Emergency Medical Services

Protocol for Therapy

JULY 1, 2003
(Approved)

Paul E. Pepe, MD, MPH, FCCM, FACEP
Medical Director

07/01/03
# UTSW / BIOTEL EMS SYSTEM
## PROTOCOL FOR THERAPY – JULY 2003
### TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL OVERVIEW</td>
<td>4</td>
</tr>
<tr>
<td>ADULT PROTOCOL PRINCIPLES</td>
<td>5</td>
</tr>
<tr>
<td>PEDIATRIC PROTOCOL PRINCIPLES</td>
<td>9</td>
</tr>
<tr>
<td>RESUSCITATION PROTOCOL PRINCIPLES</td>
<td>13</td>
</tr>
<tr>
<td>PROTOCOL OVERVIEW:</td>
<td></td>
</tr>
<tr>
<td>Allergic Reaction</td>
<td>15</td>
</tr>
<tr>
<td>Altered Level of Consciousness</td>
<td>16</td>
</tr>
<tr>
<td>Amputation</td>
<td>17</td>
</tr>
<tr>
<td>Asystole</td>
<td>18</td>
</tr>
<tr>
<td>Bradycardia (Symptomatic)</td>
<td>19</td>
</tr>
<tr>
<td>Burns</td>
<td>20</td>
</tr>
<tr>
<td>Chest Pain</td>
<td>21</td>
</tr>
<tr>
<td>Eye Injury</td>
<td>22</td>
</tr>
<tr>
<td>Newborn Resuscitation</td>
<td>23</td>
</tr>
<tr>
<td>OB (including Eclampsia &amp; Maternal Postpartum)</td>
<td>25</td>
</tr>
<tr>
<td>Pain Management (Non-Cardiac)</td>
<td>29</td>
</tr>
<tr>
<td>Poisoned Patient &amp; Overdose</td>
<td>30</td>
</tr>
<tr>
<td>Pulseless Electrical Activity (PEA)</td>
<td>31</td>
</tr>
<tr>
<td>Respiratory Distress</td>
<td>32</td>
</tr>
<tr>
<td>Seizure (Adult)</td>
<td>33</td>
</tr>
<tr>
<td>Seizure (Pediatric)</td>
<td>34</td>
</tr>
<tr>
<td>Shock</td>
<td>35</td>
</tr>
<tr>
<td>Stroke (Acute)</td>
<td>36</td>
</tr>
<tr>
<td>Supraventricular Tachycardia (Narrow Complex Tachycardia)</td>
<td>37</td>
</tr>
<tr>
<td>Trauma</td>
<td>38</td>
</tr>
<tr>
<td>Traumatic Circulatory Arrest</td>
<td>39</td>
</tr>
<tr>
<td>Ventricular Fibrillation (VF) &amp; Pulseless Ventricular Tachycardia</td>
<td>40</td>
</tr>
<tr>
<td>Ventricular Tachycardia (Wide Complex Tachycardia with Pulse)</td>
<td>41</td>
</tr>
<tr>
<td>Vomiting</td>
<td>42</td>
</tr>
<tr>
<td>DRUG LIST / DESCRIPTION</td>
<td>43</td>
</tr>
<tr>
<td>DRUG DRIP CHARTS</td>
<td>46</td>
</tr>
<tr>
<td>PEDIATRIC DRUG DOSAGE TABLE (Weight- and Age-Based)</td>
<td>47</td>
</tr>
</tbody>
</table>

Continued on the next page
### TABLE OF CONTENTS (CONTINUED)

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APPENDICES</strong></td>
<td></td>
</tr>
<tr>
<td>MANDATORY CHECKLISTS: Endotracheal Tube Verification Checklist</td>
<td>A</td>
</tr>
<tr>
<td>Chest Pain Checklist</td>
<td>B</td>
</tr>
<tr>
<td>Stroke Evaluation Sheet</td>
<td>C</td>
</tr>
<tr>
<td>Burn Diagram &amp; Parkland Burn Formula</td>
<td>D</td>
</tr>
<tr>
<td>Capnography Interpretation</td>
<td>E</td>
</tr>
<tr>
<td>Contaminated Patient</td>
<td>F</td>
</tr>
<tr>
<td>Esophageal-Tracheal Combitube™ Procedure</td>
<td>G</td>
</tr>
<tr>
<td>Field Termination Procedure</td>
<td>H</td>
</tr>
<tr>
<td>Nasotracheal Intubation</td>
<td>I</td>
</tr>
<tr>
<td>Needle Cricothyroidotomy</td>
<td>J</td>
</tr>
<tr>
<td>Obstetrical Complications &amp; Meconium/Distressed Newborn Resuscitation</td>
<td>K</td>
</tr>
<tr>
<td>Pediatric Assessment Triangle</td>
<td>L</td>
</tr>
<tr>
<td>Pediatric Intraosseous Infusion Procedure</td>
<td>M</td>
</tr>
<tr>
<td>Pleural Decompression (Needle Thoracentesis) Procedure</td>
<td>N</td>
</tr>
<tr>
<td>Pulse Oximetry Interpretation</td>
<td>O</td>
</tr>
<tr>
<td>S.T.A.R.T. (Simple Triage &amp; Rapid Treatment)</td>
<td>P</td>
</tr>
<tr>
<td>12 Lead ECG Interpretation</td>
<td>Q</td>
</tr>
</tbody>
</table>

**Revised April 2003**  **UTSW/Biotel EMS System**
GENERAL OVERVIEW

Protocols are guidelines that represent the preferred, prospective approach for a given situation.

As such, the clinical judgment exercised by the field paramedics in conjunction with on-line medical control, may call for variation from the established protocol from time to time.

Protocols may also overlap with one another (e.g. a patient in respiratory distress who also has bradycardia). Treatment priorities for these individual patients should be based on good sound clinical judgment by the paramedic in conjunction with medical control as necessary.

Standing orders are procedures/treatments that may be performed prior to contact with medical control (BIOTEL). This is acceptable under the legal concept of delegated practice. The point when BIOTEL contact is required is specified on each protocol. Earlier contact is always possible if questions, problems or unusual cases exist.

BIOTEL should be contacted and notified about all patients for whom ALS procedures or therapies are ATTEMPTED OR INITIATED, except for precautionary intravenous access procedures (IVs).

For purposes of this protocol, pediatric patients are defined as those less than 13 years of age.
ADULT PROTOCOL PRINCIPLES

AIRWAY MANAGEMENT

Passage of an endotracheal tube (cuffed, when appropriate) shall be considered definitive airway management in our EMS system.

Patients should be intubated for respiratory failure and for airway protection (especially in patients with altered mental status and GCS < 8: “GCS < 8? Intubate!”). Note that these indications are independent of respiratory rate or spontaneous effort. They are also independent of pulse oximetry readings.

Bag-valve-mask devices (BVM) are often used prior to or in conjunction with endotracheal intubation. Ideally usage of a BVM is a two (2) or three (3) person procedure. Proper BVM usage should follow the following mnemonic scheme:

C – C-spine control where indicated
O – Oral airway in place
P – Proper head and neck positioning
E – Elevate the jaw
S – Seal the mask (two hands)
S – Steady, slow squeeze followed by quick release on the bag
O – Oxygen supply sufficient and functioning properly
S – Sellick’s maneuver (cricoid pressure)

Adjuncts are often used to aid in intubation decisions and to aid in confirmation of ET tube placement. Their use is acceptable in our system as long as the following caveats are observed:

1. Pulse oximetry† – a valuable tool to detect occult hypoxia; a normal reading does not rule out respiratory distress or the need for airway management. Has no role in confirming ET tube placement. 
   †Refer to Pulse Oximetry Interpretation (Appendix O).

2. End-tidal CO2 detectors (ETCO2)* – useful to confirm ET tube placement and for ET tube surveillance, however, false negatives (no CO2 detected) can occur (e.g. if the patient is in prolonged cardiac arrest, has a massive pulmonary embolus, poor chest compressions, or is otherwise not producing CO2). Capnography with waveform analysis is more sensitive than colorimetric ETCO2 detectors or capnometry, and is the modality of choice, if available. When capnography is available, the following questions should be asked:
   1. Is the ET tube in the trachea (rise & fall of detectable CO2)?
   2. What is the ETCO2 value (height of the waveform)?
   3. What is the shape of the waveform?
   *Refer to Capnography Interpretation (Appendix E).
3. **Esophageal detector devices (EDD)** – useful to confirm ET tube placement, however, false positives do occur, especially with improperly placed nasal tubes.

**Endotracheal Tube (ET) Placement**

In summary, no single technique or adjunct is sufficient alone to confirm proper ET tube placement. ET placement should be assessed using the following scheme:

1. Visualize the tube passing through the cords (for oral intubation).
2. Ensure no sounds are heard over the stomach when ventilating the patient through the ET tube.
3. Ensure good bilateral breath sounds when ventilating the patient through the ET tube.
4. Observe the chest rising and falling with each ventilation.
5. Confirm placement with EDD and ETCO₂ detector (less sensitive in certain cardiac arrest situations).

The above should be documented on the patient’s chart and communicated to BIOTEL with each intubation. If the placement of the tube cannot be confirmed, re-evaluate and re-intubate if necessary. Do not assume a tube is in either the correct or incorrect position based on any one of these steps in isolation. Continue to re-evaluate every few minutes and particularly after patient movement. **Refer to Endotracheal Tube Verification Checklist (Appendix A).**

**Breathing via the ET Tube**

While positive pressure breaths are often necessary to ensure adequate lung inflation (>10 ml/kg) for the critically ill or injured patient, overzealous positive pressure breaths can impair venous return and cardiac output in certain patients, particularly those with hypovolemia, acute exacerbations of COPD or asthma, and other conditions that might already impair circulation (e.g. tamponade, tension pneumothorax or severe hemorrhage). Hence, excessive rates of assisted ventilation may be harmful for these types of patients. Once intubated with an ET tube, a tidal volume of 10-15 ml/kg should be used (exceptions: existing tension pneumothorax, pneumonectomy patient, long standing lung injury, or pneumonia). In turn, the respiratory rate (RR) should be modified accordingly. In CPR cases, once full stable blood pressure and circulation are restored, increase the RR accordingly.

A reasonable empiric approach is to provide 10-15 ml/kg tidal volume and:

1. A **respiratory rate (RR) of 12-15 per minute if awake and struggling** (a breath every 4-5 seconds)
2. A **RR of 8-10 per minute with CPR, shock, or significantly prolonged respiratory phase** (a breath every 6-7 seconds)
3. A **RR of 6-8 if in post-traumatic circulatory arrest** (a breath every 7-10 seconds)

The use of dynamic ETCO₂ monitoring, with waveform analysis, may be helpful in titrating the rate and volume of assisted ventilations in critically ill patients, both intubated and non-intubated.
**ET Tube Drug Administration**

Although much less effective in cardiac arrest cases when no IV access is available, the following drugs may be given via the ET tube:

- **N** Narcan
- **A** Atropine
- **V** Valium
- **E** Epinephrine
- **L** Lidocaine

When administering medications down the ET tube:

- Inject 2-2.5 times the normal dose down the ET tube
- Follow with 10 ml normal saline flush*
- Immediately attach the BVM and forcefully ventilate 3-4 times

*Alternatively the medication may be diluted to 10 ml total volume and pushed down the ET tube. In children, the flush should be smaller (2-3 cc).

**IV FLUID TYPE**

Practically speaking, only one type of fluid should be used for the small volumes and short transport times commonly encountered in urban/suburban EMS systems—Normal Saline (NS). Ringers Lactate (LR) is preferable, however, when large volumes of fluid are necessary or long transport times are anticipated.

**IV FLUID RATE**

Generally patients need either an IV access to keep the vascular site open (TKO) or to provide volume resuscitation. Certain hypotensive trauma patients may respond to fluid run wide open (WO). Others requiring volume resuscitation are best treated with 250-1000 ml boluses and frequent re-evaluation. A saline lock may be substituted for IV TKO.

**IV SITE**

Antecubital veins and external jugular veins are the access sites of choice in adults for cardiac arrest. Pre-existing central venous lines may be utilized in critical cases if the individual medic has the knowledge and equipment to do so.
CARDIAC CARE

When treating a cardiac arrhythmia, treat in order: 1) heart rate; 2) heart rhythm and 3) blood pressure.

Therapy for medical CPR cases should be performed right where the patient is found. Conditions that prohibit this, such as a hazardous environment or inadequate work space, should be indicated on the run report. Studies show what occurs at the scene determines the outcome, with certain uncommon exceptions. In addition, the earlier the restoration of stable pulses occurs, the better the chance of full recovery. Attempts to move these patients can delay therapy and interfere with proper monitoring and care delivery.
PEDIATRIC PROTOCOL PRINCIPLES

**DEFINITION:** Pediatric patients are those less than 13 years of age. In general, EMS protocols and standing orders apply to both adults and children. Some exceptions, comments and helpful tips follow.

PEDIATRIC ASSESSMENT

1. Normal vital signs vary with age. Note that the younger the child, the faster the normal heart rate and the lower the normal blood pressure. After about 12 years of age, normal vital signs approach adult levels. **Hypotension, especially with Bradycardia, signals impending arrest!**

<table>
<thead>
<tr>
<th>AGE</th>
<th>APPROX. WEIGHT (KG)</th>
<th>HEART RATE (BPM)</th>
<th>RESP. RATE (BPM)</th>
<th>SYSTOLIC BP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature</td>
<td>&lt;3</td>
<td>100-190</td>
<td>40-60</td>
<td>Difficult to measure</td>
</tr>
<tr>
<td>Neonate</td>
<td>3 - 4</td>
<td>90-190</td>
<td>30-60</td>
<td>50-70</td>
</tr>
<tr>
<td>6 months</td>
<td>5 - 7</td>
<td>80-180</td>
<td>25-40</td>
<td>60-110</td>
</tr>
<tr>
<td>1 year</td>
<td>10</td>
<td>80-150</td>
<td>20-40</td>
<td>70-110</td>
</tr>
<tr>
<td>3-4 years</td>
<td>15</td>
<td>80-140</td>
<td>20-30</td>
<td>80-115</td>
</tr>
<tr>
<td>5-6 years</td>
<td>20</td>
<td>70-120</td>
<td>20-25</td>
<td>80-115</td>
</tr>
<tr>
<td>7-8 years</td>
<td>25</td>
<td>70-110</td>
<td>20-25</td>
<td>85-120</td>
</tr>
<tr>
<td>11-12 years</td>
<td>35</td>
<td>60-110</td>
<td>15-20</td>
<td>95-135</td>
</tr>
</tbody>
</table>

Mean systolic BP can also be estimated by: 80 + (2 x Age) in years. Lower limits of systolic BP can also be estimated by: 70 + (2 x Age) in years. **Weight can be approximated from the Broselow™ tape or:** (Age (yr.) X 2) + 8 = Wt. (kg.) Pounds/kilogram conversion: Wt. (lb.) ÷ 2.2 = Wt. (kg.)
2. Pediatric respiratory distress may look just like respiratory distress in adults, but may also present as:

- slow respirations
- nasal flaring
- retractions
- accessory muscle use
- tachypnea
- decreased breath sounds
- mottling
- grunting
- pale appearance
- stridor
- cyanosis
- bradycardia

3. Signs of shock or other serious illness may mimic those in adults, but may also include:

- change in level of consciousness (LOC)—especially failure to recognize/respond to parents
- tachycardia/bradycardia
- narrowing pulse pressure
- pale/cool/mottled skin
- capillary refill > 2 seconds
- tachypnea
- relative flaccidity

Remember: hypotension is a late and ominous sign of shock, and means that cardiorespiratory arrest is imminent. A child may lose 25% of his/her circulating blood volume before becoming hypotensive. The signs and symptoms of shock listed above are much more sensitive than blood pressure.

4. A Broselow™ Pediatric Emergency tape is highly recommended as an aid to determining the patient’s weight and proper drug doses and equipment sizes.

5. ET tube size can also be estimated by: the size of the child’s nostril (nare), the size of the child’s little finger, or the formula (age + 16) ÷ 4. For laryngoscope blades: children less than 1 year usually need a #1 straight blade, children 1-4 years usually need a #2 blade and children > 4 years usually need a #3 blade.

**PEDIATRIC CARDIAC ARREST**

1. Cardiac arrests in pediatric patients are most commonly the result of respiratory failure. However, it is important to place all sick infants and children on the ECG monitor.

2. Hypotension and bradycardia are both indicators of impending cardiac arrest.

3. Start CPR if the pediatric patient is unresponsive and:

   a. Under 1 year of age: if heart rate < 60/minute and with signs of hypoperfusion and after 30-60 seconds of ventilation with supplemental oxygen.
   b. 1 year-12 years of age: if no spontaneous pulse.

4. Although VF is unusual, when present, defibrillate at 2 joules/kg initially and repeat at 4 joules/kg.

5. Transcutaneous pacing (TCP) is not usually needed. When necessary, place the pads anterior/posterior and contact BioTel for settings.
**PEDIATRIC TRAUMA**

1. Minimal on-scene time is critical for the injured pediatric patient.

2. The mechanism of injury must be taken into account even if the child appears stable on initial assessment. The mechanism of injury is critical in order to triage the pediatric trauma patient to the correct facility.

3. When necessary, NS (or RL) for initial pre-hospital fluid resuscitation is given rapidly at 20 cc/kg. Do not run IVs wide open in children; if necessary you may repeat the 20 cc/kg rapid infusion after contacting BioTel.

**PEDIATRIC FLUID THERAPY**

1. Use a **microdrip** set for patients < 20 lbs (10 kg) for IV’s; **regular** set if > 20 lb (10 kg).

2. **Regular** tubing set for intraosseous (IO), regardless of the age of the patient.

3. Intraosseous (IO) infusions are indicated for children ≤ 8 years of age who are in shock, cardiac arrest, unconscious or unresponsive to verbal stimuli and:
   
   a. Who are unconscious or seriously ill with an immediate need for venous access to administer fluids or drugs when 1 or 2 attempts at peripheral venipuncture have been unsuccessful within 90 seconds.
   
   b. Go immediately to an IO if peripheral veins are NOT readily obtainable in the unconscious seriously ill or injured patient.

**PEDIATRIC STANDING ORDERS**

Standing orders for pediatric patients are the same as those for adults for the majority of protocols (e.g. all items above CONTACT BIOTEL on protocols). **Exceptions to standing orders for pediatric patients include bradycardia, heart failure, and vomiting.** Contact BioTel for assistance anytime there are questions—even if the situation is covered by standing orders.

**PEDIATRIC DOSES**

Pediatric doses are given as cc. or mg. per kg. The maximum dose is always the adult dose, except for Epinephrine 1:1,000 via ETT. Never exceed the adult dose in large children or adolescents, except for Epinephrine 1:1,000 via ETT. To further assist you in selecting the correct drug dosage for pediatric patients, a Table is provided with all drug doses already converted to total cc. Other means of selecting the correct dosage include contacting Biotel, and use of the Broselow™ Pediatric Emergency Tape.
### UTSW/Biotel EMS System Pediatric Drug Dosages, July 2003

<table>
<thead>
<tr>
<th>AGE</th>
<th>LBS</th>
<th>KG</th>
<th>EPI 1:10,000 (0.01 mg/kg)</th>
<th>EPI 1:1000 (0.01 mg/kg)</th>
<th>ATROPINE (0.02 mg/kg)</th>
<th>ATROPINE (0.04 mg/kg)</th>
<th>D10 (0.5 g/kg)</th>
<th>D25 (0.1 mg/kg)</th>
<th>NARCAN (0.5 mg/kg)</th>
<th>VALIUM (0.5 mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>IV/IO CPR</td>
<td>ET CPR</td>
<td>SC ALLERGIC</td>
<td>IV/IO 5CC/KG</td>
<td>2CC/KG</td>
<td>Max 10 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-1MO</td>
<td>8</td>
<td>3</td>
<td>0.3 cc</td>
<td>0.3 cc</td>
<td>0.03 cc</td>
<td>1.0 cc</td>
<td>2.0 cc</td>
<td>15 cc</td>
<td>0.3 cc</td>
<td>0.3 cc</td>
</tr>
<tr>
<td>3MO</td>
<td>11</td>
<td>5</td>
<td>0.5 cc</td>
<td>0.5 cc</td>
<td>0.05 cc</td>
<td>1.0 cc</td>
<td>2.0 cc</td>
<td>10 cc</td>
<td>0.5 cc</td>
<td>0.5 cc</td>
</tr>
<tr>
<td>6MO</td>
<td>13</td>
<td>6</td>
<td>0.6 cc</td>
<td>0.6 cc</td>
<td>0.06 cc</td>
<td>1.2 cc</td>
<td>2.4 cc</td>
<td>12 cc</td>
<td>0.6 cc</td>
<td>0.6 cc</td>
</tr>
<tr>
<td>1YR</td>
<td>22</td>
<td>10</td>
<td>1.0 cc</td>
<td>1.0 cc</td>
<td>0.1 cc</td>
<td>2.0 cc</td>
<td>4.0 cc</td>
<td>20 cc</td>
<td>1.0 cc</td>
<td>1.0 cc</td>
</tr>
<tr>
<td>2YR</td>
<td>26</td>
<td>12</td>
<td>1.2 cc</td>
<td>1.2 cc</td>
<td>0.12 cc</td>
<td>2.4 cc</td>
<td>4.8 cc</td>
<td>24 cc</td>
<td>1.2 cc</td>
<td>1.2 cc</td>
</tr>
<tr>
<td>3YR</td>
<td>30</td>
<td>14</td>
<td>1.4 cc</td>
<td>1.4 cc</td>
<td>0.14 cc</td>
<td>2.8 cc</td>
<td>5.6 cc</td>
<td>28 cc</td>
<td>1.4 cc</td>
<td>1.4 cc</td>
</tr>
<tr>
<td>4YR</td>
<td>35</td>
<td>16</td>
<td>1.6 cc</td>
<td>1.6 cc</td>
<td>0.16 cc</td>
<td>3.2 cc</td>
<td>6.4 cc</td>
<td>32 cc</td>
<td>1.6 cc</td>
<td>1.6 cc</td>
</tr>
<tr>
<td>5YR</td>
<td>40</td>
<td>18</td>
<td>1.8 cc</td>
<td>1.8 cc</td>
<td>0.18 cc</td>
<td>3.6 cc</td>
<td>7.2 cc</td>
<td>36 cc</td>
<td>1.8 cc</td>
<td>1.8 cc</td>
</tr>
<tr>
<td>6YR</td>
<td>44</td>
<td>20</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
<td>0.20 cc</td>
<td>4.0 cc</td>
<td>8.0 cc</td>
<td>40 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>7YR</td>
<td>48</td>
<td>22</td>
<td>2.2 cc</td>
<td>2.2 cc</td>
<td>0.22 cc</td>
<td>4.4 cc</td>
<td>8.8 cc</td>
<td>44 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>8YR</td>
<td>50</td>
<td>23</td>
<td>2.3 cc</td>
<td>2.3 cc</td>
<td>0.23 cc</td>
<td>4.6 cc</td>
<td>9.2 cc</td>
<td>46 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>9YR</td>
<td>52</td>
<td>24</td>
<td>2.4 cc</td>
<td>2.4 cc</td>
<td>0.24 cc</td>
<td>4.8 cc</td>
<td>9.6 cc</td>
<td>48 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>10YR</td>
<td>55</td>
<td>25</td>
<td>2.5 cc</td>
<td>2.5 cc</td>
<td>0.25 cc</td>
<td>5.0 cc</td>
<td>10 cc</td>
<td>50 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>11YR</td>
<td>57</td>
<td>26</td>
<td>2.6 cc</td>
<td>2.6 cc</td>
<td>0.26 cc</td>
<td>5.2 cc</td>
<td>10 cc</td>
<td>52 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>12YR</td>
<td>59</td>
<td>27</td>
<td>2.7 cc</td>
<td>2.7 cc</td>
<td>0.27 cc</td>
<td>5.4 cc</td>
<td>10 cc</td>
<td>54 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>13YR</td>
<td>61</td>
<td>28</td>
<td>2.8 cc</td>
<td>2.8 cc</td>
<td>0.28 cc</td>
<td>5.6 cc</td>
<td>10 cc</td>
<td>56 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>14YR</td>
<td>63</td>
<td>29</td>
<td>2.9 cc</td>
<td>2.9 cc</td>
<td>0.29 cc</td>
<td>5.8 cc</td>
<td>10 cc</td>
<td>58 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>15YR</td>
<td>66</td>
<td>30</td>
<td>3.0 cc</td>
<td>3.0 cc</td>
<td>0.3 cc</td>
<td>6.0 cc</td>
<td>10 cc</td>
<td>60 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>16YR</td>
<td>68</td>
<td>31</td>
<td>3.1 cc</td>
<td>3.1 cc</td>
<td>0.3 cc</td>
<td>6.2 cc</td>
<td>10 cc</td>
<td>62 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>17YR</td>
<td>70</td>
<td>32</td>
<td>3.2 cc</td>
<td>3.2 cc</td>
<td>0.3 cc</td>
<td>6.4 cc</td>
<td>10 cc</td>
<td>64 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>18YR</td>
<td>72</td>
<td>33</td>
<td>3.3 cc</td>
<td>3.3 cc</td>
<td>0.3 cc</td>
<td>6.6 cc</td>
<td>10 cc</td>
<td>66 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>19YR</td>
<td>74</td>
<td>34</td>
<td>3.4 cc</td>
<td>3.4 cc</td>
<td>0.3 cc</td>
<td>6.8 cc</td>
<td>10 cc</td>
<td>68 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
<tr>
<td>20YR</td>
<td>77</td>
<td>35</td>
<td>3.5 cc</td>
<td>3.5 cc</td>
<td>0.3 cc</td>
<td>7.0 cc</td>
<td>10 cc</td>
<td>70 cc</td>
<td>2.0 cc</td>
<td>2.0 cc</td>
</tr>
</tbody>
</table>
RESUSCITATION PROTOCOL PRINCIPLES

**DEFINITION:** The following are guidelines regarding resuscitation in the field. Good judgment and common sense shall be used in the application of these guidelines.

1. In all situations where there is **ANY** possibility that life exists, every effort will be made to resuscitate the patient.

2. The paramedic should be cognizant of the following facts:
   a. Persons in V-fib, PEA, and asystole can potentially be resuscitated.
   b. Very often the reported “DOWN TIME” is an inaccurate parameter of resuscitation potential, as the patient may have been in bradycardia or simply unconscious for a period of time, yet still perfusing blood to the brain. Additionally, information received from bystanders in regards to time is usually inaccurate.
   c. Pupil size and response to light can be inaccurate as medications taken orally or directly in the eyes can affect them. Pupils can fixate after only a minute or two of global anoxia. Additionally, children and hypothermic patients may have fixed and dilated pupils from anoxia and yet be resuscitated without neurological deficit.

3. Resuscitation need not be attempted in the field in cases of:
   a. Decapitation
   b. Decomposition
   c. Rigor Mortis
   d. Dependent Lividity
   e. Visual massive trauma to the brain or heart conclusively incompatible with life

**MASS CASUALITY INCIDENTS**

In these situations, EMS protocols can be used as standing orders. However, BIOTEL must be contacted as soon as possible.
DNR ORDERS

1. State of Texas Out-of-Hospital DNR orders

   a. If a patient presents with properly completed Texas Department of Health DNR form or approved identification device:

      ➢ All responding EMS personnel are authorized to cease and withhold all resuscitative measures in the event of respiratory or cardiac arrest.

   b. All other appropriate care, including comfort care, shall be provided in accordance with existing protocols and procedures.

   c. Once the patient has been pronounced as dead, contact BioTel to document statistical information required by Texas Department of Health.

   d. A DNR order from the patient’s physician present on-scene will be honored in the event of respiratory or cardiac arrest.

   e. BioTel shall be contacted for situations involving:

      1. Out of state DNR orders
      2. Unclear DNR orders
      3. Scene disputes
      4. The Physician issuing the order is NOT the patient’s personal physician (or on-scene)

   NOTE: If BioTel is not readily available for situations indicated Section E, initiate CPR until BioTel is contacted.

2. Living Wills or Physician’s Advanced Directive

   The paramedics action should not be changed by a Living Will described or produced by the family or bystanders.

   NOTE: It is usually not possible to predict with certainty, the non-recoverability of a brain acutely insulted by cardiac arrest. A delay in care can increase anoxia time, increasing the likelihood of permanent brain damage. Therefore, the responsible paramedic is usually obligated to start CPR. Keep in mind the rescuers may be considered liable for failure to act if they elect not to perform CPR on an arbitrary basis.
ALLERGIC REACTION

**DEFINITION:** This protocol applies to patients presenting with rash, hives, shortness of breath, or other signs and symptoms, up to and including shock, apparently due to an allergic reaction (e.g. bee or other insect sting, food allergy, medication reaction, or latex). Common food allergens include: nuts, eggs, and shellfish.

**TREATMENT:**

1. **Obtain patent airway (intubate if needed), 100% oxygen, IV NS**
   *Monitor airway, perfusion & vital signs, including $S_O_2$ & $ETCO_2$, at least Q 5 minutes.*
   *For a patient in severe shock or with a critical airway, proceed immediately to epinephrine 1:1,000 0.3-0.5 mg (0.3-0.5 cc) SC, simultaneous with attempts to secure IV access. Do not delay administration of SC epinephrine if IV access is not immediately available.*

2. **Conditions:**
   a. **IF SHOCK, SEVERE HYPOPERFUSION, CRITICAL AIRWAY or SBP < 90:**
      - Supine position with legs elevated or Trendelenburg position
      - Epinephrine 1:1,000 0.3-0.5 mg SC (0.3 – 0.5 cc)*: administer as soon as possible
      - Do not delay administration while attempting IV access
      - IV NS Wide Open (may require at least 2 Liters)*
      - Benadryl 50 mg IVP* (no faster than 25 mg/minute)
      - Reassess
      - **If no response to Epinephrine SC & fluids:** Epinephrine 1:10,000 0.1-0.2 mg (1-2 cc) IV; BIOTEL may repeat every 5-20 minutes, as needed*#

   b. **IF DYSPNEA, BUT SBP > 90 & NO SHOCK, HYPOPERFUSION OR CRITICAL AIRWAY:**
      - Epinephrine 1:1,000 0.3-0.5 mg SC (0.3-0.5 cc)*
      - Benadryl 50 mg IVP* (no faster than 25 mg/minute)

   c. **IF LOCALIZED REACTION ONLY:**
      - Benadryl 25-50 mg IM or IV (no faster than 25 mg/minute)

   #No epinephrine IV if: COPD, CHF, s/p MI or heart disease, age >45, hypertension, arrhythmias or labor, UNLESS allergic reaction is LIFE-THREATENING (shock, or critical airway)

3. **CONTACT BIOTEL**

4. **TREATMENT CONSIDERATIONS:**
   a. Albuterol 2.5 mg via nebulizer for bronchospasm unresponsive to epinephrine SC
   b. Glucagon 1-5 mg IV* for patients on beta-blockers unresponsive to standard measures

**PEDIATRIC DOSES:**
Recall that, in pediatric patients, LOC, HR, RR, pulse quality, capillary refill, skin temperature, and skin color are more sensitive indicators of shock than is BP.
- Fluid bolus 20 cc/kg; Reassess; BIOTEL may order repeat bolus.
- Epinephrine 1:10,000 0.01 mg/kg (0.1 cc/kg) IV or IO, IF SHOCK IS PRESENT, OR Epinephrine 1:1,000 0.01 mg/kg (0.01 cc/kg SC) (max. 0.3 mg/dose), if dyspnea without shock, or if vascular access is unavailable
- Benadryl 1-2 mg/kg (IVP/IO, IM)
- CONTACT BIOTEL
- Glucagon 1 mg IM/SC/IV/IO
ALTERED LEVEL OF CONSCIOUSNESS

DEFINITION: This protocol applies to patients who are disoriented, confused or unconscious. It includes patients with or without an apparent cause for their condition, such as hypoglycemia, substance abuse, toxic ingestion or intoxication.

TREATMENT:

If trauma is suspected, immobilize the patient’s spine and refer to the TRAUMA protocol. If trauma is not suspected, place the patient in left lateral position and strap loosely to stretcher.

1. Oxygen, monitor Lead II ECG, pulse oximetry, capnography (if available), IV NS
   Ensure that suction is available and monitor airway status; strongly consider inserting a nasopharyngeal airway lubricated with lidocaine jelly.

2. Rapid glucose determination (Note: glucometer results may be inaccurate by 10-15%)

3. Conditions:
   a. Glucose < 80, OR known diabetic on insulin or taking oral hypoglycemic medications with glucose < 110:
      • If IV established:
        D50 25Gm –50 gm IVP
        Narcan 2 mg IVP
      • If no IV obtainable and patient conscious and able to swallow:
        Glutose 25-50 gm SL
        Narcan 2 mg IM
      • If no IV obtainable and patient unconscious or decreased LOC:
        Glucagon 1 mg IM or SC
        Narcan 2 mg IM
   b. Glucose ≥ 80, OR known diabetic on insulin or taking oral hypoglycemic medications with glucose ≥ 110:
      • If IV established: Narcan 2-4 mg IVP
      • If no IV obtainable: Narcan 2-4 mg IM

4. CONTACT BIOTEL

Notes:
1 If patient becomes alert and oriented after Glucose administration, do NOT give Narcan.
2 If pt. does not respond to dextrose & Narcan, always consider other possible causes of altered LOC.

*PEDIATRIC DOSES:

- Glucose: if blood glucose <60: give 0.5 gm/kg IVP or IO:
  Age newborn to 1 month: D10 (waste 40 cc. of D50; replace with 40 cc. NS); administer 5 cc/kg
  Age 1 month to 12 years: D25 (waste 25 cc of D50; replace with 25 cc. NS); administer 2 cc/kg
- Glucose 0.5 gm/kg SL
- Narcan 0.1mg/kg (0.1 cc/kg) IVP or IO
- Glucagon 1 mg IM or SC (same as adult dose)
- CONTACT BIOTEL
AMPUTATION

**DEFINITION:** This protocol applies to patients with isolated amputation of any extremity. It includes the care of the amputated part & applies to the multiple trauma victim with an amputation.

**TREATMENT:**

Control bleeding with direct pressure, contact BioTel if bleeding cannot be controlled.
Remove gross contaminants on amputated part by rinsing with saline.
Regardless of the apparent condition of the amputated extremity, the skin or tissues may be useful for reconstructive purposes. Hence, any amputated part should be treated according to protocol and transported, preferably with the patient. If the amputated part is not immediately retrieved, consider having other field providers search for and transport the part as soon as possible.

1. Wrap amputated part in moistened saline gauze and place in plastic bag or container (sterile, if available).
2. Seal container tightly and place in solution of ice water.
3. Condition:
   a. If amputation is proximal to wrist or ankle: 100% Oxygen
      Monitor Lead II ECG, pulse oximetry
      IV NS TKO
      Refer to SHOCK protocol
   b. Follow PAIN MANAGEMENT protocol
4. CONTACT BIOTEL
5. TREATMENT CONSIDERATIONS:
   Additional morphine, according to PAIN MANAGEMENT protocol

*PEDIATRIC DOSES:*

- CONTACT BIOTEL
- Morphine 0.1mg/kg (0.1 cc/kg) SLOW IVP or IO
  Monitor vital signs, pulse oximetry and capnography (if available) for respiratory depression
ASYSTOLE

**DEFINITION:** This protocol applies to apneic, pulseless patients with no cardiac activity. This **also** applies to those patients with minimal electrical activity (e.g. agonal & brady-asystolic rhythms).

**TREATMENT:**
Contact BioTel after first round of drugs if: renal failure; DKA; methanol ingestion; aspirin or cyclic antidepressant overdose.

1. CPR and Intubate / Ventilate with 100% oxygen
   *Use Capnography and Esophageal Intubation Detector to assist ET Tube placement verification.*

2. Monitor Lead II ECG, pulse oximetry and capnography (if available)
   *Confirm Asystole in two ECG Leads.*
   Consider possible causes: hypoxia, hyperkalemia, hypokalemia, pre-existing acidosis, drug overdose, hypothermia.

3. IV NS TKO

4. Epinephrine 1:10,000 1 mg IVP, repeat every 3 minutes*

5. Atropine 1 mg IVP, repeat every 3 minutes (max dose = 0.04 mg/kg, or 0.4 cc/kg)*

*Note: If a patient with pulses deteriorates into a cardiac arrest witnessed by paramedics AND quick-look reveals asystole, brady-asystolic or agonal rhythm, proceed immediately to TCP at 70 bpm, 200 mAmp; if electrical & mechanical capture are achieved, adjust mAmp to threshold + 10%. Continue CPR & other resuscitative measures during TCP. If mechanical capture is achieved, discontinue CPR and assess patient's BP. CONTACT BIOTEL for drip orders, if needed.

6. CONTACT BIOTEL (after 3rd round of drugs administered)

7. **TREATMENT CONSIDERATIONS:**
   a. Epinephrine 1:10,000 1 mg IVP, repeat every 3 minutes*
   b. Sodium Bicarbonate (NaHCO3) 1 mEq/kg IVP
   c. Calcium Chloride (10% solution) 10 -15 mg/kg IVP
   d. Transcutaneous (external) Pacing (TCP)
      Set rate:  70 BPM (beats per minute)
      MilliAmps: Set at maximum (200), then adjust downward if capture is achieved
   e. Levophed drip 8-12 mcg/minute (Drug Drip Charts, page 53): post-resuscitative phase

**PEDIATRIC DOES:**
- **Epinephrine (1:10,000):** 0.01 mg/kg (0.1 cc/kg) IVP or IO; repeat q 3 minutes, OR
  Epinephrine (1:1,000) 0.1 mg/kg (0.1 cc/kg) via ETT, if vascular access unavailable; repeat q 3 min.
- **Atropine:** 0.02 mg/kg (0.2 cc/kg) IVP or IO (minimum dose 0.1mg) -- may repeat once, OR
  Atropine 0.04 mg/kg (0.4 cc/kg) via ETT, if vascular access unavailable -- may repeat once
- **CONTACT BIOTEL**
BRADYCARDIA  
(SYMPTOMATIC BRADYCARDIA)

**DEFINITION:** This protocol applies to patients with a heart rate < 60 AND symptoms. Symptoms include: Systolic BP < 90, shock, altered level of consciousness, seizures, disorientation, confusion, dizziness. For all others, **CONTACT BIOTEL** before Steps 3 through 6.

**TREATMENT:**

If heart rate < 60 AND Symptomatic:

1. Oxygen, monitor Lead II ECG, pulse oximetry and capnography (if available), IV NS TKO

2. Obtain 12-Lead ECG & transmit to BIOTEL

   *If a patient has chest pain and bradycardia with no other symptoms, CONTACT BIOTEL after Steps 1 and 2, and before Steps 3 through 6.*

3. Atropine 1.0 mg IVP*

4. Transcutaneous (external) Pacing (TCP):
   - Set rate: 70 BPM (beats per minute)
   - Milliamps: Adjust for MECHANICAL capture (palpable pulse)

5. **CONTACT BIOTEL**

6. **TREATMENT CONSIDERATIONS:**
   a. Atropine 1.0 mg IVP (max dose = 0.04 mg/kg, or 0.4 cc/kg)*
   b. Dopamine drip 2-10 mcg/kg/minute (Drug Drip Charts, page 53)
   c. Valium 2.5 - 5 mg SLOW IV prior to pacing, if patient is conscious & alert

   *Monitor for respiratory depression and hypotension*

**PEDIATRIC DOSES:**

- Ensure adequate airway & oxygenation, since pediatric bradycardia usually results from hypoxia.
- If patient is 1 mo. - 1 yr. of age with hypoperfusion & heart rate < 60, perform chest compressions.
- If patient is a newborn (< 1 month of age) with hypoperfusion and heart rate < 60 (or between 60 and 80 and not improving rapidly), perform chest compressions. Refer to NEWBORN protocol.
- **CONTACT BIOTEL** before administering drugs for pediatric bradycardia with pulse.
- **Atropine** 0.02 mg/kg (0.2 cc/kg) (min dose 0.1mg) IVP or IO -- may repeat once, **OR**
  Atropine 0.04 mg/kg (0.4 cc/kg) via ETT, if vascular access unavailable
- **Epinephrine** 1:10,000 0.01 mg/kg (0.1 cc/kg) IVP or IO (slow IVP per BioTel), **OR**
  Epinephrine 1:1,000 0.1 mg/kg (0.1 cc/kg) via ETT, if vascular access unavailable

† Reminder: Medication history (especially digoxin, beta blockers and calcium channel blockers) is particularly important for these patients, as is the possibility of prior or acute myocardial infarction or coronary artery disease.
DEFINITION: This protocol applies to patients who have thermal, chemical or electrical burns and/or those who have sustained inhalation injuries. Refer also to the TRAUMA protocol.

TREATMENT:
Monitor airway, ventilation, oxygenation and risk of inhalation injury – assist, and intubate if needed
Take precautions to PREVENT HEAT LOSS, especially for patients with large thermal burns.
1. Conditions: REFER to the BURN DIAGRAM & FLUID RESUSCITATION form, APPENDIX D
   a. If electrical injury: 100% Oxygen
      Monitor Lead II ECG, pulse oximetry, capnography
      Large bore IV NS (or LR, if available) – wide open up to 1 liter†
      Transport to BURN CENTER
   b. If chemical injury: Brush off dry chemical, flush w/water for minimum of 15 min.
      Transport to BURN CENTER
   c. If major or moderate thermal
      with or without other injuries: 100% Oxygen
      Monitor Lead II ECG, pulse oximetry, capnography
      Large bore IV NS (or LR, if available) – wide open up to 1 liter†
      Cover burns — dry, sterile sheet preferred
      Transport to BURN CENTER

Major: burns > 25% of body surface area; burns of hands, feet, face or genitals; electrical, chemical or inhalation; burn with other injury; pre-existing medical problems (elderly, diabetic, cardiac history, etc.)

Moderate: burns 15-25% of body surface area; no complications or involvement of hands, feet, face or genitals; no electrical, chemical or inhalation injury, nor other injury nor pre-existing medical problems.

   d. If minor thermal with or
      without other injuries: Cover burns with sterile (or clean) saline dressing

Minor: burns < 15% of body surface area; no involvement of hands, feet, face or genital area; no electrical injury, inhalation injury, severe pre-existing medical problems or complications.

   e. Follow PAIN MANAGEMENT protocol

2. CONTACT BIOTEL
3. TREATMENT CONSIDERATIONS:
   a. Additional Morphine, according to the PAIN MANAGEMENT* protocol
   b. BioTel may advise specific treatments for some chemical injuries

*PEDIATRIC DOSES: CONTACT BIOTEL. Morphine 0.1 mg/kg (0.1 cc/kg) IV or IO.

† LR is the preferred burn resuscitation fluid, if available. Be sure to monitor and record the exact volume of fluid administered (number the IV bags), and convey this information to hospital personnel. Do not exceed 1 liter of IV fluids unless authorized by BIOTEL. Closely monitor patients with suspected inhalation injury for airway compromise. Contact BIOTEL for fluid orders in patients over 65 years of age, or with CHF or cardiac disease.
CHEST PAIN

DEFINITION: This protocol applies to patients with non-traumatic, non-pleuritic pain in the anterior chest. Also patients with epigastric pain, shoulder, neck or jaw pain, indigestion or other symptom, if suspected to be of cardiac origin (e.g. based on patient’s past medical history or current presentation.) See also arrhythmia protocols. Refer to 12-Lead ECG Interpretation (Appendix Q).

TREATMENT: Place patient in position of comfort, minimize patient exertion and transport on stretcher.

1. Oxygen, monitor Lead II ECG, pulse oximetry and capnography; IV NS TKO
   Insert large bore IV, if cardiogenic shock and/or inferior AMI suspected

2. Aspirin 325 mg PO* (may substitute four 81-mg. baby aspirin tabs)

3. Obtain 12-Lead ECG and transmit to BIOTEL AND complete a Chest Pain checklist (Appendix B)

4. If 12-Lead ECG shows ST segment elevation > 1mm in any inferior leads (II, III OR aVF), this suggests Inferior AMI. If so, acquire “right sided chest leads” (V3R-V6R):
   a. Remove all chest leads (V1-V6).
   b. Replace leads V3, V4, V5, V6 in the corresponding position to the right of the sternum.
   c. Press “12 Lead” twice on the Lifepak to acquire a printout.

5. If V3R-V6R show ST segment elevation > 1mm. in any leads, this suggests Right Ventricular infarct (pre-load dependent AMI):
   a. If pt.’s SBP < 110:
      i. Do NOT give NTG or Morphine***; position patient flat or in Trendelenburg.
      ii. Administer 250 cc NS IV; repeat up to total 1 L, titrated to keep SBP > 110.
   b. If pt.’s SBP >110:
      i. Administer NTG 0.4 mg. SL & observe for hypotension***.
      ii. If pt.’s SBP falls to < 110 after NTG, position patient flat or in Trendelenburg, and administer 250 cc NS IV bolus, & repeat up to a total of 1 L, titrated to keep SBP > 110. iii. Do NOT administer additional NTG.
      iv. Contact BIOTEL for Dopamine drip after 500 cc NS IV if persistent SBP < 110.

6. If V3R-V6R do NOT show ST segment elevation > 1mm OR if 12-Lead ECG does NOT show ST segment elevation in inferior leads (II, III, aVF):
   a. Administer NTG 0.4 mg SL; may repeat q 5 minutes for total of 3 doses, and if SBP > 110***.
   b. Morphine 2-4 mg SLOW IVP*; for pain unrelieved by NTG X 3, and if SBP > 110*
      Monitor vital signs, Lead II ECG, pulse oximetry and capnography for respiratory depression

7. CONTACT BIOTEL

8. TREATMENT CONSIDERATIONS:
   a. Additional Morphine 2 mg-4 mg SLOW IVP
   b. Nitronox (patient administered)
   c. Additional doses of Nitroglycerin (unless acute inferior MI suspected)
   d. If cocaine-induced chest pain and / or tachycardia:
      Valium 2.5 - 5 mg SLOW IVP may be added (monitor for respiratory depression)
   e. If acute inferior MI suspected, fluid bolus(es): 250 cc NS IV, then reassess; Biotel may repeat

***Note: Do NOT administer NTG to any patient who has taken Viagra or similar drugs in the past 24 hours.

*PEDIATRIC DOSES: This is a very unusual complaint in pediatrics. CONTACT BIOTEL.
EYE INJURY

DEFINITION: This protocol applies to patients who have blunt or penetrating trauma to the eye, or who have chemical substances in the eye. This protocol applies to adult and pediatric patients.

TREATMENT:

If patient has multi-system trauma, evaluate per TRAUMA Protocol. Transport patient with head slightly elevated and BOTH eyes closed or loosely patched (unless specific treatment indicated).

1. Types of injury:
   a. Penetrating injury with embedded foreign body:
      Stabilize Foreign Body
      DO NOT REMOVE FOREIGN BODY OR USE ANESTHETIC
   b. Corneal burn, corneal abrasion or chemical exposure:
      1-2 drops Anesthetic[*] to affected eye(s)
      (No Anesthetic [*] for penetrating injuries)
      Irrigate with NS for at least 20 minutes and continue irrigation en route

2. CONTACT BIOTEL

[*Any FDA-approved ophthalmological anesthetic agent may be substituted for Alcaine®.]
NEWBORN RESUSCITATION

I. ROUTINE NEWBORN RESUSCITATION:

ALL INFANTS, unless MECONIUM STAINING is present:

If meconium-stained amniotic fluid is present, proceed to the MECONIUM section, in APPENDIX K

FOUR STEPS of NEONATAL RESUSCITATION:

a. Prevent heat loss:
   • Dry infant’s head & body
   • Remove wet coverings
   • Cover infant with dry wrappings, especially the head
   • If mother & infant are both stable, place the naked infant against the mother’s body, and place covers over BOTH mother & infant

b. Clear the airway by positioning & suctioning:
   • Position infant on back or side
   • Neutral neck position – hyperextension or underextension will compromise airway
   • Place a small folded towel under the infant’s shoulders
   • Suction mouth & nose with bulb syringe – no more than 5 seconds at a time
   • Avoid deep or vigorous suctioning to prevent apnea and/or bradycardia
   • Monitor infant’s heart rate during suctioning
   • Provide blow-by oxygen if necessary during suctioning

c. Provide tactile stimulation for 5 to 10 seconds & initiate breathing, if drying & suctioning do not induce respirations:
   • Flicking the soles of the infant’s feet, or
   • Rubbing the infant’s back

d. Further evaluation:
   • If the above measures do not induce respirations within 5 to 10 seconds, immediately begin assisted ventilations with an infant/neonatal BVM and supplemental oxygen at a rate of 40-60 per minute
   • If the above measures are successful, proceed with further evaluation
      o 1-minute APGAR score*
      o 5-minute APGAR score*
   • Oxygen administration is not necessary for normal newborns with peripheral cyanosis (acrocyanosis) in the first few minutes of life
   • If the above measures are unsuccessful, proceed to DISTRESSED INFANTS section of the OBSTETRICAL COMPLICATIONS section, APPENDIX K

*APGAR SCORE

<table>
<thead>
<tr>
<th>SIGN</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance (skin color)</td>
<td>Blue, pale</td>
<td>Body pink, blue extremities</td>
<td>Completely pink</td>
</tr>
<tr>
<td>Pulse rate (heart rate)</td>
<td>Absent</td>
<td>&lt; 100 / minute</td>
<td>&gt; 100 / minute</td>
</tr>
<tr>
<td>Grimace (irritability)</td>
<td>No response</td>
<td>Grimace</td>
<td>Cough, sneeze, cry</td>
</tr>
<tr>
<td>Activity (muscle tone)</td>
<td>Limp</td>
<td>Some flexion</td>
<td>Active motion</td>
</tr>
<tr>
<td>Respiration (respiratory effort)</td>
<td>Absent</td>
<td>Slow, irregular</td>
<td>Good, crying</td>
</tr>
</tbody>
</table>

Written April 2003    UTSW/Biotel EMS System
NEWBORN RESUSCITATION

“INVERTED PYRAMID” OF NEWBORN RESUSCITATION:

(if MECONIUM is present, refer to MECONIUM section, APPENDIX K)
(if DISTRESSED infant, refer to DISTRESSED INFANTS section, APPENDIX K)

ALL newborns need drying, warming, positioning, suctioning and stimulation. Other interventions – in the order shown – are needed for progressively more distressed infants.

(Modified from the CPR Issue of JAMA, 28 October 1992)
OBSTETRICAL (GENERAL)
(including: ECLAMPSIA & MATERNAL POSTPARTUM)

**DEFINITION:** This protocol applies to any woman of childbearing age (10 years to 50+ years) whose chief complaint is related to her pregnancy or impending delivery. This protocol also applies to women whose chief complaint is gynecological, as well as to women in the 1st month postpartum.

**TREATMENT:**

*If a patient is unstable, initial resuscitation and stabilization must precede any action specified in this protocol. Resuscitation of the mother is the key to survival of both mother and fetus.*

*If trauma is suspected, refer to the TRAUMA protocol.*

**Manual vaginal exam should not be performed under most circumstances in the field.**

1. Assess and support ABC's: Supplemental oxygen, monitor Lead II ECG, pulse oximetry
   a. Monitor pregnant pt. closely for vomiting and risk of pulmonary aspiration

2. Transport the pregnant pt. in position of comfort, **EXCEPT** for a third trimester patient, who should be transported on her left side
   a. For trauma, immobilize the pregnant patient on a long spine board, log-roll 10-15° to the left.

3. IV NS TKO, **even if** SBP > 90 mm Hg.
   a. 250 cc NS bolus; repeat as needed to maintain SBP > 90 mm Hg
   b. 2 large-bore IV’s if maternal bleeding or if other complications suspected

4. Focused obstetrical history:
   a. “How many babies are you carrying?”
   b. “When is your due date?”
   c. “Did your bag of waters break, and, if so, what color was the fluid?”
   d. “When was the last time you used drugs or alcohol?”
   e. “Do you feel the need to bear down or as if you are going to have a bowel movement?”
   f. Other critical information: Gravidity (# of pregnancies), Parity (# of prior births), Vaginal bleeding (presence, quantity, character), Pain (onset, character, duration, evolution, location, radiation), Medical history (especially Diabetes), Prenatal care, History of previous gynecological or OB complications, Infectious disease status, Allergies and Medications

5. **CONTACT BIOTEL**

For suspected complications of pregnancy, refer to the SPECIAL CIRCUMSTANCES section.

For delivery before hospital arrival, refer to the CHILDBIRTH, NEWBORN RESUSCITATION & MATERNAL POSTPARTUM sections.

For delivery complications & meconium-stained or distressed infant resuscitation, refer to APPENDIX K (Obstetrical Complications/Distressed Newborn).

**NOTE:**

The following delivery complications require C-section and cannot be safely delivered in the field:

- Cephalopelvic disproportion (infant’s head too large or woman’s pelvis too small)
- Breech presentation when infant’s head does not deliver in 3 minutes
- Shoulder presentation (“transverse lie”)(10% of second twins)
- Umbilical cord prolapse
- Placental abruption and placenta previa
OBSTETRICAL (GENERAL)
SPECIAL CIRCUMSTANCES

All patients with these complications should first be treated according to the GENERAL OBSTETRICAL & GYNECOLOGICAL section of this protocol

1. PRE-ECLAMPSIA & ECLAMPSIA:
   a. If is pre-eclampsia suspected (third trimester, BP >140/90, generalized edema):
      TREATMENT:
      - Monitor vital signs, airway and respiratory status
      - Rapid transport
      - CONTACT BIOTEL
   b. For seizures related to eclampsia:
      TREATMENT:
      - Valium 2.5 – 5 mg SLOW IVP; may repeat once (maximum dose 10 mg)
      - Monitor vital signs, airway, respiratory status, BP, pulse oximetry, capnography
      - Monitor for vomiting and pulmonary aspiration
      - Rapid transport
      - CONTACT BIOTEL
      - Definitive treatment for eclampsia is delivery of the fetus
      - NO Magnesium Sulfate in the field (requires very large doses, & intensive maternal & fetal monitoring)

2. FIRST-TRIMESTER BLEEDING: Usually pain + bleeding + shock + missed period
   a. Assume: ruptured ectopic pregnancy (#1 cause of 1st trimester maternal death)
   b. TREATMENT: Refer to SHOCK protocol – this is life-threatening emergency
      - Assess ABC’s and Vital Signs for hypovolemic shock; supplemental oxygen
      - Rapid transport
      - IV NS – 2 large bore, wide open, titrate to SBP > 90
      - Monitor Lead II ECG, pulse oximetry, capnography
      - CONTACT BIOTEL

3. THIRD-TRIMESTER BLEEDING: NEVER NORMAL!
   a. Most common causes: placental abruption, placenta previa, uterine rupture
   b. TREATMENT: Refer to SHOCK protocol – bleeding may be hidden in the uterus
      - Same as above, and
      - DO NOT perform vaginal exam (might increase bleeding and precipitate labor)
      - Monitor bleeding by external visual exam & by applying fresh perineal pad and noting the time of application
      - If possible, check fundal height and document it for baseline measurement
      - CONTACT BIOTEL

4. PREMATURE RUPTURE OF MEMBRANES (“PROM”):
   a. Rupture of the amniotic sac prior to onset of labor, regardless of gestational age
   b. TREATMENT:
      - Assess and support ABC’s, IV NS, monitor Lead II ECG, oxygen
      - Assess for low-resistance (septic) shock; consider 250 cc. IV NS bolus
      - Rapid transport
      - CONTACT BIOTEL
OBSTETRICAL (GENERAL)  
CHILDBIRTH

1. UNCOMPLICATED VERTEX (HEAD) PRESENTATION:  
   **TREATMENT:**
   a. Place the mother on her back with her legs widely separated.  
      The buttocks can be elevated with pillows to allow access to the perineum.
   b. If time permits, drape a sterile field around the vaginal opening with sterile 
      towels or paper barriers.
   c. Place the palm of one hand over the advancing head of the infant.
   d. As the head emerges, the mother should be encouraged NOT to push, so that the 
      delivery can proceed slowly & with minimal trauma to the perineum. Have the 
      mother take slow, deep, panting breaths through her mouth to help her overcome 
      the strong urge to push.
   e. Once the head is delivered and **before** the shoulders and chest deliver, suction 
      the infant’s MOUTH FIRST, and then the nasal passages to remove secretions.
   f. If the umbilical cord is wrapped around the infant’s neck (“nuchal cord”), it can 
      usually be slipped over the infant’s head. If the cord is too tightly 
      wrapped around the neck, clamp the cord in two places and cut between the 
      clamps with **sterile** scissors or scalpel (do NOT use trauma shears).
   g. One shoulder is then delivered with the next contraction. The **UPPER** shoulder 
      usually delivers first, with gentle downward pressure on the infant’s head. The 
      **LOWER** shoulder can then be delivered with gentle upward pressure on the 
      head. 
      *Do not ever exert traction on the infant’s head or neck in order to facilitate 
      delivery*
   h. Usually, once the shoulders have delivered, the rest of the infant’s body delivers 
      rapidly. *Be prepared and hold the infant tightly.*
   i. Once delivered, support the infant at the level of the vagina. Place 2 umbilical 
      cord clamps 4 inches and 6 inches from the infant’s abdomen.
   j. Using **sterile** scissors or scalpel, cut the cord between the two clamps (do NOT 
      use trauma shears). Examine the cut ends of the cord for bleeding: if the cut end 
      attached to the infant is bleeding, apply an additional cord clamp **PROXIMAL** 
      to the previous clamp and reassess for bleeding. Do not remove the first clamp.
   k. Proceed to the **MATERNAL POSTPARTUM** section and to the **NEWBORN 
      RESUSCITATION** protocol.
   l. **Primary enemy of every newborn = hypothermia**
      - Can occur within minutes, due to evaporation & convection
      - Causes hypoxia, bradycardia
      - Smaller, more premature infants at greater risk
      - Easier to prevent than to treat

2. CONTACT BIOTEL
OBSTETRICAL (GENERAL)
MATERNAL POSTPARTUM CARE

**TREATMENT:**

1. Assess and support ABC’s: remember that the mother remains a patient

2. Transport as soon as possible

3. Problems:

   a. Delivery of the placenta:
      - The placenta may not deliver until after hospital arrival
      - Do not pull on the umbilical cord – this may cause bleeding or uterine inversion
      - Allow the placenta to deliver spontaneously
      - If the placenta delivers prior to hospital arrival, collect and transport it with the patient for examination at the hospital

   b. Postpartum hemorrhage (> 500 cc after delivery):
      - Can be delayed up to 24 hours postpartum
      - **TREATMENT:**
        - Assess & support ABC’s
        - IV NS Wide Open: titrate to SBP > 90
        - Monitor Lead II ECG, pulse oximetry
        - Control external hemorrhage from perineal tears with firm pressure
        - Massage the uterus, & reassess uterine tone and amount of vaginal bleeding at least every 10 minutes
        - Do not attempt vaginal examination or vaginal packing to control hemorrhage

   c. Postpartum fever:
      - Can occur during labor or 1-2 days postpartum
      - Risk of overwhelming, lethal sepsis & shock
      - **TREATMENT:**
        - Assess & support ABC’s
        - IV NS Wide Open: titrate to SBP > 90
        - Monitor Lead II ECG, pulse oximetry
        - Rapid transport

4. **CONTACT BIOTEL**
PAIN MANAGEMENT
(NON-CARDIAC)

**DEFINITION:** This protocol applies to patients with severe pain/discomfort, including those with pain from isolated extremity injuries and/or musculoskeletal/soft tissue injuries; flank pain due to suspected kidney stone; and women in ACTIVE labor or who are about to deliver; amputations, burns; nasotracheal tube placement (Xylocaine jelly only). **Vital signs must be stable, with SBP > 90.**

**TREATMENT:**

*Evaluate patient for life-threatening medical problems or injuries, and refer to the appropriate protocol.*

1. Monitor vital signs, Lead II ECG, pulse oximetry; supplemental oxygen; IV NS TKO.

2. Offer comfort and reassurance

3. Nitronox (patient self-administered)

   **Relative contraindications to Nitronox:**
   - a. Unable to self administer
   - b. Altered mental status or head injury
   - c. COPD
   - d. Chest trauma or suspected/known pneumothorax
   - e. Major facial trauma
   - f. Abdominal trauma
   - g. Pregnancy, other than active labor
   - h. Acutely psychotic patient

4. OR Morphine 2-4 mg SLOW IVP * (may titrate to effect, considering patient’s weight; check for patient medication allergies before administering);

   - Monitor vital signs, pulse oximetry and capnography for respiratory depression and hypotension.
   - If patient is > 65 yr of age, debilitated, has altered mental status or SBP < 90, CONTACT BIOTEL before administering Morphine.

5. Splint injured extremities

6. CONTACT BIOTEL

7. **TREATMENT CONSIDERATIONS**

   Additional Morphine as ordered

**PEDIATRIC DOSES:**

- Nitronox PRN (self-administer only, age ≥ 8 years, use only if no contraindications)
- CONTACT BIOTEL
- Morphine 0.1 mg/kg (0.1 cc/kg) SLOW IVP (may titrate to effect; first check for allergies)

   *Monitor vital signs, pulse oximetry and capnography for respiratory depression and hypotension*
POISONED PATIENT AND OVERDOSES

**DEFINITION:** This protocol applies to patients with an acute overdose or intoxication. All patients with suspected suicide must be reported to BIOTEL.

**TREATMENT:**
1. Oxygen, monitor Lead II ECG, Pulse Oximetry, Capnography, IV NS TKO
2. Rapid assessment of vital signs, with frequent reassessments en route
3. Assess medication and risk for sedation or seizure potential
4. Assess mental status
   a. If patient alert with stable V/S and no apparent risk of sedation: Activated charcoal 1 gm/kg PO(†)
   b. If altered mental status, proceed to ALTERED LOC protocol, then CONTACT BIOTEL
5. CONTACT BIOTEL
6. Conditions:
   a. Altered heart rate:
      - **Bradycardia:**
        Follow **BRADYCARDIA** protocol
      - **Tachycardia:**
        Follow **TACHYCARDIA** protocol
   b. Hypotension (††)
      If bradycardia is present, follow:
      **BRADYCARDIA** protocol
      **SHOCK** protocol
   c. Hypoglycemia:
      Follow **ALTERED LEVEL OF CONSCIOUSNESS** protocol
   d. Chest pain with cocaine:
      Follow **CHEST PAIN PROTOCOL**

**TREATMENT CONSIDERATIONS:**
If Ca-channel blocker or Beta-blocker:
- CaCl₂ 10-15 mg/kg SLOW IVP
- Glucagon 1 mg IVP over 2-5min or IM*

If cyclic antidepressants with wide complex tachycardia:
- Sodium bicarbonate 1 mEq/kg IVP
  If cocaine ingested with tachycardia:
  - Valium 2.5 - 5 mg SLOW IVP
  If tachycardia wide QRS also give:
  - Lidocaine 1.0 mg/kg IVP

If Ca-channel blocker or B-blocker:
- CaCl₂ 10-15 mg/kg IV slow push
- Glucagon 1 mg IVP over 2-5min or IM*

**PEDIATRIC DOSES:**
- CONTACT BIOTEL
- Activated charcoal 1 gm/kg PO: may be beneficial as long as 4 hours after Tylenol® ingestion
- Glucagon 1 mg IM, SC or IV, for Beta-blocker overdose
- CaCl₂ 10-15 mg/kg SLOW IVP, for Calcium-channel blocker overdose

---

*Special considerations:*
(†) Do NOT use activated charcoal if patient has ingested a liquid, chemical or caustic agent, or for pesticides, hydrocarbons, acids, alkalis, alcohols, heavy metals, lithium & solvents. Note amount, dose, and time of ingestion, and possibility of co-ingestion of other substances. If available, bring pill bottles to ED. If syrup of Ipecac given to patient prior to arrival, prepare for vomiting and aspiration if patient develops altered level of consciousness. If charcoal is given, keep patient in semi-sitting position (head of bed at 30°), and monitor for airway and vomiting.
(††) Pts. with Ca-channel blocker or B-blocker intoxication may present with bradycardia, heart block & hypotension.
PULSELESS ELECTRICAL ACTIVITY (PEA)

**DEFINITION:** This protocol applies to patients who are apneic and pulseless with any electrical activity on the monitor EXCEPT for VF/VT. Examples include: electromechanical dissociation (EMD), pseudo-EMD, idioventricular rhythms, ventricular escape rhythms, bradyasystolic rhythms and post-defibrillation idioventricular rhythms.

**TREATMENT:**

Contact BIOTEL after first round of drugs if: renal failure; DKA; methanol ingestion; aspirin or cyclic antidepressant overdose.

1. CPR

2. Intubate / Ventilate with 100% oxygen / monitor Lead II ECG, Pulse Oximetry, Capnography/ IV NS
   Assess patient for possible causes: hypovolemia, hypoxia, overzealous ventilation (especially COPD or asthma), cardiac tamponade, tension pneumothorax, hypothermia, massive pulmonary embolus, drug overdose, hyperkalemia, acidosis, massive MI.

3. Epinephrine 1:10,000 1 mg IVP, repeat every 3 minutes*

4. If heart rate < 60: Atropine 1 mg IVP, repeat every 3 minutes (max dose 0.04 mg/kg)*

5. CONTACT BIOTEL (after 3rd round of drugs administered)

6. **TREATMENT CONSIDERATIONS:**
   a. Epinephrine 1:10,000 1 mg IVP, repeat every 3 minutes*
   b. IV fluid bolus, especially if trauma or hypovolemia is suspected
   c. Pleural decompression (refer to Appendix N), especially if patient is a trauma victim
   d. Sodium Bicarbonate (NaHCO3) 1 mEq/kg IVP
   e. Calcium Chloride (10% solution) 10-15 mg/kg IVP

   **NOTE:** Item “f” may be considered in the post-resuscitation phase
   f. Levophed drip 8-12 mcg/minute (refer to Drug Drip Charts)

**PRINCIPLE:** Flush drugs with IV fluid 10-15 seconds (squeezing the bag) while maintaining chest compressions; for extremity IV’s, raise the arm while flushing the drugs in.

**PEDIATRIC DOSES:**

Epinephrine (1:10,000) 0.01 mg/kg IVP or IO (0.1 cc/kg IVP or IO); repeat every 3 minutes, OR
Epinephrine 1:1,000 0.1 mg/kg (0.1 cc/kg) via ETT, if vascular access unavailable
   - Atropine 0.02 mg/kg (minimum dose 0.1mg) (0.2 cc/kg IVP or IO) - may repeat once, OR
   - Atropine 0.04 mg/kg (0.4 cc/kg) via ETT, if vascular access unavailable
   - CONTACT BIOTEL after 3 rounds of epinephrine and 2 rounds of atropine

**NOTE:** If patient’s rhythm changes at any time during resuscitation, refer to appropriate protocol.

Revised April 2003     UTSW/Biotel EMS System
## RESPIRATORY DISTRESS

**DEFINITION:** This protocol applies to patients complaining of shortness of breath, or who have labored respirations, dyspnea, wheezes or rales. This includes patients with asthma, COPD, bronchitis, emphysema, congestive heart failure, or pneumonia. Specific treatments for these conditions differ.

**TREATMENT:**

*Place patient in position of comfort and transport on stretcher. Carefully monitor respirations and pulse. Monitor Pulse Oximetry and Capnography. Assist ventilations PRN.*

1. **Oxygen:**
   - Increase oxygen up to 100% PRN to alleviate hypoxia, respiratory distress or cyanosis
   - Be prepared to intubate prior to respiratory arrest
   - Do not withhold oxygen from the COPD patient, but monitor for decreased RR or LOC, or for increased ETCO₂, in which case concentration of supplemental oxygen may need to be decreased
   - For COPD with chronic hypoxia (e.g. home O₂), titrate oxygen flow to maintain S,O₂ 88-92%

2. **Monitor Lead II ECG, Pulse oximetry, Capnography, IV NS TKO**

3. **Conditions:**
   - **No epinephrine if:** COPD, CHF, heart disease, s/p MI, age > 45, arrhythmias, or labor
   - a. If wheezes present: **Albuterol 2.5 mg via nebulizer**
      **(or History of asthma)**
      - May repeat twice (total = 3 doses)
      - Combine with Atrovent 0.5 mg via nebulizer for 2nd & 3rd doses
      - Epinephrine 1:1,000 0.3 mg SC, **ONLY** if no response to Albuterol & Atrovent
   - b. If signs of CHF present: **Obtain 12-Lead ECG & transmit to BIOTEL**
      **(rales, peripheral edema,**
      **History of CHF)**
      - Nitroglycerin 0.4 mg SL (IF SBP > 110)
      - Morphine 2 mg SLOW IVP (IF SBP > 110)

4. **CONTACT BIOTEL**

**TREATMENT CONSIDERATIONS:** *Pt. must have NTG on board BEFORE giving Lasix*

- **No epinephrine if:** COPD, CHF, heart disease, s/p MI, age > 45, arrhythmias, or labor
  - a. Wheezes only: **Additional Albuterol ± Atrovent**
     **(History of asthma)**
     - Epinephrine 1:1,000 0.3 mg SC*
     - Magnesium Sulfate 10% 2 gm SLOW IVP over 10 min
       - (4 cc of 50% Magnesium Sulfate diluted with 16 cc NS)
     - **Contraindicated if renal failure or SBP < 110**
  - b. Signs of CHF: **Additional Nitroglycerin 0.4 mg SL (IF SBP > 110)**
     - Morphine 2 mg IVP
     - Albuterol 2.5 mg via nebulizer
     - Lasix 40 mg SLOW IVP, *OR* the patient’s usual PO dose given SLOW IVP,
       *IF* SBP > 110, and *ONLY* after Nitroglycerin.

**PEDIATRIC DOSES:**

- Albuterol 2.5 mg via nebulizer; may repeat twice; combine with Atrovent 0.5 mg for 2nd & 3rd doses
  - Atrovent dose for infants < 1 yr. of age: 0.25 mg. via nebulizer

**CONTACT BIOTEL**

- Epinephrine 1:1,000 0.01 mg/kg SC (0.01 cc/kg SC) (max. 0.3 mg = max. 0.3 cc.)
SEIZURE (ADULT)
(Age ≥ 13 years)

**DEFINITION:** This protocol applies to patients actively seizing or those who have a history of seizures prior to arrival.

**TREATMENT:**

*If trauma is suspected, immobilize spine & refer to TRAUMA protocol.*

*If no trauma is suspected, place patient in left lateral position and strap loosely to stretcher.*

Assess patient for possible causes: e.g. OD, hypoxia, head injury, hypoglycemia, alcohol withdrawal or stroke. Refer to the appropriate protocol.

1. Maintain open airway: consider nasopharyngeal airway, if patient has a gag reflex  
   **Ensure that suction is available**; monitor respirations  
   During a seizure, **DO NOT** force anything into patient’s mouth or attempt to restrain patient.

2. Oxygen, monitor Lead II ECG, Pulse Oximetry, Capnography, IV NS TKO

3. Rapid glucose determination

4. Conditions:
   a. Glucose < 80, OR known diabetic on insulin or taking oral hypoglycemic medications with glucose < 110:
      
      - If IV established:
        D50 25Gm –50 Gm IVP
      - If no IV obtainable and patient is conscious and able to swallow:
        Glucose 25-50 gm SL
      - If no IV obtainable and patient is unconscious or has decreased LOC:
        Glucagon 1 mg IM or SC
   b. If patient is still actively seizing, despite normal blood glucose, or after glucose administration:
      
      - Valium, 2.5 mg SLOW IV or IM, until seizure stops, or to maximum 10 mg.¹
      - **Monitor blood pressure, heart rate, airway, respiratory rate, pulse oximetry & capnography; assist ventilations, if necessary; suction, if necessary**

5. **CONTACT BIOTEL**

6. **TREATMENT CONSIDERATIONS:**
   a. Additional Valium
   b. Narcan 2 mg IVP or IM, if seizure is due to narcotic overdose (rare)

**Note:** ¹ If patient becomes awake and alert after glucose or glucagon administration, do not give Valium.
SEIZURE (PEDIATRIC)
(Age < 13 years)

**DEFINITION:** Patients actively seizing or who have a history of seizures prior to arrival.

**TREATMENT:**

*If trauma is known or suspected, immobilize C-spine & refer to TRAUMA protocol.*

*If no trauma is suspected, place patient in left lateral position and strap loosely to stretcher.*

Consider possible causes: e.g. fever, ingestion, hypoxia, head injury, hypoglycemia, or sepsis.

Refer to appropriate protocol.

1. Maintain open airway:
   - Consider nasopharyngeal airway lubricated with Lidocaine jelly, if patient has a gag reflex
   - Ensure that suction is available; monitor respirations
   - During a seizure, **DO NOT** force anything into patient’s mouth or attempt to restrain patient.

2. Oxygen, monitor Lead II ECG, Pulse Oximetry, Capnography, IV NS TKO

3. Rapid glucose determination

4. Conditions:
   a. Glucose < 60 (non-diabetic) or < 90 (diabetic on insulin or oral hypoglycemic medications):
      - If IV established: Glucose 0.5 gm/kg IVP (or IO for patients ≤ 8 years old)
        - Age < 1 month: D10 (waste 40 cc D50; replace with 40 cc NS): 5 cc/kg
        - Age 1 month – 12 years: D25 (waste 25 cc D50; replace with 25 cc NS): 2 cc/kg
      - If no IV obtainable and patient is conscious and able to swallow:
        Glucose 0.5 gm/kg SL (1 tube of Glucose contains 15 gm of Glucose)
      - If no IV obtainable and patient is unconscious or has decreased LOC:
        Glucagon 1 mg IM or SC
   b. “Status epilepticus”: If patient is actively seizing at the time of EMS arrival or has recurrent seizures after EMS arrival:
      - Valium 0.5 mg/kg rectally (maximum dose 10 mg)
      - **Monitor blood pressure, heart rate, airway, respiratory rate, pulse oximetry & capnography; assist ventilations, if necessary; suction, if necessary**

5. **CONTACT BIOTEL**

**Teaching point:** Seizures in children are usually benign. It is most important to treat the cause if possible. Lowering the fever, relieving hypoxia, or correcting low blood glucose are usually the most effective ways of treating pediatric seizures. Valium is used only when other efforts fail.

**Teaching point:** Fever + seizure may be meningitis, a potentially lethal diagnosis that cannot be excluded in the field. The caregiver must be encouraged to allow transport for evaluation and treatment.
SHOCK

**DEFINITION:** This protocol applies to patients who present with hypotension, tachycardia, altered mental status or poor perfusion believed to be due to shock. Recall that hypotension is NOT the only indicator of shock. Altered mental status, tachycardia, tachypnea, cool & clammy skin, and delayed capillary refill may be more sensitive. Refer also **TRAUMA, ARRHYTHMIA & ALLERGIC REACTION** protocols.

**TREATMENT:**

*If trauma is present or suspected, refer to **TRAUMA** protocol.*

1. 100% Oxygen, monitor Lead II ECG, Pulse Oximetry, Capnography, IV NS

2. Rapid assessment for etiology of shock

3. Conditions:
   a. If hypovolemic: NS or RL 250-1,000 cc. bolus*:
      (NON-trauma) Titrate to systolic BP > 90 mmHg
   b. If cardiogenic: If an arrhythmia exists, refer to the specific protocol
      CONTACT BIOTEL
      If tension pneumothorax is suspected, pleural decompression
      (Appendix N)
   c. If neurogenic/septic: NS or RL 250-1,000 cc. bolus:
      (low resistance) Titrate to systolic BP > 90 mmHg
   d. If anaphylactic: Refer to **ALLERGIC REACTION** protocol
   e. If poisoning: Refer to **POISONED PATIENT** protocol & CONTACT BIOTEL

4. CONTACT BIOTEL

5. TREATMENT CONSIDERATIONS:
   a. Hypovolemic, neurogenic/septic: Additional fluid boluses, then reassess
   b. Cardiogenic: Obtain 12-Lead ECG & transmit to BIOTEL
      Anti-arrhythmic medications, as indicated
      Pleural decompression for tension pneumothorax
      **Refer to **BRADYCARDIA** or other arrhythmia protocol**
      If BP 70-90: Dopamine drip 2-10 mcg/kg/minute
      (refer to Drug Drip Charts)
      If BP < 70: Levophed drip 8-12 mcg/minute
      (refer to Drug Drip Charts)
   c. Anaphylactic: Additional fluid boluses, then reassess
      Additional Epinephrine, Benadryl

**PEDIATRIC DOSES:** * IV or IO bolus: 20 cc/kg, then reassess; BIOTEL may order repeat fluid bolus
STROKE (ACUTE)

**DEFINITION:** This protocol applies to patients suspected of having an acute stroke event*.

**TREATMENT:**

1. **ABC’s:** Ensure adequate airway and ventilation; apply supplemental oxygen (2 L/min by nasal cannula is usually adequate, unless otherwise indicated.) **Ensure that suction is available.**

2. **Monitor Vital Signs q 5 minutes; monitor Lead II ECG, pulse oximetry and capnography.**

3. **Assess Level of Consciousness.**
   
   If LOC is altered, then proceed to **ALTERED LEVEL OF CONSCIOUSNESS** protocol; return to this protocol after evaluating and treating for altered level of consciousness.

4. **Assess for Cardiac Arrhythmias and signs or symptoms of Acute Coronary Syndromes.**

   Proceed to the appropriate protocol, if indicated.

5. **Assess for history and/or signs of primary trauma to the head and neck as a possible cause**

   for the event, rather than as secondary injury following the event.

   Proceed to the **TRAUMA** protocol, if primary or secondary trauma is present.

6. If not already done, **determine blood glucose** and treat hypoglycemia, if present.

7. Evaluate for possible stroke event, **AND complete a STROKE EVALUATION SHEET (Appendix C).**

   **CONTACT BIOTEL** for triage and transportation recommendations.

8. **IV NS TKO.**

9. **Obtain 12-Lead ECG and transmit to BIOTEL.**

10. If an adult patient (18 years or older) meets criteria for acute stroke (refer to **STROKE EVALUATION SHEET**) AND has had symptoms (“last known to be normal”) for 3.5 hours or less, then transport the patient to the patient’s appropriate hospital of choice, **OR, if the patient chooses to do so,** transport the patient to the closest on-call Stroke Service Facility (North or South).

11. The patient will be transported Code 3 if the patient is a suitable candidate for and wishes to be transported directly to a Stroke Service Facility. If the patient does not appear to be able to make an informed decision, or if there is no one present to make an informed decision, **BIOTEL will consult with the paramedics to make the best judgment on behalf of the patient.**

12. **BIOTEL** will contact the Stroke Service Facility on the rotation call list to which the patient is being transported, to activate the Stroke Team at the facility.

**PEDIATRICS:** This is a very unusual presentation in pediatrics. **CONTACT BIOTEL.**
SUPRAVENTRICULAR TACHYCARDIA
(NARROW COMPLEX TACHYCARDIA)

**DEFINITION:** This protocol applies to patients with a **sustained, narrow complex** tachycardia with a **heart rate > 150** (slower rates seldom require treatment).

*Do NOT use this protocol for wide-complex tachycardia or documented sinus tachycardia on 12-lead ECG. Assess the patient’s medical history and physical findings to differentiate SVT from sinus tachycardia.*

**TREATMENT:**

1. Oxygen, monitor Lead II ECG, Pulse Oximetry, Capnography, IV NS TKO

2. **Conditions**
   a. Conscious: Obtain 12-Lead ECG & transmit to BIOTEL
      - Valsalva Maneuver (not for known A-fib/A-flutter)
      - Adenosine: *(NOT for known A-fib/A-flutter)*
        - Initial dose 6 mg RAPID IVP
        - Flush with NS 10 ml IVP
        - Repeat dose 12 mg RAPID IVP
        - Flush with NS 10 ml IVP
        - Repeat dose 12 mg RAPID IVP
        - Flush with NS 10 ml IVP
   b. Unconscious: Synchronized cardioversion - 100/200/300/360 Joules *(BEFORE IV)*

3. **CONTACT BIOTEL**

4. **TREATMENT CONSIDERATIONS:**
   a. Conscious: Diltiazem: Initial dose = 0.25 mg/kg (SLOW IVP over 2 minutes)
      - Repeat dose = 0.35 mg/kg 15 minutes after initial dose (SLOW IVP over 2 minutes)
      - Valium: 5-10 mg SLOW IVP, then synchronized cardioversion
        - **Monitor for respiratory depression and hypotension**
   b. Unconscious: Adenosine
      - Diltiazem
      - Continued synchronized cardioversion
      - 12-Lead ECG & transmit to BIOTEL

*PEDIATRIC DOSES: CONTACT BIOTEL*

**Notes:** Do NOT give Adenosine to patients receiving Persantine (dipyridamole), or to patients who have ingested or inhaled certain poisons or toxic chemicals such as organophosphates. If a drug overdose, or an accidental ingestion or inhalation is suspected, contact BIOTEL before treating the SVT. Caution also for patients with COPD, CHF, known coronary artery disease, or any wide-complex tachycardia which might be ventricular tachycardia.
TRAUMA

**DEFINITION:** This protocol applies to patients with multiple traumatic injuries. Refer to specific protocols for specific injuries. Refer also to the *TRAUMATIC CIRCULATORY ARREST* protocol.

**TREATMENT:**
1. If primary survey is abnormal — **LOAD & GO.** Minimize scene time.

2. On scene: perform primary survey, obtain patent airway, immobilize spine, & provide supplemental oxygen (intubate PRN).

3. En route: Monitor Lead II ECG, Pulse Oximetry, Capnography, obtain IV access.

4. Conditions:
   a. If systolic BP < 90: 2 large bore IV NS or LR, give fluid only to raise SBP to 90-100, if bleeding is uncontrolled*
   b. If systolic BP ≥ 90: IV NS or LR TKO

**TRAUMA CENTER triage criteria:** These patients must be taken to a designated Level 1 or Level 2 trauma facility:

- Traumatic arrest/CPR (with signs of life on EMS arrival)
- Systolic B/P < 90
- Decreased level of consciousness (LOC) with GCS of < 10
- Penetrating injuries to head, torso, and neck
- RTS of < 10
- Amputations (proximal to wrist or ankle)
- Multi-system blunt trauma with unstable vital signs (BP < 90, RTS < 11, GCS < 14)
- Burns: Major or Moderate burns, as defined on the *BURNS* protocol
- Amputations (with reimplantation potential)
- Paralysis, numbness, or other signs of spinal cord injury
- Flail chest
- Open or suspected depressed skull fracture
- Unstable pelvis or suspected pelvis fracture
- Two or more long-bone fractures
- Fall > 10 feet

5. **Strongly consider** transport to a designated Level 1 or Level 2 trauma facility for the following, in the judgment of the paramedic and/or in conjunction with BIOTEL:
   - High energy event
   - Auto-pedestrian impact
   - Motorcycle or bicycle involvement
   - Patient > 65 years of age
   - Ejection from the vehicle
   - Death of occupant in same vehicle
   - Rollover mechanism
   - Bent steering wheel
   - Significant aggravated assault

6. **CONTACT BIOTEL FOR CODE 3 TRANSPORTS**

   **PEDIATRIC DOSES:**

   Fluid resuscitation 20 cc/kg bolus IV or IO; reassess; **CONTACT BIOTEL;** BIOTEL may repeat fluid bolus.

   Do not hesitate to proceed with intraosseous critically infusion for the injured, unresponsive child ≤ 8 years old.
TRAUMATIC CIRCULATORY ARREST

**DEFINITION:** This protocol applies to trauma patients who are unresponsive and have no vital signs, but who do not have obvious signs of irreversible death or mortal injury.

**TREATMENT:**
See appropriate ACLS protocols for drugs, etc. However, an airway and rapid transport are most important interventions for victims of traumatic arrest. *Minimize scene time, and perform ONLY critical interventions before transport.*

1. Intubate / Ventilate with 100% oxygen tidal volume of 10-15 cc/kg at RR 6-8 per minute / Immobilize spine
2. CPR
3. **LOAD & GO** — move as rapidly as possible towards an appropriate facility
4. En route: Monitor Lead II ECG, Pulse Oximetry, Capnography / IV NS or LR — 2 large-bore wide open
5. Transport to an appropriate receiving facility:
   a. Blunt Trauma (CPR in progress) Closest Hospital
   b. Penetrating Trauma (CPR in progress, intact airway)

   **SIGNS OF LIFE†** (if ever present): Closest Trauma Center

   **NO SIGNS OF LIFE‡:** Closest Hospital

7. **CONTACT BIOTEL**

**TREATMENT CONSIDERATIONS:**
**BLUNT TRAUMA:**
Bilateral pleural decompression: *Refer to APPENDIX N*
   a. **2nd intercostal space** over top of 3rd rib, in the mid-clavicular line, OR
   b. **4th intercostal space** (nipple line in males; infra-mammary crease line in females), over the top of the 5th rib in the mid-axillary line

This procedure should only be performed **IF:**
*Airway & ventilation have been confirmed,*
*Right mainstem bronchus intubation has been excluded,* and
*Fluid resuscitation has been unsuccessful.*

If you are unable to contact BIOTEL, and the above criteria are met, the procedure may be performed under standing orders, but BIOTEL should be contacted for report as soon as possible.

†SIGNS OF LIFE include: movement, vocalization, respiratory effort, swallowing, reactive pupils, reflexes, electrical cardiac activity (PEA, VF or other rhythm), measurable vital signs
VENTRICULAR FIBRILLATION (VF)
(and PULSELESS VENTRICULAR TACHYCARDIA)

DEFINITION: This protocol applies to patients who are apneic and pulseless with ventricular fibrillation, and to patients with pulseless ventricular tachycardia.

TREATMENT:

Contact BIOTEL after first round of drug if: renal failure; DKA; methanol ingestion; aspirin or cyclic antidepressant overdose.

1. CPR - until defibrillator is ready
2. Defibrillate up to 3 times (200/300/360 J), if needed for persistent VF/VT
3. CPR – Do NOT interrupt CPR more than the absolute minimum for defibrillation attempts, intubation, or procedures
4. Intubate / Ventilate 100% oxygen / monitor lead II ECG, pulse oximetry, capnography / IV NS TKO
5. Epinephrine 1:10,000 1mg IVP*
   Amiodarone 300 mg IVP*  
   Exceptions to Amiodarone:
   - pediatric patient < 13 years old
   - if no IV obtainable:
   - if patient is in traumatic arrest:

6. Defibrillate at 360 J if needed for persistent VF/VT
7. Epinephrine 1:10,000 1mg IVP*
   Lidocaine 1.5 mg/kg IVP*
8. Defibrillate at 360 J, if needed for persistent VF/VT
9. Epinephrine 1:10,000 1mg IVP*  
   Lidocaine 1.5 mg/kg IVP* (Note: the MAXIMUM COMBINED TOTAL DOSE of Lidocaine is 3 mg/kg)
10. Defibrillate at 360 J, if needed for persistent VF/VT
11. CONTACT BIOTEL
12. TREATMENT CONSIDERATIONS:
   a. Defibrillation
   b. Epinephrine 1:10,000 1mg IVP, repeat every 3 minutes*
   c. Amiodarone 150 mg IVP (one time)*
   d. Magnesium Sulfate (10%) 2 gm SLOW IVP (4 cc of 50% Magnesium Sulfate diluted with 16 cc NS)
   e. Calcium Chloride (10%) 10-15 mg/kg SLOW IVP*
   f. Sodium Bicarbonate (NaHCO3) 1 mEq/kg IVP*

   NOTE: Item “g” and “h” may be considered in the post-resuscitation phase (ROSC)
   g. Lidocaine drip 1-4 mg/minute
      Note: If patient is resuscitated prior to administration of Amiodarone or Lidocaine, bolus with 1.5 mg/kg lidocaine and go to step g
   h. Levophed drip 8-12 mcg/minute (Drug Drip Charts, page 53)

PEDIATRIC DOSES:

- Defibrillation @ 2 Joules/kg; Repeat @ 4 Joules/kg
- Epinephrine (1:10,000) 0.01mg/kg IVP or IO (0.1 cc per kg), repeat every 3 minutes
  OR, Epinephrine (1:1000) 0.1 mg/kg via ETT (0.1 cc per kg), if vascular access cannot be achieved
- Lidocaine 1.0 mg/kg IVP or IO
- CONTACT BIOTEL
- TREATMENT CONSIDERATION: Amiodarone 5 mg/kg IV in 100 cc NS IV over 30 minutes for pediatric patients less than 13 years of age (Do not administer via ET tube)

NOTE: If patient’s rhythm changes at any time during resuscitation, refer to the appropriate protocol.
VENTRICULAR TACHYCARDIA
(WIDE COMPLEX TACHYCARDIA with PULSE)

**DEFINITION:** This protocol applies to patients with a sustained or non-sustained wide complex tachycardia with a heart rate > 150 (slower rates seldom need treatment, contact BioTel for assistance). This includes rhythms known or presumed to be VT or unknown wide complex rhythms. **Any wide complex tachycardia that is or becomes pulseless, should be treated as Ventricular Fibrillation.**

**TREATMENT:**
1. Oxygen, monitor Lead II ECG, pulse oximetry, capnography, IV NS TKO

2. Conditions:
   a. If Non-sustained or PVC’s:
      - Obtain 12-Lead ECG & transmit to BIOTEL
   b. If Sustained:
      1. Conscious
         - Obtain 12-Lead ECG & transmit to BIOTEL
         - Lidocaine 1 mg/kg IVP* (no faster than 50 mg/min)
      2. Unconscious:
         - Synchronized cardioversion 100/200/300/360 joules *(Before IV)*
         - Lidocaine 1.5 mg/kg IVP*

3. **CONTACT BIOTEL**

4. **TREATMENT CONSIDERATIONS:**
   a. Non-sustained or PVC’s:
      - Lidocaine 1 mg/kg IVP* (no faster than 50 mg/min) followed by 0.5 mg/kg repeat bolus and drip (1-4 mg/minute)
   b. If Sustained
      1. Conscious
         - Additional Lidocaine* (no faster than 50 mg/min)
         - Valium 5mg SLOW IVP
         - \& synchronized cardioversion
         - (100/200/300/360 joules)
         - *Monitor for respiratory depression & hypotension*
         - Magnesium Sulfate 10% 2 Gm SLOW IV over 10 minutes
         - (4 cc of 50% Magnesium Sulfate diluted with 16 cc NS)
         - Amiodarone 150 mg IV over 10 minutes
      2. Unconscious:
         - Synchronized cardioversion
         - Additional Lidocaine*
         - Magnesium Sulfate 2 Gm. SLOW IV over 10 minutes
         - Amiodarone 150 mg IV over 10 minutes
         - Obtain 12-lead ECG & transmit to BIOTEL

* Maximum total dose of Lidocaine IVP or IO = 3 mg/kg

**PEDIATRIC DOSES:**

This is an unusual pediatric presentation.

- **CONTACT BIOTEL.**
  - Lidocaine = 1 mg/kg IV or IO; Biotel may repeat; maximum total dose = 3 mg/kg.
  - Amiodarone = 5 mg/kg SLOW IV or IO over 30 minutes; *Do not administer via ET tube.*
**VOMITING**

**DEFINITION:** This protocol applies to patients with prolonged vomiting, or to patients who are actively vomiting after EMS arrival.

*If trauma suspected, proceed to TRAUMA protocol. Do not administer Phenergan.*
*If altered level of consciousness, proceed to ALTERED LEVEL OF CONSCIOUSNESS protocol.*
*If overdose or poisoning suspected, proceed to POISONED PATIENT & OVERDOSE protocol.*

**TREATMENT:**

1. Assure patent airway, monitor perfusion, vital signs & pulse oximetry; capnography, and Lead II ECG, as indicated

2. IV NS TKO (consider bolus 250 – 500 cc NS if signs/symptoms of hypovolemia)*

2. Phenergan 12.5 mg SLOW IVP* or IM*  
   *Do NOT administer Phenergan to patients > 65 years of age, patients with altered LOC or debilitated patients. Observe for excessive sedation and dystonic reaction.*

4. CONTACT BIOTEL

*PEDIATRIC DOSES:*

It is very unusual to need drug treatment for emesis in pediatric patients. Most pediatric patients respond to fluid resuscitation.

- **IV NS, 20 cc/kg bolus; reassess vital signs and perfusion;** BIOTEL may repeat.  
  (If child is ≤ 8 years old, shows signs of shock and is unresponsive, consider IO infusion, if peripheral venipuncture is unsuccessful after 3 attempts.)

- **CONTACT BIOTEL**
<table>
<thead>
<tr>
<th>NAME / DOSE / ROUTE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activated Charcoal (Actidose)</strong> 1 gm/kg PO in suspension (adult &amp; pediatric)</td>
<td>Binds and adsorbs toxins</td>
</tr>
<tr>
<td><strong>Adenosine (Adenocard)</strong> 6 mg RAPID IVP (adult) Repeat doses: 12 mg RAPID IVP (adult)</td>
<td>Slows conduction through the AV node in narrow complex tachycardias, dilates blood vessels</td>
</tr>
<tr>
<td><strong>Albuterol</strong> 2.5 mg in NS via nebulizer (adult &amp; pediatric)</td>
<td>Bronchodilator for obstructive airway disease</td>
</tr>
<tr>
<td><strong>Alcaine</strong> 1-2 drops</td>
<td>Topical anesthetic for eyes</td>
</tr>
<tr>
<td><strong>Amiodarone (Cordarone)</strong> 300 mg IVP 1st dose in CPR (adult) 150 mg IVP repeat dose in CPR (adult) 150 mg SLOW IV over 10 min. for VT (adult) 5 mg/kg in 100 cc NC SLOW IV over 30 min. (pediatric)</td>
<td>Anti-arrhythmic; adverse effect: hypotension; contraindicated for trauma patients</td>
</tr>
<tr>
<td><strong>Aspirin (ASA)</strong> 325 mg PO (adult); may substitute four 81 mg. baby aspirin</td>
<td>Decreases platelet stickiness in suspected acute MI; anti-inflammatory</td>
</tr>
<tr>
<td><strong>Atropine</strong> 1.0 mg IVP or 2.0 mg ETT (adult) Maximum 0.04 mg/kg IVP (adult) 0.02 mg/kg IVP or IO (pediatric) Maximum 0.04 mg/kg IVP or IO (pediatric) 0.04 mg/mg ETT (pediatric)</td>
<td>Anti-cholinergic; Increases heart rate in bradyarrhythmias, reverses vagal tone during CPR; reverses effects of nerve agents</td>
</tr>
<tr>
<td><strong>Atrovent (Ipratropium bromide)</strong> 0.5 mg in 2.5 cc NS via nebulizer (adult &amp; pediatric older than 1 year of age) 0.25 mg in 2.5 cc NS via nebulizer (infants less than 1 year of age)</td>
<td>Anti-cholinergic; Bronchodilator; administered via nebulizer with beta-agonists. Contraindicated for patients allergic to soybeans, nuts, or peanuts.</td>
</tr>
<tr>
<td><strong>Benadryl (Diphenhydramine)</strong> 25-50 mg IVP or IM (adult) 1-2 mg/kg IVP, IO or IM (pediatric)</td>
<td>Antihistamine; Blocks side effects of phenothiazines; treatment of allergic reaction; treatment of dystonic reaction from phenergan</td>
</tr>
<tr>
<td><strong>Calcium Chloride 10%</strong> 10-15 mg/kg SLOW IVP (adult &amp; pediatric)</td>
<td>For hyperkalemic cardiac arrest, and for toxicity due to magnesium sulfate or calcium-channel blocker</td>
</tr>
<tr>
<td><strong>Dextrose 50%</strong> 25-50 gm IVP (adult) <strong>Dextrose 25% (dilute D50 1:1)</strong> 0.5 gm/kg (2 cc/kg) (pediatric 1 month. – 12 years of age) <strong>Dextrose 10% (dilute D50 1:4)</strong> 0.5 gm/kg (5 cc/kg) (neonates less than 1 month of age)</td>
<td>Restores circulating blood sugar level in hypoglycemia</td>
</tr>
<tr>
<td><strong>Diltiazem (Cardizem)</strong> 0.25 mg/kg SLOW IV (adult) Repeat dose: 0.35 mg/kg SLOW IV (adult)</td>
<td>Slows conduction through AV nose; used in narrow complex tachycardias; vasodilator; adverse effect: hypotension</td>
</tr>
<tr>
<td><strong>Dopamine (Intropin): refer to Drip Chart</strong> 400 mg/250 cc D5W or NS, IVPB 800 mg/500 cc D5W or NS, IVPB 2-10 mcg/kg/minute (adult and pediatric)</td>
<td>Peripheral vasoconstrictor; Increases force and rate of cardiac contractions</td>
</tr>
<tr>
<td>NAME / DOSE / ROUTE</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Epinephrine 1:10,000</strong></td>
<td></td>
</tr>
<tr>
<td>1 mg IVP every 3 minutes (adult CPR)</td>
<td></td>
</tr>
<tr>
<td>0.1 – 0.2 mg IVP (adult allergic reaction)</td>
<td></td>
</tr>
<tr>
<td>0.01 mg/kg (0.1 cc/kg) IVP or IO (pediatric CPR)</td>
<td></td>
</tr>
<tr>
<td>Stimulates heart by increasing rate and force of contractions; bronchodilator; vasoconstrictor (raises blood pressure); short half-life – may be given as frequently as every 3 minutes during CPR</td>
<td></td>
</tr>
<tr>
<td><strong>Epinephrine 1:1,000</strong></td>
<td></td>
</tr>
<tr>
<td>2.5 mg via ETT ONLY (adult CPR); dilute with 7.5 cc NS</td>
<td></td>
</tr>
<tr>
<td>0.3-0.5 mg SC (adult allergic reaction/asthma)</td>
<td></td>
</tr>
<tr>
<td>0.1 mg/kg (0.1 cc/kg)ETT ONLY (pediatric CPR); flush with 2-3 cc NS</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindicated if: patient age &gt; 45, COPD, CHF, s/p MI or heart disease, severe hypertension, labor or arrhythmias, UNLESS life-threatening emergency</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Glucagon</strong></td>
<td></td>
</tr>
<tr>
<td>1 mg IM or SC (adult and pediatric)</td>
<td></td>
</tr>
<tr>
<td>Converts stored glycogen to glucose, increasing blood sugar levels; also used as an antidote for beta-blocker overdose &amp; as a treatment consideration for patients on beta-blockers with anaphylaxis unresponsive to epinephrine</td>
<td></td>
</tr>
<tr>
<td><strong>Glucose (oral glucose)</strong></td>
<td></td>
</tr>
<tr>
<td>25 gm (one full tube) PO (adult &amp; pediatric)</td>
<td></td>
</tr>
<tr>
<td>Increases blood sugar for patients tolerating oral administration</td>
<td></td>
</tr>
<tr>
<td><strong>Lasix (Furosemide)</strong></td>
<td></td>
</tr>
<tr>
<td>40 mg SLOW IV or patient’s usual PO dose (adult)</td>
<td></td>
</tr>
<tr>
<td>Diuretic, vasodilator (acts initially as a vasoconstrictor)</td>
<td></td>
</tr>
<tr>
<td><strong>Levophed (Norepinephrine): Refer to Drip Chart</strong></td>
<td></td>
</tr>
<tr>
<td>4 mg/250 cc D5W or NS, IVPB</td>
<td></td>
</tr>
<tr>
<td>8 mg/500 cc D5w or NS, IVPB</td>
<td></td>
</tr>
<tr>
<td>8-12 mcg/minute</td>
<td></td>
</tr>
<tr>
<td>Potent peripheral vasoconstrictor; Increases blood pressure, especially post-resuscitation</td>
<td></td>
</tr>
<tr>
<td><strong>Lidocaine (Xylocaine)</strong></td>
<td></td>
</tr>
<tr>
<td>1.0 – 1.5 mg/kg IVP or ETT (adult)</td>
<td></td>
</tr>
<tr>
<td>1 mg/kg IV, IO or ET (pediatric)</td>
<td></td>
</tr>
<tr>
<td>Maximum total: 3 mg/kg (adult and pediatric)</td>
<td></td>
</tr>
<tr>
<td>Maximum infusion rate (conscious patients): 50 mg/minute</td>
<td></td>
</tr>
<tr>
<td>Suppresses ventricular ectopy</td>
<td></td>
</tr>
<tr>
<td><strong>Lidocaine Drip: Refer to Drip Chart</strong></td>
<td></td>
</tr>
<tr>
<td>After initial IV bolus:</td>
<td></td>
</tr>
<tr>
<td>1 gm/250 cc D5W or NS (4 mg/cc), IVPB</td>
<td></td>
</tr>
<tr>
<td>2 gm/500 cc D5W or NS (4 mg/cc), IVPB</td>
<td></td>
</tr>
<tr>
<td>1-4 mg/minute (15-60 gtt/minute)</td>
<td></td>
</tr>
<tr>
<td>Suppresses ventricular ectopy</td>
<td></td>
</tr>
<tr>
<td><strong>Lidocaine Jelly (Xylocaine)</strong></td>
<td></td>
</tr>
<tr>
<td>Cover distal end of ET tube liberally</td>
<td></td>
</tr>
<tr>
<td>Provides topical local anesthesia and lubrication for nasal intubation; apply to nasopharyngeal airway several minutes before intubation, if patient condition allows</td>
<td></td>
</tr>
<tr>
<td><strong>Magnesium Sulfate</strong></td>
<td></td>
</tr>
<tr>
<td>2 gm (10% solution) SLOW IVP over 10 minutes (adult)</td>
<td></td>
</tr>
<tr>
<td>Dilute 2 gm (4 cc) of 50% solution with 16 cc NS</td>
<td></td>
</tr>
<tr>
<td>Anti-arrhythmic for refractory VF, and wide complex tachycardia; Bronchodilator for obstructive pulmonary disease; adverse effect: hypotension; contraindicated for renal failure patients</td>
<td></td>
</tr>
<tr>
<td><strong>MARK 1 Autoinjector Kit</strong></td>
<td></td>
</tr>
<tr>
<td>2 mg Atropine PLUS 600 mg 2PAM Chloride; standard adult dose: 3 kits</td>
<td></td>
</tr>
<tr>
<td>standard dose (pediatric less than 10 years of age): 1 kit</td>
<td></td>
</tr>
<tr>
<td>Chemical agent antidote treatment kit for nerve agent or organophosphate exposure; repeat as necessary until bronchospasm and bronchorrhea improve (treatment endpoint); heart rate &amp; pupil size are NOT endpoints</td>
<td></td>
</tr>
<tr>
<td>NAME / DOSE / ROUTE</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Morphine Sulfate</strong> 2-4 mg SLOW IV (adult) 0.1 mg/kg SLOW IV (pediatric)</td>
<td>Opioid (narcotic) analgesic; decreases peripheral vascular resistance</td>
</tr>
<tr>
<td><strong>Narcan</strong> 2 mg IVP, ETT, IM (adult) 0.1 mg/kg IVP, ETT, IM (pediatric)(maximum dose 2 mg)</td>
<td>Narcotic (Opioid) antagonist; half life is shorter than that of many narcotics; may need to be repeated before hospital arrival</td>
</tr>
<tr>
<td><strong>Nitroglycerin (Nitrolingual spray)</strong> 0.4 mg metered dose 1 spray SL; repeat up to two additional doses if SBP &gt; 110 (adult)</td>
<td>Coronary and peripheral vasodilator; <strong>Contraindicated in a patient who has taken Viagra (sildenafil) or a similar drug within the past 24 hours.</strong></td>
</tr>
<tr>
<td><strong>Nitronox</strong> Mixture of O₂ &amp; nitrous oxide Inhalation (self-administer) (adult &amp; pediatric older than 8 years of age)</td>
<td>Analgesic</td>
</tr>
<tr>
<td><strong>Phenergan (Promethazine)</strong> 12.5 mg IVP, IM (adult) 1mg/kg (pediatric) (rarely indicated)</td>
<td>Anti-emetic; adverse effects: sedation, dystonic reaction</td>
</tr>
<tr>
<td><strong>Sodium Bicarbonate</strong> 1 mEq/kg IVP (adult &amp; pediatric)</td>
<td>Used to treat hyperkalemic cardiac arrest associated with metabolic acidosis due to renal failure; DKA; cyclic antidepressant, aspirin overdose; or methanol ingestion</td>
</tr>
<tr>
<td><strong>Valium (Diazepam)</strong> 2.5 – 10 mg SLOW IV, IM or ETT (adult) 0.5 mg/kg PR (rectal only) (pediatric)(maximum dose 10 mg)</td>
<td>Benzodiazepine; Muscle relaxant and anxiolytic; anti-convulsant; causes amnesia, sedation; adverse effects: respiratory depression and hypotension</td>
</tr>
</tbody>
</table>
**DOPAMINE (Intropin)**

<table>
<thead>
<tr>
<th>Desired Dose (mcg/kg/min)</th>
<th>LBS</th>
<th>KG</th>
<th>99</th>
<th>110</th>
<th>121</th>
<th>132</th>
<th>143</th>
<th>154</th>
<th>165</th>
<th>176</th>
<th>187</th>
<th>198</th>
<th>209</th>
<th>220</th>
</tr>
</thead>
<tbody>
<tr>
<td>400mg / 250 cc = 1600 mcg/cc</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800 mg / 500 cc = 1600 mcg/cc</td>
<td>800</td>
<td>85</td>
<td>90</td>
<td>95</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desired Dose (mcg/kg/min)</td>
<td>LBS</td>
<td>KG</td>
<td>45</td>
<td>50</td>
<td>55</td>
<td>60</td>
<td>65</td>
<td>70</td>
<td>75</td>
<td>80</td>
<td>85</td>
<td>90</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>2 microdrops per min</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>19</td>
<td>21</td>
<td>23</td>
<td>24</td>
<td>26</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>32</td>
<td>34</td>
<td>34</td>
<td>36</td>
<td>38</td>
</tr>
<tr>
<td>15</td>
<td>25</td>
<td>28</td>
<td>31</td>
<td>34</td>
<td>37</td>
<td>39</td>
<td>42</td>
<td>45</td>
<td>48</td>
<td>51</td>
<td>53</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>34</td>
<td>38</td>
<td>41</td>
<td>45</td>
<td>49</td>
<td>52</td>
<td>56</td>
<td>60</td>
<td>64</td>
<td>68</td>
<td>71</td>
<td>75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOREPINEPHRINE (Levophed)**

<table>
<thead>
<tr>
<th>4mg / 250 cc = 16mcg/cc</th>
<th>8mg / 500 cc = 16mcg/cc</th>
</tr>
</thead>
<tbody>
<tr>
<td>mcg/min</td>
<td>microdrops / min</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>10</td>
<td>38</td>
</tr>
<tr>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>14</td>
<td>52</td>
</tr>
<tr>
<td>16</td>
<td>60</td>
</tr>
<tr>
<td>18</td>
<td>68</td>
</tr>
<tr>
<td>20</td>
<td>76</td>
</tr>
</tbody>
</table>

**LIDOCAINE (1 Gm in 250 cc NS pre-mixed)**

<table>
<thead>
<tr>
<th>DOSE (mg/minute)</th>
<th>DRIP RATE (gtt/minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
</tr>
<tr>
<td>AGE</td>
<td>LBS</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CPR</td>
<td>CPR</td>
</tr>
<tr>
<td>0-1MO</td>
<td>8</td>
</tr>
<tr>
<td>3MO</td>
<td>11</td>
</tr>
<tr>
<td>6MO</td>
<td>13</td>
</tr>
<tr>
<td>1YR</td>
<td>22</td>
</tr>
<tr>
<td>2YR</td>
<td>26</td>
</tr>
<tr>
<td>3YR</td>
<td>30</td>
</tr>
<tr>
<td>4YR</td>
<td>35</td>
</tr>
<tr>
<td>5YR</td>
<td>40</td>
</tr>
<tr>
<td>6YR</td>
<td>44</td>
</tr>
<tr>
<td>7YR</td>
<td>48</td>
</tr>
<tr>
<td>8YR</td>
<td>52</td>
</tr>
<tr>
<td>9YR</td>
<td>57</td>
</tr>
<tr>
<td>10YR</td>
<td>61</td>
</tr>
<tr>
<td>11YR</td>
<td>66</td>
</tr>
<tr>
<td>12YR</td>
<td>70</td>
</tr>
<tr>
<td>13YR</td>
<td>74</td>
</tr>
<tr>
<td>77</td>
<td>35</td>
</tr>
</tbody>
</table>
**UTSW / BIOTEL EMS SYSTEM: APPENDIX A**

**ENDOTRACHEAL TUBE VERIFICATION CHECKLIST**

This form will be completed when an oral or nasal endotracheal (ET) tube or alternate airway is inserted. It includes the methods that the paramedic is REQUIRED to use in the UTSW/BioTel EMS System to confirm that the ET tube is correctly placed in the trachea. Reassess patient condition, vital signs, capnography & pulse oximetry Q 5 min. for ET tube surveillance.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>AGE:</strong> ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>SEX (Circle one):</strong> M F</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td>Visualized that the ET tube passed through the vocal cords (if oral intubation); noting cords above the ET tube balloon</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>N/A</td>
<td>In nasotracheal intubation, patient spontaneously breathed through the tube after mouth and nares closed off (recognizing, however, that the ET tube may still be sitting near the entrance of the vocal cords)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Noted ET tube depth marking _____ cm at front teeth (in oral intubation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>OR</strong> Noted Nasal ET tube depth marking ______ cm at nasal opening (in nasal intubation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bulb or syringe (Esophageal Detection Device) showed free flow of air</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absence of epigastric sounds upon delivery of first ventilation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Auscultated bilateral breath sounds (below clavicles first)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Visualized equal, bilateral rise and fall of the chest wall</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Applied a cervical collar on the patient to minimize movement of the ET tube</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Taped/secured ET tube in place, ensuring same depth of original front teeth marking</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>OR</strong> Taped/secured Nasal tube in place, ensuring same depth of original nasal opening marking</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Re-assessed ET tube placement after securing tube, after any patient movement, or after possible ET movement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Capnography reading was appropriate for tracheal placement (rise and fall after 5 breaths)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Capnography reading <strong>PEAK:</strong> AFTER 5 MINS:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pulse oximeter showed good saturation (&gt;95% on 100% oxygen) in patients with full circulation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pulse oximeter reading <strong>POST INTUBATION:</strong> %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alternate Airway used: Combitube ____ LMA ____ Other (specify) ___________________</td>
</tr>
</tbody>
</table>

**COMMENTS:**

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

**Paramedics participating in the intubation procedure:**

<table>
<thead>
<tr>
<th>Print Name</th>
<th>Employee #</th>
<th># of Attempts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Success (Circle one)**

<table>
<thead>
<tr>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Medical Director Review _____**

Attach this form to the Run Sheet that is submitted to the Fire Department.
CHEST PAIN CHECKLIST

This checklist is used by the EMT/Paramedics to screen for Acute Coronary Syndrome (ACS)*, and to assist in field triage of those patients for whom fibrinolytic therapy or Percutaneous Coronary Intervention (PCI) may be indicated. The information on this checklist should be provided in report to BIOTEL, and to the receiving hospital personnel upon arrival. ***Note: Do NOT administer NTG to any patient who has taken Viagra or similar drugs in the past 24 hours.

I. Fibrinolysis INCLUSION Criteria: In order for a patient to be an immediate candidate for fibrinolysis or PCI, it generally requires that the first 4 items below are checked “Yes” AND also that the 12 lead ECG indicates S-T elevations in at least two contiguous leads, and/or that there is a new or presumably new Left Bundle Branch Block (LBBB):

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 lead ECG performed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ongoing non-pleuritic chest discomfort (&gt;20 min and &lt; 12 hours)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient is oriented and can cooperate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age &gt;35 years for men or &gt;45 years for female</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. Fibrinolysis EXCLUSION Criteria: In order to be considered an immediate candidate for fibrinolysis, all the following answers generally should be checked “No”:

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP &gt; 180/110 mm Hg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of stroke or TIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known bleeding disorder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active internal bleeding in past 4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgery or significant trauma in past 4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaundice, hepatitis, or kidney failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of anti-coagulants</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Systolic/Diastolic Blood Pressure

<table>
<thead>
<tr>
<th>Right arm mmHg</th>
<th>Left Arm mmHg</th>
</tr>
</thead>
</table>

III. High-Risk Indications for transport to Specialized Center: If any of the following is present, consider direct transport to a center with immediate catheterization and cardiac surgical support capable of angiography and revascularization:

- Heart rate >100 bpm and Systolic Blood Pressure <100 mm Hg, OR
- Pulmonary edema (rales ≥ ½ way up posterior lung fields), OR
- Signs of Shock

Completed by: ___________________________ Printed name: ___________________________

Paramedic Signature

Date: ________________

*For any questions regarding specific elements, always CONTACT BIOTEL

Attach this form to the copy of the Run Sheet that remains with the patient at hospital.
## STROKE EVALUATION SHEET: APPENDIX C

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
<th>UNKNOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Patient age 18 years or older?</td>
<td>☐️</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>2. Symptom(s) onset 3.5 hours or less?</td>
<td>☐️</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>3. Are any one or more of the following present?</td>
<td>☐️</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>a. Facial droop</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Sudden asymmetry in neurological exam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Weak grip or loss of grip</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Arm drift (pronator drift)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Sudden abnormal speech</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Sudden imbalance in walking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Acute arm and/or leg weakness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Sudden loss of vision</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the answers to questions 1, 2 and 3 are ALL “YES”, the patient is considered to be having an acute stroke event under this protocol. (Refer to “STROKE (ACUTE)” Protocol.)

If the answer(s) to any of these 3 questions is “NO” or “UNKNOWN”, then the patient should be transported to the closest appropriate facility or to the hospital of the patient’s choice.

1: Ask the patient to smile:
   asymmetry of the facial expression suggests facial droop.
2: Ask the patient to hold his/her arms outstretched, palms down, straight in front at shoulder level, eyes closed:
   dropping of one arm, with a rotation to palm up position, suggests pronator drift.
3: Ask patient to recite a common nursery rhyme:
   slow or slurred speech or abnormal words suggests abnormal speech
4: This may be unilateral, and the patient may describe the vision loss like a “curtain”

 Attach this form to the copy of the Run Sheet that remains with the patient at hospital.
I. ESTIMATED BURN SIZE (% BODY SURFACE AREA, “BSA”) for deep burns†:
A. Wallace’s “Rule of Nines”:*  

![ADULT BURN DIAGRAMS](image1)

![INFANT BURN DIAGRAMS](image2)

B. “1% Rule”: The area of the patient’s palm and fingers ≈ 1% BSA

II. ESTIMATED BURN DEPTH by appearance†:
A. Superficial: Blistering; dermis pink & blanching; painful; sensation intact  
B. Deep:  
   1. Deep dermal: Brownish; mottled; sensation variable  
   2. Full thickness: Leathery, thick; may be charred or white; no sensation; no pain

III. ESTIMATED FLUID RESUSCITATION REQUIREMENTS:
A. Parkland Burn Formula: 4 cc. per kg. body weight per % deep burn during the first 24 hours  
   1. To calculate: multiply 4 X kg. X % burn = total fluid requirement  
   2. Give half of this amount during the first 8 hours from the time of injury  
   3. In most cases, this will work out to 2 large bore IV’s wide open until hospital arrival  
      a. Monitor and record the exact amounts given, and provide hospital personnel with this information  
   4. Lactated Ringer’s is the preferred fluid, if available

*NOTE: Estimation of burn size in the field can be difficult. The “Rule of Nines” and “1% Rule” are only approximate and can result in large miscalculations of fluid requirements. A “Lund & Browder” diagram is more accurate, but too cumbersome for the field.
†NOTE: Estimation of burn depth in the field is also difficult, and may change with progression of the injury over time.
CAPNOGRAPHY INTERPRETATION

RESPIRATORY CYCLE:
- Oxygenation: oxygen is inhaled into the lungs and carried into the blood
- Ventilation: CO₂ is transported back from the blood to the lungs & exhaled
  - Relationship between CO₂ & respiratory rate (RR):
    - ↑ RR = ↓ CO₂ = HYPERventilation (ETCO₂ < 35) → resp. alkalosis
    - ↓ RR = ↑ CO₂ = HYPOventilation (ETCO₂ > 45) → resp. acidosis

CAPNOGRAPHY = “The VENTILATION VITAL SIGN”:
- INTUBATED APPLICATIONS:
  - Verification of ETT placement
  - ETT surveillance during transport
  - CPR: compression efficacy, early sign of ROSC, survival predictor
- NON-INTUBATED APPLICATIONS:
  - Bronchospasm: asthma, COPD, anaphylaxis
  - Hypoventilation: drugs, stroke, CHF, post-ictal
  - Shock & circulatory compromise
  - Hyperventilation syndrome: biofeedback monitor

NORMAL RANGE of ETCO₂: 35 – 45 mm Hg

3 QUESTIONS to ASK EVERY TIME CAPNOGRAPHY IS USED:
1. IS THE ETT TUBE IN THE TRACHEA (rise and fall of detectable CO₂)?
2. WHAT IS THE ETCO₂ VALUE (height of the waveform)?
3. WHAT IS THE SHAPE OF THE WAVEFORM?

CAPNOGRAPHY WAVEFORM ANALYSIS:

NORMAL: “Square box” waveform; baseline CO₂ = 0; ETCO₂ = 35-45 mm Hg
Management: Monitor

DISLODGED ETT: Loss of waveform, Loss of ETCO₂ reading
Management: Replace ETT

ESOPHAGEAL INTUBATION: Absence of waveform, Absence of detectable ETCO₂
Management: Re-intubate

CPR: “Square box” waveform; baseline CO₂ = 0; ETCO₂ = 10-15 mm Hg (possibly higher) with adequate CPR
Management: Change rescuers if ETCO₂ drops < 10
CAPNOGRAPHY WAVEFORM ANALYSIS (CONTINUED):

“SHARKFIN” with/without prolonged expiration = Bronchospasm (asthma, COPD, allergic rxn):
Management: Bronchodilators (Albuterol, Atrovent, or epinephrine)

ROSC: As in CPR, but ETCO₂ rises above 10-15 mm Hg
Management: Check for pulse; contact BIOTEL for drip authorization

RISING BASELINE = Patient is rebreathing CO₂:
Management: Check equipment for adequate oxygen inflow
Allow intubated patient more time to exhale

HYPOVENTILATION: ↓ RR; Prolonged waveform; baseline CO₂ = 0; ETCO₂ > 45 mm Hg
Management: Assist ventilations or intubate, if needed

HYPERVENTILATION: ↑ RR; shortened waveform; baseline ETCO₂ = 0; ETCO₂ < 35 mm Hg
Management: Biofeedback if conscious
↓ assisted ventilation rate if unconscious/intubated

**Important exceptions: Severe metabolic acidosis (DKA, sepsis, salicylate poisoning, acute renal failure, methanol ingestion, tricyclic overdose) will cause tachypnea (↑↑ RR), but ETCO₂ will be HIGH.
**In other words, if RR is high, but ETCO₂ is also high, consider the above diagnoses. This is NOT normal!

PATIENT BREATHING AROUND ET TUBE: angled, sloping downstroke on waveform
Adult: Broken cuff or tube is too small   Pediatric: tube is too small
Management: Assess patient, oxygenation, ventilation; may need to reintubate
I. CHEMICAL EXPOSURE: Consult with BIOTEL or POISON CONTROL CENTER for any questions

A. NERVE AGENTS:

1. Possible agents: Volatile: Tabun (GA), Sarin (GB), Soman (GD); Non-volatile: VX
   a. Volatile agents: most exposed are patients symptomatic < 1 hr. after exposure
      - A patient who is not symptomatic >1 hr. after exposure is not likely to become seriously ill
   b. VX: symptom onset may be up to 18 hr. after exposure

2. COMMON PATIENT SIGNS & SYMPTOMS = “DUMBBELS”:
   a. D Defecation
   b. U Urination
   c. M Miosis (pinpoint pupils)
   d. B Bronchorrhea (wet lungs, pulmonary edema)†
   e. B Bronchospasm†, Bradycardia
   f. E Emesis
   g. L Lacrimation (tearing)
   h. S Salivation

3. LESS COMMON PATIENT SIGNS & SYMPTOMS = “MTWtHF”:
   a. M Mydriasis (dilated pupils)
   b. T Tachycardia
   c. W Weakness
   d. H Hypertension
   e. F Fasciculations (muscle twitching)

4. TREATMENT: CONTACT BIOTEL as soon as possible
   OBSERVE SCENE SAFETY MEASURES & AVOID BECOMING CONTAMINATED
   Patient decontamination: remove clothing & shoes; wash w/large amounts of soap, warm water
   Monitor HR, BP, RR, Lead II ECG, pulse oximetry, capnography, airway; monitor for HYPERthermia

   a. AIRWAY: †HYPOXIA due to bronchorrhea & bronchospasm is the major cause of death
      i. 100% oxygen
   b. BREATHING: Severe bronchospasm will create very high airway resistance
      i. Ventilation may be difficult until patient receives antidote
      ii. Frequent suctioning will be required
      iii. Improvement in ventilatory status is the treatment endpoint for antidote administration†
   c. CHEMICAL ANTIDOTES‡:
      i. ATROPINE: Start with 2-6 mg. IM or IV, but total doses up to 15 or 20 mg. may be required†
      ii. 2-PAM (Pralidoxime Chloride): 600 mg (1 autoinjector) to 1800 mg (3 autoinjectors)† IM
         Note: 2-PAM does NOT reverse bronchorrhea or bronchospasm, so it MUST be given with atropine
   d. DIAZEPAM: 5-10 mg. IV @ 2 mg/min, OR 10 mg. IM
      i. Administer even BEFORE seizures develop
   e. ENDPOINT for antidote administration: improvement in patient’s respiratory status
      i. NOT pupil size or heart rate
   f. Rapid transport
   g. CONTACT BIOTEL

‡ Military autoinjector kits (MARK 1) contain 2 mg. Atropine & 600 mg. 2-PAM for IM injection. These are more effective than routine IM injection. If kit is unavailable, but patient has IV access, begin immediate treatment with Atropine 2 mg IVP.

*PEDIATRIC DOSES: CONTACT BIOTEL
UTSW / BIOTEL EMS SYSTEM: APPENDIX F

CONTAMINATED PATIENT (CONTINUED)

I. CHEMICAL EXPOSURE:

B. CYANIDE:

1. SUSPECT CYANIDE IF:
   a. Large number of victims from the same location with non-specific symptoms
   b. Reports of fatalities near the attack epicenter
   c. Lack of “nerve agent” toxidrome or “irritant gas” toxidrome

2. COMMON PATIENT SIGNS & SYMPTOMS: Vary with form, concentration & route of exposure
   a. CNS: Excitement, dizziness, headache, weakness; drowsiness, hallucinations or seizures
   b. RESPIRATORY: Intense shortness of breath & air hunger, chest tightness, tachypnea (early); pulmonary edema due to irritant effect in lungs
   c. CARDIOVASCULAR: Hypertension (early & transient), tachycardia (early & transient), ventricular arrhythmias, bradycardia (late), irreversible hypotension (late), fatal arrhythmias
   d. SKIN: Localized irritation, eyelid irritation & swelling
   e. HEMATOLOGIC: Bright red venous blood (characteristic, but inconsistent finding), or cyanosis

3. TREATMENT: CONTACT BIOTEL as soon as possible
   OBSERVE SCENE SAFETY MEASURES & AVOID BECOMING CONTAMINATED
   TIME IS CRITICAL; DECONTAMINATION & TREATMENT must proceed simultaneously, if patient is symptomatic

   Patient decontamination: remove clothing & shoes; wash w/large amounts of soap, warm water
   ▪ For gas exposure only: Dry decontamination is sufficient
   ▪ For ingestion: Do NOT induce vomiting; administer charcoal 1-2 gm/kg PO
   ▪ For eye & mucous membrane exposure: Remove contact lenses; flush with water for 5 min.

   Monitor HR, BP, RR, Lead II ECG, pulse oximetry, capnography, airway; monitor for HYPOthermia
   a. ADMINISTER 100% oxygen, IV NS TKO
   b. SPECIFIC ANTIDOTES:
      i. AMYL NITRITE: break perle into a gauze pad & hold under nose, over BVM device, or under the lip of a face mask; have patient inhale for 30 seconds per every minute; use new perle every 3 minutes*; repeat until IV access is established
      ii. SODIUM NITRITE: 10 cc. of 3% solution (300 mg) SLOW IV over at least 5 minutes* Monitor for hypotension & slow the infusion rate if this develops
      iii. SODIUM THIOSULFATE: 50 cc. of 25% solution (12.5 gm.) SLOW IV over 10-20 minutes* BIOTEL may repeat
   c. ALBUTEROL & ATROVENT: 2.5 mg Albuterol + 0.5 mg. Atrovent via nebulizer for bronchospasm*
   d. Rapid transport
   e. CONTACT BIOTEL

*PEDIATRIC DOSES:

Amyl nitrite: Same as adult
Sodium nitrite: 0.3 cc/kg SLOW IV or IO for children < 10 years of age
Sodium thiosulfate: 1.6 cc/kg SLOW IV or IO for children < 10 years of age
Albuterol: Same as adult for children > 1 year of age; Albuterol 2.5 mg. + Atrovent 0.25 mg, for infants < 1 year of age
CONTACT BIOTEL
I. CHEMICAL EXPOSURE:

C. BLISTERING AGENTS (Vesicants):

1. Possible agents: Sulfur Mustard (HD), Nitrogen Mustard (HN), Lewisite, Phosgene Oxime (CX)
   a. Skin exposure
   b. Vapor exposure: mustard 3 times more toxic than a similar concentration of cyanide gas

2. PATIENT SIGN & SYMPTOMS: Warm, moist tissues affected most severely
   a. SKIN: Itching, burning, stinging (early); redness, edema; blistering; full-thickness burns
   b. EYES: Pain, foreign body sensation, light sensitivity, tearing, blurry vision, redness, corneal ulcers, temporary or permanent blindness
   c. RESPIRATORY: Upper tract – sore throat, burning pain, hoarseness, sinusitis, congestion
   d. GI: Abdominal pain, nausea, vomiting, diarrhea, weight loss (late)
   e. HEMATOLOGIC: Loss of white blood cells (3-5 days post exposure), anemia & loss of platelets (late)

3. TREATMENT: OBSERVE SCENE SAFETY MEASURES & AVOID BECOMING CONTAMINATED
   TIME IS CRITICAL: DECONTAMINATION & TREATMENT must proceed simultaneously, if patient is symptomatic
   a. IMMEDIATE DECONTAMINATION:
      i. Preferably within 2 minutes of exposure, to prevent irreversible effects
      ii. Remove clothing, shoes, jewelry, contact lenses
      iii. Wash skin with soap and warm water; do not scrub or use hot water
      iv. Irrigate eyes with water or saline for at least 15 minutes
   b. Secure airway, intubate if needed, 100% oxygen: monitor for deterioration
   c. Monitor HR, RR, BP, Lead II ECG, pulse oximetry, capnography, airway & ventilation
   d. IV NS TKO
      i. Consider IV NS fluid bolus if significant exposure
      ii. Fluid losses are less than those with thermal burns; avoid over-hydration
   e. Analgesia according to the PAIN protocol
   f. Albuterol 2.5 mg via nebulizer for wheezing
   g. Rapid transport
   h. CONTACT BIOTEL

*PEDIATRIC DOSES* Management is the same as for adults; then CONTACT BIOTEL
I. CHEMICAL EXPOSURE:

D. CHOKING AGENTS (Pulmonary agents):

1. Possible agents: Phosgene (CG), Diphosgene (DP), Chlorine (Cl), Chloropicrin (PS), Ammonia
   a. Generally present with EXPOSURE, not contamination, so decontamination is not needed for gas exposure
      i. Patients exposed to liquid phosgene may contaminate other personnel from off-gassing vapor
   b. Water-solubility determines whether upper, lower or both parts of respiratory tract are damaged
      i. Water-soluble (ammonia, formaldehyde): Upper
      ii. Less water-soluble (chlorine): Upper & Lower
      iii. Minimally water-soluble (phosgene): Lower

2. PATIENT SIGNS & SYMPTOMS:
   a. Phosgene: mild cough, chest tightness, shortness of breath (low levels); tearing (moderate levels); severe non-cardiogenic pulmonary edema, with cyanosis & respiratory failure (high levels); death in 24-48 hr.
      i. Associated symptoms at the time of exposure: Nausea, vomiting, headache, tearing, cough
      ii. Severity of symptoms at the time of exposure does NOT predict the severity of the exposure
      iii. Odor of newly mown hay; however, toxic levels may be present without odor
   b. Chlorine: Irritation of nose, pharynx, larynx, trachea & bronchi, with inflammation & local edema; severe non-cardiogenic pulmonary edema with hypoxia & possible hypotension (heavy exposure);
      i. Associated symptoms: Eye irritation (low levels); corneal abrasions & burns (high levels)

3. TREATMENT:
   OBSERVE SCENE SAFETY MEASURES & AVOID PERSONAL EXPOSURE
   Patients exposed to LIQUID PHOSGENE will need decontamination
   There is no specific antidote for these agents – treatment is supportive
   a. MOVE PATIENT to a CLEAN ATMOSPHERE AS SOON AS POSSIBLE
   b. 100% oxygen
   c. Monitor HR, RR, BP, Lead II ECG, pulse oximetry, capnography, airway status
      i. Assist or intubate, if needed
      ii. Pulmonary symptoms may be delayed up to 4-6 hours after exposure
   d. IV NS TKO (patient may require fluid boluses if SBP < 100 due to fluid shifts)
   e. Albuterol 2.5 mg via nebulizer for wheezing or bronchospasm
   f. For eye involvement:
      i. Check pH of tears with pH paper, if possible
      ii. Irrigate with normal saline until pH returns to 7.4
   g. CONTACT BIOTEL

*PEDIATRIC DOSES*:

Management is the same as for adults; then CONTACT BIOTEL
I. CHEMICAL EXPOSURE:

E. LACRIMATOR AGENTS (Tear Gas):

1. Widely used by law enforcement & the military

2. PATIENT SIGNS & SYMPTOMS:
   a. MUCOUS MEMBRANES: Burning sensation, watery discharge from nose
   b. EYES: Burning sensation, light sensitivity, tearing
   c. RESPIRATORY: Chest tightness & shortness of breath with prolonged exposure
   d. SKIN: Blistering with prolonged exposure
   e. SECONDARY INJURIES: Blunt or penetrating traumatic injuries from explosive discharge or kinetic effects of projectiles

3. TREATMENT:
   OBSERVE SCENE SAFETY MEASURES & AVOID PERSONAL EXPOSURE
   PROTECTIVE CLOTHING & MASKS REQUIRED to prevent transmission by physical contact

   a. DECONTAMINATE: Blot and cleanse with copious soap and water; irrigate eyes with copious normal saline for at least 5 minutes
   b. 100% oxygen for symptomatic patients
   c. Assess for & treat secondary injuries
   d. Transport patients with respiratory symptoms and/or prolonged exposure
      i. Monitor HR, BP, RR, pulse oximetry, capnography
      ii. CONTACT BIOTEL

*PEDIATRIC DOSES: Management is the same as for adults; then CONTACT BIOTEL
I. CHEMICAL EXPOSURE:

F. INCAPACITATING AGENTS:

1. Intended to produce temporary incapacitation, not death or permanent injury

2. Possible agents: “BZ” (3-quinuclidinyl benzilate) & others

3. PATIENT SIGNS & SYMPTOMS: “ANTI-CHOLINERGIC TOXIDROME”
   SLOW ONSET (start at 1 hr., peak at 8 hr.), and LONG DURATION (48-72 hr.) after exposure
   a. “Dry as a bone”: Dry skin & mucous membranes
   b. “Blind as a bat”: Dilated pupils with blurred vision
   c. “Red as a beet”: Flushed facial skin
   d. “Hot as a hare”: Elevated body temperature
   e. “Mad as a hatter”: Hallucinations, nonsensical speech, mumbling, stupor, disrobing, picking behavior
   f. Resting tachycardia

4. TREATMENT: Generally SUPPORTIVE and PROTECTIVE
   a. Assess and support Airway, Breathing, and Circulation
   b. Monitor HR, RR, BP, Lead II ECG, pulse oximetry, capnography, and temperature
      i. Hyperthermia is a significant risk, if environmental temperature > 75°F
   c. Loose physical restraints may be necessary
   d. IV NS TKO
   e. Rapid transport: specific antidote (physostigmine) available only in Emergency Department
   f. CONTACT BIOTEL

*PEdiATRIC DOSES: Management is the same as for adults; then CONTACT BIOTEL
ESOPHAGEAL-TRACHEAL COMBITUBE® INSERTION

DESCRIPTION: The ETC is a twin-lumen plastic tube. One lumen resembles an EOA (Esophageal Obturator Airway), with a blind distal end. The other lumen resembles a standard ET tube. The ETC comes in 2 sizes; the smaller SA is adequate for most patients less than 5.5 feet tall. The ETC has TWO balloons: a large, proximal balloon, and a smaller, distal balloon. The ETC is inserted blindly. Ventilation & oxygenation can be achieved through one lumen or the other, regardless of whether the ETC enters the esophagus or the trachea. It usually enters the esophagus.

INDICATIONS: The Esophageal-Tracheal Combitube® (ETC) is a secondary airway device, & should be treated as such. It should be used ONLY when two attempts at orotracheal or nasotracheal intubation have been unsuccessful. These unsuccessful attempts must be documented on the Run Sheet. The patient must be unresponsive, as in cardiac and/or respiratory arrest.

CONTRAINDICATIONS:
1. Patient with intact gag reflex
2. Patient with esophageal trauma or caustic substance ingestion
3. Known or suspected foreign body airway obstruction
4. Known esophageal disease (e.g. reflux, cancer, varices, scleroderma)
5. Children under 16 years of age, unless at least 5 feet tall
6. Patient less than 5 feet tall (unless the smaller Combitube SA is used; it is suitable for patients ≥ 4 feet tall)

PROCEDURE: Observe body substance isolation precautions.
1. Provide 100% oxygen via BVM, monitor Lead II ECG, pulse oximetry, capnography.
2. Test the cuffs on the ETC prior to insertion.
3. Lubricate the distal tip of the device with water-soluble jelly.
4. Position the patient’s head in a neutral or sniffing position.
5. Open the airway with a tongue-jaw lift maneuver. A laryngoscope may be used to help lift the jaw.
6. Gently insert the device blindly in the midline and to a depth where the printed ring is aligned with the incisors.
7. Inflate line 1 (blue pilot balloon) leading to the pharyngeal cuff with 85-100* cc. of air from the 140 cc. syringe, then remove the syringe. Do not over-inflate past the point of “no leak”.
8. Inflate line 2 (white pilot balloon) leading to the distal cuff with approximately 12-15* cc. of air from the 20 cc. syringe, then remove the syringe. Do not over-inflate.
9. Attach the BVM & capnography sensor to the blue lumen (lumen 1, esophageal placement) and attempt to ventilate.
10. Confirm placement & ventilation through the correct lumen by observing for chest rise, auscultation over the epigastrium, and bilateral auscultation over the lung fields:
   a. If the chest rises, there are no epigastric sounds and ETCO₂ readings are detected, continue ventilation through blue lumen.
   b. If the chest does not rise, epigastric sounds are present with ventilation, there is no detectable ETCO₂, and poor breath sounds are heard, remove the BVM from the blue lumen and attach it to the white lumen (lumen 2, tracheal placement).
11. Properly secure the device, and reassess every 5 minutes or after every patient movement or manipulation.

COMPLICATIONS:
Sore throat; dysphagia; upper airway hematoma; esophageal rupture; hemodynamic instability (hypotension and/or bradycardia), which can be minimized by avoiding over-inflation of the cuffs*.

*The volumes on the package insert are 100 cc. and 15 cc., respectively, for the regular size, and 85 cc. and 12 cc. for the SA. However, to minimize the risk of upper airway trauma, esophageal rupture and hemodynamic instability, use the minimal volume necessary to achieve an effective seal.

Written April 2003   UTSW/Biotel EMS System
DEFINITION: This protocol applies to termination of resuscitation efforts in the out-of-hospital setting, and applies to the ADULT patient who experiences a non-traumatic cardiac arrest, and who meets the specific criteria for futility of further resuscitation efforts.

INCLUSION CRITERIA:
The paramedic at the scene may initiate the policy to terminate field resuscitation efforts, if ALL of the following criteria are met:

1. Patient is an adult (≥ 18 years old).
2. Patient must have had a presumed primary cardiac arrest (i.e., the arrest is NOT associated with hypothermia, hyperthermia, drug overdose, toxicological exposures, airway obstruction, or electrocution).
3. Patient should have an appropriately placed endotracheal tube (confirmed by methods discussed in Airway Management in the EMS Protocols, including capnography), as well as patent IV access, and must have advanced life support (ALS) measures applied throughout the initial resuscitation effort.
4. On-scene resuscitation efforts by paramedics will be sustained for a minimum of 20 minutes, regardless of previous CPR time and the arrest interval. Time begins with paramedic initiation of ALS care (IV, ETT).
5. In the event a patient arrests in the presence of EMS personnel, the time of on-scene advanced resuscitation efforts by paramedics will be extended to 30 minutes.

EXCLUSION CRITERIA:
Resuscitation efforts will NOT be terminated on-scene if the patient meets ANY of the following exclusion criteria:

1. Paramedic is unable to contact BIOTEL.
2. Patients is < 18 years old.
3. Patient is visibly pregnant (> 20 weeks).
4. The patient whose cardiac arrest MAY BE associated with hypothermia, hyperthermia, drug overdose, toxicological exposures, airway obstruction, or electrocution.
5. Patient is a victim at a crime scene, or is in police custody.
6. Patient is in a crowded public place, excluding patients in nursing homes or extended care facilities.
7. Scene situations place the EMS personnel in jeopardy.
8. Family member conflict or disagreement.
9. Inability to communicate with family present at scene or in telephone contact, due to language or cultural barrier.
10. The patient who has persistent pulseless ventricular fibrillation (VF), ventricular tachycardia (VT), any narrow QRS complex, or any organized QRS complex at a rate of ≥ 40.
11. The patient who demonstrates any neurological signs (i.e. spontaneous eye or body movement).
12. If the patient has had a return of spontaneous pulse (even a transient pulse) and then reverts back to a pulseless rhythm, the resuscitation time begins again for an additional 20 minutes.
GUIDELINES:

1. If a patient remains unresponsive to ALS resuscitation measures after 10 minutes and meets Section 1, 2, and 3 of the Inclusion Criteria, BIOTEL will be contacted by telephone.

2. The paramedic on scene will discuss the situation with the BIOTEL physician.

3. The BIOTEL physician may then give permission to terminate the resuscitation effort and pronounce the patient dead, assuming there is no further response. Land-line conversation between physician and family members is an option (do not use the radio).

4. During the initial resuscitative effort, EMS personnel or appropriate fire/rescue personnel will inform the family of the progress of the resuscitative efforts (or lack thereof) and will begin to advise the family of the on-line medical direction and eventually the recommendation to terminate efforts if there is no further response to treatment.

5. After a full disclosure of resuscitation efforts and possible termination procedure, if any family member or responsible party indicates their objection to termination of resuscitation efforts, the resuscitation will continue until care is assumed by the receiving emergency department physician. As usual, EMS personnel will take EMS and community safety into consideration during transport.

6. Upon termination of the resuscitation effort, EMS personnel shall tie off any established intravenous lines (IV) and remove the IV fluid bag. DO NOT remove the IV catheter from the site or the endotracheal tube (ETT) from the oral or nasal orifice.

7. EMS personnel or designee will contact the dispatch center for notification of the Medical Examiner (ME) and/or chaplain (if applicable according to local fire department standards). Management of scene will be according to locally established protocols.

8. At all times, the EMS personnel will be attentive to the social and psychological support needs of the survivors (e.g. family, friends, witness) and provide support as needed.

NOTE: It is generally recommended that a decision be made to either transport or cease resuscitation once ALS efforts have persisted for 20 minutes (EXCEPTION: PERSISTENT Ventricular Fibrillation). Transport may be initiated sooner if logistics or scene situations warrant the movement of the patient.

DOCUMENTATION:

Information surrounding the events of the resuscitative efforts and the time of death will be properly recorded on the EMS run form. Documentation should include, but is not limited to:

- patient demographics
- medical condition of the patient (history, medications, allergies)
- treatment rendered
- capnography readings following endotracheal intubation & during resuscitation
- response to treatment
- scene situation, including family response to event
- witness(s) on scene
- time of pronouncement by physician
- pronouncing physician’s name
- paramedic names
NASOTRACHEAL INTUBATION

**INDICATIONS:** This procedure is indicated for patients who require definitive airway management for oxygenation, ventilation and/or airway protection, and for whom orotracheal intubation is impossible or contraindicated due to patient presentation or condition. Candidates for this procedure include: conscious, spontaneously breathing patients with an intact gag reflex (such as COPD or asthma); unconscious patients with GCS < 8 due to trauma or medical conditions; patients with possible cervical spine trauma whose injuries may be aggravated by neck flexion & orotracheal intubation; and burn patients.

**LIMITATIONS:** Absolute contraindications for blind nasotracheal intubation are: Apnea, age < 10 years, severe midface congenital or traumatic deformity, and nasal airway obstruction. Relative contraindications include: suspected basilar skull fracture (raccoon eyes, Battle’s sign, or CSF leakage from nose or ears), coagulopathy (e.g. hemophilia or liver disease); anticoagulant use (e.g. Coumadin); acute hypertension; or suspected elevated ICP.

**MATERIALS:**
1. Endotracheal tube 0.5 to 1 size smaller than for oral intubation; alternatively, select a tube just slightly smaller than the diameter of the patient’s nostril. **Avoid using a tube that is too small.**
2. Lidocaine jelly: 
   a. **If time allows, apply this to a nasopharyngeal airway & insert several minutes prior to intubation.**
3. BAAM® “whistle-tip” device.
4. 10 cc. syringe.
5. Soft suction catheter.
6. ETCO₂ detection device, preferably capnography with waveform analysis capability.
7. Tape or commercial tube holder device.

**PROCEDURE:** **Observe body substance isolation precautions**
1. Prepare the tube: wrap it into a circular shape for 1 minute and attach the BAAM® device. Lubricate tip with Lidocaine.
2. Place the patient into a “sniffing position” ONLY IF CERVICAL SPINE TRAUMA IS NOT SUSPECTED.
3. Insert the tube straight back into the RIGHT nare first, parallel to the floor, anterior to posterior:
   a. Do NOT angle the tip of the tube upwards towards the skull or downwards.
   b. Insert with the tube bevel towards the patient’s nasal septum.
   c. Use a slight back-and-forth rotation of the tube if minor resistance is felt.
4. If significant resistance is encountered, remove the tube & insert into the left nare:
   a. Precautions as above.
5. Once the tip of the tube has reached the pharynx, listen for breath sounds at the proximal end of the tube through the BAAM® device, & observe for tube condensation.
6. **IF THE PATIENT IS CONSCIOUS:** Ask the patient to take a deep breath, and gently advance the tube during inhalation.
7. **IF THE PATIENT IS UNCONSCIOUS:** Time advancement of the tube to coincide with inhalation.
8. Indications of proper tube placement:
   a. Patient coughs.
   b. Condensation appears in the tube.
   c. CO₂ detection by colorimetric device or waveform analysis occurs.
   d. Conscious patient is unable to speak.
   e. Auscultation of bilateral breath sounds, and chest rise and fall.
9. If tube placement is confirmed, advance another 1 – 1.5 inches to ensure that the tip is in the trachea. Remove the BAAM®.
10. Inflate the cuff & secure the tube: **Do not let go of the tube until it has been secured.**

**TROUBLESHOOTING:**
1. If the tip of the tube reaches the pharynx but will not make the turn through the vocal cords, temporarily remove the BAAM® device & CO₂ detector, thread a soft suction catheter through the tube into the patient’s pharynx as a guide, & advance the ET tube over the suction catheter. Once the ET tube is in place, remove the suction catheter.
2. Ask a conscious patient to stick out his/her tongue while you advance the tube; this minimizes esophageal tube placement.
3. If no BAAM® device is available, pull the bell off a stethoscope & insert the tubing end into the ET tube to auscultate for breath sounds.

**COMPLICATIONS:** Bleeding (common); nasal fracture; vomiting or aspiration; intracranial tube placement (theoretical).
NEEDLE CRICOTHYROIDOTOMY

INDICATIONS: Inability to establish or maintain airway, oxygenation, ventilation by BVM, or by oral or nasal endotracheal intubation, such as in the pt. with massive facial trauma.

LIMITATIONS: Provides short-term (<30-45 min) oxygenation, but very limited ventilation. Hypercarbia will develop more quickly. This may be a life-saving procedure, but is not a substitute for definitive airway management. Intermittent ventilation with high-flow oxygen is required.

MATERIALS:
1. Oxygen tubing, with a hole cut toward one end, & the other connected to a high-flow source of ≥ 50 psi.
2. #12 or #14 gauge angiocatheter, connected to a 10 cc. syringe.
3. ET tube adaptor from a #3 or #3.5 Fr. Endotracheal tube, to fit the hub of the angiocatheter.
4. Iodine prep swabs.

PROCEDURE: Observe body substance isolation precautions.
1. Place pt. supine & prep the neck with iodine & alcohol; monitor Lead II ECG, pulse oximetry and capnography.
2. Palpate cricothyroid membrane, anteriorly, between the thyroid cartilage and cricoid cartilage. Stabilize the trachea with thumb & forefinger of the other hand to prevent lateral movement of the trachea during the procedure.
3. Puncture the skin with the angiocatheter-syringe directly over the cricothyroid membrane in the midline.
4. Direct the needle at a 45° angle towards pt.’s feet, while applying negative pressure on the syringe.
5. Carefully insert the needle through the lower half of the cricothyroid membrane, aspirating as the needle is advanced. Aspiration of air into the syringe confirms entry into the tracheal lumen.
6. Remove the syringe and withdraw the stylet, while simultaneously advancing the catheter downward into position. Take care not to perforate the posterior tracheal wall, nor to withdraw the catheter itself.
7. Attach the oxygen tubing to the catheter; the use of the #3 or #3.5 ET tube adaptor may be required.
8. Secure the catheter to the patient’s neck.
9. Intermittent ventilation:
   a. Occlude the open hole cut into the oxygen tubing for 1 second, then release for 4 seconds.
   b. After release of your thumb from the tubing hole, passive exhalation occurs.
   c. Adequate oxygenation can be maintained ONLY for 30-45 minutes; CO₂ accumulation will be more rapid.
10. Continue to observe lung inflation, breath sounds, heart rate, pulse oximetry and capnography.

COMPLICATIONS:
Inadequate ventilation and/or oxygenation, leading to hypoxia & death; Aspiration of blood; Esophageal laceration; Hematoma; Posterior tracheal wall perforation; Subcutaneous and/or mediastinal emphysema; Thyroid perforation.
OBSTETRICS: DELIVERY & NEWBORN COMPLICATIONS

Refer to the OBSTETRICS protocol for routine OB & Newborn care

I. DELIVERY COMPLICATIONS:

A. CEPHALOPELVIC DISPROPORTION ("CPD"): CONTACT BIOTEL

The fetal head is too large or mother’s pelvis is too small to permit normal birth. The mother is often a primigravida & experiencing strong, frequent contractions for a long time.

Risks: uterine rupture, fetal demise.

*This infant must be delivered by C-section.*

**TREATMENT:**

- Rapid transport
- Refer to the OBSTETRICS protocol

B. SHOULDER DYSTOCIA: CONTACT BIOTEL

The fetal shoulders impact against the mother’s symphysis pubis, preventing shoulder delivery. The head delivers normally, but then pulls back tightly against the mother’s perineum.

Incidence increases with increasing birth weight (up to 10% of infants > 10 lb.)

Risks: Brachial plexus injury, fractured clavicle, fetal anoxia from cord compression.

**TREATMENT:**

- Assess & support maternal ABC’s
- Rapid transport
- Refer to the OBSTETRICS protocol
- General principles: Dislodging 1 shoulder and rotating the fetal shoulder girdle into the wider oblique pelvic diameter; deliver anterior shoulder IMMEDIATELY after the head (before suctioning) to minimize risk of cord compression
- Position the mother on her back in a knee-chest position
- Attempt to guide the fetal head downward to allow the ANTERIOR shoulder to slip under the symphysis pubis. Avoid undue force or traction on the head.
- Application of maternal suprapubic pressure may help.
- Gently rotate the shoulder girdle into the wider oblique pelvic diameter. The posterior shoulder should then deliver without resistance
- Proceed to the NEWBORN protocol and the MATERNAL POSTPARTUM section of the OBSTETRICS protocol
C. **UMBILICAL CORD PROLAPSE ("cord presentation"):**  
*CONTACT BIOTEL*  
The cord slips down into the vagina or presents externally after the amniotic membranes have ruptured.  
*Risk:* the umbilical cord is compressed against the presenting fetal part, causing anoxia.  
*Incidence:* 1 in ~200 pregnancies.  
*Predisposing factors:* breech presentation; PROM; large fetus; multiple gestation; long cord; preterm labor.  
*This infant must be delivered by C-section.*

**TREATMENT:**  
- Assess & support maternal ABC’s  
- Rapid transport  
- Refer to the *OBSTETRICS protocol*  
- To prevent fetal asphyxia, if the cord is visible or palpable in the vagina:  
  - Position the mother with hips elevated as much as possible, OR in Trendelenburg position or in a knee-chest position  
  - Administer supplemental oxygen to the mother  
  - Instruct the mother to “pant” with each contraction to prevent bearing down  
  - Assess fetal viability by checking for a palpable pulse in the cord  
  - Apply moist sterile dressings to the exposed cord; handle the cord carefully  
  - With a gloved, hand, gently push the fetus back into the vagina and elevate the presenting part off the cord. If the cord spontaneously retracts, do not attempt to reposition it  
  - Periodically reassess fetal viability by confirming the presence of a palpable pulse in the cord  
  - *This position must be maintained en route and until the infant can be delivered by emergency C-section*
I. DELIVERY COMPLICATIONS (CONTINUED):

D. BREECH PRESENTATION: CONTACT BIOTEL

The largest part of the fetus (the head) is delivered last. 3-4% of term deliveries; increased incidence with multiple births and preterm labor.

Most common: “frank” or “front” – hips flexed, legs extended, buttocks presentation.
2nd most common: “incomplete” - one or both hips incompletely flexed, foot presentation.
Least common: “complete” – both knees and hips flexed, buttocks presentation.

Risk: fetal asphyxia (suffocation).

If the head does not deliver within 3 minutes, the infant cannot be safely delivered in field.

TREATMENT:
- Assess & support maternal ABC’s
- Rapid transport
- Refer to the OBSTETRICS protocol
- If field delivery will occur before hospital arrival:
  - Prepare the mother for delivery
  - Administer supplemental oxygen and IV access to the mother
  - Allow the fetus to deliver spontaneously up to the level of the umbilicus
  - If the fetus is in a front presentation, gently extract the legs downward after the buttocks are delivered
  - After the infant’s legs are clear, support his/her body with the palm of the hand and your forearm
  - Gently rotate the fetus to align the shoulders in the anterior-posterior direction. Continue with gentle traction until the axilla is visible
  - Gently guide the infant upward to allow delivery of the posterior shoulder
  - Gently guide the infant downward to allow delivery of the anterior shoulder
  - Ensure that the fetal face or abdomen is turned away from the maternal symphysis pubis
  - The head often delivers without difficulty after shoulder delivery – avoid excessive traction or manipulation of the head or spine, but maternal suprapubic pressure may help
  - Proceed to NEWBORN protocol & MATERNAL POSTPARTUM section of OB protocol

- If the head does not deliver immediately, take action to prevent suffocation:
  - Place a gloved hand in the vagina, with the palm toward the fetal face
  - Form a “V” with the index & middle fingers on either side of the nose
  - Gently push the vaginal wall away from the fetal face until the head is delivered – this position must be maintained en route and until the infant can be delivered by emergency C-section
I. DELIVERY COMPLICATIONS (CONTINUED):

E. SHOULDER PRESENTATION ("TRANSVERSE LIE"): CONTACT BIOTEL

The long axis of the fetus lies perpendicular to that of the mother.
Fetal arm or shoulder may be the presenting part.
Rare, except in second twins (10%).
This infant must be delivered by C-section.

TREATMENT:
• Assess & support maternal ABC’s
• Rapid transport
• Refer to the OBSTETRICS protocol
• Emergency C-section is required, whether or not the fetus is viable

F. UTERINE INVERSION: CONTACT BIOTEL

Uterus turns “inside out”.
#1 cause: personnel placing excessive traction on the cord or pressure on uterine fundus.
May also occur spontaneously with forceful contraction, or after a maternal cough or sneeze.
“Incomplete”: uterine fundus does not extend past the cervix.
“Complete”: entire uterus protrudes through the cervix.
Signs & symptoms: postpartum hemorrhage, & sudden, severe lower abdominal pain.
Risk: maternal shock.

TREATMENT:
• Assess & support maternal ABC’s
• Rapid transport
• Establish 2 large-bore IV’s and treat hypovolemia with NS bolus(es)
• Refer to the OBSTETRICS protocol
• If delivery occurs prior to hospital arrival, proceed to the NEWBORN protocol & MATERNAL POSTPARTUM section of the OBSTETRICS protocol
• TREATMENT CONSIDERATION:
  o Position the mother supine
  o Do NOT attempt to remove the placenta
  o If the uterus is freshly inverted AND the placenta has already separated, apply pressure with gloved fingertips and palm and push the uterine fundus upward through the cervical canal, in the long axis of the vagina
  o If this is ineffective, or if the placenta has not already separated, cover all protruding tissues with moist, sterile dressings and transport; treatment will require sedation and/or anesthesia
  o Do NOT attempt to replace the uterus that has been inverted for a prolonged period of time; if in doubt, cover all tissues with moist, sterile dressings and transport
I. DELIVERY COMPLICATIONS (CONTINUED):

G. MULTIPLE GESTATION:

Increased risk of complications: prematurity, PROM, placental abruption, postpartum hemorrhage, abnormal presentation (up to 50%).
Mothers without prenatal care may be unaware of their multiple pregnancies.

**TREATMENT:**

- If delivery of the first infant has occurred or will occur before hospital arrival, CONTACT BIOTEL for transport recommendations*
- Assess & support maternal ABC’s
- Refer to the OBSTETRICS protocol
- **TREATMENT CONSIDERATIONS:**
  - 1st twin delivery is identical to single with the same presentation
  - Proceed to the NEWBORN protocol & MATERNAL POSTPARTUM section of the OBSTETRICS protocol
  - Uterine contractions usually resume within 5-10 minutes
  - Delivery of the second fetus usually occurs within 30-45 minutes
  - Both twins usually deliver before the placenta delivers
  - *BIOTEL may recommend transport before delivery of the 2nd fetus
  - Infants of multiple births are smaller and more prone to hypothermia, hypoxia, hypoglycemia, sepsis and other risks
  - Postpartum maternal hemorrhage may be severe, requiring vigorous fluid resuscitation and uterine massage. (Oxytocin infusion may be required after hospital arrival.)
  - Rapid transport

H. PRECIPITOUS DELIVERY:

Rapid spontaneous delivery less than 3 hours after onset of labor.
Overactive uterine contractions & little maternal bony or soft tissue resistance.
Usually: grand multipara (woman with ≥ 7 prior deliveries).
Risks: fetal head trauma, fetal hypoxia, hemorrhage due to tearing of umbilical cord

**TREATMENT:**

- Assess & support maternal ABC’s
- Refer to the OBSTETRICS protocol
- Apply gentle counterpressure to the fetal head, but do NOT attempt to detain fetal descent
- Proceed to the NEWBORN protocol & MATERNAL POSTPARTUM section of the OBSTETRICS protocol
  - Examine the maternal perineum for perineal tears, bleeding
  - Control maternal perineal bleeding with firm pressure on gauze pad
- CONTACT BIOTEL as soon as possible
I. PULMONARY EMBOLISM & AMNIOTIC FLUID EMBOLISM:
One of the most common causes of maternal death during pregnancy, labor or postpartum.
Pulmonary embolism more common after C-section than after vaginal delivery.
Amniotic fluid embolism most common in multiparous women late in 1st stage of labor.
Incidence increased with: placenta previa, placental abruption, intrauterine fetal death.
Signs & symptoms: Sudden severe dyspnea; sharp, “pleuritic”, localized chest pain; tachycardia;
tachypnea; hypotension; cyanosis; cardiopulmonary arrest.
Risk: maternal death.

TREATMENT:
Refer to the appropriate protocol in the event of cardiac arrest, shock or arrhythmia
- Assess & support maternal ABC’s
- Supplemental oxygen
- Monitor Vital Signs, Lead II ECG, pulse oximetry, capnography
- IV NS TKO
- 12-Lead ECG
- CONTACT BIOTEL
- Rapid transport
MECONIUM STAINING: DISTRESSED NEWBORN RESUSCITATION

A. **MECONIUM STAINING:**

Definition: The presence of fetal stool in the amniotic fluid, indicative of fetal distress.

Increased incidence with post-term delivery, & small-for-gestational-age infants.

Risks: Increased perinatal mortality, hypoxemia, aspiration pneumonia, & pneumothorax.

Thick meconium increases risk of “meconium aspiration syndrome” & severely depressed infant.

Presence of meconium staining can be determined only after rupture of fetal membranes, when delivery may be imminent.

Overall management goal: preventing or minimizing the risk of meconium aspiration by the infant.

**TREATMENT:**

1. Refer to the *NEWBORN RESUSCITATION protocol*

2. Prepare newborn resuscitation equipment:
   - Intubation equipment
   - Bulb syringe
   - Meconium aspirator
   - Portable suction
   - Normal saline for irrigation
   - Gauze pads
   - Infant BVM

3. *As the infant’s head delivers and before shoulder delivery,* clear the airway and thoroughly suction the mouth, pharynx and nose, **in that order**
   - Suctioning before the chest delivers minimizes the chance that the infant will aspirate meconium below the vocal cords with his/her 1st breath

4. After delivery of the infant, remove residual meconium from the hypopharynx by suctioning under direct vision

5. If the infant is depressed or if the meconium is thick or particulate, *perform direct ET suctioning using the ET tube as a suction catheter*
   - Quickly intubate the trachea, preferably before the infant takes 1st breath
   - Apply suction to the proximal end of the ET tube while withdrawing it
   - During this procedure, aim 100% oxygen toward the infant’s face & monitor the HR
   - If the infant HR becomes < 80, ventilate with a pediatric BVM
   - Repeat the intubation-suction-extubation cycle until no further meconium is obtained. Do not ventilate between cycles, unless HR drops to < 80.
   - If the ET tube occludes with meconium, replace it with a fresh tube

6. After tracheal succioning is complete, continue resuscitation according to the *DISTRESSED INFANTS* section (Section II of this Appendix).
II. MECONIUM STAINING & DISTRESSED NEWBORN RESUSCITATION (CONTINUED):

B. DISTRESSED INFANTS:

ANTEPARTUM Risk Factors:
- Multiple Gestation
- Inadequate prenatal care
- Maternal age < 16 or > 35
- History of pregnancy/labor/delivery problems
- Post-term gestation (“post dates”)  
- Maternal drugs, alcohol, medications, tobacco
- Toxemia, hypertension
- Diabetes

POSTPARTUM Risk Factors:
- Premature labor
- Meconium-stained fluid
- Membrane rupture > 24 hr prior
- Meconium-stained fluid
- Abnormal presentation
- Prolonged labor
- Precipitous delivery
- Prolapsed cord (“cord presentation”)
- Bleeding

TREATMENT:

Distressed infants who do not respond to assisted ventilation with 100% oxygen and chest compressions may require ET intubation or medications. These infants are even more susceptible to the lethal effects of hypothermia and hypoxia. Bradycardia and cyanosis are ominous signs indicative of impending full cardiac arrest.

1. Prevent heat loss and hypothermia (refer to the NEWBORN RESUSCITATION protocol)
2. Monitor airway patency, HR, RR, pulse oximetry, perfusion
3. Provide 100% oxygen by assisted ventilation with pediatric BVM
4. Chest compressions, if HR <60 OR 60-80 and not responding to 100% oxygen by BVM
5. Before intubation or drug administration, assess
   a. Chest movement:
      - Is the BVM seal tight?
      - Is the airway obstructed by secretions or improper positioning?
      - Is adequate ventilatory pressure being used? (The BVM pop-off valve may need to be disabled, especially for premature infants or meconium aspiration syndrome.)
      - Is air in the stomach interfering with chest expansion?
   b. The supplemental oxygen being delivered (it should be 100%):
      - Is the equipment properly connected?
      - Is there an oxygen reservoir?
   c. Indications for ET intubation include:
      - Meconium staining
      - If BVM ventilation is ineffective or prolonged
      - When chest compressions are performed
      - When endotracheal drug administration is indicated
      - Special circumstances, such as extreme prematurity
   d. Satisfactory ET tube placement should be confirmed with standard techniques of physical examination and capnography (ETCO₂ monitoring)

6. Drugs: Only if HR < 60, despite BVM with 100% oxygen and CPR
   a. Epinephrine 1:10,000 IVP or IO: 0.01 mg/kg (0.1 cc/kg), or Epinephrine 1:1,000 via ETT: 0.1 mg/kg (0.1 cc/kg)
   b. Narcan (naloxone) 0.1 mg/kg IVP or IO (0.1 cc/kg), or Narcan (naloxone) 0.2 mg/kg via ETT (0.2 cc/kg)
   c. Dextrose 10% IVP or IO (5 cc/kg) (dilute D50 10 cc in 40 cc NS)

7. CONTACT BIOTEL
UTSW / BIOTEL EMS SYSTEM: APPENDIX L

PEDiatric assessment TRIANGLE

I. PURPOSE: The P.A.T. helps answer the following questions -
1. How sick is this child?
2. What might be the problem?
3. What do I need to do?
4. How is the child likely to respond to my intervention?
5. What is my triage/transport decision?

II. COMPONENTS:

“A” - APPEARANCE: Tone, Interactiveness, Consolability, Look/Gaze, Speech/Cry = “TICLS”
Assesses: Oxygenation, ventilation, brain perfusion, systemic problems (e.g. poisoning, infection, hypoglycemia)
NORMAL – Alert, makes eye contact, interacts with environment, responsive, consolable, strong cry
ABNORMAL – Lethargic, “blank stare”, “rag doll”, doesn’t interact, inconsolable, weak or muffled cry

“B” - WORK OF BREATHING: Respiratory rate; AND position/posture, such as tripod or sniffling; retractions; nasal flaring; head bobbing; noises: snoring, grunting, wheezing, or stridor
Assesses: Child’s attempt to compensate for difficulty with oxygenation and/or ventilation
NORMAL – No abnormal rate, sounds, positioning or retractions
INCREASED – Trouble oxygenating, ventilating or both
DECREASED – Signals impending respiratory/cardiac arrest

“C” - CIRCULATION: Skin color: pink, pale or cyanotic
Assesses: Cardiac output and perfusion to vital organs
NORMAL – Pink
ABNORMAL – Pale; mottled or cyanotic/ashen (with abnormal appearance) = shock

III. ASSESSMENT PROCEDURE:
A. FAST: 30 – 60 seconds to assess child’s OVERALL physiologic stability
B. FLEXIBLE: A, B & C may be checked in any order (unlike “ABCDE’s”, which should be performed in order, next)
C. FRIENDLY: Leave child in parent’s lap during this assessment, no equipment needed, minimizes risk of agitation
D. FOCUSED on COMMON CRITICAL PEDIATRIC CONDITIONS: Respiratory illness and shock
E. FOLLOWED by FORMAL ABC’s, DETAILED HISTORY and PHYSICAL ASSESSMENT

IV. COMMON EXAMPLES:
A. Abnormal appearance + Normal work of breathing + Abnormal circulation suggests SHOCK
   1. Tachypnea without increased work of breathing = “effortless” tachypnea may be present
B. Abnormal appearance + Normal work of breathing + Normal circulation suggests METABOLIC problem
   1. Examples: Post-ictal, intracranial bleed, drug or other intoxication, hypoglycemia, sepsis
C. Abnormal appearance + Increased work of breathing + normal circulation suggests AIRWAY/RESPIRATORY problem
   1. Upper airway sounds: snoring, stridor
   2. Lower airway sounds: grunting, wheezing
D. Normal appearance + Normal work of breathing + Normal circulation suggests absence of critical illness
   1. EXCEPTIONS: Some ingestions (acetaminophen, iron, cyclic antidepressants); Some blunt trauma (EARLY)

Adapted from Pediatric Education for Prehospital Professionals, 2000
PEDIATRIC INTRAOSSEOUS INFUSION PROCEDURE

INDICATIONS:
- Children < 8 yrs - in shock, cardiac arrest, unconscious or unresponsive to verbal stimuli **AND:**
  - Unconscious or seriously ill with immediate need for venous access to administer fluids or drugs, when 1 or 2 attempts at peripheral venipuncture have been unsuccessful within 90 seconds.
- Proceed **immediately** to an IO if peripheral veins are **NOT** readily obtainable in the unconscious, seriously ill or injured pediatric patient.

MATERIALS:
1. Alcohol and Iodine Preps.
2. IV Infusion Set, with regular (macro) size tubing: **this must be flushed and ready to go.**
   a. **If not,** the needle may clot in the marrow cavity, making infusion impossible.
   b. **This is even more critical than it is when starting a peripheral IV.**
3. Intraosseous needle, assembled, with stylet in place.
4. Two 10 cc. syringes for aspirating bone marrow and flushing needle after insertion.
   a. One **EMPTY** syringe
   b. One filled with Normal Saline
5. Glucometer, Gauze rolls, tape.

CONTRAINDICATIONS:
Fracture of that extremity, Osteomyelitis, Bony lesion at site.

PROCEDURE: **Observe body substance isolation precautions**
1. Identify landmarks and prep insertion site with iodine solution. Site for insertion:
   a. Proximal tibia approximately 1 finger-width below the tibial tuberosity and 1 finger-width medial over the flat part of the anteromedial tibia.
2. For insertion into the proximal tibia, insert the needle perpendicular (90°) to the bony cortex: Once entry into the bone has been achieved, angle the needle slightly towards the foot, so as to avoid damage to the tibial growth plate.
3. Insert the needle using a steady twisting motion into the bone until you feel a “pop”.
4. Remove the stylet and confirm placement by aspirating bone marrow using an **empty** 10-cc syringe.
   a. Failure to aspirate marrow does **NOT** necessarily mean that insertion was unsuccessful.
   b. If marrow **CAN** be aspirated, it can be used to check blood glucose.
5. Regardless of whether marrow was aspirated, **IMMEDIATELY** gently flush the needle with 10 cc. of saline.
   a. Observe and palpate for swelling in the calf or fluid leakage around the needle.
6. Immediately detach syringe, connect regular size IV tubing and begin infusion.
   a. It may be necessary to apply slight pressure to the IV bag to encourage flow.
7. Secure in position with tape and gauze rolls.
   a. Do not tape around the calf circumferentially, and do not obscure the insertion site.

COMPLICATIONS:
Bone fracture, growth plate injury, soft tissue infiltration, local abscess, cellulitis, and osteomyelitis.
PLEURAL DECOMPRESSION (NEEDLE THORACENTESIS)

**INDICATIONS:** Adult or pediatric patient with suspected tension pneumothorax, after contacting BIOTEL.  
**IF** you are unable to contact BIOTEL AND pt. is a CPR after BLUNT trauma, proceed with bilateral pleural decompression and contact BIOTEL as soon as possible.

**SIGNS / SYMPTOMS:**
- Profound hypotension, shock or PEA, especially in the following settings: Blunt trauma, or Penetrating trauma, or “Iatrogenic” trauma from positive-pressure ventilation
- Cyanosis
- Decreased ability to ventilate (“hard to bag”), or severe dyspnea (conscious pt.)
- Diminished breath sounds on affected side
  - Asymmetric chest rise and fall with respiration or ventilation
  - Marked distention of jugular veins
  - Hyper-resonance to percussion on affected side
  - Tracheal deviation (very late sign; detected only by palpation in suprasternal notch)

**DIFFERENTIAL DIAGNOSIS:**
- Massive hemothorax (dullness to percussion, no neck vein distention)
- Cardiac tamponade (symmetrical breath sounds, symmetrical chest rise and fall)
- Right-main stem intubation (no hyperresonance, no neck vein distention, no shock)
- Simple pneumothorax (no hypotension, usually no cyanosis)

**MATERIALS:**
- Iodine prep
- Long (preferably at least 2½”), large (preferably 14 g.) angiocatheter.
- Empty 10-cc. syringe (optional)

**PROCEDURE:** Observe body substance isolation precautions
1. Locate landmarks for needles insertion – 2nd intercostal space (between 2nd & 3rd ribs) at the midclavicular line on the affected side. Prep with iodine.
   - In order, palpate clavicle, then 2nd rib, then 3rd rib (1st rib is NOT palpable).
   - **Alternate location:** Mid-axillary line, 4th intercostal space (Nipple line! no lower!), over superior edge of 5th rib. This may be necessary for patients with large pectoral muscles and very thick anterior chest wall.
2. Remove cotton plug from catheter, if necessary, and insert needle at a 90 degree angle to the chest wall at the superop border of the 3rd rib.
   - Do not angle the needle towards the patient’s head, to avoid damage to subclavian vessels.
3. Advance and confirm the location of the needle in the pleural space:
   - Feel a “POP” and a sudden rush of air through the needle or into the syringe barrel.
   - The conscious patient may immediately report resolution of dyspnea, and vital signs may improve.
   - Unconscious patient will become much easier to ventilate, and vital signs may improve.
4. Advance catheter over the needle into the pleural space until hub is flush with skin, withdrawing the needle.
5. Assess & document breath sounds, BP, pulse oximetry, neck vein distention, and level of consciousness.
6. Re-assess patient frequently en route: Catheter is prone to clotting or kinking, and the chest may re-pressurize; If this occurs, insert a 2nd catheter in the same intercostal space next to the first catheter.

**COMPLICATIONS:**
Local hematoma, pneumothorax, lung or vessel laceration.
PULSE OXIMETRY INTERPRETATION

RESPIRATORY CYCLE:
- Oxygenation: oxygen is inhaled into the lungs and carried into the blood
- Ventilation: CO2 is transported back from the blood to the lungs and is exhaled

PULSE OXIMETRY: = “The OXYGENATION VITAL SIGN”
- Each hemoglobin (Hgb) molecule can carry up to 4 oxygen molecules
  - A Hgb molecule carrying 4 O2 molecules is “fully saturated”
  - A Hgb molecule carrying fewer than 4 O2 molecules is “unsaturated”
  - The higher the saturation, the better
- Pulse oximetry provides indirect measurement of Hgb saturation with O2
  - Pulse oximetry does not provide direct measurement of blood oxygen content
  - Pulse oximetry does not indicate whether the body cells can utilize the oxygen present
- Readings are recorded as: “\( S_{p}O_2 = \_\_\_\_\% \)”
  - One MUST specify whether on Room Air “R.A.” or specify the amount of supplemental O2
  - Procedure:
    - Obtain & record a “baseline” reading on R.A. (“\( S_{p}O_2 \ R.A. = \_\_\_\_\% \)”)
    - Place patient on supplemental oxygen per protocol
    - Obtain & record reading on oxygen after 1-2 minutes of equilibration

APPLICATIONS:
- MONITORING OF INTUBATED & NON-INTUBATED PATIENTS AT RISK FOR HYPOXIA
  ***(NOT THE PRIMARY TOOL FOR ET TUBE VERIFICATION!)***

NORMAL RANGE OF PULSE OXIMETRY READINGS:
- Room Air \( S_{p}O_2 \) should be GREATER THAN 95%
- DO NOT ASSUME THAT A READING LESS THAN 95% IS DUE TO MACHINE MALFUNCTION
  - EXAMINE the patient and consider possible causes for a low reading

CAUSES of LOW READINGS (<95%): THESE ARE THE PATIENTS WHO MOST NEED MONITORING
- ANY primary or secondary lung disease or injury (e.g. asthma, COPD, anaphylaxis, trauma, or pneumonia)
- ANY low cardiac output state due to shock (hypovolemic, cardiogenic, or low-resistance)
  - Management:
    - Identify & treat the underlying cause
    - Provide supplemental oxygen
    - Monitor closely

CAUSES of MISLEADING HIGH READINGS (>95%): THESE PATIENTS ALSO NEED MONITORING
- CARBON MONOXIDE POISONING (e.g. Smoke inhalation)
  - In this setting, the sensor is measuring CARBON MONOXIDE bound to hemoglobin
  - Management: Provide all smoke inhalation victims with supplemental oxygen, regardless of pulse oximetry readings
- PROFOUND ANEMIA (e.g. Severe multi-trauma pt. who has received significant NS IV)
  - In this setting, there may be very little circulating hemoglobin, because blood loss has been replaced with NS
  - What little hemoglobin is present might be fully saturated and provide a high reading, if perfusion is adequate
  - Management: Provide all multi-system trauma patients with supplemental oxygen, regardless of pulse oximetry readings

PULSE OXIMETRY MAY BE MISLEADING or INACCURATE in the FOLLOWING SETTINGS: THESE PATIENTS SHOULD ALSO BE MONITORED, BUT BE AWARE OF THE LIMITATIONS:
- Hypothermia
- Vasoactive drug administration (Levophed, dopamine, epinephrine)
- Severe jaundice
- Excessively bright ambient light (cover pt’s hand)
- Dark nail polish (turn sensor sideways)
- Cyanide poisoning
- False nails (turn sensor sideways)
- Low-flow states or any poor perfusion states, such as CPR
INDICATIONS: This protocol is indicated for use in Mass Casualty Incidents (MCI), when resources will be overwhelmed. The critical principle of this protocol is that of “doing the most good for the most victims”.

START where you stand
Assess the scene
Call for assistance
Determine safety

CALL OUT
“Anyone who can hear me, please move to the area with the green flag.”

Walking Wounded & Uninjured
MINIMAL: Green
Hold in a specific location
Remember to fully triage ASAP

Non-walking
RESPIRATIONS
YES
10 to 30 / min.
Less than 10 or
More than 30 / min.
NO
Open Airway
Look, listen & feel

PERFUSION
IMMEDIATE: Red
NO
Radial Pulse
Capillary Refill
Reposition Airway

Absent
Present
Less than 2 sec.
More than 2 sec.

IMMEDIATE: Red
MENTAL STATUS
IMMEDIATE: Red
EXPECTANT: Black

Follows Simple
Simple Commands
DELAYED: Yellow

Cannot Follow
Simple Commands
IMMEDIATE: Red
UTSW / BIOTEL EMS SYSTEM: APPENDIX Q

12-LEAD ECG INTERPRETATION

PURPOSE: This form is intended to provide steps to interpret a 12 lead ECG quickly and efficiently.

PROCESS:

1. Identify the rate and rhythm.

2. Look for grouped Lead S-T segment elevation or depression as discussed in the chart below. Remember that ST segment elevation is found in groupings in the 12 lead, based upon where the positive pole of the ECG is located. Also, remember that when one group shows ST elevation, you MAY see “reciprocal depression” in the other leads. You MAY find ST segment elevation in more than one group at a time, such as in myocardial infarctions that involve more than one “wall” (antero-lateral, infero-lateral, etc.).

<table>
<thead>
<tr>
<th>12 lead ECG Lead Groupings</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated (↑) ST segment in II, III, and aVF (May have reciprocal depression in other leads)</td>
<td>Inferior MI</td>
</tr>
<tr>
<td>Elevated (↑) ST segment in I, aVL, V5 &amp; V6 (May have reciprocal depression in other leads)</td>
<td>Lateral MI</td>
</tr>
<tr>
<td>Elevated (↑) ST segment in V1, V2, V3, V4 (May have reciprocal depression in other leads)</td>
<td>Anteroseptal MI</td>
</tr>
</tbody>
</table>

3. If Inferior MI present, perform V3R-V6R to exclude Right Ventricular involvement:
   a. Remove V1 & V2
   b. Move V3, V4, V5 & V6 to the corresponding locations on the RIGHT side of chest
   c. Press “12 Lead” button TWICE
   d. Look for ST segment elevation in V3R-V6R of ≥ 1mm
   e. Notify BioTel of this finding and ask for further orders

4. Exclude the following conditions, which make 12-Lead ECG diagnosis of AMI inaccurate:
   a. Bundle Branch Block:
      i. LBBB: RR' or wide, notched QRS in V5 & V6
   b. Left Ventricular Hypertrophy:
      i. S in V1 or V2 + R in V5 or V6 ≥ 35 mm.
   c. Artificial Pacemaker

5. Make rough estimate of axis (remember that leads I and aVF should have upright R waves to be a normal axis):

<table>
<thead>
<tr>
<th>Axis</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive QRS in I and positive QRS in aVF</td>
<td>Normal</td>
</tr>
<tr>
<td>Positive QRS in I and negative QRS in aVF (often found in people with a history of hypertension)</td>
<td>Left Axis Deviation</td>
</tr>
<tr>
<td>Negative QRS in I and positive QRS in aVF (often found in people with a history of right heart failure, COPD)</td>
<td>Right Axis Deviation</td>
</tr>
<tr>
<td>Negative QRS in I and negative QRS in aVF (uncommon, but found in both extreme right and extreme left axis deviation)</td>
<td>Indeterminate</td>
</tr>
</tbody>
</table>