stress than an adult's neck.
4. The larynx is located more cephalic and anterior. The epiglottis is also more floppy. The cricoid cartilage is the narrowest portion of the airway.
5. The thorax is more pliable than the adult's, so blunt trauma is more damaging to underlying organs. Tension pneumothorax can develop more easily.
6. The abdomen is protected less by ribs, thus exposing spleen, liver and diaphragm to more injury.
7. The bones have growth plates, which are sites of a relative weakness.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Establish and maintain an airway providing C-spine stabilization.
   a. Use sniffing position if no C-spine injury.
   b. Use jaw thrust for C-spine injury.
   c. See airway management section.
2. Assess breathe sounds and ventilate as needed.
3. Give supplemental O_2 100% nonrebreather.
4. Assess heart sounds, capillary refill, and blood pressure.
5. CPR if indicated.
6. Control active bleeding with direct pressure.
7. Assess Glasgow Coma Score.
8. Stabilize all fractures including possible back fracture.
9. Perform secondary survey if time permits.

B. EMT I:

10. Intubate if indicated (see airway protocol) maintaining C-spine control.
11. Establish IV of LR peripheral preferred, followed by intraosseous.
12. For signs of shock (see shock protocol) - give a 20 cc/kg fluid bolus.

C. EMT P, RN:

13. For signs of tension pneumothorax, perform needle thoracentesis (see trauma section).
14. May repeat fluid bolus as indicated.
15. Transport rapidly

*Specific trauma care is well outlined in the trauma section of this manual.

PEDIATRIC PATIENT WITH ALTERED LEVEL OF CONSCIOUSNESS (ALC)

Historical Data:

1. Consider the following **AEIOU -TIPS:**
   - A. **Alcohol**: Alcohol is more commonly encountered in adolescents than younger pediatric patients. However, the young may exhibit ALC at serum levels less than 100 mg/100 ml. ALC also may due to concurrent hypoglycemia.
   - E. **Epilepsy** (and other causes of seizures): Postictal states are common causes of ALC, and an actively seizing infant may appear to be in coma until close observation reveals continued subtle seizure activity.
   - I. **Insulin** (hypo- or hyperglycemia): Hypoglycemia as a result of poor hepatic glycogen stores and depressed gluconeogenesis may result in hypoglycemia in children, as an end product of many disease states.
   - I. **Intussusception**: Altered sensorium may be the first manifestation of intussusception. ALC may occur without intermittent pain and before the development of mass or melena.
   - O. **Overdose**: Drugs may be transferred to the fetus transplacentally; through neglect, abuse, accident or with suicidal intent. Intoxicants and opiates can also depress sensorium.
   - U. Uremia (and other metabolic causes): Hepatic and adrenal insufficiency, electrolyte disorders, and congenital enzyme defects are some of the metabolic considerations. Hemolytic uremic syndrome and chronic renal impairment are causes in childhood.
   - T. **Trauma**: Trauma is a major cause of ALC. It is the leading cause of death in the first four decades of life. Head injuries, chest injuries leading to hypoxia, and other injuries leading to shock all have significant effects on the level of consciousness.
   - I. **Infection**: Infection is more common as a cause of ALC in children than adults. Meningitis, encephalitis, Reye's syndrome, and sepsis are more common in the pediatric patient.
   - P. **Psychiatric**: Fictitious ALC is exceedingly rare in children and can only be considered after all other possible etiologies have been excluded.
   - S. **Stroke, shock, and other cardiovascular causes**: Cardiovascular abnormalities such as arteriovenous malformations may present in childhood resulting in CNS symptomatology including ALC. Poor brain perfusion because of hypovolemia may lead to altered sensorium in the presence of an otherwise normal CNS.

Prep for Transport and Treatment:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Establish an airway and assist ventilations as needed.
2. O_2 100% nonrebreather.
3. Careful vital signs.
4. CPR as needed

B. EMT I:

5. Intubate if indicated.
6. Establish IV access (saline lock) and draw a green-topped tube for lab.

C. EMT P, RN:

7. Glucose: 0.25 g/kg (l.0 ml/kg of 25% solution) if indicated by Glucometer.
8. Narcan: 0.01 mg/kg (0.025 ml/kg).
9. Follow ACLS protocol.

CHILD ABUSE

I. INTRODUCTION:

A. Battered, or abused children are those who suffer deliberately induced injuries. Child abuse is a major pediatric problem. In the United States there are an estimated 500,000 to 1,000,000 cases of child abuse every year. They occur at every social and economic level. Furthermore, child abuse may lead to serious mental and physical disabilities and approximately 2,000 battered children die from their injuries each year.

B. The adult (usually a parent) who abuses a child often behaves in an evasive manner, volunteering little information or giving contradictory information about what happened to the child. The parent may show outright hostility toward the child, toward the other parent, or toward the EMT, and rarely shows any guilt. Other parental indicators are lack of apparent concern for the child and haste to get away from the hospital before making certain the child is safe.

II. SIGNS/SYMPTOMS/CLUES TO IDENTIFICATION OF THE BATTERED CHILD:

A. The child who is poorly nourished and poorly taken care of.

B. The child with multiple extremity fractures.

C. The child with multiple bruises and abrasions, especially about the trunk and buttocks. Be particularly suspicious if there are OLD BRUISES IN ADDITION TO FRESH ONES.

D. The child with burns, especially cigarette burns or scalds from hot bath water in infants.

E. The child with multiple soft tissue injuries or injuries about the mouth from having a bottle forced into it.

F. The child who has been involved in a bizarre accident according to the history, or an accident that does not logically account for the injuries observed.

G. The child who seems apathetic and does not cry despite his injuries, or the child who does not turn to his parents for comfort.

H. The child who has been to several emergency rooms recently for related complaints.

I. The child whose injury occurred several days before you were contacted.

CHILD ABUSE

FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT B, I, P, RN:

A. Treatment begins with recognizing that the child MAY have been abused.

B. Once one has reason to suspect abuse, based on the primary survey and history, one must examine the child from head to toe, searching for abrasions, bruises, lacerations and evidence of internal injury. Look also for signs of head trauma, closely examining the ears and nose for blood and cerebrospinal fluid and the eyes for pupillary changes.

C. Conduct the examination in a matter-of-fact manner, keeping your suspicions to yourself.

D. Make careful notes, especially what you have observed at the scene such as condition of the home; any objects that might have been used to abuse the child. DOCUMENT EXTENSIVELY!

E. When you arrive at the hospital, convey your suspicions and findings to the emergency department staff/physician. What you have observed at the scene is valuable information for the physician, since this information is otherwise unavailable to him. Remember, child abuse is a chronic problem. The battered child you bring into the emergency room this week may be a DOA next week if the problem is not detected and dealt with.

F. It is not the EMT's responsibility to confront the parents with the charge of child abuse, nor is it appropriate to do so. One must be tactful and discreet in dealing with these parents and should save one's comments for the professional staff in the emergency room.

G. Remember - be calm, patient, and gentle when examining the child. Reassure the child in very simple terms within the level of his/her comprehension.

TRAUMA

TRAUMA

Western RTAC has adopted the current policies of the American College of Surgeons Committee on Trauma. The following protocols are outlined and should be followed to the level of skill the EMS attendant has.

Trauma accounts for more deaths in the United States than all other diseases combined in the patient age 1 to 35. The quality of the initial care significantly influences outcome. Rapid, accurate assessment and prioritization are keys in trauma care.

The following protocols will follow the concepts of:

1. Primary survey:
    A. Airway maintenance with C-spine control
    B. Breathing and ventilation
    C. Circulation with hemorrhage control
    D. Disability: Neurologic status
    E. Exposure: Completely undress the patient
2. Resuscitation Phase
3. Secondary Survey

TRAUMA ALGORYTHM

SHOCK

Historical Data:

1. You must recognize its presence.
2. Types include:
   a. Hypovolemic from hemorrhage, dehydration, burns, etc.
   b. Cardiogenic caused by poor heart function from infarction, tamponade, contusion, tension, pneumothorax.
   c. Neurogenic from loss of sympathetic tone. Remember isolated head injuries **do not** cause shock.
   d. Septic from overwhelming infection.
3. In trauma we are most often dealing with hypovolemia from hemorrhage (internal or external).
4. Estimate fluid and blood requirements for the adult.

	Class I	**Class II**	**Class III**	**Class IV**
Blood Loss (ml)	up to 750	750-1500	1500-2000	2000 or more
Blood Loss (%BV)	up to 15%	15%-30%	30%-40%	40% or more
Pulse Rate	<100	>100	>120	140 or higher
Blood Pressure (mmHg)	Normal or Increased	Decreased	Decreased	Decreased
Capillary Refill Test	Normal	Positive	Positive	Positive
Respiratory Rate	14-20	20-30	30-40	>35
Urine Output (ml/hr)	30 or more	20-30	5-15	Negligible
CNS-Mental Status	Slightly Anxious	Mildly Anxious	Anxious and Confused	Confused - Lethargic
Fluid Replacement (3:1 Rule)	Crystalloid	Crystalloid	Crystalloid + Blood	Crystalloid + Blood

Initial Assessment and Prep for Transport:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Establish an airway and maintain C-spine control.
2. Apply O_2 100% nonrebreather.
3. Assist ventilation as needed
4. CPR if needed
5. Control hemorrhage with direct pressure.
6. Elevate lower extremities.
7. Maintain body heat.
8. Vital signs every 5 minutes.
9. If pulseless, attach to AED and follow protocol.

B. EMT Basic Airway:

10. Establish a Combitube if indicated.

C. EMT Basic IV:

11. Establish a large-bore IV (16 gauge or larger of lactated Ringers). **Do Not Delay Scene Time.**
12. Run 1 liter of fluid as fast as possible if BP systolic less than 100 mmHg, otherwise run at 100 cc/hr.
13. If pressure responds to fluid challenge (returns over 100 systolic) maintain IV at 200 cc/hr.

D. EMT Basic Intubation:

14. Intubate patient if indicated maintaining C-spine stabilization.

E. EMT Intermediate, Paramedic, CCEMTP, RN:

14. Establish a second large bore IV of lactated Ringers.
15. Adjust fluids to maintain blood pressure over 100 systolic.
16. Rapid transport.
17. Interosseous access if unable to get IV access after 2 tries.

MAST PROTOCOL

There is no good literature that consistently supports the use of the MAST garment. MAST trousers are not an accepted part of the Missoula area EMS protocols.

GENERAL TRAUMA

Historical Data:

1. Rapid assessment and intervention is key to survival.
2. Rapid transport to a definitive care facility is vital.
3. Scene time **must not** be delayed for procedures. The following are acceptable standards:
   a. Airway must be established
   b. C-spine must be stabilized
   c. Ventilations must be maintained
   d. IV access can be attempted, but no delay over **60 seconds**
   e. Bleeding must be controlled
   f. Fractures should be stabilized.
4. Assess:
   a. Airway and C-spine
   b. Breathing
   c. Circulation
   d. Disability - neuro status
   e. Exposure - identify wounds.
5. Resuscitation with airway and IV fluids.
6. Secondary survey en route.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish airway (Airway Protocol), maintain C-spine control.
2. Apply O_2 100% nonrebreather.
3. Assist ventilations as necessary.
4. CPR as necessary.
5. Control active bleeding with direct pressure.
6. Be alert for signs of shock and follow protocol.
7. Splint all fractures.
8. Vital signs every 5 minutes.

B. FIRST RESPONDER A, EMT Basic:

9. Rapid transport.
10. Transport pregnant patients with right hip elevated.
11. If pulseless attach to AED and follow protocol.

C. EMT Basic Airway:

12. Establish Combitube if indicated.

D. EMT Basic Intubation:

12. Intubate if necessary (airway protocol).

E. EMT Basic IV:

13. Establish IV of lactated Ringers. Large bore (16 or larger).
14. Run fluids at 100 cc/hr or faster if signs of shock (see Shock protocol).

E. EMT Intermediate:

15. Establish a second IV (large bore) of lactated Ringers.

G. EMT Paramedic, CCEMTP, RN:

16. Treat specific injuries per protocol:
    a. Tension pneumothorax with needle thoracentesis (Chest Trauma Protocol)
    b. Increased intracranial pressure with mannitol (Head Trauma Protocol)
    c. Cord disruption with steroids (Spine Trauma Protocol).
17. Sternal interosseous access if unable to establish IV.
18. Do not neglect pain control for the trauma patient. Fentanyl is the drug of choice and can safely be used in the trauma patient.
    Adult doses of 25-50 mcg every 15 minutes are of great help.
    Children can be given .5-1 mcg/kg IV in 15 minute increments.

ABDOMINAL TRAUMA

Historical Data:

1. Abdominal trauma can be very subtle and benign-appearing at first
2. The mechanism of injury is extremely important to know i.e., lap seat belt, steering wheel, blunt trauma to the stomach, penetrating trauma to the abdomen.
3. Intrathoracic abdomen contains liver, spleen, stomach, diaphragm, and transverse colon.
4. Abdominal segment contains large bowel, small bowel, pancreas, kidneys, and great vessels.
5. Pelvic segment contains rectum, bladder, iliac vessels, uterus and ovaries.
6. Look for abrasions, contusions, lacerations and any penetrating wounds.
7. Listen for bowel sounds and bruits.
8. Feel for pain localization, tensing, guarding.
9. **Repeat Exams.**

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish an airway and C-spine control.
2. Apply O_2 100% nonrebreather.
3. Assist ventilations as needed.
4. CPR as needed.
5. Every 5 minute vital signs.
6. Be alert for changing status.
7. Note any contusions, lacerations or wounds.
8. Immobilize impaled objects. **DO NOT REMOVE.**
9. Note pregnancy history.
10. If pulseless, attach to AED and follow protocol.

B. FIRST RESPONDER A, EMT Basic:

11. Rapid transport.
12. Transport pregnant patients with right hip elevated.
13. If pulseless attach to AED and follow protocol.

C. EMT Basic Airway:

14. Establish Combitube if indicated.

D. EMT Basic Intubation:

15. Intubate if necessary (airway protocol).

E. EMT Basic IV:

16. Establish IV of lactated Ringers. Large bore (16 or larger).
17. Run fluids at 100 cc/hr or faster if signs of shock (see Shock protocol).

E. EMT Intermediate, Paramedic, CCEMTP, RN:

18. Establish a second IV (large bore) of lactated Ringers.
19. Sternal interosseous access if unable to establish IV.
20. Consider pain control.

EXTREMITY TRAUMA

Historical Data:

1. Extremities receive little attention during the primary survey except to control bleeding.
2. Care revolves around perfusion, alignment, neuro function.
3. Take a careful history:
   a. Mechanism of injury; crush, blast, etc.
   b. Environment; contaminate.
   c. Findings at accident site; position of limb, amount of blood loss, open wounds, spontaneous movement
   d. Re-assess limb perfusion and function.
4. Physical includes:
   a. Looking at color, perfusion, angulation, swelling, discoloration and wounds.
   b. Feeling for sensation, tenderness, crepitation, capillary refill, pulses.
   c. Movement; for active and passive range of motion (if patient refuses to move a limb, do not move it passively).
5. Be especially alert for life-threatening injuries such as: severe crush injuries to the pelvis, traumatic amputations, open fractures.
6. Be alert for massive blood loss, which can occur from open or closed fractures.
7. Identify and document neuro and vascular supply to the injured extremity.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish an airway and maintain C-spine control.
2. Apply O_2 100% nonrebreather.
3. Assist ventilation if needed.
4. CPR if needed.
5. Control all bleeding with direct pressure.
6. After primary survey and initial management, assess extremity status:
   a. Vascular supply
   b. Neuro function
   c. Deformity and disability.
7. Cover wounds with dry sterile dressings.
8. Splint extremities assessing neurologic and vascular status before and after splinting:
   a. Forearm and wrist - padded or pillow splints.
   b. Elbow - splint in flexed position and apply sling.
   c. Arm - splint to body with sling and swath.
   d. Femur - traction splints (First Responder A or above).
   e. Tibia - padded board splint or gutter splint.
   f. Ankle - pillow splint or padded board splint.
   g. Pelvis - backboard.
9. Dislocations: immobilize in position of comfort and carefully document neurologic and vascular status.
10. Amputations:
    a. Apply sterile pressure dressing to the attached limb.
    b. Wrap the amputated part in saline-soaked sterile dressings and place in plastic bag.
    c. Then place the bag on ice and transport with the patient.
11. Vital signs, neurologic, vascular checks every 5 minutes.

B. FIRST RESPONDER A, EMT Basic:

12. Rapid transport.
13. If pulseless attach to AED and follow protocol.

C. EMT Basic Airway:

14. Establish Combitube if indicated.

D. EMT Basic Intubation:

15. Intubate if necessary (airway protocol).

E. EMT Basic IV:

16. Establish IV of lactated Ringers. Large bore (16 or larger).
17. Run fluids at 100 cc/hr or faster if signs of shock (see Shock protocol).

E. EMT Intermediate, Paramedic, CCEMTP, RN:

18. Establish a second IV (large bore) of lactated Ringers.
19. Sternal interosseous access if unable to establish IV.
20. Consider pain control.

HEAD TRUAMA

Historical Data:

1. About 50% of all trauma deaths are head injury.
2. The scalp and face have massive blood supply so injuries result in a large blood loss.
3. Consider the brain being enclosed in a contained vault making it susceptible to increased pressure.
4. Altered level of consciousness is the hallmark of brain injury.
5. The mechanism of injury is important in understanding underlying pathology.
6. Never assume that brain injury is the cause of hypotension.
7. With increased intracranial pressure we see hypertension, bradycardia, and decreased respirations.
8. Use the AVPU exam in the primary survey for a mini-neuro exam:
   - A - Alert
   - V - Responds to vocal stimuli
   - P - Responds to painful stimuli
   - U - Unresponsive
9. Assess Glasgow Coma Score (see chart).
10. Assess pupil response. More than l mm difference is abnormal.
11. Look for lateralized weakness.
12. The most important exam is the **Repeat Exam.**

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish and maintain airway.
2. Consider all head injuries to have associated C-spine injuries and immobilize with semi-rigid collar, tape and rolls.
3. Apply O_2 100% nonrebreather.
4. Assist ventilations as needed.
5. Hyperventilate at a rate of 20-25 per minute if patient has signs of increased intracranial pressure.
6. CPR if needed.
7. Control all bleeding with direct pressure.
8. Do mini neurological exam and repeat every 5 minutes.
9. Do Glasgow Score and pupil response.
10. Vital signs every 5 minutes.
11. Evaluate and stabilize other injuries.
12. If pulseless attach to AED and treat per protocol.

B. FIRST RESPONDER A, EMT Basic:

13. Prepare for rapid transport.

C. EMT Basic Airway:

14. Establish Combitube if indicated.

D. EMT Basic Intubation:

15. Intubate and ventilate if necessary.

E. EMT Basic IV:

16. Establish an IV of lactated Ringers at 100 cc/hr. If shock is present follow shock protocol.

F. EMT Intermediate:

17. Establish a second IV of lactated Ringers and keep open.
18. Treat seizures with Valium: 5 mg-10 mg IV for adult

    Ativan: 1-4 mg IV for adult
    0.l mg/kg IV for child
    Maximum dose, 4 mg IV

G. EMT Paramedic, CCEMTP, RN:

19. For obvious signs of increased intracranial pressure, use mannitol l gm/kg IV over 20 minutes **after clearance with medical control.**

HELMET REMOVAL POLICY

MOTORCYCLE AND AUTOMOBILE HELMETS

Removal of a helmet should not be performed in the field except under the following conditions:

1. You are unable to establish and maintain an airway.
2. The helmet fits poorly to the patient, allowing free movement of the head and neck.

The helmet should be taped to the backboard and towel rolls used to support the neck.

If an airway cannot be maintained, it is recommenced the face guard or front part of the helmet be cut using the appropriate tool to allow access to the airway.

FOOTBALL AND OTHER SPORT HELMETS

The following guidelines, while focused on football, are applicable to and removal of protective helmets worn in any sport. These guidelines represent minimal standards of care to assist physicians, coaches, athletic trainers, student athletic trainers, paramedics, EMTs and hospital personnel who care for student-athletes.

Proper on-the-field management of head and neck injuries is essential to minimize sequelae, expedite emergency measures and to prepare for transportation. The action of those in attendance must not compound the problem. For this reason, clear communication between the medical staff and the emergency-transportation personnel should be maintained.

Although the helmet is designed for a stable fit for protection during play, removal of the helmet by others is relatively difficult. In the case of a head or neck injury, jostling and pulling during removal presents high potential for further trauma.

Unless there are special circumstances such as respiratory distress coupled with an inability to access the airway, the helmet should never be removed on the field when there is a potential head/neck injury.

When such helmet removal is necessary in any setting, only personnel trained in this procedure should perform it.

Ordinarily, it is not necessary to remove the helmet in the field to evaluate the scalp. Also, the helmet can be left in place when evaluating an unconscious student-athlete, an individual who demonstrates transient or persistent neurological findings in his extremities, or the student-athlete who complains of continuous or transient neck pain.

Airway, breathing and circulation (ABCs) should be evaluated before moving the injured athlete by looking, listening, and palpation. To monitor breathing, care for facial injury, or to institute resuscitation, cutting the plastic loops that attach the mask to the helmet can swing the facemask away. A sharp pocketknife may work but each school should have a special tool for this purpose. It should be noted that cold weather and old loops may make cutting difficult. The chinstrap can be left in place unless resuscitative efforts are necessary. For resuscitation, the mouthpiece needs to be manually removed and a finger-swipe made of the mouth.

Once the ABCs are stabilized, transportation to an emergency facility by an experienced crew demands that the head be secured in the helmet and the neck immobilized by strapping, taping and using lightweight bolsters on a spine board. Care is needed to skillfully complete this maneuver to provide a stable unit of head, neck and spine.

At the emergency facility, satisfactory initial skull and cervical x-rays usually can be obtained with the helmet in place. Should removal of the helmet be needed to initiate treatment of or to obtain special x-rays, specific protocol needs to be followed. With the head, neck and helmet manually stabilized, the chinstrap can be cut. While maintaining stability, the cheek pads can be removed by slipping the flat blade of a screwdriver or bandage scissor under the pad snaps and above the inner surface of the shell. While another individual provides manual stability of the chin and neck, the persons stabilizing the head place their thumbs or index fingers into the ear holes on both sides. By pulling both laterally and longitudinally, the helmet shell can be spread and eased off. Should a rocking motion be necessary to loosen the helmet, the head/neck unit must not be allowed to move. Those individuals participating in this important maneuver must proceed with caution and coordinate every move.

It should be noted that shoulder pads will need to be removed at the same time as the helmet as they take up approximately 1.5 inches of space behind the back.

SPINAL TRAUMA

Historical Data:

1. Any patient sustaining an injury above the clavicle should be considered as having a cervical spine injury.
2. The total spine needs to be considered in the trauma patient.
3. Altered consciousness suggests C-spine injury.
4. Symptoms of cord injury include:
   a. Flaccid areflexia
   b. Diaphragmatic breathing
   c. Ability to flex, but not extend elbow
   d. Grimaces to pain above, but not below clavicles
   e. Hypotension and bradycardia.
5. When examining the back, check for point tenderness and step-off deformity of spine.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish and maintain airway.
2. Consider all head injuries to have associated C-spine injuries and immobilize with semi-rigid collar, tape and rolls.
3. Apply O_2 100% nonrebreather.
4. Assist ventilations as needed.
5. CPR if needed.
6. Control all bleeding with direct pressure.
7. Do mini neurological exam and repeat every 5 minutes.
8. Do Glasgow Score and pupil response.
9. Vital signs every 5 minutes.
10. Evaluate and stabilize other injuries.
11. If pulseless attach to AED and treat per protocol.

B. FIRST RESPONDER A, EMT Basic:

12. Place patient on backboard without moving the spine.
13. When rolling a patient do in unison by logrolling. One person should always maintain C-spine control and direct all necessary movements.
14. Prepare for rapid transport.

C. EMT Basic Airway:

15. Establish Combitube if indicated.

D. EMT Basic Intubation:

16. Intubate and ventilate if necessary maintaining C-Spine immobilization.

E. EMT Basic IV:

17. Establish an IV of lactated Ringers at 100 cc/hr. If shock is present follow shock protocol.

F. EMT Intermediate:

18. Establish a second IV of lactated Ringers and keep open.

G. EMT Paramedic, CCEMTP, RN:

19. Solu-Medrol 30 mg/kg IV over 15 minutes. Contact medical control.
20. Consider pain control.

THORACIC TRAUMA

Historical Data:

1. Chest injuries account for one out of four trauma deaths.
2. Immediately life-threatening chest injuries include:
   a. Airway obstruction
   b. Tension pneumothorax - causes displacement of the mediastinum and trachea to the opposite side:
      1) Respiratory distress
      2) Absence of breath sounds
      3) Distended neck veins and tracheal deviation to side opposite the pneumothorax
      4) Cyanosis.
   c. Open pneumothorax - usually with a sucking chest wound
   d. Massive hemothorax - occurs with the accumulation of over 1500 cc of blood (most commonly from penetrating wound)
   e. Flail chest - associated with multiple rib fractures (usually see abnormal chest motion with respirations)
   f. Cardiac tamponade - usually from penetrating injuries:
      1) Venous distension in neck
      2) Muffled heart tones
      3) Decreased arterial pressure
      4) Pulses paradoxus - a decrease in systolic pressure of more than 10 mmHg with inspiration.
3. In assessing chest trauma:
   a. Look for wounds, flail segments, neck vein distension, tracheal deviation, swelling
   b. Listen for decreased breath sounds, muffled heart tones, crepitus
   c. Feel -subcutaneous air, bony crepitus, flail segments.
4. Occult injuries include: aortic rupture, esophageal rupture, diaphragmatic rupture, pulmonary and myocardial contusions, rib fractures, simple pneumothorax.

Prep for Transport and Treatment:

A. FIRST RESPONDER:

1. Establish and maintain airway and C-spine control.
2. Apply O_2 100% nonrebreather.
3. Assist ventilations if necessary.
4. CPR if indicated.
5. Control hemorrhage with direct pressure.
6. For sucking chest wounds, apply an occlusive dressing taped on 3 sides.
7. For impaled objects stabilize. **DO NOT REMOVE.**
8. For signs of tension pneumothorax alert medical control.
9. Follow shock protocol.

B. FIRST RESPONDER A, EMT Basic:

10. Rapid transport.
11. If pulseless attach to AED and follow protocol.

C. EMT Basic Airway:

12. Establish Combitube if indicated.

D. EMT Basic Intubation:

13. Intubate if necessary (airway protocol).

E. EMT Basic IV:

14. Establish IV of lactated Ringers. Large bore (16 or larger).
15. Run fluids at 100 cc/hr or faster if signs of shock (see Shock protocol).

F. EMT Intermediate, Paramedic, CCEMTP, RN:

16. Establish a second IV (large bore) of lactated Ringers.
17. Sternal interosseous access if unable to establish IV.

G. EMT Intermediate Surgical, Paramedic, CCEMTP, RN:

18. For signs of tension pneumothorax:
    a. Identify the side
        1) Absent breath sounds, trachea deviated away from the side, hyper-tympanitic, and hypotension
    b. Inset an 18 gauge needle attached to a 20 cc syringe in the second intercostal space midclavicular line
    c. Advance the needle pulling back on the syringe; easy aspiration of air confirms the diagnosis
    d. Disconnect the syringe but leave needle in place; trachea should return to midline; blood pressure should improve
18. Frequently reassess the patient for further compromise.
19. Treat arrhythmias per ACLS protocol.
20. Consider pain control.

BURNS

Historical Data:

1. **All burn patients are multiple trauma patients**. Pay close attention to the ABCs.
2. Obtain a careful history:
   a. Time of burn
   b. Type of burn: thermal, chemical, and electrical
   c. Toxic fumes.
3. Past medical history.
4. Extremes in age (the very young and very old) do poorly.
5. Depth of burn:
   a. First degree;
      1) Superficial destruction
      2) Local pain and erythema
   b. Second degree;
      l) Superficial - wet, red, painful blisters
      2) Deep - dry, mottled, partially painful, blisters
   c. Third degree;
      1) Full thickness
      2) No pain
      3) Wound is dry and hard
      4) White, red, or black.
6. Extent of burn:
   a. Lund-Browder Chart
   b. Rule of nines
   c. Patient's palm is 1% BSA.

Prep for Transport and Treatment:

I. THERMAL BURNS:

A. FIRST RESPONDER:

1. Stop burning process, remove smoldering clothing, and jewelry.
2. Stabilize the airway and apply O_2 100% nonrebreather mask.
3. Apply cool, wet (not iced) sterile dressings to first degree, and small (less than 10% BSA) second degree burns.
4. Apply dry sterile dressings to all deep second degree and third degree burns.
5. Stabilize other injuries.

B. FIRST RESPONDER A, EMT Basic:

6. Rapid transport.
7. Transport pregnant patients with right hip elevated.
8. If pulseless attach to AED and follow protocol.

C. EMT Basic Airway:

9. Establish Combitube if indicated.

D. EMT Basic Intubation:

10. Intubate if necessary (airway protocol). Intubate early for any signs of distress.

E. EMT Basic IV:

11. Establish IV of lactated Ringers. Large bore - (16 or larger).
12. Run fluids at 100 cc/hr or faster if signs of shock (see Shock protocol).

F. EMT Intermediate, Paramedic, CCEMTP, RN:

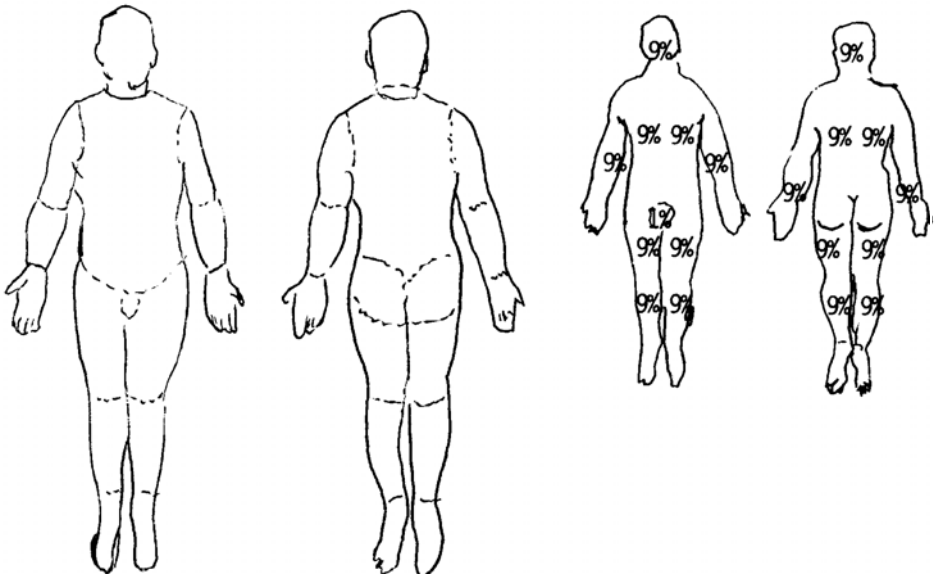
13. Establish a second IV (large bore) of lactated Ringers. Use Parkland formula for replacement;
    2-4 ml/kg x % burn x wt (kg) = Total fluid
    Replace ½ in the first 8 hours and the other ½ over the remaining 16 hours.
14. Consider second large bore IV.
15. Morphine sulfate 2-5 mg IV every 15 minutes up to 15 mg.
16. Fentanyl 25-50 mcg IV every 15 minutes up to 200 mcg.

BURNS

	Age (Years)					%	%	%	
	0-1	1-4	5-9	10-15	Adults	2°	3°		Total
Head	19	17	13	10	7				
Neck	2	2	2	2	2				
Ant. Trunk	13	17	13	13	13				
Post. Trunk	13	13	13	13	13				
Right Buttock	2.5	2.5	2.5	2.5	2.5				
Left Buttock	2.5	2.5	2.5	2.5	2.5				
Genitalia	1	1	1	1	1				
Right Upper Arm	4	4	4	4	4				
Left Upper Arm	4	4	4	4	4				
Right Lower Arm	3	3	3	3	3				
Left Lower Arm	3	3	3	3	3				
Right Hand	2.5	2.5	2.5	2.5	2.5				
Left Hand	2.5	2.5	2.5	2.5	2.5				
Right Thigh	5.5	6.5	8.5	8.5	9.5				
Left Thigh	5.5	6.5	8.5	8.5	9.5				
Right Leg	5	5	5.5	6	7				
Left Leg	5	5	5.5	6	7				
Right Foot	3.5	3.5	3.5	3.5	3.5				
Left Foot	3.5	3.5	3.5	3.5	3.5				

Weight _____ Total _____

Height _____



Lund and Browder chart. "Rule of Nines" divides the body surface into areas of approximately 9 percent or multiples of 9 percent; the head and neck and an upper extremity each represents 9 percent; a lower extremity and the front and back of the torso each represents 18 percent; the perineum one percent. This method of estimation is sufficiently accurate for emergency situations. It is modified in children from birth to 1 year of age to allow 19 percent for the head and neck and 13 percent for each lower extremity. One percent is subtracted from the head and neck and added to the lower extremities for each year from ages 1 to 10.

II. CHEMICAL BURNS:

A. FIRST RESPONDER, FIRST RESPONDER Monitor, A, EMT Basic:

1. Remove contaminant:
   a. Remove clothing
   b. Irrigate area with **LARGE** amounts of water.
2. For plastics and tar, cool with water but do not peel off.
3. Stabilize the airway and apply high flow O_2.
4. Stabilize other injuries.

B. EMT Basic IV:

5. Establish IV access of lactated Ringers K.O. rate.
6. Intubate for any signs of airway compromise.

C. EMT Intermediate, Paramedic, CCEMTP, RN:

7. Consider second IV.
8. Morphine 2-5 mg IV or Fentanyl 25-50 mcg IV every 15 minutes for pain.

III. ELECTRICAL BURNS:

A. FIRST RESPONDER, FIRST RESPONDER Monitor:

1. Don't touch the patient unless electricity is off.
2. Assess and stabilize airway.
3. O_2 100% nonrebreather mask.
4. CPR as indicated.
5. Be extremely alert for other trauma including neck fracture.

B. FIRST RESPONDER A, EMT Basic:

6. Rapid transport.
7. Transport pregnant patients with right hip elevated.
8. If pulseless attach to AED and follow protocol.

C. EMT Basic Airway:

9. Establish Combitube if indicated.

D. EMT Basic Intubation:

10. Intubate if necessary (airway protocol). Intubate early for any signs of distress.

E. EMT Basic IV:

11. Establish IV of lactated Ringers. Large bore (16 or larger).
12. Run fluids at 100 cc/hr or faster if signs of shock (see Shock protocol).

F. EMT Intermediate, Paramedic, CCEMTP, RN:

13. Establish a second IV (large bore) of lactated Ringers. Use Parkland formula for replacement;
    2-4 ml/kg x % burn x wt (kg) = Total fluid
    Replace ½ in the first 8 hours and the other ½ over the remaining 16 hours.
14. Consider second large bore IV.
15. Morphine sulfate 2-5 mg IV every 15 minutes up to 15 mg.
16. Fentanyl 25-50 mcg IV every 15 minutes up to 200 mcg.

SEXUAL ASSAULT

Historical Data

Sexual assault is a violation of the patient's rights and privacy. This patient has been traumatized emotionally and physically. You must have an empathetic, gentle approach.

1. Protect the scene and preserve evidence in cooperation with law enforcement.
2. Encourage the patient not to bathe, douche, brush teeth or change clothes.
3. Document well.

Prep for Transport and Treatment:

A. FIRST RESPONDER, Monitor, A, EMT B, I, P, RN

1. Try to console patient if possible.
2. Notify law enforcement.
3. Carefully assess for other injuries or trauma.
4. Alert the hospital so they are prepared with the appropriate support groups
5. Treat other injuries per protocol.

INFECTION CONTROL

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INFECTION CONTROL

Purpose: The following section is intended to provide a current resource for infection control issues, which the EMT may have to deal with. There are several sections included in this chapter, listed below. This section was not meant to be entirely comprehensive, but instead, it was meant to be a ready resource for the EMT in the field. Certain OSHA policies and standards can be obtained from the operations manager upon request.

Definition: For the purpose of this section Health Care Worker (HCW) refers to ambulance staff.

Contents:

I. UNIVERSAL PRECAUTIONS/PERSONAL PROTECTIVE EQUIPMENT

Policy:
Universal precautions have been established as the national standard for the protection of patients and health care workers from infection, which might be spread, by blood and body fluids. It is the policy that all HCW□s will follow universal precautions. It is a concept, which requires that all blood and certain body fluids be treated as though they are infected with a blood borne pathogen.

Purpose:
To prevent parenteral mucous membrane and non-intact skin exposures to blood borne pathogens Universal precautions apply to blood, any fluid containing visible blood, tissues, semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid and amniotic fluid.

Important point:
Personal protective equipment (PPE): PPE will be considered appropriate protection only if it does not permit blood or body fluids to pass through to the HCW□s work clothes, street clothes, undergarments, skin, eyes, mouth, or mucous membranes under normal conditions and duration of use.

IMPLEMENTATION OF PPE:

Gloves:

A. Must be worn for performing all vascular access procedures.
B. Must be worn for direct hand contact with blood and body fluids, mucous membranes or non-intact skin of all patients.
C. Must be worn for handling items or surfaces soiled with tissues, blood and designated body fluids that require universal precautions.
D. The HCW is to wear gloves when he/she has cuts, abrasions or other breaks in their skin and there is potential risk of contamination with tissues, blood and designated body fluids that require universal precautions.
E. Must be worn as indicated by specific policy/procedure.
F. Disposable gloves are to be discarded after each use. Remove gloves prior to performing other unrelated tasks, i.e., answering the phone, charting, etc. and not worn between patient contact.
G. Non-sterile gloves should be worn for procedures not requiring sterile technique.

Hand washing:

A. Hands must be washed after removal of gloves, and as soon as possible after each patient contact.
B. Any skin surface is to be thoroughly washed immediately if accidentally contaminated with tissue, blood or body fluid.

Sharps:

A. Syringes with needles, scalpel blades and other contaminated sharp items will be placed directly in a puncture-resistant biohazard sharps container at the point of use.
B. Recapping needles are prohibited unless required and specified in a procedure where no reasonable alternative is available. In these limited exceptions where recapping is necessary hand holding the sheath is prohibited; an alternate device or method must be used.
C. Reusable sharps must be handled in a method to avoid accidental exposure. They must be placed directly onto a puncture-resistant receptacle. HCW□s must utilize tongs, forceps or racks to eliminate the need for reaching into any reusable sharp container/basin, etc.

Gowns, aprons and other protective clothing:

A. Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets or similar garments are encouraged to be worn when splashes of blood or body fluids are likely to occur.
B. Protective clothing should protect all areas of exposed skin and must be fluid resistant.
C. The type and characteristics of protective clothing to be worn will depend on the task and degree of exposure anticipated.
D. Any garment penetrated with blood/body fluids is to be removed immediately or as soon as feasible.

Masks and protective eye wear:

Masks and protective eyewear or face shields will be worn during procedures where spraying or splashing of the eyes and mucous membranes of the face is likely. Masks and protective eyewear are not required for routine patient care where spraying/splashing is unlikely to occur.

Lab specimens:

All specimens of blood and body fluids will be put in a well-constructed container with a secure lid to prevent leaking during transport. Care will be taken when collecting each specimen to avoid contaminating the outside of the container. If the outside of the container is contaminated, the container is to be placed in an additional secondary clean container (i.e. zip lock bag, etc.)

Resuscitation devices:
Emergency resuscitation equipment (pocket mask and other ventilation devices) will be available to resuscitate a patient to minimize the need for mouth-to-mouth resuscitation.

Blood/body fluid spills:

A. Spills will be cleaned up promptly, avoiding skin contact, with an effective approved disinfectant.
B. In the event HCW□s personal clothing becomes grossly soiled/contaminated, remove clothing as soon as feasible. It is the HCW□s responsibility to launder personal clothing.

II. ASEPTIC TECHNIQUE

A. Cleanse the site three (3) times with povidone-iodine. Use Hibiclens if allergic to iodine.
B. Wear sterile gloves.
C. Drape field with sterile towels if available.
D. Have all instruments opened for you by an assistant without contaminating them.

III. SHARPS: SAFE HANDLING

Policy:
Sharps will be handled in a safe and protective manner.

Purpose:
To provide precautions for the safe handling and disposal of sharps, hypodermic needles, IV needles, razors, scalpels, broken glass contaminated with blood or body fluids.

Important points to remember:
A. Shearing, breaking, bending, recapping or removing contaminated needles by hand is prohibited.
B. Sharps are to be directly placed into appropriate receptacles at the point of use.
C. In limited circumstances, which must be specified in the specific procedure, recapping or needle removal where no other alternative is feasible, must be performed using a device or practice which does not involve hand-holding of the sheath, i.e., properly performed one-hand scoop technique is acceptable.
D. In the event of a needle stick or injury, follow the instructions in the "Exposure Policy."

Procedure: disposable contaminated sharps:
A. Sharps containers are pre-labeled with the universal biohazard symbol or are color-coded red.
B. Use only puncture resistant designated containers for disposal of sharps.
C. Place containers conveniently in areas where sharps are used.
D. Discard sharps directly into sharps receptacle after use.
E. Sharps containers are to be removed and replaced when they are 3/4 full. Overfilling can lead to injuries. Close the top securely prior to removal. It is not necessary to replace containers between patient transfers.
F. Do not discard the sharps unit in the general waste system. Place the identifiable unit in the designated collection area for transport.

IV. BIOHAZARDOUS WASTE DISPOSAL

Policy:
Biohazardous (infective) waste identification, management and effective disposal are necessary to protect the health and safety of employees, patients, visitors and the community at large to prevent the potential for disease transmission.

Purpose:
Provide guidelines for safe, efficient and effective management of infectious waste from the point of origin to ultimate disposal.

Responsibility:
MESI will provide the necessary supplies and protective equipment available for HCW□s. The operations manager will insure that all staff members involved are properly trained and comply with established policies and procedures.

Definition of Biohazardous (infectious) wastes:

A. Biohazardous waste is waste, which, in all probability, contains pathogenic microorganisms that, because of their type, concentration, and quantity, have the potential during handling and disposal for causing infection in an exposed person.
B. Biohazardous body fluids, blood and blood components, which are in the free-flowing liquid state, are capable of being injected into the handler or splashed onto the mucous membranes of the handler's eyes, nose and mouth or onto non-intact skin, and are to be treated as Biohazardous.
C. Blood or Biohazardous body fluids, which are contained by absorption into disposable cloth or paper products will be treated as Biohazardous even though there is minimal risk for splashing or injection.

Categories of waste designated as Biohazardous:

A. Isolation waste. Waste contaminated by or containing infective material of patients who are placed on disease specific precautions/isolation because of certain communicable diseases or infection.
B. Blood and blood products - Blood, blood components, products including transfusion bags and transfusion tubing. Any body fluid and/or substance contaminated with visible blood.
C. Sharps. Contaminated needles, syringes, pipettes, scalpel blades and broken glass having contact with blood, body fluids or culture substances.
D. Surgical waste. Soiled dressings, sponges, drapes, lavage tubes, drainage sets, under-pads, surgical gloves and soiled attire.
E. Pathological waste. Waste containing tissue, organs, body parts and body fluids removed during surgical procedures.
F. Miscellaneous waste. Any waste contaminated with body fluids containing highly pathogenic organisms.

The following body fluids are considered Biohazardous: vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid and amniotic fluid.

Body fluids not considered Biohazardous unless visibly contaminated with blood or suspected or known to be the infective material identified under the disease-specific isolation precautions are: feces, nasal secretions, sputum, sweat, tears, urine, and vomitus.

Segregation of Biohazardous waste:

A. Biohazardous waste is to be segregated from general waste at the point of disposal.
B. Biohazardous waste will be discarded directly into appropriate labeled/colored coded containers or plastic bags at the receiving facility. Liquid waste may be discarded carefully into the sewer system.
C. Containers or bags will be distinctively identified by readily recognizable and identifiable biohazard color-coding or labeling and placed in designated collection area for transport.

Containment supplies/equipment for Biohazardous waste:

A. Non-sterile gloves are to be worn when handling Biohazardous waste until it is safely packaged for transport and disposal.
B. All biohazard waste containers/bags etc. must be labeled with the universal biohazard symbol or color-coded red.
C. The following containers will be used appropriately for the type of waste being discarded:
    1. Identifiable biohazard labeled color-coded plastic bags for solid and semi-solid wastes.
    2. Puncture-resistant disposal containers.
    3. Liquid infectious waste will be placed in capped or tightly stoppered bottles or containers. (Liquids may be carefully discharged into the sanitary sewer system.)

Contingency plan/accidental spills:

A. Spill of liquid infectious waste: Biohazardous spills are to be promptly cleaned up with an effective disinfectant using necessary protective equipment to prevent skin or mucous membrane exposure. Following completion of the cleanup, the spill surface is to be cleansed again with an effective disinfectant/germicide.
B. Rupture of container or spillage of infectious waste: uncontained Biohazardous waste is to be re-packaged using the necessary protective equipment to prevent skin contact or puncture injury.

V. AMBULANCE AND EQUIPMENT CLEANING CHECK-OFF

Clean each and every piece of ambulance equipment with a Klenzyme or bleach solution. Rigid items can be sprayed and wiped down while cloth items must be soaked in a solution for 1 hour. **Equipment must be cleaned weekly and after every use.**

Wipe down the following:

[ ] long backboard(s) _____# [ ] traction splint(s) [ ] folding flat

[ ] scoop stretcher [ ] stair chair [ ] infant seat

[ ] KED vest[ ] gurney/pad* [ ] stethoscopes**

[ ] pulse ox (cord & probe) [ ] _____ [ ] _____

* Examine stretcher closely, wipe down all surface areas including rails, carriage, and framework under mattress. Wipe down the mattress pad top and bottom, and the CPR board of your cot is equipped with one.
** Stethoscope tubes, bells, diaphragms, and earpieces all need to be wiped off.

Soak the following items:

[ ] blood pressure cuffs and bladders (remove gauges and bulbs prior)

[ ] speed straps [ ] remove and soak gurney straps (replace with clean/dry straps)

In addition:

[ ] examine airway bag and contents [ ] examine drug box

Clean each item as needed.

Fill in the bottom of this form and turn in with the day's paperwork.

Crewmembers signature: _____ _____

Date: __/__/__ Ambulance Number: _____

IV. HEPATITIS B VACCINATION POLICY

Introduction:

Hepatitis B is a serious health problem for health care workers. The virus attacks your liver and can make you extremely ill. The infection can lead to cirrhosis, liver cancer and even early death in about 1% of those infected.

Hepatitis B is easier to catch than you may realize. The virus can be found in blood, semen, vaginal secretions and saliva. If you come into contact with these body fluids, the virus may enter your body through an opening in the skin or through your eyes or mouth. Once you are infected there is no treatment, but there is a way to prevent infection.

In addition to protective measures practiced during patient care (gloves), a vaccine is available to protect you from the disease. The following describes the current vaccine.

Vaccine:

The vaccine is known to provide protection against Hepatitis B infection and it also has been shown to prevent a fatal form of cancer caused by the virus. Approximately 90%-95% of healthy adult recipients respond by developing antibodies. Of those who don't respond to the initial series, 30% will respond to a booster. Protection will usually last for more than five years. The vaccine itself has been shown to be very safe.

The only contraindication to the vaccine is hypersensitivity to yeast, thimerosal, and/or aluminum. The vaccine should be delayed in persons with any febrile illness.

The side effects of the vaccine are also considered small but might include:

Most commonly:

Soreness, redness and swelling at the injection sight
Low-grade fever
Headache, dizziness
Sweating, malaise, weakness, chills, flushing, and tingling
Hypotension
Influenza like illness
Nausea, anorexia, abdominal pain, vomiting, constipation, diarrhea
Lymphadenopathy
Arthralgia, myalgia
Rash, hives, pruritus, erythema
Somnolence, insomnia, irritability, agitation
Anaphylaxis, erythema, multiforme, angioedema
Tachycardia, palpitations
Bronchospasm
Abnormal liver function tests, dyspepsia
Migraine, syncope, paresis, neuropathy, Guillain-Barre syndrome, and Bells Palsy

The vaccine is given in 3 doses of 1 ml on days 0, 30, 180.

The hepatitis vaccine is strongly recommended to all pre-hospital personnel. Your agency should make this available to you and information can be obtained from your local Medical Director.

I _____ have read the Hepatitis B information above and understand that I may possibly be at risk for an occupational exposure to Hepatitis B virus. I believe I understand the benefits and the risks outlined above.

I wish to receive the vaccine.

_____
Signature and date

I wish to decline the vaccine at this time.

_____
Signature and date

VII. TUBERCULOSIS EXPOSURE CONTROL PLAN

Introduction:
Tuberculosis has once again become a growing health care concern. Recently OSHA has mandated hospitals to comply with standards to prevent possible transmission of tuberculosis. The following policy applies to mycobacterium tuberculosis pulmonary infections. Although extra pulmonary tuberculosis and other mycobacterial infections are contagious, they do not require the extreme precautions set forth in the following document.

Policy:
Missoula Area EMS will comply with the Department of Labor's tuberculosis control directive to maintain a safe working environment in effort to eliminate and/or reduce the potential for occupational exposure to pulmonary tuberculosis.

Plan:
1. All pre-hospital personnel will attend the lecture or view the videotape on the subject, mycobacterium tuberculosis, for educational background on the subject.
2. All pre-hospital personnel will be instructed on the proper use and application of OSHA approved HEPA filter masks.
3. All pre-hospital personnel must have baseline TB skin testing and annual testing thereafter unless there is a contraindication to the test, in which case the medical director will determine appropriate testing.
4. In the event of an exposure the employee will complete the exposure incident paper work, and the Medical Director will follow-up with appropriate testing or referral.
5. Health care facilities are required by law (House Bill 220) to notify EMS providers of potential exposure to infectious disease.
6. Seroconversions will be referred to the Medical Director for appropriate treatment and follow-up.

VII. EXPOSURE PLAN

In the event of an exposure to a possible pathogen, the employee should follow the following steps:

1. The exposure site should be washed thoroughly with soap and water as soon as possible. If an eye splash has occurred, the eye should be irrigated with water or saline for at least five minutes.
2. The HCW is to notify the receiving hospital immediately of the exposure event. The receiving hospital should be encouraged to obtain and save a lab specimen for possible future testing.
3. The HCW will immediately fill out the exposure form (found in the exposure packets in all ambulances) and turn in the top sheet to the infection control officer at the receiving facility.
4. The receiving facility will have a designated infection control person who will investigate the exposure and is responsible for follow-up.
5. The remaining two copies of the exposure form will be turned into the operations manager upon returning to the shop.
6. The Medical Director will be notified of the exposure and help insure appropriate prophylaxis and follow-up is obtained.
7. Information about certain exposures and their implications can be found in the exposure packets as well as in the infection control section of infection control.

IX. SPECIFIC DISEASE PROPHYLAXIS

Policy:
The infection control medical director determines exposure determination and recommendation for prophylaxis. When prophylaxis treatment is indicated, it will be provided at no charge to the employee.

Purpose:
The following section was written as a resource for the health care worker. The subject matter is about certain diseases, which one may become exposed to in the work place. Each topic will include a brief summary and the current recommendations for prophylaxis. These discussions were not meant to be an exhaustive, comprehensive description of each disease. Should you have further questions, please contact the infection control officer, or the infection control medical director.

Important point:
The degree of disease transmission risk associated with the specific type of exposure incident determines whether or not actual exposure could occur.

HEPATITIS A

Disease summary:
Hepatitis A is caused by a picornavirus that is transmitted primarily by the fecal-oral route. Sexual transmission is also documented. The virus incubates 15-50 days with an average of 28-30 days. Approximately □ of the people infected by the virus show signs and symptoms, they usually have an abrupt onset of fever, malaise, gastrointestinal symptoms, and jaundice. Fatality is very rare (0.6%) with this infection in the normal host. To date a chronic state has not been identified. The risk factors for infection include exposure to contaminated food, water, and persons already infected with the virus.

Prophylaxis:
It has been found that immune globulin given within the first 2 weeks of exposure is more than 90% protective for the exposed individual. Testing an exposed individual prior to the administration of immune globulin is advised because up to 50% of the adult population is already immune to Hepatitis A. The dose of immune globulin is 0.02 ml/kg given IM. Pre-exposure prophylaxis is generally limited to travelers to endemic areas.

HEPATITIS B

Disease summary:
Hepatitis B virus is a double-shelled DNA virus, which accounts for 38% of the hepatitis cases reported in the United States. It is estimated the 300,000 new cases occur each year and as many as 1,000,000 people may be chronic carriers. This virus can be contracted in various ways including the following:

1. Direct percutaneous inoculation by sharps stick with infected serum or transfusion.
2. Contamination through cuts or abrasions.
3. Absorption of infective serum through mucosal surfaces.
4. Sexual transmission.
5. From mother to fetus.

This virus can incubate for 45-160 days before symptoms appear. The symptoms include combinations of anorexia, malaise, nausea, vomiting, abdominal pain, and jaundice. Anywhere from 2-10% of those infected will become chronic carriers and of those, 25% will have chronic active hepatitis. 1-2% will die from cirrhosis or hepatocellular carcinoma. This disease accounts for 200-300 deaths of health care workers each year.

Prophylaxis:
The development of the Hepatitis B vaccine has had a dramatic impact on the epidemiology. Successful vaccination and maintenance of antibody levels offer virtually complete protection. Please refer to the Hepatitis B vaccine program in this manual.

Recommendation for post-exposure prophylaxis:

IF AN EXPOSED PERSON IS:	AND THE SOURCE IS:	THEN TREATMENT IS:
Unvaccinated	HBsAg-positive	HBIG x 1 & initiate HB vaccine
Vaccinated HBsAb test Positive w/in 12 months	HBsAg-positive	No treatment
Vaccinated; previous HBsAb Test positive	HBsAg-positive	Repeat HBsAb test: A) if pos. - no treatment B) if neg. - give 1 dose HB vaccine
Vaccinated and a non-responder	HBsAg-positive	HBIG x 1 or 2 & 1 dose HB vaccine
Vaccinated; response unknown	HBsAg-positive	HBsAb test: A) if pos. - no treatment B) if neg. - give HBIG x 1 + HB vaccine

IF AN EXPOSED PERSON IS:	AND THE SOURCE IS:	THEN TREATMENT IS:
Unvaccinated	HBsAg-negative	Initiate HB vaccine
Vaccinated HBsAb Test positive w/in 12 months	HBsAg-negative	No treatment
Vaccinated; previous HBsAb Test pos. > 12 months	HBsAg-negative	No treatment
Vaccinated & a non-responder	HBsAg-negative	No treatment
Vaccinated; response unknown	HBsAg-negative	No treatment
IF AN EXPOSED PERSON IS:	AND THE SOURCE IS:	THEN TREATMENT IS:
Unvaccinated	Unknown	Initiate HB vaccine
Vaccinated HBsAb test Positive w/ 12 months	Unknown	No treatment
Vaccinated; previous HBsAb Test positive > 12 months	Unknown	No treatment
Vaccinated & a non-responder	Unknown	If the source is high risk treat as HBsAb positive
Vaccinated; response unknown	Unknown	Perform HBsAb test: A) if pos. - no treatment B) if neg. - give 1 dose HB vaccine

HEPATITIS C

Disease summary:
Hepatitis C is caused by a flavivirus and is now recognized as one of the major causes of transfusion hepatitis. It can also be transmitted by needle stick and exposure to contaminated blood and body fluids. Sexual transmission can occur but is much lower than other forms of hepatitis. The virus incubates for 2-26 weeks before symptoms appear. Symptoms include various combinations of anorexia, malaise, nausea, vomiting, abdominal pain, and jaundice. This type of hepatitis has a very high rate of chronicity (50-70%). Cirrhosis occurs in about 10% and there is a slight increase in hepatocellular carcinoma. The overall mortality is 0.2%.

Prophylaxis:
No therapy is currently accepted for prophylaxis

HIV

Disease summary:

No other issue in the past century has had a greater impact on hospital epidemiology than the issue of HIV infection. This disease more that any other, has forced health care workers and hospitals to focus attention to the risks involved with the health care workplace. Unfortunately there has been much misprinted information about the risks of transmission of HIV virus that further complicate the issue.

For the health care worker, the main risk of contracting HIV is not his or her exposure at work, but instead is the risk of exposure through known vectors. These include: IV drug use with contaminated needles, homosexual and heterosexual exposure. In the health care setting there is a small risk from percutaneous exposure (needle stick) to HIV positive blood. The best estimate is about 1 in 360 exposures. There also may be a risk from mucous membrane exposure, and cutaneous exposure although these risks seem extremely small if at all. Regardless, universal precautions and education is the health care workers best protection.

The clinical symptoms of HIV infection usually begin with a mono like illness 3-4 weeks after HIV infection. The patient recovers and then has a dormant period followed by the beginning of opportunistic infections like pneumocystis carinii pneumonia and various fungal infections. As the immune system further deteriorates death is inevitable. More detailed information about HIV infection can be acquired through the infection control office.

Prophylaxis:

Currently vaccines are under study but not yet available. Prevention is the best prophylaxis for HIV. However, recent Studies indicate that drugs like ZDV, 3TC, and IDV be **recommended** for **highest** or **increased** risk **exposures**.

Highest risk exposure: Both a **Deep** injury with a **large volume** of blood **and** the blood is **known** to contain a **high titer of HIV.**

Increased risk exposure: Either a **Deep** injury with a **large volume** of blood known to contain **HIV or** the exposure to blood **known** to have a **high titer of HIV**.

No increased risk exposure: HIV exposure was **neither** exposure to **large volume** of blood **nor** the blood with a **high titer of HIV** (i.e., solid suture needle injury from a source with known asymptomatic HIV infection.

Percutaneous or mucous membrane HIV positive blood exposure in the **Highest risk category** or Increased risk category; **recommended** to receive antiretroviral **prophylaxis**. The recommended regimen is ZDV plus 3TC plus IDV (the possible toxicity of IDV may or may not be warranted for exposure in the Increased risk category).

Percutaneous HIV positive blood exposure in the **No increased risk category, exposure** to fluid containing **visible HIV positive** blood **or** percutaneous **exposure to other HIV positive** Biohazardous body **fluid** or tissue: **Offer** antiretroviral prophylaxis. The recommended regimen is ZDV plus 3TC.

Mucous membrane or skin **exposure to** fluid containing **visible HIV** positive **blood** or other known HIV **positive** Biohazardous **body fluid** or tissue in the **Increased risk category**; **offer** antiretroviral prophylaxis. The recommended regimen is ZDV plus 3TC (3TC may or may not be warranted).

Additional Information:

Counseling is **required** regarding efficacy, toxicity, etc. **Prophylaxis should be started within 24 hours** of exposure and due to drug toxicity should be prescribed **in consultation** with persons having **expertise** in anti-retro viral therapy and HIV transmission.

Skin risk is increased for exposures involving a high titer of HIV, prolonged contact with HIV positive blood or Biohazardous body fluid and HIV positive blood/fluid to an extensive area or area in which the skin integrity is visibly compromised. Skin exposures **without** increased risk, **the risk for drug toxicity out weighs the benefit of post exposure prophylaxis.**

Biohazardous body fluid includes semen, vaginal secretions, cerebrospinal, synovial, pleural, pericardial and amniotic fluids. Post exposure **prophylaxis should not** be offered for exposure to other body fluids from a known HIV patient, i.e. urine.

INFLUENZA

Disease summary:
Influenza, the flu, is caused by a virus, which has two main serotypes. Type A and Type B. Each serotype has many subtypes circulating in the population. The disease primarily affects the very young, the elderly, and the immunocompromised. Health care workers are an important reservoir for disease spread. It is estimated that from 1972 to 1985, influenza accounted for 10,000-40,000 deaths per year. Among those who died 80-90% were more than 65 years old.

The virus primarily affects the respiratory tract. Symptoms include: sore throat, cough, nasal drainage, conjunctivitis, fever and chills. The disease may progress to high fever, headache, muscle aches, pneumonia, encephalitis, and myocarditis.

Prophylaxis:
Annual influenza vaccination remains the single most important means for prevention and control of influenza. Persons at increased risk should receive the vaccine. These include: a) persons over 65, b) residents of extended care facilities, c) patients with cardiopulmonary disease including asthma, d) patients with chronic diseases like diabetes, renal failure, carcinoma and the immunocompromised. Influenza vaccine should also be given to health care workers caring for the above patients.

Several medications are available that will lessen the course of the illness if administered within the first 48 hours of symptoms. You should contact your physician to discuss the use of these medications.

MENINGOCOCCEMIA

Disease summary:
A gram-negative, diplococcus bacteria called Neisseria meningitis cause the disease. The disease occurs worldwide with the highest prevalence in spring and fall. The infection predominates in preschool-aged children and semi-closed communities (day care centers, military recruits, colleges). Meningococcus is transmitted by droplet infection.

Disease symptoms begin with an upper respiratory prodrome, malaise, weakness, fever, headache, and a fine petechial rash.

It can progress rapidly to high fever, headache, muscle aches, respiratory distress and shock. Mortality rates vary from 7-70 % depending on the availability of medical facilities.

Prophylaxis:
Because of the explosive nature of meningococcal infection, exposure of HCWs to patients causes much anxiety. The risk of becoming infected is in fact quite low. Studies show that HCWs who are involved in the following should receive prophylaxis, direct mouth-to-mouth resuscitation (without barrier protection), direct mucosal contact with oral secretions, i.e. suctioning the patient, or exposure to a patient with meningococcal pneumonia. Other indications for prophylaxis include: close household contacts, persons with intimate contact, day care and nursery school contacts, sharing food, drinking or eating utensils and immunosuppressed individuals. The drug of choice is rifampin 600 mg twice a day for 2 days. An alternative is ciprofloxacin 750 mg once. Sulfonamides can also be used but are less effective.

PERTUSSIS (WHOOPING COUGH):

Disease summary:
This disease is caused by a gram-negative bacilli Bordetella pertussis. It can occur in all age groups but has the greatest morbidity in infants. The peak incidence is in the late summer and early fall. Pertussis is transmitted by droplet infection.

Symptoms of infection begin after a 7-10 day incubation period. Patients first have low-grade fever, runny nose and red eyes. This phase lasts up to 2 weeks. The disease may be complicated by apnea, seizures, encephalitis, pneumonia, and pneumothorax.

Prophylaxis:
Even though many have been vaccinated for Pertussis or had Pertussis as a child, immunity is not lifelong. Erythromycin is the drug of choice for prevention of disease in the exposed individual. Also, for individuals who develop any symptoms while taking care of an infected patient.

The dose is 250 mg four times a day for 10 days.

TUBERCULOSIS

Disease summary:
An acid-fast bacteria, mycobacterium tuberculosis, causes tuberculosis. Its incidence seems to be increasing especially in those of adverse social and economic factors (i.e. substance abuse, poverty, homelessness, HIV positive patients, and minorities). This is an airborne pathogen and spread by droplet infection.

Many patients infected with tuberculosis develop a low-grade fever, fatigue, weight loss, and loss of appetite. A cough develops slowly and may last months. Patients usually experience fever, chills, muscle aches and night sweats during the coughing phase. The disease may also cause meningitis, lymphadenitis, kidney, heart, bone and gastrointestinal complications.

Prophylaxis:
If you have been exposed to tuberculosis, the procedure for follow-up is well defined in the tuberculosis screening section. Persons exposed should have a skin test 10 weeks after exposure (if they have been negative reactors previously). If the test is positive, (greater than 10 mm of induration) then you will be given review information on the test's significance and be counseled by the Medical Director about prophylaxis with INH or other medications.

X. WORK RESTRICTIONS FOR EMPLOYEES WITH COMMUNICABLE DISEASES

Introduction:
The following document contains a list of infectious diseases, which are felt to be high risk of being spread by a HCW to a patient or fellow HCW. The work restrictions listed reflect current literature and thinking in the prevention of nosocomial spread of these diseases. This list is not meant to be comprehensive, and should you have some other infection not listed, please contact the Medical Director for advice concerning patient contact and/or work restrictions.

Policy:
HCWs who contract an infection listed below or think they may have a potentially transmissible disease, which may anger patients, or co-workers should report to their supervisor for potential work restrictions.
The HCW may be required to be excluded from work and/or direct patient care.
HCWs are to notify the operations manager of disease occurrences.

Purpose:
Monitor and investigate infectious diseases, potentially harmful infectious exposures and outbreaks of infections among personnel.

Important points:
At times, a HCW may have close, unprotected exposure to a known or suspected communicable infection for which there may be recommended prophylactic treatment. In such cases the Medical Director should be consulted.

Persons restricted from work due to communicable disease may return only after receiving appropriate treatment and verification from their private physician that they are no longer contagious.

The definition of immunocompromised for purposes of this policy: any patient with an absolute white counts less than 1000; a patient who is receiving immunosuppressive drugs (i.e. Imuran, Cytoxan, etc.); a patient with a condition affecting their immunity (i.e. AIDS, leukemia, etc.); or a patient whose personal physician feels is high for infection.

Report the following conditions to your operations manager:
1. Febrile illness;
2. Infected skin lesions;
3. Acute diarrhea accompanied by fever, abdominal cramps or bloody stool;
4. Any communicable illness/disease, including those listed below. If the specific disease is not listed and questions about transmission should occur, contact the Medical Director for further advice.

ILLNESS	WORK RESTRICTION	DURATION
Conjunctivitis	May not work	Until discharge ceases
Diarrhea (acute)	No patient contact	Until symptoms resolve, or salmonella is ruled out. Infection is treated.

ILLNESS	WORK RESTRICTION	DURATION
Hepatitis A	May not work	Until enzymes decline
Hepatitis B	May not work	Until lab test reflects recovery
Hepatitis C	May not work	Until your lab test reflects recovery
Herpes simplex	Should not work in: nursery, maternity, ICU, or with immunocompromised patients.	Until lesions crust over
Herpetic whitlow	No direct patient contact	Until the lesion is healed
Measles (rubeola)	May not work	Until seven days after rash appears
Mumps	May not work	Until nine days after parotitis begins
Pertussis (whooping cough)	May not work	Until seven days after effective therapy
Rubella	May not work	Until five days after rash appears
Scabies	May not work	Until treated

HIV INFECTED AND/OR HBV INFECTED HEALTH CARE WORKERS

Introduction:
The seriousness of the pandemic caused by the Human Immunodeficiency Virus (HIV) and Hepatitis B virus (HBV) has been recognized nationwide. Recent federal statutes require states and institutions to develop specific guidelines as they pertain to the HIV and HBV infected health care worker (HCW). The Centers for Disease Control (CDC) has developed guidelines for preventing transmission of HIV and HBV from infected HCW's to patients. The State of Montana has also recently introduced recommendations in regard to the infected HCW to the state institutions. Based on the above guidelines and the current literature, Western RTAC adopts the following policy.

Definition:
For the purposes of this policy, the term HCW refers to both ambulance staff (including students) and other EMS personnel.

Policy:
All HCW's should adhere to universal precautions, including the appropriate use of hand washing, protective barriers, and care in the use of disposable needles and other sharp instruments. HCW's who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling patient care equipment and devices used in performing invasive procedures until the condition resolves. HCW's should also comply with current guidelines for disinfection and sterilization of reusable devices used in invasive procedures.

Current available data provide no basis for recommendations to restrict the practice of HCW's infected with HIV or HBV who perform invasive procedures not identified as exposure-prone, provided the infected HCW's practice recommended surgical or dental techniques and comply with universal precautions and current recommendations for sterilization and disinfection.

A review panel selected on a case-by case basis as specific problems arise will identify exposure-prone procedures. Characteristics of exposure-prone procedures include digital palpation of a needle tip in a body cavity or the simultaneous presence of the infected HCW's fingers and a needle or other sharp instrument or object in a poorly visualized or highly confined anatomic site. Exposure-prone invasive procedures are defined as "surgical entry into the tissues, cavities or organs or repair of major traumatic injuries" associated with any of the following:

1. An operation or delivery room, emergency department or outpatient setting, including physicians' or dentists' offices;
2. Cardiac catheterization and angiographic procedures;
3. A vaginal or caesarian delivery or other invasive obstetrical procedure during which bleeding may occur;
4. The manipulation, cutting, or removal of any oral or perioral tissues, including tooth structure, during which bleeding occurs or the potential for bleeding exists.

HCW's who perform exposure-prone procedures should know their HIV antibody status. HCW's who perform exposure-prone procedures and who do not have serologic evidence of immunity to HBV from vaccination or previous infection should know their HBsAg status and, it that is positive, should also know their HBeAg status. Mandatory testing of HCW's for HIV antibody, HBsAg or HBeAg, however, is currently not recommended.

Health care workers who are infected with HIV or HBV (and are HBeAg positive) should not perform exposure-prone procedures unless they have sought counsel from the expert review panel, defined below, and have been advised under what circumstances, if any, they may continue to perform these procedures. Such circumstances would include notifying prospective patients of the HCW's seropositivity before they undergo exposure-prone invasive procedures.

The review panel is selected on a case-by-case basis and will consist of a minimum of:

1. The personal physician of the HCW's concerned;
2. A professional with knowledge of infectious disease and infection control in the epidemiology of HIV and HBV;
3. An HCW peer with knowledge of the procedures performed by the HCW under consideration; and
4. A professional recognized for his/her knowledge of medical ethics.

The review panel will consider on an individual basis when evaluating the HBeAg or HIV seropositive HCW:

1. Whether the HCW performs procedures in which injury could result in contamination of a patient's body cavity, subcutaneous tissues, and/or mucous membranes by the HCW's blood (procedures in which hands may be in contact with sharp instruments, objects, or sharp tissues inside a patient's body cavity, particularly when the hands are not completely visible);
2. Factors affecting the performance of procedures by the individual HCW (i.e. techniques used, skill and experience and compliance with recommended infection control practices); and
3. The medical condition of the HCW (i.e. the presence of physical conditions or mental impairments that may interfere with the HCW's ability to perform these procedures safely).

Depending on its initial evaluation, the panel will determine whether and/or what circumstances the HCW may continue to perform or be restricted from performing procedures. In some cases the panel may recommend modification and monitoring of procedures performed by the HCW to decrease the risk to patients.

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ACETYLSALICYLIC ACID
ASPIRIN

Actions

Inhibits platelet aggregation by blocking the formation of Thromboxane A-2.

Indications

Cardiac chest pain suggestive of an acute MI

Precautions

1. Known hypersensitivity to aspirin.
2. Active GI bleeding.
3. Current anticoagulant therapy.
4. Acute stroke with severe headache.
5. Severe interscapular pain.

How Supplied

1. 81 mg tablets
2. 324 mg tablets

Administration

1. Administer 2x81 mg chewable tabs orally

ADENOSINE
(Adenocard)

Actions

1. Slows conduction time through the A-V node.
2. Interrupts the reentry pathways through the A-V node.

Indications

1. Conversion to sinus rhythm of paroxysmal supraventricular tachycardia (PSVT).
2. Conversion of tachy rhythms in Wolff-Parkinson-White Syndrome.

Precautions

1. Do not use in second- or third-degree A-V blocks.
2. Do not use in sick sinus syndrome.
2. Do not use if known allergy to the drug.

How Supplied

Injection:
Amps, 6 mg/2 ml in 2 ml flip-top vials.

Administration

Initial dose: 6 mg rapid (1-2 sec) IV bolus
Repeat doses: Can be given if no response is seen after 2 minutes.
First repeat dose of 12 mg rapid IV bolus.
If no response a second repeat dose of 12 mg rapid IV bolus may be given.

Side Effects

1. Cardiovascular: Facial flushing, headache, chest pain, and hypotension.
2. Respiratory: Shortness of breath, dyspnea, and hyperventilation.
3. CNS: Lightheadedness, dizziness, numbness, apprehension, blurred vision, burning sensations, heaviness in arms, neck and back.
4. Gastrointestinal: Nausea, metallic taste, tightness in throat, pressure in groin.

ALBUTEROL SULFATE
(Proventil, Ventolin)

Actions

This agent is a selective beta-2 agonist.
1. Stimulates the dilation of bronchial, uterine and vascular smooth muscle.
2. Decreases airway resistance leading to increased ease of air exchange as measured by pulmonary function test.
3. Bronchodilatation usually begins within 5-15 minutes after oral inhalation.

Indications

1. Bronchospasm associated with reversible airway disease (asthma, bronchitis, emphysema or cystic fibrosis).
2. Effective in prophylaxis for exercise-induced bronchospasm.

Precautions

1. Use with caution in patients with diabetes mellitus, hyperthyroidism, coronary insufficiency or hypertension.
2. Inhalation product may paradoxically cause bronchospasm.
3. Tolerance may occur during chronic administration.

How Supplied

Inhalation:
- Solution for nebulization: 0.083%
- Solution, concentrate, for nebulization: 0.5%
- Aerosol: 90 □g/metered spray

Oral:
- Syrup: 2 mg/5 ml
- Tablets: regular 2 mg and 4 mg / extended-release 4 mg

Administration

Acute episodes of bronchospasm:
- Inhalation: 2 "puffs" every 2 hours if needed
- Nebulization: 2.5 mg every 15 minutes if needed.

Prevention of exercise-induced bronchospasm:
- Inhalation: 2 "puffs" 15 minutes prior to exercise

Chronic treatment/prevention of bronchospasm:
- Solution/Tablets: 2-4 mg every 6-8 hours as needed to control symptoms
- Extended-release tablets: 4-8 mg every 12 hours

Side Effects
1. Tachycardia, palpitations, tremor, nervousness.
2. Nausea, vomiting, CNS stimulation.
3. Urticaria, rash, bronchospasm.

AMIODARONE
(Cardarone)

Actions

Thought to prolong the refractory period of the action potential and prevent dysrhythmia.

Indications

1. Recurrent ventricular fibrillation.
2. Recurrent hemodynamically unstable ventricular tachycardia.
3. ACLS indications.

Precautions

1. Contraindicated in people known to be sensitive to the drug.
2. Contraindicated in patients with cardiogenic shock.
3. Should not be used in patients with heart block.
4. Should be used in extreme caution if other antiarrhythmics are on board.
5. Should be used cautiously in patients with hepatic and pulmonary disease.

How Supplied

1. Supplied in 50 mg/ml ampoules.
2. Must be mixed prior to administration in D5W.

Administration

1. Can be given as a bolus of 150 mg –300 mg in the arrest situation.
2. Can be given as a rapid infusion in tachycardia.
3. Also given as a slow infusion in more stable situations.
4. Refer to the ACLS algorithms.

Side Effects

1. Bradycardia
2. Heart Failure
3. Heart Block
4. Sinus Arrest
5. Coagulation abnormalities
6. Liver failure.

ATROPINE SULFATE
(Parasympathetic Blocking Agent)

Action

1. Blocks parasympathetic impulses responsible for bradycardic dysrhythmias.
2. Accelerates sinus node discharge rate.
3. Improves AV conduction.
4. By increasing sinus rate may reduce chances of ectopic escape ventricular activity.
5. May restore cardiac rhythm in asystole.

Indications

1. Any bradycardia accompanied by significant hypotension and/or ventricular ectopic beats. (Less likely to be effective than beta stimulators in complete block, but should be tried first to increase AV conduction.)
2. May be indicated for ventricular asystole.
3. An antidote for organophosphate poisoning.

Precautions

1. Should not be used for bradycardia unless signs of poor perfusion or ventricular ectopy are present.
2. Atrial flutter or atrial fibrillation with a rapid ventricular rate.
3. Use with caution when patients have glaucoma.
4. Use with caution in a patient having a myocardial infarction.

How Supplied

Pre-filled syringes l mg/1 ml or multi-dosage vials with a concentration of l mg/l ml.

Administration

1. Initial adult dosage: 0.5 mg IV push repeated at 5-minute intervals until desired heart rate is reached. Not to exceed a total dosage of 3.0 mg.
2. 1.0 mg can be given as initial dosage for asystole.
3. Pediatric dosage: 0.01 - 0.04 mg/kg (0.1 mg minimum).
4. May be administered through endotracheal.
5. Should not be pushed slowly or in smaller than recommended dosages; might slow rate further.
6. Organophosphate poisoning: 2 mg – 5 mg IM and l mg IV. IV dosage may be repeated every 5 to 10 minutes until secretions decrease.

Side Effects

1. Decreased GI motility, urinary retention, blurred vision, pupil dilation, flushed, dry, warm skin, and dry mouth.
2. Possible rapid pulse.
3. Possible ventricular tachycardia/fibrillation.

CHARCOAL
(Activated)

Actions

Charcoal adsorbs toxic substances and forms a barrier between the remaining particulate and GI mucosa thereby inhibiting adsorption.

Indications

Emergency treatment for toxic ingestions and overdoses

Precautions

1. Not to be used in cyanide ingestions, mineral acids, alkalis, and iron salts.
2. You must protect the airway in the obtunded patient.

How Supplied

1. 30 gm liquid aqueous or wit sorbitol.
2. Pellets 30 gm.

Administration

1. Adult: 30 gm p.o. or per NG
2. Child: 1 gm/kg up to 30 gm.

Side Effects

1. Aspiration can cause pneumonitis.
2. May inhibit oral antidote adsorption.

DEXTROSE 50%

Actions

1. Increases circulating blood sugar levels when used in hypoglycemic conditions.
2. Short-acting osmotic diuretic.

Indications

1. Coma due to hypoglycemia.
2. Unknown cause of coma.
3. Seizures of unknown cause, except CVA.
4. Patients with a reagent strip (Dextrostix) reading less than 70 mg with an altered state of consciousness.
5. A medical cardiac arrest.

Precautions

Intracranial hemorrhage.

How Supplied

Pre-filled syringe containing 50 ml of 50 percent dextrose (25 grams of dextrose)

Administration

1. Draw one tube of blood for glucose determination prior to administration of dextrose 50%.
2. Make sure that it is being administered in a secure IV.
3. Dosage: 50 ml of 50 percent dextrose IV push.

Side Effects

1. Tissue necrosis if it infiltrates.
2. May precipitate severe neurologic symptoms in the alcoholic patient. Give thiamine (50 mg IV) along with dextrose 50%.

DIAZEPAM
(Valium)

Actions

1. Tranquilizes, calms patient.
2. Terminates seizure activity.
3. Relaxes skeletal muscle.

Indications

1. Treat status epilepticus.
2. Given prior to cardioversion in the conscious patient.
3. To sedate possible AMI patients who have little pain, but high anxiety level.
4. Reduce anxiety in selected patients.

Precautions

1. Respiratory depression (monitor respiratory status closely).
2. Hypotensive patients.
3. Pregnant patients.
4. Patients who have taken alcohol or sedative drugs.

How Supplied

Pre-filled syringes of 2 ml concentration of 5 mg/ml

Administration

1. Should not be mixed with other drugs or IV solutions --- pinch tubing well and administer right at IV site rather than higher up tubing.
2. Status epilepticus: Initial dosage, 2.5-5.0 mg slow IV push. Monitor blood pressure if stable and, if necessary, give second dosage of 2.5-5.0 mg slow IV push. Do not exceed a total dosage of 10 mg in the field.
3. Sedation or cardioversion: 2.0-3 mg slow IV push (3 mg/minute) until desired degree of sedation obtained.

Side Effects

1. Respiratory depression/arrest.
2. Dizziness, ataxia.
3. Transient hypotension.

DIPHENHYDRAMINE
(Benadryl)

Actions

This agent is an antihistamine.

1. Blocks the actions of histamine at numerous receptors.
2. Suppresses the pruritus, flaring and local edema associated with "allergic" reactions.
3. Onset of action is nearly immediate for IV administration, within 15-20 minutes for orally administered products.

Indications

1. Used as an adjunct with other therapy for anaphylactic reactions.
2. Used as an anti-tussive.
3. Used as an anti-emetic and for treatment of motion sickness.
4. Treatment of allergic rhinitis.

Precautions

1. Some products contain sodium bisulfite. (May cause allergic type reactions in sensitive patients.)

How Supplied

Parenteral: 10 mg/ml
50 mg/ml

Administration

Adult dose: 25-50 mg IV/IM. Some patients may require up to 100 mg
Maximum daily IM dose 400 mg.
Pediatric dose: 1.25-1.75 mg/kg per dose for a total daily dose of 5 mg/kg.

Side Effects

1. Sedation, dizziness, seizures, or irritability.
2. Tremors, psychotic reactions, or palpitations.

DOPAMINE
(INTROPIN)
BETA SYMPATHETIC DRUG

Actions

1. Chemical precursor of epinephrine, naturally occurring in man.
2. Stimulates alpha, beta, and dopamine receptor sites.
3. Actions of this drug are dependent on the dosage level.
4. Dilate renal and mesenteric arteries.
5. Increase the force and rate of cardiac contractions.
6. Low dosages, alpha effects are developed, causing vasoconstriction.
8. Causes less increase in cardiac O_2 usage than isoproterenol.

Indications

1. Cardiogenic shock while maintaining good renal blood flow.
2. May be useful in treating other hypotension except that secondary to hypovolemia.

Precautions

1. May by inactivated if mixed with sodium bicarbonate.
2. Contraindicated for hypovolemic shock.
3. In the presence of uncontrolled tachycardia dysrhythmias or ventricular fibrillation.
4. Infusion rate must be regulated carefully to obtain desired effects --- may be hazardous in the field.
5. Tissue necrosis and sloughing can occur from IV infiltration (like Levophed).
6. Potentiated by drugs such as Parnate, Marplan, and Nardil. Dosage may need to be decreased.
7. Serious acute hypertension may develop in patients with pheochromocytoma.

How Supplied

5 ml ampoules containing 40 mg/ml

Administration

1. Adult dosage: by IV drip only. Mix 200 mg Dopamine in 250 ml D_5W with micro drip for a concentration of 800 □g/ml. The following are effects at specific dosages:
   - Begin infusion at 2 to 5 □g/kg/minute --- adjust according to clinical response (e.g., increase as necessary to attain an adequate blood pressure and level of consciousness).
   - At a dosage of 1 to 2 □g/kg/minute --- dilates renal and mesenteric blood vessels with no effect on heart rate or blood pressure.
   - At a dosage of 2 to 10 □g/kg/minute --- increased cardiac output due to beta effects on heart.
   - At a dosage of 10 to 20 □g/kg/minute --- peripheral vasoconstriction (alpha effect) and increased blood pressure may begin to cause renal vasoconstriction.
   - At a dosage above 20 □g/kg/minute --- alpha effect reverses dilation of renal and mesenteric vessels and decreased flow through these vessels.
2. Pediatric dosage: 2 to 10 □g/kg/minute.

Side Effects

1. Tachycardiac dysrhythmias/ectopy.
2. Nausea, vomiting.
3. Dyspnea, angina.
4. Headache.
5. Excessive vasoconstriction at high dosages.

EPINEPHRINE
(ADRENALIN)

Actions

1. Both alpha and beta effects.
2. Increased heart rate.
3. Increased force of contractions.
4. Increased arterial blood pressure.
5. Increased systemic vascular resistance.
6. Increased myocardial oxygen demand.
7. Stimulates cardiac contractions in asystole.
8. May restore electrical activity in asystole.
9. Converts fine ventricular fibrillation to course.
10. Bronchodilatation.

Indications

1. First-line drug in cardiac arrest: to enhance defibrillation in ventricular fibrillation, in asystole, and electromechanical dissociation (EMD).
2. To increase systemic vascular resistance, improving perfusion during resuscitation.
3. To treat life-threatening anaphylaxis.
4. To treat acute asthmatic attacks.

Precautions

1. Avoid mixing with bicarbonate: it may inactivate Epinephrine.
2. No contraindications in cardiac arrest or anaphylactic shock.
3. Use with caution in patients who have hypertension, angina, hyperthyroidism, or are over 40 years of age.

How Supplied

Pre-filled syringes containing l mg of epinephrine in 10 ml (1:10,000 solution)
Ampoules containing l mg epinephrine in 1 ml (1:1,000 solution)

Administration

1. In cardiac arrest: adults 0.5 to 1.0 mg of 1:10,000 solution IV push, repeated at 5-minute intervals as needed.
   May be given through endotracheal tube if IV line placement delayed --- 2 mg (20 ml) 1:10,000 solution.
   Avoid intracardiac injection (optional skill) due to numerous complications.
   May be given by drip to increase and sustain blood pressure and heart rate --- l mg epinephrine in 250 ml 5 percent dextrose in water to infuse at 1 to 4 μg/minute.
   Pediatric dosage: 0.1 ml/kg of 1:10,000 IV bolus.
2. In anaphylactic shock:
   Mild: May be given subcutaneously at 0.5 mg (0.5 ml of a 1:1,000 solution). If the reaction was caused by an injection or insect sting on the extremity, a constricting band should be placed proximal to the site of the injection (sting); then 0.5 ml of 1:1,000 solution may be injected subcutaneously to delay absorption. Do not inject in fingers or toes. Give the initial dosage in the other extremity.
   Severe: With shock, give 0.5 mg (5 ml of a 1:10,000 solution) slow IV push.
3. Mild to moderate asthmatic attack: Subcutaneously, 0.3 ml to 0.5 ml of a 1:1,000 solution.

Side Effects

1. In the conscious patient: Palpitations, hypertension, and dysrhythmias.
2. Remember that the use of epinephrine increases myocardial oxygen demand, so provide high-flow/high-concentration oxygen to the patient.

FENTANYL

Actions

1. Potent narcotic analgesic.
2. Binds to opiate receptors producing analgesia and sedation.
3. Fast onset and shorter action than morphine.
4. Minimal effects on BP.
5. Decreases rise in intracranial pressure when intubating the head injured patient

Indications

1. Relief of moderate to severe pain especially in trauma.
2. Sedation for intubation.
3. Requires on-line medical control.

Precautions

1. Slow IV push to avoid chest wall rigidity, and respiratory depression.
2. COPD

3. If other depressant drugs are on board.
4. Do not use with benzodiazepines.
5. Hypotension.

How Supplied

Pre-filled syringes, 50 mcg/cc

Administration

Pain relief: Adults; 25-50 mcg IV may repeat once in 10 minutes.
Children: 1 mcg /kg maximum dose of 25 mcg, may repeat once in 10 minutes.
Intubation: 2mcg/kg, one time dose.

Side Effects

1. Respiratory depression /arrest.
2. Bradycardia, hypotension.
3. Laryngospasm.
4. Severe muscle rigidity.

FUROSEMIDE
(Lasix)

Actions

This is a potent diuretic.

1. Inhibits sodium re-absorption in the kidneys, promoting diuresis: also causes increased potassium excretion.
2. Thought to cause venous dilation, decreasing venous return (preload).
3. Rapid onset of action (5 minutes), peaking in 30 to 60 minutes, with short duration of effect (2 hours).

Indications

1. To reduce fluid overload associated with congestive heart failure and acute pulmonary edema.
2. May be used with increasing intracranial pressure in systems that do not use mannitol.

Precautions

1. Can cause profound diuresis --- monitor blood pressure closely.
2. Should not be administered to pregnant women.
3. In hypovolemic states.
4. In hypokalemic patients.

How Supplied

Ampoules of 2 ml and 10 ml containing a concentration of 10 mg/ml

Administration

1. Adult initial dosage: 0.5 to 2.0 mg/kg IV bolus (40 mg) administered over 2 minutes.
2. Pediatric dosage: l mg/kg IV bolus.

Side Effects

1. Immediate: Nausea and vomiting.
2. Later: Volume depletion and dehydration.
3. Potassium depletion with dysrhythmias.

GLUCAGON

Actions

1. Glucagon converts liver glycogen into glucose.
2. Glucagon relaxes the smooth muscle of the stomach and esophagus.

Indications

1. Hypoglycemia when other routes for glucose administration are unsuccessful.
2. Known beta-blocker overdose.
3. Esophageal spasm.

Precautions

1. Contraindicated if there is know hypersensitivity.
2. Patient must be hypoglycemic.

How Supplied

1. Ampoules contain 1 mg dose of Glucagon

Administration

1. If other methods of glucose administration are not available, Glucagon can be given as 1 mg IM.
2. May repeat in 15 minutes if glucose is still < 50 per Accu-Chek.

Side Effects

1. Hypotension.
2. Respiratory distress.

IPRATROPIUM
(ATROVENT)

Action

1. This is an anticholinergic agent.
2. Chemically related to atropine.

Indications

1. Bronchial asthma, COPD.
2. Bronchospasm associated with COPD and emphysema.

Precautions

1. Contraindicated in patients sensitive to the agent.
2. Not indicated alone for acute treatment of bronchospasm.
3. Use caution in patients with cardiovascular disease.

How Supplied

1. 1. Supplied in unit dose vials containing 0.5 mg in a .02% inhalation solution.

Administration

1. The initial dose of Atrovent should be mixed with 2.5 mg of albuterol and given in a nebulizer treatment with 2-3 ml of NS.

Side Effects

1. Dry mouth.
2. Tachycardia

LIDOCAINE HYDROCHLORIDE

Actions

1. Suppresses dysrhythmias of ectopic ventricular origin.
2. In ischemic tissue, thought to further depress conduction and interrupt re-entry pathways.
3. Does not significantly alter conduction or contractility on healthy tissue.
4. Elevates ventricular fibrillation threshold.
5. Little effect with normal dosages on atrial muscle.

Indications

1. PVCs, especially in setting of myocardial ischemia when frequent.
2. Ventricular tachycardia.
3. Refractory or recurrent ventricular fibrillation.
4. Prophylactic administration in the setting of acute MI.
5. Following successful defibrillation.

Precautions

1. Use with caution with conduction system disorders and/or bradycardia. (Second- or third-degree heart block, sinus bradycardia, or sinus arrest.)
2. Reduce dosage to one-half in presence of reduced cardiac output (CHF, shock) or liver disease to prevent toxicity.

How Supplied

Ampoules and pre-filled syringes containing 100 mg in 5 ml for bolus injection
Vials of 1 or 2 grams for infusion solution

Administration

1. Administer IV bolus slowly by 50 mg/minute.
2. Adult dosage options: Initial bolus l to 1.5 mg/kg followed by IV drip at 1 to 4 mg/minute: additional half-dosage boluses if ectopy continues: or, initial bolus of 75 mg and IV drip at 2 mg/minute: then if ectopy persists, additional 50 mg boluses every 5 minutes to total of 225 mg; drip increased 1 mg/minute with each bolus to maximum of 4 mg/minute.
3. For prophylaxis: Similar bolus and drip.
4. Pediatric dosage: Bolus of l mg/kg of body weight to maximum 50 mg.
5. May be administered through ET tube.
6. Bolus administration must precede a drip. The drip by itself takes 30 to 60 minutes to obtain desired effect.

Side Effects

1. Hypotension.
2. Numbness, altered state of consciousness, drowsiness.
3. When given in high dosages, may cause seizures.

LORAZEPAM
(Ativan)

Actions

1. Tranquilizes, calms patient.
2. Terminates seizure activity.
3. Relaxes skeletal muscle.

Indications

1. Treat seizures and status epilepticus.
2. Reduces anxiety in select patients.

Precautions

1. Respiratory depression.
2. Hypotensive patients.
3. Patients who have taken alcohol or sedative drugs.

How Supplied

Pre-filled syringes.

Administration

Seizure activity:

Adult: 2-4 mg IV may repeat x 1
Child: 0.1 mg/kg IV maximum of 4 mg.

Side Effects

1. Respiratory depression.
2. Dizziness, ataxia.
3. Hypotension.

MAGNESIUM SULFATE

Actions

1. May decrease acetylcholine released by nerve impulses.
2. Mechanism unknown in toxemia and preterm labor.

Indications

1. Prevention and control of seizures in preeclampsia or eclampsia.
2. Management of life-threatening ventricular dysrhythmias such as sustained V-tach or torsades de pointes.

Precautions

1. May cause additive sedation in patients on CNS depressants.
2. May cause increased neuromuscular blockade.

How Supplied

10% solution
25% solution
50% solution

Administration

Toxemia:

4 gm of 10% solution by slow IVP over 20 minutes
40 gm of 50% solution in 1000 cc NS or LR. Drip rate 1 gm - 3 gm per hour

Cardiac Dysrhythmias:

1-2 gm of 10% solution IVP slowly

Side Effects

1. CNS - sweating, drowsiness, depressed reflexes.
2. Hypotension, flushing, circulatory collapse, heart block.
3. Respiratory paralysis, hypocalcemia.

Antagonist

1. Ca Gluconate 10% 1-2 gm IVP over 5 minutes.

METHYLPREDNISOLONE
(Solu-Medrol)

Actions

1. This steroid (glucocorticoid) decreases inflammation, reduces edema formation, and antagonizes histamine and kinin release.
2. Suppresses the immune response by decreasing lymphocyte activity, immunoglobulin and complements concentrations.
3. Short-term dosing, even massive dosages, are unlikely to produce harmful effects.

Indications

1. Treatment of status asthmaticus or other acute, severe episodes of asthma.
2. Used to treat angioedema, serum sickness, drug hypersensitivity, or "allergic" reactions.
3. High-dose regimens may be used to prevent cerebral edema associated with head injury or pseudotumor cerebri.

Precautions

1. Prolonged use may result in secondary adrenocortical insufficiency.
2. May increase susceptibility to infection while masking symptoms of developing infections.
3. Patients may have hypersensitive reactions to preservatives used in some parenteral products.
4. Used very cautiously in pregnant patients.

How Supplied

Parenteral: 40 mg vial
125 mg vial
500 mg vial
1 gm vial
2 gm vial

Administration

1. Usual adult dose: 10-250 mg IV/IM (may be repeated up to 6 times daily). Intravenous doses given over at least one minute.
2. Usual Pediatric dose: 0.03-0.2 mg/kg (may be repeated 1-2 times daily).

Side Effects

1. Sodium and fluid retention, potassium wasting.
2. Aggravation of hypertension, syncope.

MIDAZOLAM
(Versed)

Actions

1. Tranquilizes, calms patient.
2. Terminates seizure activity.
3. Relaxes skeletal muscle.

Indications

1. Treat status epilepticus.
2. Given prior to cardioversion on the conscious patient.
3. To reduce anxiety in the select patients.

Precautions

1. Respiratory depression.
2. Hypotensive patients.
3. Patients who have taken alcohol or sedative drugs.

How Supplied

Pre-filled syringes, 1or 5 mg/cc

Administration

Sedation: Adult: 1 mg IV q 5 minutes up to 3 mg.
Child: .035 mg/kg IV, repeat once as needed.

Status Epilepticus: Adult: 2 mg IM, repeat 1-2 mg IM in 5 minutes as needed.
Child: 0.05 mg/kg IM, repeat once 0.025 mg/kg IM in 5 minutes.

Side Effects

1. Respiratory depression.
2. Dizziness and ataxia.
3. Hypotension.

MORPHINE SULFATE

Actions

1. Potent narcotic analgesic.
2. Dilates peripheral vasculature (arterial and venous), causing reduction of preload and afterload, thus reducing cardiac workload and oxygen consumption.
3. Reduces pulmonary edema.
4. Reduces respiratory rate and tidal volume.
5. Constricts pupils.
6. Reduces anxiety apprehension.

Indications

1. Acute pulmonary edema.
2. Acute myocardial infarction.
3. To reduce pain in selected situations.

Precautions

1. Hypotension.
2. COPD or asthma (may reduce drive to breathe).
3. Respiratory depression except that caused by pulmonary edema.
4. Head injury.
5. If other depressant drugs have been taken (including alcohol).

How Supplied

Pre-filled syringe (Tubex) containing 10 - 15 mg

Administration

(May be given IV or IM)

1. Must be administered slowly (IV - 2 mg/minute).
2. 2 to 5 mg increments IV titrated to pain relief or desired hemodynamic effect.
3. Monitor blood pressure closely before and after administration.
4. May be repeated every 5 to 30 minutes as needed.
5. Do not exceed 15 mg in the field.

Side Effects

1. Respiratory depression - be prepared to assist ventilations (reversed with naloxone).
2. Hypotension - most often in hypovolemic patient.
3. Nausea and vomiting.
4. Decreased level of consciousness.
5. Side effects reduced by administering small dosages and administering slowly.

NALOXONE
(Narcan)

Actions

1. Is a narcotic antagonist, which, competitively binds to narcotic sites, and exhibits almost no pharmacologic activity of it's own.
2. Will reverse stupor, coma, and respiratory depression when due to a narcotic overdose.
3. Duration of action is 1 to 4 hours.

Indications

1. Known narcotic overdose: coma, respiratory depression due to a narcotic overdose (Demerol, heroin, Dilaudid, Darvon, Percodan, Codeine, Lomotil, Talwin, morphine and Methadone).
2. Diagnostically in coma of unknown etiology if drugs are suspected (or to rule them out).
3. Possible role in the treatment of shock, spinal cord injury, and stroke.

Precautions

None

How Supplied

Vials of 1 ml containing 0.4 mg and 1 ml containing 2.0 mg

Administration

1. Adult: 2 mg SLOW IV push (may be given IM or SQ). Watch for increased respirations. If no response, may be repeated at 2 to 3 minute intervals for 2 to 3 dosages.
2. Pediatric: 0.01 mg/kg.

Side Effects

1. Rapid administration may cause vomiting and ventricular dysrhythmias.
2. May cause acute withdrawal with the narcotic-dependent patient.
3. Duration of naloxone is shorter than most narcotics. Monitor patient closely. Patients who have been roused may fall back into coma and/or respiratory depression.

NITROGLYCERIN

Actions

1. Relaxes smooth muscle, particularly vascular smooth muscle.
2. May increase coronary blood flow by coronary artery dilation.
3. Relieves coronary artery spasm.
4. May decrease left ventricular work and oxygen demand by dilation of peripheral vascular bed and reduction of preload and afterload.

Indications

1. To relieve pain of angina pectoris.
2. May be used for pulmonary edema due to left heart failure.

Precautions

1. Patients with early (recent) MI.
2. Increased intracranial pressure.
3. Contraindicated in hypotension/shock.
4. Glaucoma.

How Supplied

0.44 mg tables ($1/150^{th}$ grain)

Administration

(Given sublingually.)

1. 0.4 mg (grains $1/150^{th}$) sublingually
2. May be repeated at 5-minute intervals up to 3 dosages.
3. Must be dissolved under tongue.
4. Best to have patient sitting or semi-reclined.

Side Effects

1. Transient throbbing headache
2. Hypotension.
3. Dizziness, weakness.
4. Drug is unstable and deterioration hastened by exposure to air, light and temperature extremes. Store in dark glass bottles and limit opening and closing.
5. Monitor blood pressure closely before and after administration.

OXYTOCIN
(Pitocin)

Actions

1. Hormone, which produces uterine contractions (especially on the gravid uterus).
2. Possesses vasopressor and antidiuretic effects.

Indications

1. Antepartum: to improve uterine contractions to achieve early vaginal delivery.
2. Postpartum: to produce uterine contractions during third stage of labor to control postpartum hemorrhage.

Precautions

1. Evaluate pelvic adequacy, maternal and fetal conditions prior to use.
2. Monitor for hypertonic contractions, hypertension and potential water intoxication in patients receiving supplemental oral fluids.

How Supplied

Ampoules: 1 ml containing concentration of 10 units/ml
Vials: 1 and 10 ml's with concentration of 10 units/ml
Tubex: 1 ml with concentration of 10 units/ml

Administration

Induction/Stimulation of labor:
IV infusion: *Start a non-oxytocin IV fluid*
- Initial dose: Oxytocin 1-2 units/minutes (0.0001 to 0.0002 units/minute)
  Increase dose no more than 1-2 m units every 15-30 minutes until contraction pattern established

Control of postpartum bleeding:
- IM dose: 10 units after delivery of placenta
- IV infusion: add 1-40 units to 1000 ml non-hydrating fluid and infuse at rate necessary to control uterine atony

Side Effects

1. Anaphylactic reactions, hyper-stimulation with hypertonic or tetanic contractions.
2. Severe water intoxication with convulsions.
3. Fetal bradycardia, PVCs or other arrhythmias.

SUCCINYLCHOLINE
(Anectine)
Depolarizing Muscle Relaxant

Actions

1. Acts as acetylcholine receptor agonist and depolarizes the motor endplates.
2. They are not hydrolyzed by acetylcholinesterase and remain at the neuromuscular junction.
3. Rapid onset of action (30 seconds) and a short half-life (5 - 20 minutes).

Indications

1. Paralytic drug of choice for rapid intubation when airway control is mandated by patient's condition.

Precautions

1. This is a depolarizing agent and may cause muscle fasciculation.
2. This drug may cause increased salivation and bronchial secretions.
3. May cause the release of potassium and cardiac dysrhythmias.
4. May have a prolonged half-life in a small subset of the population.
5. Relatively contraindicated in the patient with severe burns, known renal failure, and extensive muscle damage.
6. This drug causes muscle relaxation only and has no sedative effects.

How Supplied

Multiple-dose vials 20 mg/ml 10 ml total Anectine

Administration

1. On-line medical control must be established.
2. It is best if atropine and Versed is also given to control bronchial secretions and to provide sedation.
3. Have all intubation equipment and alternative airway techniques available.
4. Give 1.5 mg/kg slow IVP.

Side Effects

1. Excessive salivation and bronchial secretions.
2. Muscle fasciculation.
3. Hyperkalemia causing cardiac dysrhythmias.
4. Prolonged paralysis.

SYRUP OF IPECAC

Actions

Induces vomiting in the hopes of emptying the stomach if ingested poisons or an overdose of drugs. This may only be effective if given within the first twenty to thirty minutes after ingestion.

Indications

To induce vomiting in poisonings and drug overdoses.

Precautions

1. Acute MI.
2. Pregnancy.
3. Stupor, coma, or seizures.
4. Ingestion of corrosives (strong acids/alkalis) or petroleum products.
5. Strychnine or iodides.
6. Do not give charcoal after ipecac.

How Supplied

In 16-ounce bottle containing 70 mg/ml.

Administration

1. Give orally only.
2. Adults: 1 to 2 tablespoons (15 to 30 ml) followed by 2 to 3 glasses of water.
3. Pediatrics: 3 to 5 teaspoons (15 to 25 ml) followed by 1 to 2 glasses of warm water.
4. Walking should be encouraged.
5. Check with medical control prior to administration.
   Many systems are moving away from using syrup of ipecac in the field.

Side Effects

The possibility of aspiration, protect the patient.

TERBUTALINE
(Brethine)

Actions

This agent is a beta-agonist.

1. Causes relaxation of bronchial smooth muscles and to a lesser extent, peripheral vascular smooth muscles.
2. Results in a marked decrease in airway resistance as measured by standard pulmonary function tests.
3. Onset of action, peak effects and duration of action is dependent upon route of administration.

Indications

1. Symptomatic treatment of bronchospasm associated with bronchial asthma, bronchitis or emphysema.
2. Subcutaneous or intravenous Terbutaline has been used to inhibit spontaneous contracture during preterm labor.

Precautions

1. Should be used with caution in patients with the following concomitant disease states: diabetes mellitus, hypertension, hyperthyroidism, history of seizures, or cardiac disease (especially arrhythmia's).
2. Inhalation product may cause a paradoxical bronchospastic episode.
3. Use cautiously in patients prone to hypokalemia.
4. Tolerance may develop during chronic inhalation therapy.

How Supplied

Tablets: 2.5 mg
5.0 mg
Oral Inhalation: 200 □g/metered spray
Parenteral: ***For subcutaneous use only*** 1 mg/ml

Administration

Subcutaneous dosage:
Usual adult dose: 0.25 mg sq May *repeat dose one time*
Pediatric dose: 3.5-5 □g/kg
Oral inhalation dosage:
Usual dose: 400 □g or 2 "puffs" every 4-6 hours
Oral dosage:
Usual adult dose: 2.5 mg every 6-8 hours (*daily maximum: 15 mg)

Side Effects

1. Tachycardia, palpitations.
2. Nervousness, tremor.
3. Nausea, vomiting.

THIAMINE
(Vitamin B-1)

Actions

1. Combines with adenosine triphosphate (ATP) and is essential in carbohydrate metabolism.

Indications

1. Adjunctive therapy in treatment of Wernicke's encephalopathy.

Precautions

1. In Wernicke's encephalopathy, administer thiamine prior to initiating glucose fluids/therapy.
2. Hypersensitivity reactions have occurred. Skin-test patients suspected of having a "thiamine" allergy.

How Supplied

Injection:
Amps, syringes and vials: 100 mg/ml
Vials: 200 mg/ml

Administration

Wernicke's: 50 mg IV stat, followed by 50 mg IM daily thereafter until patient can resume normal diet

Side Effects

1. Sensitivity reactions - pruritus, sweating, nausea, tightness in throat, cyanosis, pulmonary edema, GI hemorrhage, and circulatory collapse.
2. Tenderness and induration following IM use.

VASOPRESSIN

Actions:

It produces potent vasoconstriction and causes cardiac irritability during cardiac arrest.

Indications:

Asystolic arrest

Precautions:

1. Monitor for hypersensitivity reactions.
2. Contraindicated in patients with chronic nephritis

How Supplied:

Ampules come in 20 units/ml

Administration:

In the asystolic arrest administer 40 units IV as a one-time bolus only in place of epinephrine.

Side Effects:

1. May increase myocardial ischemic damage.
2. May decrease cardiac output.
3. May potentiate dysrhythmias.

VECURONIUM
(Norcuron)
Nondepolarizing muscle relaxant

Actions

1. Vecuronium is an intermediate nondepolarizing neuromuscular blocking agent.
2. The onset of action is 3-5 minutes after administration.
3. The half-life is approximately 65 to 80 minutes.

Indications

1. To help facilitate endotracheal intubation in the trauma patient or combative patient in need of an advanced airway.
2. This agent is preferred in the head injured patient because of less hemodynamic changes with administration.

Precautions

1. May cause prolonged neuromuscular blockade in hepatic failure.
2. Bronchoconstriction can rarely occur.

How Supplied

1. 10 ml vials containing 10 mg of Vecuronium (1 mg/1ml)

Administration

1. On-line medical control must be established.
2. Have intubation equipment and alternative airway equipment available and ready.
3. Give 0.1 mg/mg slow IVP

Side Effects

1. May cause prolonged paralysis in patients with underlying hepatic disease.

IV DRIP MEDICATIONS

The paramedic may encounter the following IV drips during a transport. Most of these drugs are not primary field resuscitative drugs, and not expected to be initiated by the paramedic. However, if they are used in a transport the paramedic should be familiar with normal dosage and side effects. This training may be obtained through approved ICU in-service. The paramedic must have on-line contact to medical control to alter rates in any way.

DRUG	USUAL MIXTURE	DOSAGE RANGE	SIDE EFFECTS
Dopamine	400 mg/500 cc D_5W	2 µg/kg/min to 20 µg/kg/min	Ectopy, nausea vomiting, dyspnea, angina, headache hypertension.
Dobutamine	500 mg/500 cc D_5W	2.5 µg/kg/min to 20 µg/kg/min	Arrhythmias, tachycardia, headache nausea, tremor.
Heparin	25,000 Units/500 cc D_5W	500-2000 Units/hr	Excessive bleeding, tissue necrosis, vasospasm, allergic reactions.
Lidocaine	2 g/500 cc D_5W	1-4 mg/min	Hypotension, numbness, altered consciousness, seizures.
Nitroglycerin	50 mg/500 cc D_5W	5 µg/min to 100 µg/min	Headache, hypotension, dizziness, weakness.
Procainamide	2 g/500 cc D_5W	1 mg/min to 4 mg/min	Hypotension, widened QRS, prolonged QT, heart block.
Streptokinase	1.5 mil Units/100cc D_5W	Usually given for MI as 1.5 million units over 60 minutes	Bleeding complications, arrhythmias, hypotension, CVA, agitation, confusion, bronchospasm, allergic reaction.
t-PA	100 mg/100 cc D_5W	Usually given as 100 mg over 2 hours	Bleeding complications, arrhythmias, hypotension, CVA.

SPECIAL CONSIDERATIONS

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COMFORT ONE PROTOCOL

INTRODUCTION:
Advances in home health and hospice have resulted in more chronically and terminally ill patients living in private residences or in nursing homes. Many of these patients do not wish to have CPR performed and have made formal Living Will Declarations or have a physician's Do-Not-Resuscitate order.

The Amended Living Will Act, passed by the 1989 Legislature, addressed the issue of emergency care providers' obligation to provide resuscitation even for the patients who have declared a Living Will. The new statute provides legal immunity to EMS personnel acting in accordance with a qualified patient's Living Will and directed the Department of Health and Environmental Sciences to develop rules including a means of "reliable documentation" of a patient's DNR status. The result is the COMFORT ONE Program, which effectively meets the need for pre-hospital providers to know at the scene, immediately and unequivocally, when they are to withhold life-sustaining treatment while providing appropriate symptom control, and comfort measures.

TITLE: COMFORT ONE

Do-Not-Resuscitate orders (DNR orders)
"Living Will Act (as amended, 1989)"

PURPOSE:
1. To provide symptom control, patient care and comfort measures during the dying process.
2. To avoid resuscitation of terminally ill patients who have made a Living Will declaration or for whom there is a physician's Do-Not-Resuscitate (DNR) order.
3. To clarify the role and responsibilities of pre-hospital care providers at the scene and/or while providing transportation for such a patient.

DEFINITION: COMFORT ONE or a physician's DNR order means the patient will receive palliative, supportive care but NO resuscitative measures.

ELIGIBILITY: a physician or a licensed hospice program determines COMFORT ONE eligibility. Criteria for eligibility are:

1. A valid Living Will declaration is on file that has been activated by an incurable or irreversible condition, and/or
2. A physician's DNR order.

APPLICATION: COMFORT ONE protocol is applicable to emergency medical services personnel acting in the non-hospital setting, including inter-facility transfers.

ACTIVATION/IDENTIFICATION:

The COMFORT ONE status is confirmed and this COMFORT ONE protocol is activated when pre-hospital personnel have been presented with:

1. COMFORT ONE necklace or bracelet on patient (no further identification is necessary), or
2. COMFORT ONE card or form for the patient, provided the patient's identity is verified by ONE of the following:
   - The patient communicates their name
   - Personal knowledge of individual by rescuer(s)
   - Institution armband in place
   - Drivers license/credit card, etc.
   - Another individual present confirms patient's identity, or

COMFORT ONE PROTOCOL

ACTIVATION/IDENTIFICATION: (Continued)

3. A physician's Do-Not-Resuscitate order has been presented, and

   a. The order is in writing, signed by the physician and dated and the personnel have a copy of the order or have seen the order; or
   b. A physician issues a verbal order DIRECTLY to the EMS personnel.

EMS PROVIDER ACTIONS:

1. Proceed with the usual patient assessment and care INCLUDING resuscitative measures UNTIL COMFORT ONE status or physician's DNR order is confirmed.

2. Upon verification of COMFORT ONE status or physician's order:

   DO NOT initiate CPR
   Administer chest compressions
   Intubate (ET or EOA)
   Initiate cardiac monitoring
   Administer cardiac resuscitation drugs
   Defibrillate
   Provide ventilatory assistance

   DO (as indicated by the patient's condition) suction airway
   Administer oxygen
   Position for comfort
   Splint
   Control bleeding
   Provide pain medication (ALS only)
   Provide emotional support
   Contact hospice or home health agency if either has been involved in patient's care - or the patient's attending physician.

3. If efforts are begun prior to confirmation of COMFORT ONE status or physician's DNR order, discontinue the resuscitative measures upon verification of COMFORT ONE status, including stopping:

   CPR
   Ventilator assistance
   Cardiac medications
   IV(s) line or ET tube are to be left in place).

REVOCATION:

1. The patient may revoke his/her COMFORT ONE status by direct communication with the pre-hospital care provider or other licensed health care provider.

2. A physician may revoke COMFORT ONE status or DNR order at any time either in writing or by direct verbal communication with EMS personnel.

3. A revocation communicated by family or other non-licensed person is not valid in the emergency or transport setting.

4. It is the responsibility of EMS personnel or other licensed health care providers, upon witnessing a revocation, to communicate that revocation directly, or in writing, to the patient's attending physician.

COMFORT ONE PROTOCOL

DOCUMENTATION:

The minimum COMFORT ONE trip report information shall include:

- Patient's name, gender, estimated age
- Attending physician

  *COMFORT ONE identification seen - or
  *Date and physician's name on the DNR order

- Time, date, location of event
- Description of event
- Assessment of findings, care provided
- Any revocation directly witnessed by EMS personnel
- Attach copy to trip report if possible

INTERACTION WITH FAMILY/BYSTANDER:

1. If family/bystanders request resuscitative efforts for a patient with COMFORT ONE status or written DNR order:

   Do not initiate CPR
   Provide palliative care and comfort to patient
   Provide explanation, reassurance and support to the family/bystanders.

2. Should family/bystanders <u>insist</u> on resuscitative efforts:

   Avoid emotional confrontation

   If necessary for avoiding such confrontation CPR may be initiated, pending transport and/or contact with medical control

   If resuscitative efforts are initiated at the scene for the sole purpose of avoiding emotional confrontation with family, such efforts may be discontinued en route only after consultation with and on order of medical control.

WILDERNESS CONSIDERATIONS

CLINICAL GUIDELINES FOR DELAYED/PROLONGED TRANSPORT

Wilderness considerations should be considered when encountering patients in the PRE-AMBULANCE portion of rescue, such as backcountry rescue teams.

These considerations are not to be considered protocol deviations when transporting patients via ambulance, even when faced with long or delayed transport times.

Four areas of concern are addressed:

1. Wound care
2. Cardiac arrest (both non-hypothermic and hypothermic)
3. C-spine immobilization
4. Dislocations.

WOUND CARE

DEFINITIONS: High-risk wound - high potential for infection

* Bite wounds
* Very dirty contaminated wounds
* Crushing/contused/ragged wounds
* Wounds over injured bone, joint or tendon
* Puncture wounds.

TREATMENT CONSIDERATIONS:

High-risk wound should be cleansed as possible if transport time is prolonged (usually more than 2 hours) if bleeding is controlled:

* Remove foreign material
* Wash skin with soap and clean water
* Irrigate the wound with clean water
* Cover with sterile dressing.

A non-irritating antibacterial solution is applied to the wound/wound dressing for prolonged evacuation to help control infection (in excess of 12 hours).

CARDIAC ARREST

TREATMENT CONSIDERATIONS:

Non-Hypothermic arrest victims:

If cardiac arrest is sustained longer than 30 minutes without the return of a spontaneous pulse, CPR may be stopped.

Ventilation can provide effective respiratory function even for prolonged time. If a pulse or any other sign of functional cardiac activity is present, ventilation should be continued during prolonged transport.

Hypothermic victims: (Severe hypothermia - below 90^{o}F core)

CPR should not be initiated in the field if:

* Core temperature is less than 60^{o}F (15^{o}C)
* Chest is frozen/noncompliant
* Victim has been submersed more than 1 hour
* Obvious lethal injury is present
* These procedures significantly delay evacuation to controlled rewarming or put rescuers at risk.

Chest compression should never be done if clinical signs of functional cardiac activity are present even if a pulse is not palpable under field conditions. This includes victims who show any movement, spontaneous respiration, response to positive pressure ventilation or other signs of life.

Chest compression should be done if functional cardiac activity is absent (take up to 1-2 minutes to feel for a pulse) under the following conditions:

1. Victim loses a palpable pulse during evacuation

2. Ventricular fibrillation or asystole is seen on cardiac monitor

Defibrillation and anti-dysrhythmia medications require core temperatures above 86^{o}F or higher to be effective. DO NOT use ALS medications if core temperatures are below 86^{o}F.

ALS/BLS procedures can be effective in severe hypothermia even if they can only be used intermittently during evacuation. These procedures should be discontinued if rescuers are exhausted, at risk or evacuation is significantly delayed. ALS/BLS procedures can be restarted as conditions permit.

C-SPINE IMMOBILIZATION

DEFINITIONS:

Positive mechanism: any mechanism capable of causing unstable spine injury.

Positive signs/symptoms: spine pain
Spine tenderness
Abnormal motor or sensory function

TREATMENT CONSIDERATIONS:

If, during assessment, it is determined that the patient has a positive mechanism and positive signs/symptoms then it must be assumed that the patient has a possible unstable spine injury.

Then: immobilize the patient's head, neck and spine in the position found on an appropriate immobilization device, with sufficient security that integrity of the spine is maintained.

Realignment of the head, neck and spine may be necessary to facilitate immobilization or correct an airway problem or allow transportation. Return patient to an in-line neutral position if no resistance is met. Careful assessment prior to manipulation is critical. Maintain and transport with entire immobilization device turned onto its side when possible to control airway.

Cervical collars alone, WILL NOT provide secure cervical spine immobilization.

If a patient has a helmet in place and it is poor fitting or interferes with airway management, remove it in accordance with the American College of Surgeons procedure.

If, during assessment, it is determined that the patient has a positive mechanism and negative signs/symptoms, it may be assumed the patient does not have an unstable spine injury and the rescuers may choose not to immobilize the patient. This should be based upon available rescuers, equipment, location of patient and danger to rescuers. When all things are equal, immobilization based on mechanism is the prudent choice.

NOTE: if for any reason the patient's response to pain or LOC is altered or questioned by the rescuer, the patient should be immobilized based on mechanism of injury.

DISLOCATIONS

DEFINITIONS:

Direct injury: dislocation caused by force applied directly to the joint.

Indirect injury: force applied at a distance from the joint and dislocation caused by lever or torque force at the joint.

TREATMENT CONSIDERATIONS:

An attempt to reposition or reduce any dislocated joint into anatomical position should be made if distal circulation is impaired.

An attempt to reduce a simple dislocation into anatomical position should be made if transport time is delayed or prolonged (usually more than 2 hours).

After reduction, recheck circulation and nerve function and splint in anatomical position for transport.

Discontinue an attempt at reduction

1. If pain is significantly increased, or
2. If resistance to movement is encountered (same as rapid transport context).

In these cases, the joint should be splinted in the injured position for transport.

HAZARDOUS MATERIALS SCENE MANAGEMENT

When approaching the scene of any accident potentially involving hazardous materials or any cargo:

* Slow down, be careful
* Position vehicles uphill and upwind
* Ask yourself, IS THIS A HAZARDOUS MATERIAL INCIDENT?
* Isolate the scene - keep people out
* Assess immediate danger to responders or public
* **REMEMBER! THE SAFETY OF EMERGENCY RESPONDERS IS YOUR TOP PRIORITY**
* Do not walk into or touch spilled materials
* Do not walk into, touch or breathe any smoke, fumes or vapors
* Size up the situation from a safe distance
* If you have any doubt - stay back, keep people from the site and get additional help.

WHO IS IN CHARGE?

Find out who is in command when you are involved in an emergency response.

An Incident Commander should be designated when more than one person is involved in an emergency response.

Prior designation of an emergency response command structure is highly recommended to avoid confusion and misdirection at the scene.

Learn to use the DOT Emergency Response Guidebook for Hazardous Materials and carry it with you!

SPECIAL CONSIDERATIONS WHEN SUMMONING AN ALS ROTOR WING AMBULANCE

All ALS Rotor Wing Ambulance services should be integrated into the local EMS Systems in which they will respond.

Consider summoning an ALS ROTOR WING AMBULANCE when:

* Multi casualty accident, disaster or incident, which overwhelms or taxes the local EMS system.

* Critical patient with the receiving hospital more than 20 minutes away.

* Critical patient(s) that require a long on-scene delay due to extrication, evacuation or other delay.

* Remote patient locations inaccessible by normal means.

Once you determine an ALS ROTOR WING AMBULANCE is needed, dispatch them through your local dispatch. REMEMBER, they can always be canceled - dispatch them early so their speed can be utilized.

If the patient is ready for transport and the ALS ROTOR WING AMBULANCE'S ETA is greater than 10 minutes, arrange to meet the ALS ROTOR WING AMBULANCE EN ROUTE to the medical facility.

When or if the determination has been made that the ALS ROTOR WING AMBULANCE is not needed, cancel them through your local dispatch.

Have ALL of your personnel trained in the safety procedures of ALS ROTOR WING ambulance landing, approaching, loading, unloading and takeoff. USE those procedures at all times when utilizing ROTOR WING AMBULANCES.

SPECIAL CONSIDERATIONS WHEN SUMMONING A GROUND ALS AMBULANCE

All ground ALS Ambulance Services should be integrated into the local EMS Systems in which they will respond.

Consider summoning a GROUND ALS AMBULANCE when:

* Multi casualty accident, disaster or incident, which overwhelms or taxes the local EMS system.

* Critical patient with the receiving hospital more than 20 minutes away.

* Critical patient(s) that require a long on-scene delay due to extrication, evacuation or other delay.

* When Rotor Wing ALS is unavailable or inappropriate.

* When necessary patient treatments are beyond the responding crew's abilities.

Once you determine a GROUND ALS AMBULANCE is needed, dispatch them through your local dispatch. REMEMBER - they can always be canceled, dispatch them early. Transport of the patient should not be delayed for the arrival of the GROUND ALS AMBULANCE service, arrange for appropriate EN ROUTE patient transfer.

When or if the determination has been made that the GROUND ALS AMBULANCE is not needed, cancel them through your local dispatch.

Have ALL of your personnel trained in the safety procedures of transferring patients and operating procedures of the GROUND ALS AMBULANCE service. USE those procedures at all times.

CCEMTP TRANSPORT ORDERS

Pediatric Transport Team: Advanced Life Support Order

Check boxes where appropriate. Mark through undesired orders.

ORDER AND PHYSICIAN'S SIGNATURE
DATE: TIME: Weight: _____kg Allergies: ⏲⑧ NKDA ⏲⑧ Other:
Place patient on CR Monitor, continuous pulse oximetry, administer oxygen to maintain O_2 sat >94% ***Airway Protocol*** Per RT
Hypotension/Shock (non-traumatic): (If shock related to traumatic injury, use ***Pediatric Multiple Trauma Protocol***)
Symptoms include: tachycardia, slow capillary refill, decreased consciousness, decreased urine output and/or hypotension (late) • NS bolus 20 mL/kg IV over 5 minutes. Repeat up to 2 more times as needed until perfusion improves. • If no response to fluid boluses, contact MCP and begin **Dopamine** at 5 mcg/kg/min IV and titrate up by 5 mcg/kg/min every 5 minutes to maximum 20 mcg/kg/min until perfusion and/or blood pressure improved. • If no response to Dopamine, give **Epinephrine** 0.1 mcg/kg/min, after consulting with MCP. • Check blood glucose and ABG if not already done. • If prior to leaving referring facility, check serum ionized calcium.
Bradycardia:
Identify treatable causes: Hypoxemia, Hypothermia, Head injury, Heart block, Heart transplant, Toxins/Poisons/Drugs If **unstable** (hypotension, poor perfusion, respiratory distress, altered mental status, acidosis): • Chest compressions if HR < 60 despite adequate oxygenation/ventilation. • Maintain IV access per protocol • **Epinephrine** 0.01 mg/kg (1:10,000; 0.1 mL/kg*) IV / IO* or if no IV give **Epinephrine** 0.1 mg/kg (1:1000; 0.1 mL/kg) *per tracheal tube* followed by 2-3 mL NS Flush, **may repeat every 3-5 minutes as needed.** • If no response to epinephrine, **Atropine** 0.02 mg/kg IV/IO/per tracheal tube (minimum dose 0.1 mg, max dose 0.5 mg for children and 1 mg for adolescents) **may repeat once if needed.** • If no response or transient response to above measures, notify MCP and consider: ⏲③ External cardiac pacing. **Dopamine** infusion 5-20 mcg/kg/min *or* **Epinephrine** infusion 0.1 – 1 mcg/kg/min
Pulseless Ventricular Fibrillation or Ventricular Tachycardia: ***Do not delay defibrillation for airway maneuvers or IV access. Perform Chest Compressions.***
• Defibrillate immediately up to three times if necessary using 2J/kg, 2 to 4J/kg, 4J/kg • **Epinephrine** 0.01 mg/kg (1:10,000; 0.1 mL/kg) *IV/IO.* If no IV give, **Epinephrine** 0.1 mg/kg (1:1000; 0.1 mL/kg) *per tracheal tube* followed by 2-3 mL NS Flush, **may repeat every 5 minutes as needed.** • Repeat defibrillation at 4J/kg. Repeat as needed every 5 minutes. • **Amiodarone** 5 mg/kg IV/IO or **Lidocaine** 1 mg/kg IV/IO/per tracheal tube. **Notify MCP.**

Asystole or Pulseless Electrical Activity (PEA):

• **Epinephrine** 0.01 mg/kg (1:10,000; 0.1 mL/kg) IV / IO or **Epinephrine** 0.1 mg/kg (1:1000; 0.1 mL/kg) per tracheal tube, **may repeat every 3-5 minutes as needed.**
• Notify MCP. Consider external pacing.

Identify and treat causes: Hypoxemia, Acidosis, Volume depletion, Tension pneumothorax, Hypothermia, Hypoglycemia

Supraventricular Tachycardia:

Stable Supraventricular Tachycardia **(normal mental status, normal blood pressure, no respiratory distress)**

• Attempt vagal maneuvers. (Ice pack, Valsalva Maneuver)
• **Adenosine** 0.1 mg/kg IV rapid push, followed by NS Flush. If needed repeat **Adenosine** 0.2 mg/kg IV rapid push.
• Notify MCP.

Unstable Supraventricular Tachycardia **(chest pain, hypotension, syncope, respiratory distress)**

• **Adenosine** 0.1 mg/kg IV rapid push followed by NS Flush. If needed repeat **Adenosine** 0.2 mg/kg IV rapid push.
• If unsuccessful or if no IV access, initiate Cardioversion 0.5-1 J/kg, may repeat Cardioversion 2 J/kg
• Notify MCP.

Approved by: **Gregory J. Moore, MD**	**Orders Processed by:** _____ **Date:_____ Time:_____**

Pediatric Transport Team Airway Protocol

Check boxes where appropriate. Mark through undesired orders.

ORDER AND PHYSICIAN'S SIGNATURE	
DATE: TIME: Weight: _____ kg	
Allergies: ☐ NKDA ☐ Other:	
☐ Ensure open airway ☐ Assess the following: a. Respiratory Rate b. Effort c. Gag Reflex d. Pulse Oximetry ☐ Assist with BVM device if necessary ☐ Place oral or nasal airway if needed to assist ventilation. ☐ Provide supplemental oxygen as needed to maintain oxygen saturation 93% or greater. ☐ Follow other protocols as indicated. ☐ If airway and breathing are adequate continue pulse oximetry monitoring and reassess. 1. If **inadequate** airway/breathing perform Basic Airway Maneuvers: A. If breathing spontaneously and gag reflex present 1. Provide supplemental oxygen as needed to maintain oxygen saturation 93% or greater 2. Allow position of comfort, suction, reassess 3. If still inadequate, contact MCP to consider RSI. B. Apneic and/or absent gag reflux 1. Orotracheal Intubation by RT 2. Continue BVM 3. Contact MCP	
Approved by: Gregory J Moore, MD	**Orders Processed by:** _____ **Date: _____ Time: _____**

Pediatric Transport Team Head Trauma Protocol

Check boxes where appropriate. Mark through undesired orders.

ORDER AND PHYSICIAN'S SIGNATURE	
DATE: TIME: Weight: _____kg	
Allergies: ☐ NKDA ☐ Other:	
1. Spinal Immobilization. 2. Reassess neurological exam and GCS every 10 minutes. 3. Prior to transport, ensure that a Trauma team physician is aware of the patient's transfer (Trauma Transfer Hotline: 1-800-982-2217) 4. Assure adequate perfusion/volume status a. Bolus NS 20 mL/kg IV. Repeat x 1 if needed. b. If still inadequate: ☐ Contact MCP ☐ Consider **Dopamine** 5-20 mcg/kg/min IV 5. If intubated: a. Keep patiently deeply sedated. See ***Mechanical Ventilation Protocol***. b. Maintain $ETCO_2$ near 35. 6. Treat elevated temperature aggressively. a. **Acetaminophen*** 15 mg/kg NG x 1 dose 7. Treat under ***Pediatric Seizure Protocol*** and ***Pediatric Multiple Trauma Protocol*** as indicated. 8. Contact MCP for any deterioration in neurological status. 9. For any acute serious deterioration or change in vital signs (bradycardia, hypertension, pupillary changes, etc): a. **Mannitol** 0.5 gm/kg IV, infuse quickly. b. If intubated, provide BVM ventilation and hyperventilate. c. Contact MCP	
Approved by: **_____Gregory J. Moore, MD_____**	**Orders Processed by:** **Date: _____Time: _____**

Pediatric Transport Team Mechanical Ventilation Protocol

Check boxes where appropriate. Mark through undesired orders.

ORDER AND PHYSICIAN'S SIGNATURE
DATE: TIME: Weight: _____kg
Allergies: ☐ NKDA ☐ Other:

• Prior to transport, all ventilator settings and goals for ventilation should be reviewed with the MCP. Specific orders regarding any anticipated changes to ventilator settings as well as causes for significant alarm should be reviewed. Additionally, any recent trends in oxygen saturation experienced by the patient should be noted.
• Confirm endotracheal tube placement by chest x-ray prior to leaving referring facility.
• An ABG/VBG/CBG should be obtained after initiation of mechanical ventilation as needed for any change in patient condition.
• Assess breath sounds and $ETCO_2$ with every patient transfer to ensure the tube has not become dislodged.
• Once in the transporting unit confirm adequate oxygen delivery to the ventilator.
• Frequently reassess the patient's respiratory status, noting any decreases in oxygenation or changes in tidal volumes, peak pressures, etc.
• If any significant change in patient's condition, including vital signs or oxygen saturation or there is a concern regarding ventilator performance/alarms, disconnect the ventilator from the endotracheal tube and ventilate with bag-valve-mask and 100% oxygen. Contact MCP immediately.

Sedation:
• All mechanically ventilated patients should receive adequate sedation to minimize pain/discomfort and risk of tube dislodgement while ensuring optimal ventilation and oxygenation.
1. **Fentanyl** 2 mcg/kg IV q 5 minutes prn pain/agitation
a. If transport will be prolonged, may begin Fentanyl by continuous infusion at 2-4 mcg/kg/hr IV.
3. Midazolam **(Versed)** 0.1 mg/kg IV q 5 minutes prn agitation
a. **Do not use in patients with shock or significant hypotension.**
b. Effective when used in conjunction with Fentanyl.
4. Vecuronium **(Norcuron)** 0.1 mg/kg IV prn movement
a. **Do not use in patients at risk for or with recent or recurrent seizures.**
b. Unless contraindicated, all intubated patients should be kept pharmacologically paralyzed during transport.
c. Paralyzed patients should also receive sedation and analgesia medications.

Approved by:	**Orders Processed by:**
_____Gregory J. Moore, MD_____	_____
	Date: _____Time: _____

Pediatric Transport Team Multiple Trauma Protocol

Check boxes where appropriate. Mark through undesired orders.

ORDER AND PHYSICIAN'S SIGNATURE	
DATE: TIME: Weight: _____kg	
Allergies: ☐ NKDA ☐ Other:	
1. Spinal Immobilization. 2. Prior to transport, ensure that a Trauma team physician is accepting the patient (Trauma Transfer Hotline: 1-800-982-2217). 3. Obtain cross-matched or O-Negative, uncross-matched blood (less desirable) from referring hospital for transport, if expected long transport time, intra-abdominal injury, active bleeding, or anemia. 4. Obtain consent for administration of blood if needed prior to transport. 5. **Vital signs stable with good perfusion:** a. Complete secondary survey b. Transport c. Contact MCP as needed. 6. **Vital signs unstable (tachycardia, hypotension, respiratory distress, altered mental status) with or without impaired perfusion** a. Reassess Airway, if intubated check tube position. b. **NS** 20 mL/kg IV bolus. May repeat 3 times. c. Consider blood transfusion 15 mL/kg if no change. Contact MCP prior to transfusion. d. Consider tension pneumothorax if hypotension persists. Needle decompression if present. e. Contact MCP as needed. 7. Refer to ***Head Trauma Protocol*** as indicated.	
Approved by: **_____Gregory J. Moore, MD**	**Orders Processed by:** **_____** **Date: _____Time: _____**

Pediatric Transport Team Respiratory Distress Protocol

ORDER AND PHYSICIAN'S SIGNATURE

DATE: TIME: Weight: _____kg

Allergies: ⌚® NKDA ⌚® Other:

For Bronchospasm:

1. **L Epinephrine** 2 mLs of 1:1000 in 1 mL normal saline or **racemic epinephrine** (2.25%) 0.5 mL in 2.5 mL Normal Saline nebulized for RSV induced bronchospasm. May repeat q 20 minutes prn respiratory distress.
2. **Albuterol** 2.5 mg nebulized
3. If no response, albuterol 5 mg nebulized Repeat albuterol at effective dose as needed
4. If repeated doses are required, start continuous nebulized albuterol at 10-20 mg/hr
5. Ipratropium **(Atrovent)** 500 mcg nebulized with first albuterol dose
6. Methylprednisone **(Solu-Medrol)** 2 mg/kg IV if not already given
7. If no response, contact MCP and consider **Terbutaline** 5 mcg/kg IV over 10 minutes, then continuous infusion of 0.5 mcg/kg/min. Increase by 0.5 mcg/kg/min every 15 minutes to maximum 4 mcg/kg/min.
8. Check ABG or CBG as needed, especially if mental status abnormal.
9. Contact MCP as needed.

For Stridor:

1. Racemic **epinephrine** (2.25%) 0.5 mL nebulized. Repeat as needed.
2. **Dexamethasone** 0.5 mg/kg IV or IM if not already given.
3. Contact MCP as needed.

Maintain Airway per Protocol**:**

⌚⌘ Ensure open airway
⌚⌘ Assess the following: Respiratory Rate, Effort, Gag Reflex, Pulse Oximetry

⌚⌘ Assist with BVM devise if necessary
⌚⌘ Place oral or nasal airway if needed to assist ventilation.
⌚⌘ Provide supplemental oxygen as needed to maintain oxygen saturation 93% or greater.
⌚⌘ Follow other protocols as indicated.
⌚⌘ If airway and breathing are adequate continue pulse oximetery monitoring and reassess.

If **inadequate** perform Basic Airway Maneuvers:
A. If breathing spontaneously and gag reflex present
1. Provide supplemental oxygen as needed to maintain oxygen saturation 93 or greater
2. Allow position of comfort, suction, reassess
3. If still inadequate, contact MCP to consider RSI.
B. If apnea and/or absent gag reflux
1. Orotracheal intubation by RT
2. Continue BVM
3. Contact MCP

Approved by:	**Orders Processed by:**
_____Gregory J. Moore, MD	_____
	Date: _____ Time: _____

Pediatric Transport Team Rapid Sequence Intubation(RSI)

Check boxes where appropriate. Mark through undesired orders.

ORDER AND PHYSICIAN'S SIGNATURE	
DATE: TIME: Weight: _____kg	
Allergies: ☐ NKDA ☐ Other:	

1. Evaluate for predictors of difficult intubation:

☐ Small mouth
☐ Recessed or protruding jaw
☐ Decreased neck mobility
☐ Obstruction (tumor, croup, foreign body)

2. Contact MCP to discuss medication choice and indication for intubation.
3. At referring institution, notify referring physician of your intention to intubate patient.
4. Determine time of last oral intake if available. Assume all patient have a full stomach.
5. Pre-oxygenate spontaneously breathing patients with 100% oxygen.
6. Make sure all equipment is available and ready including: suction, oxygen source, multiple tube sizes, backup devices such as oral/nasopharyngeal airways, bag-valve-mask, end-tidal CO_2 detector.
7. Administer medications as follows, unless MCP specifies otherwise:
   - ☐ **Fentanyl** 4 mcg/kg IV x 1
   - ☐ **Midazolam** 0.1 mg/kg IV x 1
   - ☐ **Vecuronium** 0.2 mg/kg IV x 1
8. Apply cricoid pressure.
9. Assist ventilations, if necessary to maintain oxygenation, with bag-valve-mask.
10. As soon as muscle relaxation occurs, place appropriately sized endotracheal tube.
11. Confirm placement by auscultation, end-tidal CO_2 detector, and pulse oximetry.
12. Release cricoid pressure
13. If prior to leaving referring facility, obtain chest x-ray for placement confirmation.
14. Follow ***Mechanical Ventilation Protocol.***

Approved by:	**Orders Processed by:**
_____Gregory J. Moore, MD	**_____**
	Date: _____ Time: _____

Pediatric Transport Team Seizure Protocol:

Check boxes where appropriate. Mark through undesired orders.

ORDER AND PHYSICIAN'S SIGNATURE	
DATE: TIME: Weight: _____kg	
Allergies: ☐ NKDA ☐ Other:	
For Active Seizures:	
Position on side to prevent aspiration. Maintain IV Access per protocol. 1. Lorazepam **(Ativan)** 0.1 mg/kg IV (Maximum dose 4 mg) ☐ May repeat 2nd dose of 0.05 mg/kg IV in 10 minutes if needed. 2. If ineffective, fosphenytoin **(Cerebyx)** 20 mg PE/kg IV over 10 minutes. ☐ Use only if patient is not receiving fosphenytoin **(Cerebyx)** or phenytoin **(Dilantin)** chronically. 3. If still ineffective, contact MCP and consider **phenobarbital** 10 mg/kg IV. ☐ Repeat 10 mg/kg IV x 1 in 10 minutes, if no response. 4. If no IV access is available: ☐ Midazolam **(Versed)** 0.2 mg/kg IM, or ☐ Diazepam **(Diastat Gel)** 0.3 mg/kg PR – round dose to 2.5 mg, 5 mg or 10 mg. 5. Contact MCP as needed. Be prepared to follow ***Airway Protocol***. Respiratory depression more likely with the use of multiple medications or increasing doses. Check blood glucose. If less than 60 mg/dL, then give: ☐ Infant: **D_{10}** 5 mL/kg IV ☐ Child: **D_{25}** 2 mL/kg IV ☐ Adolescent: **D_{50}** 50 mL (1 amp) IV ☐ Consider other correctable causes such as: Electrolyte imbalance, Trauma, Infection, Toxins	
Fever:	
• If age < 3 months and temperature > 100.4° F, notify MCP. • If temperature at any age > 101° F orally or 102 rectally, give acetaminophen **(Tylenol)** 10-15 mg/kg PO/PR up to a dose of 1gm PO or rectally unless allergic. If allergic, give Ibuprofen **(Motrin)** 10mg/kg PO up to a maximum dose of 600 mg. ☐ If 2 hour or less since last dose, repeat only after consulting physician. ☐ If 2 hours or more since last dose, may repeat x 1.	
Approved by: Gregory J. Moore, MD	**Orders Processed by:**

	Date: _____Time: _____

Adult Standing Orders

- ❖ Vital Signs every15 Minutes while in transport, unless ordered otherwise
- ❖ Cardiac Monitor
- ❖ Continuous O2 Sat & Capnometry if available
- ❖ Intake & Output of fluids
- ❖ Saline Lock, NS TKO
- ❖ Oxygen Therapy: Maintain O2 Sat > 90%

Portable Ventilator Settings: *Tidal Volume* _____ *FI02*_____ A/C rate_____

Medications: Follow ACLS guidelines for emergencies

__x____ Albuterol 0.5cc nebulizer q 20 min PRN wheezing
__x____ Ativan 1 – 4 MG IV PRN
__x____ Benadryl 25mg IV q 4hr PRN allergic reaction / motion sickness
__x____ Dopamine start @ 2mcg/kg/min and titrate to get systolic BP>90
__x____ Fentanyl 50 – 100mcg IV q 5min PRN pain
__x____ Heparin _____ units/kg IV bolus; then _____ units/kg hr IV
__x____ Lopressor 5mg slow IV if HR >70, BP>100, may give three 5mg doses total w/in 15min
__x____ Lovenox 1mg/kg IV q 1hr PRN
__x____ Morphine 2mg IV q 5min until pain free, or up to 10mg/hr
__x____ Nitroglycerin drip @ 10mcg/min and titrating until pain free, or systolic BP<100
__x____ Norcuron 0.1mg/kg IV q 1hr PRN
__x____ Phenergan 12.5mg IV q 4hr, may repeat x 1 PRN nausea
__x____ Reglan 10mg slow IV q 4hr PRN nausea
__x____ Versed 1 – 3mg IV q 15 – 20min PRN sedation

Gregory J. Moore, MD

Transferring Physician: _____
Orders: _____
_____
_____
_____
_____

Receiving Physician: _____
Orders: _____
_____
_____
_____
_____

All pediatric patients under 6 years of age must have a pediatric consult for transport.

ADULT RSI STANDING ORDERS

1. 100 % oxygen for 5 minutes prior to paralysis:
    - Conscious deep breaths of 100 % O2 or assist with BVM. (If necessary bag with cricoid pressure.)
    - Assemble equipment: (ETT, stylet, blades, suction, BVM, Difficult airway kit including cric kit)
    - Attach to cardiac monitor, pulse oximeter
    - Initiate one (preferably two) large bore IV lines
    - Assemble and label all medications: (Lido Spray, Atropine, Versed, Fentanyl, Etomidate, Succinylcholine, Vecuronium)
    - Position the patient
2. 2 minutes prior to paralysis
    - Spray oropharynx with Lidocaine spray
    - Consider Atropine 0.5mg IV for brady rhythms
    - Fentanyl 1 mcg/kg IV
    - Midazolam 2-4mg IV
    - Etomidate 0.3 mg/kg IV (May be used instead of Fentanyl and Midazolam)
3. Time Zero (Neuromuscular blockade)
    - Succinylcholine 1.5 mg/kg IV: (Allow 30-45 seconds for complete muscle relaxation)
    - Alternatives
        1. Vecuromium 0.1 - 0.2 mg/kg IV
        2. Rocuronium 0.6 - 1.2 mg/kg IV
    - Sellick's maneuver
    - Intubate
4. Confirm tube placement with ETCO2
5. Maintain ventilations, monitoring, sedation and paralysis
    - Versed 2-4mg IV every 30 minutes PRN
    - Fentanyl 50mcg – 100mcg IV every 30 minutes PRN
    - Vecuronium 0.1mg/kg IV every 30 minutes PRN