Florida Regional Common

EMS Protocols

Section 2
Adult Protocols

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## 2.1 Adult Initial Assessment Management

### GENERAL GUIDELINES

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<tr>
<td>Protocols in Section 2.1 are designed to guide the EMT or paramedic in his or her initial approach to assessment and management of adult patients. Supportive care is specified as being either EMT and Paramedic (BLS) or Paramedic Only (ALS).</td>
</tr>
</tbody>
</table>

Protocol 2.1.1 should be used on all adult patients for initial assessment. During this assessment, if the EMT or paramedic determines that there is a need for airway management, Protocol 2.1.2 should be used for the management of the adult airway. These protocols are frequently referred to by other protocols, which may or may not override them in recommending more specific therapy.

Protocol 2.1.3 presents the basic components of preparation for transport of medical patients. Due to the significant differences in priorities and packaging in the prehospital care of trauma and hypovolemia cases, a separate Trauma Supportive Care protocol has been developed. After following Protocol 2.1.1, this Medical Supportive Care protocol may be the only protocol used in medical emergency situations where a specific diagnostic impression and choice of additional protocols cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.

Protocol 2.1.4 presents the basic components of preparation for transport of trauma patients. Due to the significant differences in priorities and packaging in the prehospital care of medical cases, a separate Medical Supportive Care protocol has been developed. After following Protocol 2.1.1, this Trauma Supportive Care protocol may be the only protocol used in trauma or hypovolemia situations where a specific diagnostic impression and choice of additional protocols cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.
2.1.1 Initial Assessment

GENERAL GUIDELINES

EMT AND PARAMEDIC

I. Scene Size-up.
   A. Review the dispatch information.
   B. Assess the need for body substance isolation.
   C. Assess for scene safety.
   D. Determine mechanism of injury.
   E. Determine the nature of the illness.
   F. Determine the number and location of patients.
   G. Determine the need for additional resources.
   H. Consider c-spine immobilization.

II. Initial Assessment.
   A. General impression of the patient.
   B. Assess mental status; AVPU scale (Alert, Alert to Verbal, Responds to Pain, Unconscious); maintain spinal immobilization as needed.
   C. Assess circulation (rapid evaluation of pulse, major bleeding, skin color, and temperature). Assess need for defibrillation: VF/VT without pulse.
   D. Assess airway.
   E. Assess breathing.
   F. Assess disability: movement of extremities.
   G. Expose and examine the patient’s head, neck, chest, abdomen, and pelvis (check the back when the patient is rolled on his/her side).
   H. Identify priority patients.
      1. Poor general impression.
      2. Unresponsive patients.
      3. Responsive but does not or cannot follow commands.
      4. Difficulty breathing
      5. Hypoperfusion or shock
      6. Complicated child birth
      7. Chest pain with a systolic BP below 100 mm Hg.
      8. Uncontrolled bleeding
      9. Severe pain anywhere
     10. Multiple injuries

III. Initial Management. (Adult Protocol 2.1.3 or 2.1.4, Medical Supportive Care, or Trauma Supportive Care).

IV. Secondary Assessment
   A. Conduct a head-to-toe survey
   B. Conduct a neurological assessment
      1. Pupillary response
      2. Glasgow Coma Scale (GCS) score
2.1.1 Initial Assessment (continued)

GENERAL GUIDELINES

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<th>General Guidelines</th>
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<td>3. Blood pressure</td>
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<td>4. Capillary refill</td>
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<td>5. Skin condition</td>
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<tr>
<td>a. Color</td>
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<tr>
<td>b. Temperature</td>
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<tr>
<td>c. Moisture</td>
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<td>6. Lung sounds</td>
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<tr>
<td>D. Obtain a medical history. (SAMPLE &amp; OPQRRRST)</td>
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<tr>
<td>a. O - Onset and location</td>
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<tr>
<td>b. P - Provocation</td>
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<tr>
<td>c. Q - Quality</td>
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<td>g. S - Severity</td>
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<td>h. T - Time</td>
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<td>2. A - Allergies</td>
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<td>4. P - Past medical history</td>
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<td>5. L - Last oral intake</td>
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<td>6. E - Events leading to illness or injury</td>
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<tr>
<td>V. Other Assessment Techniques.</td>
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<td>1. Cardiac monitoring</td>
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<td>2. Pulse oximetry (Medical Procedure 4.22)</td>
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<td>3. Glucose determination (Medical Procedure 4.17)</td>
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<td>4. Monitor temperature</td>
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<td>5. Capnography (EtCO2)</td>
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2.1.2 Airway Management

TREATMENT GUIDELINES

Supportive Care

EMT AND PARAMEDIC

- Initial Assessment Protocol 2.1.1.

If spontaneous breathing is present without compromise:
- Monitor breathing during transport.
- Administer oxygen as needed to maintain O2 saturation of 94% or greater.
- Avoid over oxygenation: Wean oxygen concentration as tolerated.

If spontaneous breathing is present with compromise:
- Maintain airway patency (Medical Procedure 4.1.3).
- Administer oxygen via non-rebreather mask (10-15 L/min).
- If unconscious, insert oropharyngeal, nasopharyngeal as needed (Medical Procedure 4.2).
- If patient accepts oropharyngeal airway, consider the need for a supraglottic device. EMT may insert the supraglottic device if he/she has been authorized by that department’s Medical Director (Medical Procedure 4.4).
- Assist ventilations with a bag-valve mask (BVM) device attached to supplemental oxygen at 15-25 L/min as needed (Medical Procedure 4.1.5).
- Suction as needed (Medical Procedure 4.3.1, Flexible Suctioning, and Medical Procedure 4.3.2, Rigid Suctioning).
- Apply and monitor pulse oximeter (Medical Procedures 4.2).
- Apply and monitor capnography for wave form (Medical Procedure 4.10.1)

If spontaneous breathing is absent or markedly compromised:
- Maintain airway patency (Medical Procedure 4.1.3).
- Assist ventilation with a BVM device attached to supplemental oxygen at 15-25 L/min as needed (Medical Procedure 4.1.5). Maintain O2 saturation of 94% or greater. Avoid over oxygenation: Wean oxygen concentration as tolerated
- If unconscious, insert oropharyngeal, nasopharyngeal as needed (Medical Procedure 4.2).
- If patient accepts oropharyngeal airway, consider the need for a supraglottic device. EMT may insert the supraglottic device if he/she has been authorized by that department’s Medical Director (Medical Procedure 4.4).
- Suction as needed (Medical Procedure 4.3.1, Flexible Suctioning, and Medical Procedure 4.3.2, Rigid Suctioning).
- Apply and monitor pulse oximeter (Medical Procedures 4.2).
- Apply and monitor capnography for wave form (Medical Procedure 4.10.1)
### 2.1.2 Airway Management (continued)

<table>
<thead>
<tr>
<th>ALS Level 1 continued</th>
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<tbody>
<tr>
<td><strong>PARAMEDIC ONLY</strong></td>
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<tr>
<td>• If patient accepts oropharyngeal airway, consider the need for an advanced airway (see ALS Level 1, Advanced Airway Management).</td>
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</table>

**ALS Level 1: Advanced Airway Management**

- Insert an advanced airway and document the following (Medical Procedure 4.4)
  1. Confirm an advanced airway placement with an end-tidal CO\(_2\) monitoring device.
  2. Additional confirmation methods may include the following options:
     a. Visualization of the tube passing through the vocal cords.
     b. Negative epigastric sounds.
     c. Positive bilateral breath sounds.
  3. Secure the advanced airway with a commercially available device.
     a. Application of a c-collar may be useful in preventing the advanced airway from becoming dislodged,
     b. For trauma patients or for patients with head/neck injury use full spinal immobilization

- If unable to insert the advanced airway and patient cannot be adequately ventilated by other means, perform cricothyroidotomy (Medical Procedure 4.5) and transport rapidly to the nearest appropriate facility.

<table>
<thead>
<tr>
<th>ALS Level 2</th>
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<tbody>
<tr>
<td>➢ None</td>
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<tr>
<th>Note</th>
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<tr>
<td>• None</td>
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## 2.1.3 Medical Supportive Care

### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th>EMT AND PARAMEDIC</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>• Initial Assessment Protocol 2.1.1.</td>
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<td></td>
<td>• Airway Management Protocol 2.1.2.</td>
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<tr>
<td></td>
<td>• The EMT should apply the AED (Medical Procedure 4.1.1, AED)</td>
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<td></td>
<td>• Establish hospital contact for notification of an incoming patient.</td>
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<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th>PARAMEDIC</th>
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<tbody>
<tr>
<td></td>
<td>• Establish IV of normal saline with a regular infusion set (a) (b), unless overridden by the specific protocol. (Medical Procedure, Medication Delivery 4.18.5)</td>
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<tr>
<td></td>
<td>• In a critical medical patient, an intraosseous (IO) line may be considered (Medical Procedures 4.18.4)</td>
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<td>OR</td>
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<td>• Medication may be administered intranasal (IN) via the MAD device. (Medical Procedure, Medication Delivery 4.18.3)</td>
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<td></td>
<td>• Monitor ECG as needed.</td>
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</tbody>
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| ALS Level 2 | ➢ The paramedic should obtain consultation for ALS Level 2 orders. |

| Note | (a) Authorized IV routes include all peripheral venous sites. External jugular veins may be utilized when other peripheral site attempts have been unsuccessful or would be inappropriate. A large-bore intracatheter should be used for unstable patients. Avoid use of access sites below the diaphragm. |
|      | (b) An IV lock or MAP may be used in lieu of an IV bag in some patients, when appropriate (Medical Procedure 4.18.5). |
2.1.4 Trauma Supportive Care

**TREATMENT GUIDELINES**

**EMT AND PARAMEDIC**

- Initial Assessment Protocol 2.1.1. Initiate Trauma Alert; if applicable (General Protocol 1.10, Trauma Transport).
- Airway Management Protocol 2.1.2. (Manually stabilize c-spine as needed.)
- Correct any open wound/sucking chest wound (with an occlusive dressing).
- Control hemorrhage.
- Immobilize fractures.
- Determine if the patient is taking any anticoagulant such as warfarin (Coumadin) or antiplatelets such as dabigatran (Pradaxa).
- Immobilize c-spine and secure the patient to a backboard as needed (Protocol 2.10.1. and Medical Procedure 4.24, Spinal Immobilization).
- Expedite transport.

The following steps should not delay transport.
- Complete bandaging, splinting, and packaging as needed.
- Establish hospital contact for notification of an incoming patient, and obtain consultation for Level 2 orders.

**PARAMEDIC ONLY**

- Consider advanced airway to assist with the correction of a massive flail segment that causes respiratory compromise.
- Correct any tension pneumothorax (Medical Procedure 4.9, Chest Decompression).

**ALS Level 1**

**PARAMEDIC**

- Establish IV of normal saline with a regular infusion set (a) (b), unless overridden by the specific protocol. (Medical Procedure, Medication Delivery 4.18)
- In a critical trauma patient, an intraosseous (IO) line may be considered (Medical Procedure, Medication Delivery 4.18)
- Monitor ECG as needed.

**ALS Level 2**

- None

**Note**

(a) Authorized IV routes include all peripheral venous sites. External jugular veins may be utilized when other peripheral site attempts have been unsuccessful or would be inappropriate. Two IVs using large-bore intracatheters should be initiated in unstable patients. Avoid use of access sites below the diaphragm.

(b) If the exam reveals any new deficit, or if a witness actually saw the patient strike their head, consideration shall be given to transport to the nearest appropriate Trauma Center as a High Index of Suspicion Patient. Should the patient deteriorate enroute, to the point where they meet Trauma Alert criteria, an immediate upgrade should be called into the Trauma Center.
### 2.1.5 Pain Management

#### General Guidelines

**ISOLATED EXTREMITY FRACTURE**  
The purpose of this procedure is to manage pain associated with isolated extremity fractures.

**ACUTE BACK STRAIN**  
This procedure should be used in the isolated back strain.

**ABDOMINAL PAIN/RENAL COLIC**  
This procedure can be used for abdominal pain or with flank pain that is associated with kidney stones.

**SOFT-TISSUE INJURIES, BURNS, BITES, AND STINGS**  
This procedure is used for pain associated with multisystem trauma, soft-tissue injuries, burns, bites, and stings.

#### Treatment Guidelines

**Supportive Care**

For Isolated Extremity Fractures
- Any extremity fracture should be immobilized as described in Adult Protocol 2.10.6, Extremity Injuries.
- Extremity fractures should be elevated, if possible, and cold applied.
- Distal circulation, sensation, and movement in the injured extremity should be noted and recorded.

**ALS Level 1**

When treating patients with altered mental status use CAUTION when considering any pain management medication

Patients should be asked to quantify their pain on an analog pain scale (from 0 = least severe, to 10 = most severe). This number should be documented and used to measure the effectiveness of analgesia:

- Nitrous Oxide-Nitronox:  
  Self-administered analgesia with nitrous oxide should be given special consideration for pain management during this procedure (Medical Procedure 4.20, Nitrous Oxide-Nitronox), if available.

- **OR**  
  Morphine Sulfate  
  May be given via slow IV in 5 mg increments may repeat once, titrated to pain and BP above 100 mm Hg, up to a maximum of 10 mg.(a)

- **OR**  
  Fentanyl  
  May be given 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM.  
  IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg (a)(b) (Medical Procedure 4.18, Medication Administration).  
  Second dose if needed, maximum total dose of 200 mcg IV, IN, IM.

- **OR**  
  Ketamine - Adults **Must dilute** if using 100mg/ml concentration. 20 mg IV over 1 minute slow push. May repeat x 1 in 5 minutes.(c)

**ALS Level 2**

- None

**Note**

- (a) When administering Morphine Sulfate or Fentanyl, closely monitor the patient’s respiratory status. In the event that the patient’s respirations/oxygenation is suppressed (SpO₂ less than 94%), utilize basic airway maneuvers (open airway), administer oxygen and if no improvement consider Narcan.
- (b) If Fentanyl was initially given IN and an IV is then established, then one IV dose of 50 mcg. can be given if needed.
- (c) Dilution instructions - add 20 mg (0.2 ml) to 0.8 ml Normal Saline
2.2 Adult Respiratory Emergencies

GENERAL GUIDELINES

Assessment of the adult patient in respiratory distress requires specific attention to the function of the respiratory system. The EMT’s and paramedic’s assessment should be more concentrated in this area, to include the following considerations:

1. Assessment of chest wall movement, including the rate and depth of ventilation as well as the presence of symmetrical rise and fall.
2. Assessment of accessory muscle use.
3. Auscultation of bilateral lung sounds.
4. Use of pulse oximetry.
5. Use of EtCO2, monitor wave form.

The paramedic must be able to determine the adequacy of ventilation and understand its relationship to respiration. If signs of hypoxia and respiratory distress are present, immediate airway and ventilatory management should be initiated. These signs include altered mental status, tachypnea, and use of accessory muscles, nasal flaring, pursed lips, abnormal lung sounds, tachycardia, and cyanosis. In addition, the general signs of shock may be seen. Other signs of respiratory insufficiency that should alert the paramedic to the need for immediate airway and ventilatory management, including placement of an advanced airway, are respiratory rate below 10/min or above 36/min, SpO2 below 94%, or EtCO2 outside the normal range of 35-45mmHg.

In patients with chronic respiratory disease, the paramedic must be able to differentiate between what is chronic and what is acute, as it pertains to the respiratory assessment. Specific questions about the chief complaint and accompanying symptoms may prove to be invaluable in this setting. Assessment of lung sounds should be combined with patient history. For example, a patient with a history of CHF who has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient.” The paramedic must remember that patients with CHF may also present with wheezing. If this patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF.

Specific treatments for the different causes of respiratory distress are outlined in the following protocols. When the paramedic is unsure as to which protocol to follow, he/she should follow the protocols in Section 2.1 and contact medical control for further direction.
### 2.2.1 Airway Obstruction

#### GENERAL GUIDELINES

**General Guidelines**

Causes of upper airway obstruction include the tongue, foreign bodies, swelling of the upper airway due to angio-neurotic edema (see Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis), and trauma to the airway. Differentiation of the cause of upper airway obstruction is essential to determining the proper treatment.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3
- If air exchange is inadequate and there is a reasonable suspicion of foreign body airway obstruction (FBAO), apply abdominal thrusts until the patient becomes unresponsive then begin CPR, starting with chest compressions. Continue CPR with the addition of looking in the mouth before delivering breaths. (Medical Procedure 4.1.6) (a).

**ALS Level 1**

- If unable to relieve FBAO, visualize it with a laryngoscope and extract the foreign body with magill forceps.
- If the obstruction is due to trauma and/or edema, or if uncontrollable bleeding into the airway causes life-threatening ventilatory impairment, utilize an advanced airway (Medical Procedure 4.4, Advanced Airways).
- If unable to insert an advanced airway and the patient cannot be adequately ventilated by other means, perform a cricothyroidotomy (Medical Procedure 4.5, Needle Cricothyroidotomy).
- Establish an IV; give normal saline KVO.

**ALS Level 2**

- None

**Note**

(a) If air exchange is adequate with a partial airway obstruction, do not interfere; instead, encourage the patient to cough up the obstruction. Continue to monitor the patient for adequacy of air exchange. If air exchange becomes inadequate, continue with the protocol.
### 2.2.2 Asthma/Bronchospasms

#### GENERAL GUIDELINES

**General Guidelines**

This protocol is used for patients who are complaining of dyspnea and having wheezing. A patient with a history of CHF who has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient.” If the CHF patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF (cardiac asthma) (Adult Protocol 2.2.4, Pulmonary Edema-CHF).

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1, Airway Management 2.1.2
- Place the patient in Fowler’s position and assist ventilations as needed (Medical Procedure 4.1.5).

**ALS Level 1**

- Establish an IV; give normal saline.
- Give Albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). This treatment may be repeated twice as needed.
- If bronchodilators are administered, may add Ipratropium bromide (Atrovent®) 0.5 mg (0.5 mL) to Albuterol nebulizer treatment.
- Consider the need for advanced airway management (Medical Procedure 4.4).

If patient continues to have severe respiratory distress, consider the following:

- Administer the following steroid
  - Methylprednisolone sodium succinate (Solu-Medrol) 125mg IV, if IV cannot be established then administer IM, if available (Medical Procedure, Medication Delivery 4.18)
- Administer Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18)(a).

If severe respiratory distress continues, consider the following:

- Administer Magnesium Sulfate 2 g IV (mixed in 50 mL or 100mL of D5W) given over 5-10 minutes.
- Repeat Epinephrine (1:1000) 0.3 mg IM, if the patient has not responded to the previous treatments (a) (Medical Procedure, Medication Delivery 4.18)
- Administer CPAP with 2.5-5 cm H2O PEEP (Medical Procedure 4.12).

**ALS Level 2**

- Repeat Epinephrine (1:1000) 0.3 mg IM (a).

**Note**

(a) When administering Epinephrine caution should be used when the patient is older than 40 years of age or has a history of hypertension or heart disease.
# 2.2.3 Emphysema and/or Bronchitis

## GENERAL GUIDELINES

**General Guidelines**

This protocol is used for patients with a history of emphysema and/or chronic bronchitis (COPD) who complain of dyspnea. If at any point the patient’s respiratory status deteriorates, consider an advanced airway and administration of Albuterol via the ET tube nebulized, and transport the patient immediately.

## TREATMENT GUIDELINES

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Place the patient in Fowler’s position and assist ventilations as needed (Medical Procedure 4.4).

### ALS Level 1

- Establish an IV; give normal saline KVO.
- Give Albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). This treatment may be repeated twice as needed.
- If bronchodilators are administered, may add Ipratropium Bromide (Atrovent®) 0.5 mg (0.5 mL) to Albuterol treatment.
- Administer CPAP with 2.5-5 cm H2O PEEP (Medical Procedure 4.12).
- Consider the need for advanced airway management (Medical Procedure 4.4).

If patient has severe respiratory distress you may administer:

- Methylprednisolone sodium succinate (Solu-Medrol) 125mg, IV push. If IV cannot be established then administer IM, if available. (Medical Procedure, Medication Delivery 4.18)

### ALS Level 2

- None

### Note
## 2.2.4 Pulmonary Edema (CHF)

### GENERAL GUIDELINES

**General Guidelines**

This protocol is used for patients who are exhibiting signs of pulmonary edema-CHF, including dyspnea with rales and/or wheezing (cardiac asthma). The patient may also have diminished air exchange. Other treatments for the causes of pulmonary edema-CHF should be considered (e.g., supraventricular tachycardia, myocardial infarction, and cardiogenic shock). A patient with a history of CHF who has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient.” The paramedic must remember that patients with CHF may also present with wheezing. If the CHF patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF (cardiac asthma).

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Place the patient in Fowler’s position and assist ventilations as needed (Medical Procedure 4.1.5).
- If the patient is hypotensive (systolic BP below 90 mm Hg), Adult Protocol 2.4.1, Cardiogenic Shock.

**ALS Level 1**

- If there is no improvement in the patient’s pulse oximetry, capnography, and mental status, consider use of an advanced airway (Medical Procedure 4.4).
- Establish an IV; give normal saline KVO.
- Do not administer nitroglycerin (NTG) if:
  - The patient’s systolic BP is below 100 mm Hg.
  - The patient has taken any of the following erectile dysfunction medications. (Note the following medications are also marketed under a variety of other trade names).
    - Stendra (Avanafil) – in the past 12 hours
    - Viagra (Sildenafil) – in the past 24 hours
    - Levitra (Vardenafil) or Cialis (Tadalafil) – in the last 48 hours
- If the patient’s systolic BP is between 100 and 160 mm Hg, give nitroglycerin (Nitrostat® or Nitrolingual® spray) 0.4mg SL, prior to applying CPAP. May repeat every 3 to 5 minutes (maximum of two additional doses (0.4mg/each) if the patient is symptomatic and the systolic pressure is greater than 100 mmHg (b).
- If the patient’s systolic BP is above 160 mm Hg, give nitroglycerin (Nitrostat® or Nitrolingual® spray) 0.8mg SL, prior to applying CPAP. May repeat as needed every 3 to 5 minutes (0.4mg/each) if the patient is symptomatic and the systolic blood pressure is greater than 160 mmHg (b) (c).
- Administer CPAP with **10 cm** H₂O PEEP (Medical Procedure 4.12) (a).
- Reevaluate the need for advanced airway management. If there is no improvement in the patient’s pulse oximetry, capnography, and mental status, consider use of advanced airway management (Medical Procedure 4.4, and Medical Procedure 4.10, Capnography).
2.2.4 Pulmonary Edema (CHF) (continued)

TREATMENT GUIDELINES

- None

Note

- (a) The CPAP mask must be tight fitting. Some patients may not tolerate CPAP at 10 cm H₂O PEEP initially, in which case you may start with lower pressures (5 – 7.5 cm H₂O PEEP). CPAP should not be used if the patient’s systolic BP below 100 mm Hg.
- (b) Consider withholding if the clinical presentation of the patient indicates signs of hypovolemia (e.g., poor skin turgor, decreased capillary refill, and elevated temperature).
- (c) It is preferred to have an IV in place prior to NTG administration. However, if you are unable to establish IV access, NTG may be administered with caution.
### 2.2.5 Suspected Pneumonia

**GENERAL GUIDELINES**

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients complaining of dyspnea should be suspected of having pneumonia when they present with fever, productive cough, possible pleuritic chest pain, history of being bedridden, known immune-compromise, diabetes, elderly age, and lung sounds indicative of consolidation (rales and/or rhonchi with egophony over area of consolidation).</td>
</tr>
</tbody>
</table>

**TREATMENT GUIDELINES**

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 2.1.1.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Establish an IV; If lungs sounds are clear administer 500mL normal saline</td>
</tr>
<tr>
<td>- Give albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). This treatment may be repeated twice as needed.</td>
</tr>
<tr>
<td>- If bronchodilators are administered, may add Ipratropium Bromide (Atrovent®) 0.5 mg (0.5 mL) to albuterol nebulizer treatment.</td>
</tr>
<tr>
<td>- Avoid the use of diuretics.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
</tr>
</tbody>
</table>

**Note**
### General Guidelines

The paramedic should use these protocols to guide him/her through the treatment of cardiac patients with specific dysrhythmias and accompanying signs and symptoms. After stabilization of the patient, the paramedic may need to refer to additional protocols for continued treatment (e.g., other cardiac protocols).

In cardiac arrest, a major component of the primary and secondary survey is to consider the secondary, differential diagnosis and to think carefully about what could be causing the arrest. The “H’s and T’s” chart will assist in the recognition of a possible underlying cause.

<table>
<thead>
<tr>
<th>H’s Cause</th>
<th>Treatment</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypovolemia</td>
<td>Fluid challenge NS 500 mL IV/IO</td>
<td>Protocol 2.10</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Airway management</td>
<td>Protocol 2.1.2</td>
</tr>
<tr>
<td>Hydrogen ion-acidosis</td>
<td>Airway management, ventilate consider Sodium Bicarbonate</td>
<td>Protocol 2.1.2 Drug Summary 5.31</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Consider Calcium Chloride 1 g</td>
<td>Drug Summary 5.9 and 5.31</td>
</tr>
<tr>
<td></td>
<td>Consider Sodium Bicarbonate 1 mEq/kg</td>
<td></td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Cold-related emergencies</td>
<td>Protocol 2.9.2</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>If less than 60, consider D₅₀ or Glucagon</td>
<td>Protocol 2.8.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drug Summary 5.9 and 5.16</td>
</tr>
<tr>
<td>Hypocalcemia</td>
<td>Consider Calcium Chloride 1 g</td>
<td>Drug Summary 5.7</td>
</tr>
<tr>
<td>T’s Cause</td>
<td>Treatment</td>
<td>Protocol</td>
</tr>
<tr>
<td>Tablets</td>
<td>Consult poison control for specific therapy</td>
<td>Protocol 2.6</td>
</tr>
<tr>
<td>Tamponade, cardiac</td>
<td>Consider fluid challenge, Dopamine drip</td>
<td>Protocol 2.4.1</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>Consider chest decompression</td>
<td>Procedure 4.9</td>
</tr>
<tr>
<td>Thrombosis, coronary</td>
<td>Consider AMI, cardiogenic shock</td>
<td>Protocol 2.4.2</td>
</tr>
<tr>
<td>Thrombosis, pulmonary</td>
<td></td>
<td>Protocol 2.4.1</td>
</tr>
<tr>
<td>Trauma</td>
<td></td>
<td>Protocol 2.10</td>
</tr>
</tbody>
</table>
# 2.3.1 Asystole/Pulseless Electrical Activity (PEA)

## Supportive Care

- Consider criteria for death/no resuscitation (General Protocol 1.4).
- Initial Assessment Protocol 2.1.1.
- Look for no breathing or only gasping and check pulse (simultaneously)
- If no pulse, begin CPR using cycles of 30 compressions and 2 breaths for 2 minutes while monitor is being attached.
- Oxygenate with 15-25 L/min via bag-valve mask (BVM) with an appropriate airway adjunct (Airway Management Protocol 2.1.2) (a).
- Do not interrupt the 2 minutes of CPR to check the heart rhythm. **Continuous uninterrupted CPR is paramount to patient survival.**
- Check the heart rhythm; confirm asystole in two leads.
- Resume 2 minutes of CPR at a rate of 100-120 per minute; check the heart rhythm.
- Consider the H’s and T’s.

## ALS Level 1

- Confirm airway adjunct placement with electronic EtCO₂ and waveform on scene, during transport, and during transfer at the hospital.
- Establish IV or IO access; give normal saline KVO. Consider infusing saline wide open in PEA.
- When IV or IO line is established:
  - Epinephrine (1:10,000) 1 mg IV/IO; repeat every 3-5 minutes.
  - Give 2 minutes of CPR, check the heart rhythm.
  - Search for and treat possible contributing factors; see the H’s and T’s charts.
  - If the patient is taking a calcium-channel blocker or has known renal failure, give Calcium Chloride 10% 1 g IV or IO.
  - As soon as the patient regains spontaneous circulation (Return of Spontaneous Circulation (ROSC) Protocol 2.3.7

## ALS Level 2

- None

### Note

(a) Provide a 30:2 compression to ventilation ratio.

   Once an advanced airway is in place, provide 1 breath every 6 seconds.

(b) If EtCO₂ less than 10mmHg: Attempt to improve CPR (compressions vs. ventilation).

   - If EtCO₂ = 12 - 25mm Hg: Goal during resuscitation.
   - If EtCO₂ = 35 - 45mm Hg: Check for ROSC

(c) If ROSC achieved, wean down oxygen to maintain a SpO₂ equal to greater than 94%
2.3.2 Bradycardia

TREATMENT GUIDELINES

Supportive Care

Patients who present with a heart rate less than 50 and are symptomatic (a).

Consider the potential causes:

- Acute myocardial infarction
- Head injury
- Atrio-ventricular block
- Hypoxia
- Hypoglycemia
- Medications (beta blockers)
- Trauma
- Calcium-channel blockers
- Clonidine
- Digitalis (e)
- Toxins
- Sick sinus syndrome
- Spinal cord lesion

- Initial Assessment Protocol 2.1.1.
- Access the CABs and vital signs.
- Apply a SpO$_2$ monitor, and administer oxygen to maintain SpO$_2$ greater than or equal to 94% or assist with bag-valve mask (BVM) ventilations if indicated.
- Consider the H’s and T’s.

ALS Level 1

- Establish IV access; give normal saline KVO.
- Perform 12-lead ECG. If inferior wall MI is identified, perform additional 12-lead ECG with V4R to confirm/rule out concurrent right ventricular MI (b).

Unstable (e.g., acutely altered mental status, ischemic chest pain/discomfort, acute heart failure, hypotension (systolic BP below 100 mm Hg), dyspnea, heart blocks or ischemia/infarction on 12-lead ECG or other signs of shock that persist despite adequate airway and breathing),

- Atropine 0.5 mg IV/IO; repeat every 3 - 5 minutes, up to a maximum total dose of 3 mg (a) (b) (c).
  - If atropine is ineffective, consider pacing (e) (f)

OR

Dopamine drip infusion 5–10 mcg/kg/min, titrate to maintain minimum systolic BP of 100 mm Hg and maximum systolic BP of 120 mm Hg

OR

Epinephrine drip infusion 2-10 mcg per minute, titrate to maintain minimum systolic BP of 100 mm Hg and maximum systolic BP of 120 mm Hg

Bradycardia with hypotension may be due to an inferior wall MI associated with right ventricular MI (confirmed on 12-lead ECG as a V4R ST elevation). If the patient has an acute inferior wall MI with hypotension and clear lungs, give normal saline 500 cc fluid challenge; may repeat once (Adult Protocol 2.4.2, Chest Pain—Suspected AMI).

- When an inferior wall MI is associated with right ventricular MI, avoid the use of nitrates (Nitroglycerin) and Morphine/Fentanyl.
- If bradycardia and hypotension exist, pacing and IV fluids may improve the patient’s hemodynamic status; consider pacing and IV fluids prior to the use of Atropine. Also refer to Adult Protocol 2.4.2, Angina/Suspected AMI. (b)
If the patient has persistent hypotension/cardiogenic shock, give Dopamine 5–10 mcg/kg/min (1600 mcg/mL infusion concentration = 15-60 gtt/min). Titrate to maintain a minimum systolic BP of 100 mm Hg and maximum BP of 120 mm Hg. If pacing is chosen as the second-line treatment and it is also ineffective, begin an infusion of dopamine or epinephrine.

- If the patient is conscious and aware of the situation during pacing, administer one of the following benzodiazepines (d): (Medical Procedure, Medication Delivery 4.18).

  Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, to a maximum dose of 10 mg.

  OR

  Midazolam (Versed) (5 to 10 mg) IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg (d).

  OR

  Lorazepam (Ativan) 2 mg IV, IO, IM, or IN; may repeat once, to a maximum dose of 4 mg.

**ALS Level 2**

- None

**Note**

- (a) Consider pacing before giving the maximum dose of atropine.
- (b) For second-degree AV block type II and third-degree AV block, omit Atropine and use an external pacer.
- (c) Use atropine with caution in the presence of myocardial ischemia.
- (d) Administer benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
- (e) If suspected digitalis toxicity, Atropine improves AV nodal conduction. Caution should be used with pacing because it can lower the fibrillatory threshold and induce arrhythmias. Refer to Protocol 2.6.4 Digitalis Toxicity.
- (f) If pacing is chosen as the second-line treatment and it is also ineffective, begin an infusion of dopamine or epinephrine.
Adult Bradycardia With a Pulse Algorithm

1. Assess appropriateness for clinical condition. Heart rate typically <50/min if bradyarrhythmia.

2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IV access
   - 12-Lead ECG if available; don’t delay therapy

3. Persistent bradyarrhythmia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?

4. Monitor and observe

5. Yes
   - **Atropine**
     - If atropine ineffective:
       - Transcutaneous pacing
       - **Dopamine** infusion
       - **Epinephrine** infusion

6. Consider:
   - Expert consultation
   - Transvenous pacing

**Doses/Details**

- **Atropine IV dose:**
  First dose: 0.5 mg bolus. Repeat every 3-5 minutes. Maximum: 3 mg.
- **Dopamine IV infusion:**
  Usual infusion rate is 2-20 mcg/kg per minute. Titrate to patient response; taper slowly.
- **Epinephrine IV infusion:**
  2-10 mcg per minute infusion. Titrate to patient response.
2.3.3 Narrow Complex Tachycardia

GENERAL GUIDELINES

Patients suffering from tachycardia may or may not exhibit symptoms. It is important to note that narrow complex tachycardia has many origins. The atrial rate may be helpful in the differential interpretation of these types of tachycardia. The following rates should be considered:

**Sinus tachycardia** ranges from 100 to 160 beats per minute.
**Junctional tachycardia** ranges from 100 to 180 beats per minute.
**Atrial tachycardia** ranges from 150 to 250 beats per minute (atrial rate).
**Atrial flutter** ranges from 250 to 350 beats per minute (atrial rate).
**Atrial fibrillation** starts at 350 beats per minute (atrial rate).

In addition, wide complex tachycardia (QRS greater than or equal to 0.12 seconds) should initially be considered as ventricular in origin, unless proven otherwise (e.g., documented QRS morphology consistent with preexisting BBB; refer to Adult Medical Protocol 2.3.6, Wide Complex Tachycardia with a Pulse).

Those patients who present with SVT may have evidence of cardiovascular dysfunction. Those patients who present with symptomatic signs and symptoms may be treated with medications. Those patients who present with “unstable” signs and symptoms should be cardioverted immediately.

The following table shows stable to unstable signs and symptoms:

<table>
<thead>
<tr>
<th>Symptomatic (Stable)</th>
<th>Critical (Unstable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert and oriented</td>
<td>Decreased level of consciousness</td>
</tr>
<tr>
<td>SBP equal to greater than 100 mm Hg</td>
<td>SBP below 100 mm Hg (shock)</td>
</tr>
<tr>
<td>Mild chest discomfort</td>
<td>Chest pain</td>
</tr>
<tr>
<td>Mild to Moderate Shortness of breath</td>
<td>Severe Shortness of breath</td>
</tr>
<tr>
<td></td>
<td>Diaphoresis</td>
</tr>
<tr>
<td></td>
<td>Pulmonary edema/CHF</td>
</tr>
</tbody>
</table>
### 2.3.3 Narrow Complex Tachycardia (Supraventricular Tachycardia) (continued)

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NARROW COMPLEX TACHYCARDIAS</strong></td>
<td>Heart Rate greater than 150 BPM</td>
</tr>
</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initial Assessment Protocol 2.1.1.</td>
<td></td>
</tr>
<tr>
<td>• Determine hemodynamic stability and symptoms.</td>
<td></td>
</tr>
<tr>
<td>• Consider the H’s and T’s.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>STABLE SVT, HEART RATE greater than or equal to 150 BPM</td>
<td></td>
</tr>
<tr>
<td>• Apply the ECG monitor, record a rhythm strip, and obtain a 12-lead ECG.</td>
<td></td>
</tr>
<tr>
<td>• Establish IV access; give normal saline KVO.</td>
<td></td>
</tr>
<tr>
<td>• If the patient is asymptomatic, provide medical supportive care (Protocol 2.1.3) and transport immediately.</td>
<td></td>
</tr>
<tr>
<td>• If necessary, perform vagal maneuvers (Medical Procedure 4.26).</td>
<td></td>
</tr>
<tr>
<td>• If not resolved, administer Adenosine Triphosphate (Adenocard®) 12 mg rapid IVP, followed by rapid 10 mL NS flush.</td>
<td></td>
</tr>
<tr>
<td>• If not resolved, after 2 minutes Adenosine Triphosphate (Adenocard) 12 mg rapid IVP, followed by rapid 10 mL NS flush. (a).</td>
<td></td>
</tr>
<tr>
<td>• If available, administer Diltiazem (Cardizem) 0.25 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.25 mg/kg.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>o Stop the administration of Cardizem once the Heart Rate is less than 120 and/or SBP is less than 100mmHg.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• If the tachyarrhythmia is not resolved in 15 minutes, may repeat Diltiazem (Cardizem) 0.35 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.35 mg/kg.</td>
<td></td>
</tr>
</tbody>
</table>

| Note |  |
## General Guidelines

### STABLE ATRIAL FIBRILLATION OR ATRIAL FLUTTER

Heart rate greater than or equal to 150 BPM

### Treatment Guidelines

####ALS Level 1
- Apply the ECG monitor, record a rhythm strip, and obtain a 12-lead ECG.
- Establish IV access; give normal saline KVO.
- If the patient is asymptomatic, provide medical supportive care (Protocol 2.1.3) and transport immediately.
- If the patient has borderline symptoms with a SBP of 100 mm Hg, then consider other causes of hypotension (e.g., hypovolemia or sepsis).
- If available, administer Diltiazem (Cardizem) 0.25 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.25 mg/kg.
  - Stop the administration of Cardizem once the Heart Rate is less than 120 and/or SBP is less than 100 mmHg.
- If the tachyarrhythmia is not resolved in 15 minutes, may repeat Diltiazem (Cardizem) 0.35 mg/kg IV. Give in 5 mg increments every 2 minutes up to maximum of 0.35 mg/kg IV.

####ALS Level 2

- 

### Note
2.3.3 Narrow Complex Tachycardia (Supraventricular Tachycardia) (continued)

GENERAL GUIDELINES

UNSTABLE NARROW COMPLEX TACHYCARDIAS

This patient group includes individuals who are hypotensive with a systolic BP less than 100 mm Hg and a heart rate greater than or equal to 150 beats/min and who are symptomatic (clinical evidence of impending cardiac arrest) as evidenced by any of the following:
Diaphoresis, Shortness of breath, Decreased level of consciousness, Chest pain, Pulmonary edema

TREATMENT GUIDELINES

Supportive Care

- Initial Assessment Protocol 2.1.1.
- Determine hemodynamic stability and symptoms.
- Consider the H’s and T’s.

ALS Level 1

- Provide advanced airway management, if necessary (c).
- Establish IV access; give normal saline KVO.
- Evaluate lung sounds. If they are clear, administer a fluid challenge of normal saline 500 mL IV.
- Perform synchronized cardioversion Start at the lower dose and increase to the higher dose until appropriate clinical effect is obtained.
  Narrow regular SVT, atrial flutter: 50-100 joules
  Narrow irregular, atrial fibrillation: 120-200 joules (per manufacture recommendation)
- Escalate the second and subsequent shock doses as needed.
- If the patient is conscious and aware of the situation, consider sedation with one of the following benzodiazepines (d): (Medical Procedure, Medication Delivery 4.18)
  o Diazepam (Valium) 5 mg IV, IO, IM or IN, maximum dose of 10 mg (e)
  OR
  o Midazolam (Versed) 5 to 10 mg IV, IO, IM or IN (In concentration 10mg/2ml)
  OR
  o Lorazepam (Ativan) 2 mg IV, IO, IM, or IN; may rpat once, up to a max dose of 4 mg (e).

ALS Level 2

- None

Note

(a) Adenosine Triphosphate should not be given to patients with known atrial flutter or atrial fibrillation.
(b) Do not give diltiazem (Cardizem®) to patients with a known history of Wolff-Parkinson-White (WPW) syndrome.
(c) Confirm airway adjunct placement with electronic EtCO₂ and waveform on scene, during transport, and during transfer at hospital.
(d) Administer benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
2.3.4 Premature Ventricular Ectopy (PVC)

### GENERAL GUIDELINES

**General Guidelines**

Treatment of ventricular arrhythmias after MI has been a controversial topic for two decades. Similarly, management of ventricular arrhythmias during the acute phase of MI continues to evolve as treatment strategies are reviewed in the context of new information and changing epidemiological data during the era of adjunctive medical and reperfusion therapy. At present, the treatment of asymptomatic premature ventricular ectopy (PVC) is not recommended. Current ACLS protocols recommend amiodarone for the treatment of hemodynamically stable VT and prevention of recurrent VF.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3

#### ALS Level 1

- None

#### ALS Level 2

- If the patient is symptomatic, contact the physician for further orders

#### Note


### 2.3.5 Wide Complex Tachycardia with a Pulse (Ventricular Tachycardia)

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>STABLE</th>
</tr>
</thead>
</table>

#### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- Consider the H’s and T’s.

**ALS Level 1**
- Monitor the ECG.
- Establish IV access; give normal saline KVO.
- Give Amiodarone infusion of 150 mg in 50 mL or 100 mL of D₅W over 10 minutes IV
- If the patient has torsades de pointes, administer Magnesium Sulfate 2 g in 50 mL or 100 mL of D₅W infused over 5-10 minutes IV. If the Magnesium Sulfate successfully converts the rhythm, start Magnesium Sulfate maintenance infusion (1 g in 250 mL of D₅W) at 30-60 gtts/min. with a 60 gtts set.

**ALS Level 2**
- None

**Note**
### 2.3.5 Wide Complex Tachycardia with a Pulse (Ventricular Tachycardia continued)

#### GENERAL GUIDELINES

**UNSTABLE** - Heart rate greater than 150 beats/min and systolic blood pressure less than 100 mm Hg with one of the following signs and symptoms: chest pain, dyspnea, pulmonary edema, diaphoresis, and altered mental status.

#### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- If necessary, oxygenate with 15-25 L/min via bag-valve mask (BVM) with an appropriate airway adjunct device at 10-12 BPM (Airway Protocol 2.1.2) (a).
- Confirm airway adjunct placement.
- Consider the H’s and T’s.

**ALS Level 1**
- Monitor the ECG.
- For unstable monomorphic perform synchronized cardioversion at 100, 200, 300, or 360 joules. If wide irregular/unstable or polymorphic and/or torsades: defibrillate at 200 joules (not synchronized). (c)(d)
- Establish IV or IO access; give normal saline KVO.
  - If the patient is conscious and aware of the situation, consider sedation with one of the following benzodiazepines (b): (Medical Procedure, Medication Delivery 4.18)
    - Diazepam (Valium) 5 mg IV, IO, IM or IN; maximum dose of 10 mg.
    - Midazolam (Versed) 5 to 10 mg IV, IO, IM or IN (In concentration 10mg/2ml) maximum dose of 10 mg.
    - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a maximum dose of 4 mg

**ALS Level 2**
- None

### Note

(a) Provide one breath every 5-6 seconds
   Once an advanced airway is in place, provide 1 breath every 6 seconds.
(b) Administer benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
   If an antiarrhythmic medication was not administered prior to cardioversion, then administer an. Give Amiodarone infusion of 150 mg in 50 mL or 100 mL of D₅W over 10 minutes IV.
(c) IV if patient’s BP is above 100.
(d) If suspected digitalis toxicity, consider lowering initial cardioversion dose to 5-20 joules.
   Protocol 2.6.4 Digitalis Toxicity
### 2.3.6 Wide Complex Tachycardia Without a Pulse/Ventricular Fibrillation

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Determine the patient’s responsiveness or unresponsiveness
- Look for no breathing or only gasping and check pulse (simultaneously)
- If no pulse, begin CPR using cycles of 30 compressions and 2 breaths for 2 minutes while monitor is being attached.
- Oxygenate with 15-25 L/min via a BVM with an appropriate airway adjunct device. (see Airway Protocol 2.1.2) (a) (e).
- Do not interrupt the 2 minutes of CPR to check heart rhythm. **Continuous uninterrupted CPR is paramount to patient survival.**
- Check the heart rhythm. Confirm the rhythm and shock accordingly (b).
- Perform a focused rapid assessment.
- Consider the H’s and T’s.

#### ALS Level 1

- Confirm placement of the airway adjunct with electronic EtCO$_2$ and wave-form while on scene, during transport, and during transfer at hospital.
- Establish IV or IO access; give normal saline KVO.
- Defibrillate at 200 joules (for a biphasic device based on manufacturer recommendation) (e). Continue CPR while the defibrillator is charging.
- Immediately resume CPR for 2 minutes.
- Check the heart rhythm. If it is a shockable rhythm, defibrillate at 300 joules for a biphasic device based on manufacturer recommendation) (e). Continue CPR while the defibrillator is charging.
- When an IV or IO line is established
  - Give Epinephrine (1:10,000) 1 mg IV/IO; repeat every 3-5 minutes for the duration of the arrest.
- Immediately resume CPR for 2 minutes.
- Check the heart rhythm. If it is a shockable rhythm, defibrillate at 360 joules for a biphasic. Continue CPR while the defibrillator is charging.
- Immediately CPR for 2 minutes.
- Administer Amiodarone 300 mg IV/IO once. If V-Fib/pulseless V-Tach continues after 3-5 minutes administer an additional 150 mg IV/IO once. Administer during CPR.
- Check the heart rhythm. If it is a shockable rhythm, defibrillate at 360 joules for a biphasic device based on manufacturer recommendation) (e). Continue CPR while the defibrillator is charging.
- Immediately resume CPR for 2 minutes.
- Check the heart rhythm.
- If the patient has torsades de pointes, administer Magnesium Sulfate 2 g in 50 mL or 100 mL of D$_5$W infused over 5-10 IV/IO (c).
- Continue treatment until there is a return of spontaneous circulation (ROSC), a rhythm change, or termination of efforts.
- If the patient has Return of Spontaneous Circulation (ROSC), (Protocol 2.3.7).
2.3.6 Wide Complex Tachycardia Without a Pulse/Ventricular Fibrillation (continued)

TREATMENT GUIDELINES

(a) Provide a 30:2 compression to ventilation ratio.
   Once an advanced airway is in place, provide 1 breath every 6 seconds.
(b) The EMT should apply the AED. The paramedic should proceed to ALS Level 1 defibrillation.
(c) If Magnesium Sulfate successfully converts the heart rhythm, start a Magnesium Sulfate maintenance infusion (1 g in 250 mL NS) at 30-60 gtt/s/min.
(d) If EtCO2 is less than 10mmHg: Attempt to improve CPR (compressions vs. ventilation).
   If EtCO2 = 12-25mm Hg: Goal during resuscitation.
   If EtCO2 = 35-45mm Hg: Check for ROSC
(e) For Zoll monitor biphasic device the manufacturer recommends the initial defibrillation at 120 joules and subsequent defibrillations at 150, 200 as the maximum.
Adult Cardiac Arrest Circular Algorithm—2015 Update

Start CPR
- Give oxygen
- Attach monitor/defibrillator

2 minutes

Check Rhythm

Return of Spontaneous Circulation (ROSC)

If VF/pVT Shock

Post-Cardiac Arrest Care

Drug Therapy
IV/IO access
Epinephrine every 3-5 minutes
Amiodarone for refractory VF/pVT

Consider Advanced Airway
Quantitative waveform capnography

Treat Reversible Causes

CPR Quality
- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If P<sub>ETCO₂</sub> < 10 mm Hg, attempt to improve CPR quality
  - Intra-arterial pressure.
  - If relaxation phase (diastolic) pressure < 20 mm Hg, attempt to improve CPR quality.

Shock Energy for Defibrillation
- Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy
- Epinephrine IV/IO dose: 1 mg every 3-5 minutes
- Amiodarone IV/IO dose: First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in P<sub>ETCO₂</sub> (typically > 40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

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## 2.3.7 Return of Spontaneous Circulation (ROSC)

| General Guidelines | Post-resuscitation is an extremely unstable period for the patient, so the patient should be monitored closely and reassessed frequently. The immediate goals of post-resuscitation care are as follows:  
- Provide cardio-respiratory support to optimize tissue perfusion, especially to the brain.  
- Institute antiarrhythmic therapy to prevent recurrence of the arrest.  
- Attempt to identify the precipitating cause of the arrest.  
- Rapidly transport the patient to the closest appropriate facility. |

| Supportive Care |  
- Initial Assessment Protocol 2.1.1.  
- Reassess the CABs and vital signs.  

| ALS Level 1 |  
- Maintain an open airway with an appropriate airway adjunct device, administer 100% O₂ to maintain SpO₂ greater than or equal to 94%, and monitor with electronic EtCO₂ capnography/waveform. Ventilate at 10-12 BPM; avoid hyperventilation (d).  
  - Determine the patient’s hemodynamic stability. If systolic blood pressure below 100 mm Hg:  
  - If the patient’s lungs are clear, administer IV NS 500 mL; may repeat once to maintain systolic blood pressure above 100 mm Hg (a).  
  - If systolic BP remains below 100 mm Hg:  
    - Give a Dopamine infusion at 5 – 10 mcg/kg/min; titrate to maintain minimum systolic BP of 100 mm Hg and a maximum systolic BP of 120 mm Hg.  
- Manage dysrhythmias according to the specific protocol.  
- If the cardiac arrest was the result of VF or VT, manage the patient as follows:  
  - If an antiarrhythmic medication was not used to convert the heart rhythm, administer Amiodarone 150 mg in 50 mL or 100 mL of D₅W over 10 minutes IV/IO (b).  
  - If Amiodarone was administered during resuscitation, do not administer additional Amiodarone.  
  - If the patient is having frequent PVC or runs of VT, or if the transport time will exceed 30 minutes, start an Amiodarone drip (150 mg in 50 mL of D₅W = 3:1 concentration). Using a 60 gtt/mL set, initiate the flow at 1 gtt every 3 seconds.  
- Transport the patient to the closest interventional cardiac facility (c). |

| ALS Level 2 | None |

| Note | (a) If rales or crackles are auscultated in the lungs or the patient’s systolic blood pressure remains less than 90 mm Hg despite fluid therapy, proceed directly to dopamine administration.  
(b) Do not use Amiodarone if the patient has a heart rate less than 60, second-degree type II AV block, third- degree AV block or if patient is hypotensive  
(c) If the patient’s airway is compromised or crews are unable to manage the patient, transport the patient to the nearest facility.  
(d) If EtCO₂ is less than10mmHg: Attempt to improve CPR (compressions vs. ventilation).  
  - If EtCO₂ = 12-25mm Hg: Goal during resuscitation.  
  - If EtCO₂ = 35-45mm Hg: Check for ROSC |
### 2.4.1 Cardiogenic Shock

#### GENERAL GUIDELINES

**General Guidelines**

This protocol is used for the patient who is hypotensive (systolic BP less than 100 mm Hg) with signs and/or symptoms that are cardiac in origin (Adult Protocol 2.2.4, Pulmonary Edema-CHF; Adult Protocol 2.3, Adult Cardiac Dysrhythmias; and Adult Protocol 2.4.2, Angina/Suspected AMI).

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Administer oxygen via non-rebreather mask (10-15 L/min). If the patient’s airway is compromised, assist ventilations by using the appropriate airway adjunct.
- Consider possible causes (e.g., the H’s and T’s).

**ALS Level 1**

- Monitor the ECG.
- Perform a 12-lead ECG, and initiate a Cardiac Alert if AMI is present.
- Start IV/IO normal saline. If time permits, establish a second IV/IO line if possible.
- If the patient is not experiencing pulmonary edema, administer a fluid challenge of 500 mL normal saline. If this measure does not improve the patient’s systolic blood pressure, the fluid challenge may be repeated once (a).
- If the fluid challenge does not improve blood pressure, or if the patient is experiencing rales (or pulmonary edema), administer a Dopamine infusion at 5-20 mcg/kg/min (b).
- Titrate Dopamine to maintain a minimum systolic SBP of 100 mm Hg and a maximum systolic BP of 120 mm Hg.
- If the heart rate is slow, less than 60/min, Adult Protocol 2.3.2, Bradycardia.
- If the heart rate is fast, greater than 150/min, Adult Protocol 2.3.3, Narrow Complex Tachycardia, or Adult Protocol 2.3.6, Wide Complex Tachycardia with a Pulse, as appropriate.

**ALS Level 2**

- None

**Note**

(a) Avoid giving fluids if an anterior wall MI is suspected (evidenced by ST elevations in leads I, AVL, V1 through V6).

(b) Dopamine 1600 mcg/mL infusion concentration = 15-60 gts/min with a 60-gtt set. The maximum dose is 20 mcg/kg/min.
## 2.4.2 Angina/Suspected AMI

### GENERAL GUIDELINES

**General Guidelines**

This protocol is used for the patient who is experiencing chest pain or discomfort due to angina pectoris or suspected AMI. Other SS associated with acute coronary syndrome include dyspnea, diaphoresis, nausea/vomiting, and weakness/fatigue. If these additional signs and symptoms are present in the absence of chest pain or discomfort, AMI may still be present. If nontraumatic chest pain other than angina/AMI is suspected consider other potential causes; dissecting aortic aneurysm, pericarditis, spontaneous pneumothorax, pulmonary embolism, pneumonia, pleurisy, costochondritis, hiatal hernia, esophageal spasm, peptic ulcer, cholecystitis, pancreatitis, and cervical disk problem. These conditions should not be treated under this protocol, refer to specific protocol and utilize Appendix 6.5, Chest Pain Differential.

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Consider oxygen if the SpO₂ is less than 94% and/or the patient is in respiratory distress. Maintain SpO₂ of 94% (nasal cannula recommended).
- EMTs should:
  - Assist the patient in self-administration of previously prescribed Aspirin.
  - Assist the patient in self-administration of previously prescribed Nitroglycerin. The total dose should not exceed three doses (tablets or spray), including doses that the patient may have taken prior to your arrival. Do NOT administer Nitroglycerin if the SBP less than 100 mm Hg or if the patient has taken erectile dysfunction medications within the last 24 hours (Viagra) or within the last 48 hours (Levitra or Cialis). The patient has taken any of the following erectile dysfunction medications. (Note the following medications are also marketed under a variety of other trade names).
    - a. Stendra (Avanafil) – in the past 12 hours
    - b. Viagra (Sildenafil) – in the past 24 hours
    - c. Levitra (Vardenafil) or Cialis (Tadalafil) – in the last 48 hours

**ALS Level 1**

- Monitor the ECG.
- If AMI is probable (c), initiate a Cardiac Alert and transport the patient to the appropriate cardiac interventional facility.
- Limit cardiac alert on scene time. (d)
- Establish IV access; give normal saline KVO.
- Give aspirin 162 mg, up to 324 mg PO (chewable), unless contraindicated (a).
- Perform a 12-lead ECG and transmit the results to the destination hospital, as soon as possible.
- If an inferior wall MI is identified, perform an additional 12-lead ECG with V4R to confirm/rule out concurrent right ventricular MI (b). (Medical Procedure 4.14)
- If the patient is hypotensive (SBP less than 100 mm Hg), see Adult Protocol 2.4.1, Cardiogenic Shock.
- If the patient is experiencing chest pain or discomfort and systolic BP above 100 mm Hg, administer Nitroglycerin (Nitrostat® or Nitrolingual® Spray) 0.4 mg SL; repeat every 3-5 minutes (maximum dose is 1.2 mg or 3 doses).
2.4.2 Angina/Suspected AMI (continued)

**TREATMENT GUIDELINES**

### ALS Level 1

- Do NOT administer Nitroglycerin if:
  - SBP less than 100 mm Hg.
  - Patient taking drug classification phosphodiesterase-5 inhibitor (PDE-5).
  - The patient has taken any of the following erectile dysfunction medications. (Note the following medications are also marketed under a variety of other trade names).
    a. Stendra (Avanafil) – in the past 12 hours
    b. Viagra (Sildenafil) – in the past 24 hours
    c. Levitra (Vardenafil) or Cialis (Tadalafil) – in the last 48 hours

- If pain continues and the patient is normotensive (systolic BP greater than 100 mm Hg), administer
  - Morphine 5 mg IVP may repeat once in 5 - 10 min (maximum 10 mg) Titrated to pain and BP greater than or equal to 100 mm Hg, up to a maximum of 10 mg. Can also be given IM (Medical Procedure, Medication Delivery 4.18)
  - Fentanyl may be given 100 mcg increments IN/IM, every 3-5 minutes to a maximum of 200 mcg IN/IM
  - IV dose 1mcg/kg SLOW IV increments every 3-5 minutes up to a maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg. (Medical Procedure, Medication Delivery 4.18).
    - Second dose if needed, maximum total dose of 200mcg IV/IN/IM.
      - If Fentanyl was initially given IN/IM and an IV is then established, one IV dose (50mcq) can be given if needed.

- Treat dysrhythmia per specific protocol.

### ALS Level 2

- None

**Note**

(a) Allergies to ASA should be suspected in patients with anaphylaxis signs and symptoms (e.g., flushed itchy skin, increased heart rate, dyspnea, or urticaria).

(b) Bradycardia with hypotension may be due to an inferior wall MI associated with right ventricular MI (confirmed on 12-lead ECG by ST elevation in lead V4R); (Adult Protocol 2.3.2, Bradycardia). When an inferior wall MI is associated with right ventricular MI, avoid the use of nitrates (Nitroglycerin). If bradycardia and hypotension exist, pacing and IV fluids may improve the patient’s hemodynamic status.

(c) AMI is probable when there is:
  1. A minimum of 1mm ST elevation in two or more related leads on the 12-lead ECG with a history suggestive of AMI, signs and symptoms regardless of onset time.
  2. A “new onset” left bundle branch block (LBBB) on the ECG with signs/symptoms and history suggestive of AMI.
  3. Patients meeting the above criteria should be transported to the nearest cardiac center and pre-alert the hospital of a Cardiac Alert

(d) Minimize the Cardiac Alert on-scene time to 10 minutes or less.
## 2.4.3 Hypertensive Emergencies

### GENERAL GUIDELINES

**Hypertensive emergencies** are commonly defined as accelerated blood pressures (systolic greater than 220 mm Hg, diastolic greater than 120 mm Hg) with signs and symptoms of end organ failure. Neurologic end-organ damage due to uncontrolled BP may include hypertensive encephalopathy and cerebral vascular accident. Cardiovascular end-organ damage may include myocardial ischemia/infarction, acute left ventricular dysfunction, acute pulmonary edema, and aortic dissection. Other organ systems may also be affected by uncontrolled hypertension, which may lead to acute renal failure, and eclampsia.

Hypertension is rarely treated in the prehospital setting. Treatment should focus on the patient’s presentation and not the blood pressure by itself. Blood pressures that should not be treated in the prehospital setting include:

- Transient hypertension secondary to pain, anxiety, hypoxia, or drug intoxication. (treatment should be directed at the underlying causes, not antihypertensive medications).
- Chronic hypertension. (rapid reduction of blood pressure in asymptomatic patients may cause more harm than benefit)
- Thrombotic stroke. (elevated blood pressure is a normal physiologic response to brain ischemia, excessively lowering of blood pressure in these patients may extend the area of injury)

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3: Administer oxygen via nasal cannula at 4 L/min (use a non-rebreather mask at 15 L/min if SpO₂ less than 94%). If the patient is asymptomatic, contact medical control.

#### ALS Level 1

Symptomatic patients with accelerated blood pressures should be treated by the appropriate protocol based on their symptoms.

- Chest pain consistent with myocardial ischemia or infarction, (Angina/AMI Protocol 2.4.2)
- Shortness of breath with signs and symptoms of acute pulmonary edema, (CHF Protocol 2.2.4)
- Patients in the 2\(^{nd}\) or 3\(^{rd}\) trimester of pregnancy (over 20 weeks) or up to 6 weeks postpartum with accelerated hypertension and or seizures (Toxemia of Pregnancy Protocol 2.7.4)

#### ALS Level 2

- Labetolol (Normodyne® or Trandate ®) 10-20 mg IV over 2 minutes for hypertension not associated with CVA (a), if available. May repeat in 20 minutes. (0.25mg/kg)

#### Note

- (a) if available
# 2.5.1 Altered Mental Status Unknown Etiology

## General Guidelines

This protocol is used for patients with altered mental status where the etiology is unknown (e.g., patients with a history of diabetes; Adult Protocol 2.8.2).

## Treatment Guidelines

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3: Consider the need for cervical spine immobilization.
- Consider restraining the patient (Medical Procedure 4.23, Physical Restraints).
- Contact the Poison Information Center (1-800-222-1222).

### ALS Level 1

- Obtain O₂ Sat above 94% and EtCO₂
- Consider the need for an advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick (Medical Procedure 4.17).
- If blood glucose below 60 mg/dL, refer to Hypoglycemia/Hyperglycemia Protocol 2.8.2.(b)
- Administer Naloxone (Narcan) 0.4 – 2 mg IV/IO, IM, or IN to restore adequate ventilatory effort and/or improve mental status and titrate to effect. Usual doses should not exceed 10mg, Fentanyl may require large doses of Naloxone to reverse Fentanyl’s effects. (c).
  - If administering Naloxone (Narcan) via IN, use concentration 2 mg/2 mL. (Medical Procedure, Medication Delivery 4.18).
  - If administering Naloxone (Narcan) via prepackaged product Nasal Spray the dose is 4mg/0.1 ml spray IN
- If administering Naloxone (Narcan) via nebulization must use concentration 2 mg/2 mL (add 2 mg of Narcan to 3 mL of saline) and titrate to effect.
- Reevaluate the need for an advanced airway (Medical Procedure 4.4).

### ALS Level 2

- None

### Note

(a) Use appropriate discretion regarding immediate placement of an advanced airway in patients who may quickly regain consciousness, such as hypoglycemic after administration of D₅₀ or opiate overdose cases after administration of Narcan. If the patient is conscious with control of the airway, oral glucose may be given
(b) To avoid infiltration and resultant tissue necrosis, Dextrose 50% should be given via slow IV with intermittent aspiration of the IV line to confirm IV patency, followed by saline flush.
(c) Administration of Narcan to patients with chronic use of narcotics may induce withdrawal and/or violent behavior.
(d) Recent increase of synthetic opioids may require higher initial doses of Naloxone. Consider starting at 2 mg initial dose.
2.5.2 Violent, Combative and/or Excited Delirium (ExDS) Patient

GENERAL GUIDELINES

This treatment protocol is used in conjunction with General Protocol 1.2, Behavioral Emergencies. There are many reasons for patient to be impaired or violent like psychiatric, drug overdose, CVA, ETOH, hypoxia, hypoglycemia.

- If patient is violent and an immediate threat to the patient, EMS crew or bystander safety exists, chemical and/or physical restraint should be used to prevent patient from harming him / herself or others.
- If patient is not violent, be observant for possibility of violence and avoid provoking patient.
- Particular caution should be exercised when evaluating and treating any patient that was subdued by a “non-lethal” law enforcement device with pepper spray or taser.
- Typical findings for any violent and/or impaired patient:
  - P – Psychological issues
  - R – Recent drug / alcohol use
  - I – Incoherent thought process
  - O – Off (clothes) and sweating
  - R – Resistant to presence / dialogue
  - I – Inanimate objects / shiny / glass – violent
  - T – Tough, unstoppable, superhuman strength
  - Y – Yelling
- Excited delirium syndrome is a state in which a person is in a psychotic and extremely agitated state. Mentally the patient is unable to focus and process any rational thought. The condition is brought on by overdose on stimulant or hallucinogenic drugs, drug withdrawal, or psychiatric patient not taking medication for significant amount of time.
- Typical signs and symptoms to suspect excited delirium are elevated temperature, nudity, profuse sweating, and change from aggressive behavior to “instant tranquility.” These patients should be closely observed for cardiac and respiratory changes.

TREATMENT GUIDELINES

- Initial Assessment Protocol 2.1.1. Monitor the patient’s glucose.
- Follow Medical Supportive Care Protocol 2.1.3
- Consult with Law Enforcement about placing patient under Baker Act or Impaired/Incapacitated Persons Act, and refer to the Impaired/Incapacitated Persons Act (see General Protocol 1.2).
- Rule out non-psychiatric causes (e.g., drug overdose, CVA, ETOH, hypoxia, hypoglycemia).
- Apply SpO2 and administer oxygen to maintain SpO2 greater than or equal to 94%.
- Perform glucose test with finger stick.
- Obtain body temperature.
- If appropriate, consider physically restraining patient. (Medical Procedure 4.23, Physical Restraints).
# Violent, Combative and/or Excited Delirium (ExDS) Patient (continued)

## TREATMENT GUIDELINES

### ALS Level 1

- If patient has elevated temperature above 100 degrees, consider cooling patient using cold packs to patient’s head, axilla and groin; if surface is ineffective consider cold fluid challenges of 500mL normal saline in increments, to a maximum of 30mL/kg to a maximum of 2 liters (goal temperature less than 100 degrees F).
- Administer Ketamine 4mg/kg IM, or 2mg/kg IN (concentration 100mg/mL). May be repeated in 20 minutes if desired effects are not met.

OR

- Consider administration one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium®) 5 mg IV, IM or IN; may repeat to a max of 20 mg (a) (b).
  - Midazolam (Versed) 2 mg increments IV, IO, or IN, up to a maximum dose of 10 mg (a).
  - Lorazepam (Ativan®) 2 mg IV, IM, or IN; may repeat once (maximum dose of 4 mg)(a)

OR

- Administer Haloperidol (Haldol®) 5 mg IM or IV (a) (c).if available; Administer Haloperidol with Diphenhydramine (Benadryl) 50 mg IM or SLOW IV.
- Initiate cardiac monitoring.
- Once patient has been sedated establish an IV; give normal saline wide open.
- Treat dysrhythmias per specific protocol (see Adult Protocol 2.3).
- Expedite transport – Transport Code 3 to closest appropriate facility.

### ALS Level 2

- None

- Note

(a) In some instances, IV administration may present a safety concern; in this case, IM or IN administration of sedatives may be the more desirable route.
# 2.5.3 Seizure Disorders

## GENERAL GUIDELINES

**General Guidelines**

This protocol should be used when the patient has witnessed, continuous convulsions (generalized tonic-clonic seizure or grand mal) or repeating episodes without regaining consciousness or sufficient respiratory decompensation. Consider the underlying etiology, such as hypoglycemia, drug overdose, head injury, or fever. Other types of seizures include absence (petit mal), simple partial (focal motor and Jacksonian), complex partial (psychomotor or temporal lobe), atonic (drop attacks), and myoclonic. When the patient is continuously showing signs of these other types of seizures, Medical Supportive Care Protocol 2.1.3 should be initiated and the paramedic should contact medical control for further direction.

## TREATMENT GUIDELINES

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3.

### ALS Level 1

- If the patient is an eclamptic female, administer Magnesium Sulfate 4 g IV (mixed in 50 mL or 100 mL of D5W given over 5-10 minutes). (Toxemia of Pregnancy Protocol 2.7.4) (a).
- Administer one of the following benzodiazepines: (Medical Procedure 4.18, Medication Administration)
  - Midazolam (Versed) 10 mg Intranasal as first line (5 mg/mL concentration only). Alternatively Midazolam (Versed) 5-10 mg increments IV, IO, IM every 3-5 minutes to a maximum dose of 10 mg. (b)
  - **OR**
    - Diazepam (Valium®) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg. (b)
  - **OR**
    - Lorazepam (Ativan®) 2 mg IV, IO, IM, or IN; may repeat once as needed, up to a maximum dose of 4 mg. (b)
- Perform a glucose test with a finger stick (Medical Procedure 4.17). If glucose is less than 60 mg/dL, refer to Hypoglycemia/Hyperglycemia 2.8.2.

### ALS Level 2

- For additional benzodiazepine contact Medical Control

### Note

(a) Females in their second or third of pregnancy (over 20 weeks gestation) who are seizing should be assumed to have eclampsia. It should also be noted that eclampsia can occur postpartum (up to 6 weeks post partum).
(b) For IN administration, administer 1ml per nare, give half the volume in one nostril and the other half of the volume in the other nare.
2.5.4 Suspected Stroke (CVA)

**GENERAL GUIDELINES**

This protocol is used for those patients exhibiting signs consistent with acute stroke/cerebrovascular accident (CVA)/“brain attack,” such as altered mental status, slurred speech, loss of function of any body part, hemiplegia, loss of vision, weakness of facial muscles, loss of sensation, and drooling. Other causes should be ruled out (e.g., hypoglycemia, drug overdose, hypoxia).

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
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<td>Previous stroke/TIA</td>
<td>Impaired understanding of speech</td>
<td>TIA</td>
</tr>
<tr>
<td>Previous neurological deficit</td>
<td>Aphasia/dysarthria Weakness /hemiparesis</td>
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<td>Hypertension</td>
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<tr>
<td>Smoking</td>
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<td>• Hemorrhagic</td>
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</tbody>
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**STROKE ALERT INCLUSION CRITERIA**

- Utilize the Rapid Arterial occlusion Evaluation (RACE) scale (Appendix 6.20 or online forms).
- Time last seen normal is less than 24 hours (Includes Wake Up Stroke)
- Deficit not likely due to head trauma, TIA or stroke mimic.
- Blood glucose is greater than 60 OR symptoms don’t resolve after correction of BGL.
- Paramedic judgment; altered mental status, vision (loss of vision or double vision), loss of sensation, poor coordination & balance, severe headache, nausea & vomiting, dizziness/severe vertigo, dysarthria/expressive aphasia.

**TREATMENT GUIDELINES**

- Initial Assessment Protocol 2.1.1.
- Determine and document the time of onset of stroke symptoms, defined as “the last time the patient was seen without symptoms”. If possible, get the witness name and contact numbers.
- If stroke is suspected, complete the RACE scale (Appendix 6.20 or online forms) to determine if the patient meets criteria for Stroke Alert. (a) (b)
- Limit Stroke Alert on scene time and transport the patient to the closest appropriate stroke center.
- If the patient is unconscious position the patient with head elevation of 30 degrees, unless the patient cannot tolerate this position. supine,
- Administer oxygen according to following criteria:
  - SpO2 94% or above do not administer O2.
  - SpO2 less than 94% administer O2 by nasal cannula at 2 L/min.
  - If SpO2 cannot be maintained at 94% with nasal cannula at 2 L/min and/or the patient is in respiratory distress, administer high-flow O2 and assist ventilations with a bag-valve mask if indicated.
### 2.5.4 Suspected Stroke (CVA continued)

#### ALS Level 1

- If the patient has a decreased level of consciousness and does not have an intact gag reflex, insert an advanced airway (Medical Procedure 4.4), confirm tube placement and oxygenation, and monitor ventilations with EtCO₂.
- Establish IV access; give normal saline KVO.
- Perform a glucose test with a finger stick (Medical Procedure 4.17). If glucose is less than 60 mg/dL, refer to Hypoglycemia/Hyperglycemia 2.8.2.
- If drug overdose is suspected, refer to Adult Protocol 2.6, Adult Toxicologic Emergencies.
- Perform a neurological exam, including assessment of the patient’s level of consciousness, Glasgow Coma Scale (GCS) score, and RACE scale score.
- Contact the stroke center, and advise its personnel of the time of symptom onset, baseline neurological examination findings, including the RACE scale and any changes found in reassessment. (b)

#### ALS Level 2

- Elevated blood pressure is commonly present with stroke. Severely elevated blood pressure may be lowered with a physician order (Hypertensive Emergencies 2.4.3).

#### Note

(a) Minimize the Stroke Alert on-scene time to 10 minutes or less.
(b) Continually reassess the patient to determine if his/her symptoms are worsening or improving, and advise the stroke center of any changes.
# 2.5.5 Syncopal Episode

## GENERAL GUIDELINES

| General Guidelines | This protocol should be used for patients with a chief complaint of syncopal episode. Consider the patient’s history and the possibility of medication side effects, glucose imbalance, inner ear disorders, CVA, TIA, and MI. |

## TREATMENT GUIDELINES

### Supportive Care
- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3 (refer to other protocols as appropriate): Treat the underlying cause, if it can be determined.
- All patients with a known syncopal episode, or a syncopal episode that was witnessed by a reliable source, should be transported to the hospital via ambulance.

### ALS Level 1
- Perform a 12-lead ECG. If an inferior wall MI is identified, perform an additional 12-lead ECG with V4R to confirm/rule out concurrent right ventricular MI. Transmit the 12-lead ECG results to the destination hospital, if possible (a). If acute coronary syndrome is suspected, see Adult Protocol 2.4.2.

### ALS Level 2
- None

### Note
- (a) Bradycardia with hypotension may be due to inferior wall MI associated with right ventricular MI (confirmed on the 12-lead ECG by ST elevation in lead V4R); see Adult Protocol 2.3.2, Bradycardia. When an inferior wall MI is associated with right ventricular MI, avoid the use of nitrates (Nitroglycerin). If bradycardia and hypotension exist, pacing and IV fluid may improve the patient’s hemodynamic status.
### 2.6 Adult Toxicologic Emergencies

#### GENERAL GUIDELINES

This protocol is to be used for those patients suspected of exposure to toxic substances via any route of exposure (e.g., drug overdose, snake bite). The protocols give specific considerations for each type of exposure as well as general treatment guidelines. Additional assistance may be necessary in certain cases (e.g., hazardous materials team for toxic exposure or police for scene control, including management of a violent and/or impaired patient; see Adult Protocol 2.5.2). If the toxic substance is unknown or cannot be readily determined, see Adult Protocol 2.6.7 Unknown Toxicity.

A history of the events leading to the illness or injury should be obtained from the patient and bystanders:

1. To which drugs, poisons, or other substances was the patient exposed? Consider exposure to multiple substances, especially on overdoses.
2. What was the route of exposure?
3. When did the exposure occur, and how much exposure was there?
4. What is the duration of symptoms?
5. Is the patient depressed or suicidal? Does he/she have a history of previous overdose (if applicable)?
6. Was the exposure accidental? What was the nature of the accident?
7. What was the duration of exposure (if applicable)?

Collect all pill bottles, empty or full, and check for “suicide notes” (if applicable). Transport any/all information or items that may assist in the treatment of the patient to the emergency department.

Contact the Poison Information Center (1-800-222-1222) for consultation regarding specific therapy.
## 2.6.1 Bites and Stings

### General Guidelines

This protocol includes the treatment for snake bites, dog and cat bites, insect stings, and marine animal envenomations and stings. All bite victims should be transported to the hospital. Contact the Poison Information Center (1-800-222-1222) for treatment and transport decision and consultation in all cases involving bites and stings.

### Treatment Guidelines

#### Supportive Care

- Initial Assessment 2.1.1
- Trauma Supportive Care Protocol 2.1.4.
- Contact the Poison Information Center (1-800-222-1222).
- See General Protocol 1.12, Infectious Disease Exposure and 1.10.1 Exposure Reference Sheet if needed

#### Snake Bites

- Consider the need for Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis.
- Splint the affected area.
- Place the patient supine, with extremities kept at a neutral level.
- Keep patient quiet.
- Remove and secure all jewelry.
- Wash the area of the bite with copious amounts of water.
- Attempt to identify the snake, if it is safe to do so.
- Check the patient’s temperature and pulse distal to the bite on an extremity, and mark the level of swelling and time with pen every 15 minutes.

#### Dog, Cat, and Wild Animal Bites

- Wound care: BLS (do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat). Clean the wound area with soap and water.
- Advise dispatch to contact animal control and the police department for identification and quarantine of the animal.

#### Insect Stings (Including Centipedes, Scorpions, and Spiders)

- Consider the need for Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis.
- Remove the stinger by scraping the patient’s skin with the edge of a flat surface (e.g., a credit card). Do not attempt to pull the stinger out, as this action may release more venom.
- Clean the wound area with soap and water.

#### Marine Animal Envenomations: Stingray, Scorpionfish (Lionfish, Zebrafish, Stonefish), Catfish, Weeverfish, Starfish, Sea Urchin

- Consider the need for Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis.
- Immerse the punctures in nonscalding hot water to tolerance (110-113°F) to achieve pain relief (30-90 minutes). Transport should not be delayed for this measure; immersion in nonscalding hot water may be continued during transport.
- Remove any visible pieces of the spine(s) or sheath. Gently wash the wound with soap and water, and then irrigate it vigorously with fresh water (avoid scrubbing).
2.6.1 Bites and Stings (continued)

TREATMENT GUIDELINES

**Supportive Care**

MARINE ANIMAL STINGS: JELLYFISH, MAN-OF-WAR, SEA NETTLE, IRUKANDJI, ANEMONE, HYDROID, FIRE CORAL

- Consider the need for Adult Protocol 2.8.1, Allergic Reactions/Anaphylaxis.
- Rinse the skin with sea water. (Do not use fresh water; do not apply ice; do not rub the skin.)
- Apply soaks of acetic acid 5% (vinegar) until the pain is relieved. If vinegar is not available, use a paste of baking soda or unseasoned meat tenderizer.
- Remove large tentacle fragments using forceps (use gloves to avoid contact with your bare hands).
- Apply a lather of shaving cream or a paste of baking soda, and shave the affected area with the edge of a flat surface (e.g., a credit card).
- Apply Zerym Spray if agency available

**HUMAN BITES**

- Wound care: BLS (do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat). Clean the wound area with soap and water.
- Consider contacting the police department for investigation

**ALS Level 1**

- Refer to Adult Protocol 2.1.5 for pain management guidelines.
- Consider OTC formulation for symptom relief (i.e. Zerym) (a)

**ALS Level 2**

- None

**Note**

(a) Caution to patient of known mesothelioma
# 2.6.2 CNS Depressant Overdose – 2.6.2.1 Benzodiazepines and Sedative Hypnotics

## GENERAL GUIDELINES

Benzodiazepines are used for anxiety, seizures, insomnia, agitation, muscle spasms, and alcohol withdraw. Sedative hypnotics are used for inducing sleep. Signs and symptoms of overdose include:

- Altered mental status
- Slurred speech
- Hypotension
- Coma
- Dilated pupils (benzodiazepines)

## TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3 (refer to other protocols as appropriate): Treat the underlying cause, if it can be determined.
- Contact Poison Information Center (1-800-222-1222) for consultation.
- Obtain Pulse oximetry reading and administer oxygen as needed. SpO2 readings less than or equal to 94% require oxygenation, or if indicated, assist with BVM ventilations.

**ALS Level 1**

- Consider the need for an advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick (Medical Procedure 4.17).
- If glucose is less than 60 mg/dL, refer to Adult Protocol 2.8.2 Hypoglycemia/Hyperglycemia.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, or IN; may repeat once, up to a max dose of 10 mg.
  - Midazolam (Versed) 2 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is hypotensive (systolic BP less than 90 mm Hg), administer a fluid challenge of 500mL.
- If the patient is combative, consider the need for physical and chemical restraints (Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

**ALS Level 2**

- None
## General Guidelines

### Signs and symptoms of opioid and narcotic overdose include:
- Altered mental status
- Respiratory depression
- Constricted pupils
- Hypotension
- Bradycardia
- Coma

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3
- Contact Poison Information Center (1-800-222-1222) for consultation.
- Obtain Pulse oximetry reading and administer oxygen as needed. SpO2 readings less than or equal to 94% require oxygenation, or if indicated, assist with BVM ventilations.

### ALS Level 1

- Consider the need for an advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick (Medical Procedure 4.17).
- If glucose is less than 60 mg/dL, Adult Protocol 2.8.2, Hypoglycemia/Hyperglycemia.
- Administer Narcan 0.4-2 mg IV/IO, IM, or IN (c), titrated to effect. Usual dose should not exceed 10mg. Fentanyl may require large doses of Naloxone to reverse Fentanyl’s effects. Narcan can also be administered via nebulization (add 2 mg of Narcan to 3 mL of saline) and titrated to effect. (Medical Procedure, Medication Delivery 4.18).
- If the patient is experiencing chest pain, Adult Protocol 2.4.2, Angina/Suspected AMI.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg.
  - OR
  - Midazolam (Versed) 2 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - OR
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is hypotensive (systolic BP less than 100 mm Hg), administer a fluid challenge of 500mL.
- If the patient is combative, consider the need for physical and chemical restraints (Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

### ALS Level 2

- None

### Note

- (a) Use appropriate discretion regarding immediate intubation of patients who may quickly regain consciousness following treatment.
- (b) If patient is a suspected opioid addict, the administration of Narcan should be titrated to increase respirations to normal levels without fully awakening patient to prevent hostile and confrontational episodes. Consider restraining patient. Narcan may need to be repeated in 20-30 minutes to maintain effect.
- (c) If administering Naloxone (Narcan) via prepackaged product Nasal Spray then the dose is 4mg/0.1 ml spray IN.
## 2.6.3 CNS Stimulant Overdose

### GENERAL GUIDELINES

**Signs and symptoms of CNS stimulant overdose include dilated pupils, agitation, paranoia, bizarre behavior, PVC, tachycardia, hypertension, hyperthermia, and seizures. The following is a partial list of CNS stimulants.**

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3.
- Contact the Poison Information Center (1-800-222-1222).

#### ALS Level 1

- If the patient is experiencing chest pain, see Adult Protocol 2.4.2, Chest Pain/Suspected AMI.
- Establish IV access; give normal saline.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; maximum dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is hyperthermic (hot to the touch), aggressively cool the patient.
- If the patient is combative, consider the need for physical and chemical restraints (see Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

#### ALS Level 2

- Treat tachydysrhythmias as per physician order.

#### Note

- Beta blockers are contraindicated in cocaine overdose.
### 2.6.4 Digitalis Toxicity

#### GENERAL GUIDELINES

**Digitalis Toxicity** should be suspected in patients who are taking digitalis and have signs and symptoms associated with digitalis toxicity - for example, bradycardia, AV blocks with rapid ventricular response, supraventricular tachycardias, ventricular ectopy, and other ECG changes: wide PR interval greater than 0.20, short QT interval (rate dependent), spoon-shaped ST segment, peaked T wave. Contact with the oleander tree can also cause a digitalis-type toxicity, which will cause the same type of dysrhythmias and requires the same treatment.

**DIGITALIS: GENERIC NAME (TRADE NAME)**
- digoxin (Lanoxicaps, Lanoxin, Digoxin)
- digitoxin (Crystodigin)

#### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3.
- Contact the Poison Information Center (1-800-222-1222).

**ALS Level 1**
- Treat tachydysrhythmias with medication per specific protocol (Adult Protocol 2.3). Avoid the use of Calcium Chloride.
- If unstable tachycardia (heart rate greater than 150 beats/min), synchronize and cardiovert. Energy settings for synchronized cardioversion should be in the range of 5-20 joules.
- If the patient has unstable bradycardia with wide QRS (greater than 0.12 seconds), administer Sodium Bicarbonate 1 mEq/kg IV.

**ALS Level 2**
- None

**Note**
# 2.6.5 Hallucinogen Overdose

## GENERAL GUIDELINES

This protocol includes the hallucinogenic drugs: LSD (acid, microdot), mescaline and peyote (mesc, buttons, cactus), and similar agents (e.g., DET, EMT, psilocybin). Signs and symptoms of hallucinogen overdose include illusions and hallucinations, poor perception of time and distance, possible paranoia, anxiety, panic, unpredictable behavior, emotional instability, possible flashbacks, dilated pupils, and rambling speech.

## TREATMENT GUIDELINES

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3: “Talk down” the patient.
- Contact the Poison Information Center (1-800-222-1222).

### ALS Level 1

- Consider the need for ventilation assistance and advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick. If glucose is less than 60 mg/dL, see Adult Protocol 2.8.2, Hypoglycemia/Hyperglycemia.
- If respiration is depressed, administer Narcan 0.4-2 mg IV/IO, IM, or IN (c), titrated to effect. Usual dose should not exceed 10 mg. Fentanyl may require large doses of Naloxone to reverse Fentanyl’s effects. Narcan can also be administered via nebulization (add 2 mg of Narcan to 3 mL of saline) and titrated to effect. (Medical Procedure, Medication Delivery 4.18). If administering Naloxone (Narcan) via prepackaged product Nasal Spray the dose is 4mg/0.1 ml spray IN.
- If the patient is experiencing chest pain, see Adult Protocol 2.4.2, Angina/Suspected AMI.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is combative, consider the need for physical and chemical restraints (Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

### ALS Level 2

- Treat tachydysrhythmias as per physician order.
- Additional benzodiazepine

### Note

(a) Use appropriate discretion regarding immediate placement of an advanced airway in patients who may quickly regain consciousness, such as hypoglycemics after D50 administration or opiate overdose patients after Narcan® administration.

(b) If the patient is a suspected opioid addict, the administration of Narcan® should be titrated to increase respiration to normal levels without fully awakening the patient, so as to prevent hostile and confrontational episodes. Consider restraining the patient (Medical Procedure 4.23, Physical Restraints).
### 2.6.6 Tricyclic Antidepressant/Barbiturates/SSRI Overdose

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Universally found EKG cases in all three classifications include:</strong></td>
<td></td>
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<tr>
<td>Wide QRS complex greater than 0.12 seconds</td>
<td>R waves in lead aVR</td>
</tr>
<tr>
<td>ST and T wave changes</td>
<td>S waves in lead aVL and lead I</td>
</tr>
</tbody>
</table>

**Barbiturates are used as sleep aids, antianxiety medications, and anticonvulsants. Signs and symptoms of overdose include:**
- Lethargy
- Altered mental status
- Respiratory depression
- Hypotension
- Coma

**Tricyclic antidepressants are used as antidepressants. Signs and symptoms of overdose include:**
- CNS depression
- Tachycardia
- Dilated pupils
- Respiratory depression
- Slurred speech
- Twitching and jerking
- Seizures
- Hypotension/hypertension

**Selective Serotonin Reuptake Inhibitors (SSRI) is used as antidepressants, antianxiety medications, and personality disorders. Signs and symptoms of overdose include:**
- Agitation
- Nausea and vomiting
- Muscular rigidity
- Teeth chattering
- Dilated pupils
- Hypotension/hypertension
- Seizures
- Tachycardia
- Hallucinations
- Hyperthermia
### 2.6.6 Tricyclic Antidepressant Overdose (continued)

#### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care 2.1.3: “Talk down” the patient.
- Contact the Poison Information Center (1-800-222-1222).
- Obtain pulse oximetry reading and administer oxygen as needed. SpO2 readings less than or equal to 94% require oxygenation, or if indicated, assist with BVM ventilations.

**ALS Level 1**
- Consider the need for ventilation assistance and advanced airway (Medical Procedure 4.4) (a).
- Perform a glucose test with a finger stick. If glucose is less than 60 mg/dL, see Adult Protocol 2.8.2, Hypoglycemia/Hyperglycemia.
- Perform 12 lead, if QRS is greater than 0.12 seconds, Sodium Bicarbonate 1 mEq/kg IV.
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- If the patient is combative, consider the need for physical and chemical restraints (Adult Protocol 2.5.2, Violent and/or Impaired Patient, and Medical Procedure 4.23, Physical Restraints).

**ALS Level 2**
- None

**Note**

None
## 2.6.7 Unknown Toxicity

### GENERAL GUIDELINES

This protocol is to be used for those patients suspected of exposure to toxic substances via any route of exposure, where the toxic substance is unknown or cannot be readily determined.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3. If the patient has an altered mental status, dyspnea, or SpO₂ is less than 94%, administer oxygen to maintain SpO₂ at or above 94%.

#### ALS Level 1

- If the patient has an altered mental status, see Adult Protocol 2.5.1.
- If bronchospasm is present, administer Albuterol (Ventolin®): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). This treatment may be repeated twice as needed (a).
- If Albuterol is administered, may add Ipratropium Bromide (Atrovent®) 0.5 mg (0.5 mL) to the Albuterol nebulizer treatment.
- Treat dysrhythmias with medication per specific protocol (Adult Protocol 2.3).
- If the patient has unstable bradycardia with wide QRS (greater than 0.12 second), administer Sodium Bicarbonate 1 mEq/kg IV (Adult Protocol 2.6.6).
- If the patient is hypotensive and not in pulmonary edema, administer a fluid challenge of normal saline 500 mL IV (Adult Protocol 2.4.1).
- If the patient is seizing, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; may repeat once, up to a max dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.

#### ALS Level 2

- None

#### Note
2.7 Adult OB/GYN Emergencies

GENERAL GUIDELINES

The paramedic should use these protocols to guide him/her through the treatment of patients who are pregnant. These protocols cover complications of pregnancy and normal and abnormal labor delivery. In addition to these protocols, the paramedic may need to refer to other protocols (e.g., protocols for seizures). The assessment of these patients should follow the normal approach to patient assessment as well as ask specific questions related to the history of the pregnancy. Questions for pregnancy history include:

1. Number of previous pregnancies (gravida).
   a. Miscarriages.
2. Number of previous live births (para).
3. Expected date of delivery or due date.
4. When did contractions begin?
5. Any history of labor complications?
   a. Premature births?
   b. C-section?
   c. Multiple births?
6. What are the duration and frequency of contractions?
   a. Duration is timed from when the contraction starts to when the contraction stops (e.g., 45 seconds, 1 minute).
   b. Frequency is timed from the beginning of one contraction to the beginning of the next contraction (e.g., 2 minutes apart, 4 minutes apart).
7. Evidence of blood show or spotting?
8. Did the water break?
   a. When?
   b. What was the color (e.g., clear, greenish, brownish)?
   c. Did it have an unusual odor?
9. Does the patient have an urge to push?
10. Does the patient feel like she has to move her bowels? If the patient complains of uterine contractions, an external visual examination for crowning should be done to determine if the delivery is imminent.
2.7.1 Complications of Labor and Delivery

TREATMENT GUIDELINES

Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4. Notify the nearest appropriate OB-capable hospital early and prepare for transport to an OB-capable hospital.

PROLAPSED CORD
- Place the mother in a knee-chest position or supine position with pillows under the buttocks.
- Do not attempt to push the cord back. Wrap the cord in a warm, sterile-saline-soaked dressing.
- With a gloved hand, palpate the cord for a pulse.
- If a pulse is absent in the umbilical cord, and positioning of the mother does not restore the pulse, insert a gloved hand into the vagina and lift the fetal head, or other presenting part, off of the umbilical cord while gently pushing the fetus into the uterus. With the other hand, press on the lower abdomen in an upward or cephalic direction. Push the fetus back only far enough to regain a pulse in the umbilical cord.
- Transport immediately, while maintaining fetal position so as to maintain umbilical pulse.

BREECH BIRTH
- Do not pull on the newborn. Allow the delivery to proceed normally, supporting the newborn with the palm of your hand and arm, and allowing the head to deliver.
- If the head does not deliver within 3 minutes, place a gloved hand in the vagina with your palm toward the newborn’s face. Form a “V” with your index and middle fingers on either side of the newborn’s nose, and push the vaginal wall away from the newborn’s face to create an airspace for the newborn until delivery of the head. Suction may be provided as needed.
- Transport immediately, while maintaining the airspace for the newborn.

LIMB PRESENTATION
- Place the mother in either a knee-chest position or a supine position with pillows under the buttocks.
- Transport immediately.

SHOULDER DYSTOCIA
- Determine the presence of shoulder dystocia as follows: The newborn’s head will deliver normally, and then it will retract back into the perineum because the shoulders are trapped between the symphysis pubis and the sacrum (the “turtle sign”).
- If this occurs, do not pull on the newborn’s head.
- Have the mother drop her buttocks off the end of the bed and flex her thighs upward to facilitate delivery.
- Apply firm pressure with an open hand immediately above the symphysis pubis.
- If delivery does not occur, transport immediately.

ALS Level 1
- None

ALS Level 2
- None
This protocol should be used when the paramedic encounters an imminent delivery prior to arrival at the hospital. Imminent delivery is evidenced by crowning at the vaginal opening.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4. Notify the nearest appropriate OB-capable hospital early and prepare for transport.
- Place the mother in a comfortable, supine position.
- Prepare the OB kit. (Also have a pediatric kit on standby.)
- Gently and carefully assist expulsion of the newborn from the birth canal in its natural descent. Do not pull or push the newborn.
- Upon complete presentation of newborn’s head:
  - Instruct the mother to stop pushing.
  - Inspect and palpate the newborn’s neck for the umbilical cord. If it is present, carefully unwrap the cord from the neck. If unable to remove the cord, apply two umbilical clamps and cut between the clamps to release the cord.
  - Once the newborn’s cord is free from around its neck, instruct the mother to push on her next contraction to complete delivery.
- Upon complete delivery of the newborn:
  - Keep the newborn at the level of the placenta (vagina) to prevent over- or under-transfusion of blood from the cord.
  - Never “milk” the cord, after infant delivery wait at least 30 seconds up to 3 minutes or until the cord stops pulsating to clamp/cut the cord. Apply two umbilical cord clamps (2 inches apart and at least 8 inches from the navel), and then cut the cord between the clamps.
  - Avoid holding the newborn by the legs, allowing the head to hang below the body, as this may cause cerebral hemorrhage to occur.
  - Only if the airway is compromised (obstructed), gently suction the newborn’s mouth and nose with the bulb syringe.
  - If meconium is noted in the airway, see Pediatric Protocol 3.4.1, Newborn Resuscitation.
  - Dry and wrap the newborn in a blanket to preserve body heat. Be sure to cover the newborn’s head, as this is a major area of heat loss.
- Evaluate the newborn:
  - If the newborn is not breathing, see Pediatric Protocol 3.4.1, Newborn Resuscitation.
  - Evaluate the APGAR scores at 1 and 5 minutes (Appendix 6.3).
  - If APGAR score is less than 7, see Pediatric Protocol 3.4.1, Newborn Resuscitation.
- Following delivery of the newborn, the mother’s vagina will continue to ooze blood. Do not pull on the umbilical cord.
### Supportive Care continued

- If active hemorrhage is noted from the vagina, apply firm continuous massage manually to the uterine fundus. If the mother wants to breastfeed, encourage her to do so; this will aid in the contraction of the uterus, which will help stop the bleeding and facilitate delivery of the placenta. (Do not attempt to examine the patient internally. Never pack the vagina to stop bleeding.) Apply a sanitary napkin to the vaginal opening.
- If the placenta does deliver, preserve it in a plastic bag and transport it with the mother. It is not necessary to delay transport to wait for the placenta to deliver.
- After delivery of the placenta, clean the perineal area and remove soiled drop sheets from under the mother’s buttocks. Visually inspect the perineal area for tears. If active bleeding is present, apply direct pressure with sterile gauze. Apply a sanitary napkin to vaginal opening.

### ALS Level 1

- Administer Nitronox for pain control during a normal, uncomplicated delivery (Medical Procedure 4.20)

### ALS Level 2

- 

### Note

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**TREATMENT GUIDELINES**
## 2.7.3 Nontraumatic Vaginal Bleeding

### GENERAL GUIDELINES

This protocol should be used for female patients who may or may not be pregnant and who present with nontraumatic vaginal bleeding. Examples of causes include antepartum hemorrhage (abruption placenta, placenta previa, and uterine rupture), postpartum hemorrhage, ruptured ectopic pregnancy, ruptured ovarian cyst, and spontaneous abortion.

### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Place all products of delivery (e.g., undeveloped fetus, placenta) in a plastic bag and transport with the patient to the hospital.

#### ALS Level 1

- If the patient is hypotensive (systolic BP less than 100 mm Hg), administer a fluid challenge of 500 mL to start. Repeat as needed.

#### ALS Level 2

- None

#### Note
This protocol should be used for the patient in her second or third trimester of pregnancy (above 20 weeks gestation) who is exhibiting signs of pre-eclampsia or eclampsia. The signs of toxemia include proteinuria (dark-colored urine), excessive weight gain, and hypertension. The presence of two of these signs constitutes pre-eclampsia; the presence of all three constitutes eclampsia. The seizing patient in her second or third trimester of pregnancy should be assumed to be eclamptic and treated as specified below. However, consideration of another underlying etiology, such as hypoglycemia, drug overdose, head injury, or fever, should also be considered. Eclamptic seizures can also occur postpartum (≤ 6 week after giving birth). Witnessed continuous convulsions (generalized tonic-clonic seizure or grand mal) or repeating episodes without regaining consciousness or sufficient respiratory decompensation demonstrate a need for immediate treatment.

### Supportive Care
- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care 2.1.4.

### ALS Level 1
- If the patient is seizing, administer Magnesium Sulfate 4 g IV (mixed in 50 mL or 100 mL of D5W given over 5-10 minutes). May repeat once at 2 g IV (mixed in 50 mL or 100 mL of D5W given over 5-10 minutes) as needed.
- If the patient continues to seize, administer one of the following benzodiazepines: (Medical Procedure, Medication Delivery 4.18)
  - Diazepam (Valium) 5 mg IV, IO, IM or IN; maximum dose of 10 mg.
  - Midazolam (Versed) 5-10 mg increments IV, IO, IM or IN (IN concentration 10mg/2ml) maximum dose of 10 mg.
  - Lorazepam (Ativan) 2 mg IV, IO, IM or IN; may repeat once, up to a max dose of 4 mg.
- Perform a glucose test with a finger stick (Medical Procedure 4.17) if glucose is less than 60 mg/dL refer to Hypoglycemia/Hyperglycemia Protocol 2.8.2.

### ALS Level 2
- None

### Note
2.8.1 Allergic Reactions/Anaphylaxis

GENERAL GUIDELINES

This protocol should be used for patients exhibiting signs and symptoms consistent with allergic reaction, as follows:

- Skin: flushing, itching, hives, swelling, cyanosis.
- Respiratory: dyspnea, sneezing, coughing, wheezing, stridor, laryngeal edema, laryngospasm, bronchospasm.
- Cardiovascular: vasodilation, increased heart rate, decreased blood pressure.
- Gastrointestinal: nausea/vomiting, abdominal cramping, diarrhea.
- CNS: dizziness, headache, convulsions, tearing.

Treatment is outlined here according to the severity of the allergic reaction (mild, moderate, and severe or anaphylaxis).

MILD REACTIONS
These reactions consist of redness and/or itching, stable vital signs with a systolic BP greater than 100 mm Hg without dyspnea.

MODERATE REACTIONS
These reactions are evidenced by edema, hives, dyspnea, wheezing, “lump in throat” feeling, difficulty swallowing, facial swelling, and stable vital signs with a systolic BP greater than 100 mm Hg.

SEVERE REACTIONS
Signs and symptoms include edema, hives, severe dyspnea and wheezing, unstable vital signs with a systolic BP less than 100 mm Hg, and possibly cyanosis and laryngeal edema.

TREATMENT GUIDELINES

For all Allergic Reactions and Anaphylaxis:

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4
- Remove offending agent, if possible

MILD REACTIONS

- Diphenhydramine HCl (Benadryl®) 50 mg IM or SLOW IV (Medical Procedure, Medication Delivery 4.18).
- If bronchospasm is present, administer Albuterol (Ventolin®): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). May be repeated twice as needed.
- If bronchodilators are administered, may add Ipratropium bromide (Atrovent®) 0.5 mg (0.5 mL) to Albuterol nebulizer treatment
- Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18) (a) (b).
- Consider the need for advanced airway management (Medical Procedure 4.4).
- SOLU MEDROL 125 mg IV/IM
- May repeat Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18) (a) (b).
MODERATE REACTIONS

- Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18) (a) (b).
- Diphenhydramine HCl (Benadryl®) 50 mg IM or SLOW IV (Medical Procedure, Medication Delivery 4.18).
- If bronchospasm is present, administer Albuterol (Ventolin®): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6). May be repeated twice as needed.
- If bronchodilators are administered, may add Ipratropium bromide (Atrovent®) 0.5 mg (0.5 mL) to Albuterol nebulizer treatment
- Consider the need for advanced airway management (Medical Procedure 4.4).
- SOLU MEDROL 125 mg IV/IM
- May repeat Epinephrine (1:1000) 0.3 mg IM (Medical Procedure, Medication Delivery 4.18) (a) (b).

SEVERE REACTIONS

- Administer Epinephrine 1:100,000 (0.1 mg/10 mL) IV diluted; To dilute Epinephrine from 1:10,000 to 1:100,000:
  - Remove 9 ml of Epi 1:10,000 from the 10 ml prefilled syringe
  - Fill the syringe back up with 9 mLs of normal saline, **You now have Epi 1:100,000**
  - Administer the 10 mL Epinephrine (1:100,000) solution IV slowly over 5-10 minutes, titrate to clinical effect and systolic BP greater than 90. Close hemodynamic monitoring is required when providing Epinephrine 1:100,000 IV

ALS Level 2

- None

Note

(a) Caution should be used with administration of Epinephrine when the patient has a history of hypertension or heart disease.
(b) The EpiPen® may be used if other means of Epinephrine administration are not available (Medical Procedure 4.18.1).
# 2.8.2 Hypoglycemia/Hyperglycemia

## GENERAL GUIDELINES

**General Guidelines**

This protocol is to be used for those patients whose blood glucose is less than 60 mg/dL or more than 300 mg/dL.

## TREATMENT GUIDELINES

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.

### ALS Level 1

- Perform a glucose test with a finger stick (Medical Procedure 4.17).
- If glucose is less than 60 mg/dL:
  - If the patient is conscious and has an intact gag reflex, administer oral glucose 15g (1 tube), if possible.
  - If the patient is stuporous or unconscious, administer D\textsubscript{50} 50 mL via slow IV (a).
  - If unable to start an IV/IO access, provide Glucagon 1 mg IM. This can be repeated once in 20 minutes. (Medical Procedure, Medication Delivery 4.18)
  - Perform a second glucose test with a finger stick. If glucose remains less than 60 mg/dL, administer D\textsubscript{50} 50 mL IV (a).
- If blood glucose greater than 300 mg/dL:
  - Administer normal saline 500 mL IV, unless contraindicated.

### ALS Level 2

- None

### Note

(a) To avoid infiltration and resultant tissue necrosis, D\textsubscript{50} should be given via slow IV with intermittent aspiration of the IV line to confirm IV patency, followed by saline flush.
# 2.8.3 Nausea/Vomiting

**GENERAL GUIDELINES**

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>To enhance patient comfort and safety, the treatment of nausea and vomiting may be appropriately accomplished in the field. The symptoms of nausea and vomiting may occur as a result of acute illness or as a medication side effect.</td>
</tr>
</tbody>
</table>

## TREATMENT GUIDELINES

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.

### ALS Level 1

- Administer Zofran® (Ondansetron hydrochloride)
  - Oral 4 mg PO oral disintegrating tablet (ODT) placed under the tongue. May repeat at 10-15 minutes with maximum dose is 8 mg

  **OR**

  - Injection 4 mg slow IV push over 2-3 minutes OR IM lateral thigh. May be repeated once if no improvement within 10-15 minutes. Do not exceed 8 mg total dosage.

### ALS Level 2

- None

### Note
## General Guidelines

This protocol should be used for patients who complain of abdominal pain without a history of trauma. Assessment should include specific questions pertaining to the GI/GU systems.

**Abdominal physical assessment:**

- Ask the patient to point to the area of pain (palpate this area last).
- Gently palpate for tenderness, rebound tenderness, distention, rigidity, guarding, and pulsatile masses. Also palpate the flank for CVA tenderness.

**Abdominal history:**

- History of pain (OPQRRRST)
- History of nausea/vomiting (color, bloody, coffee grounds)
- History of bowel movement (last BM, diarrhea, bloody, tarry)
- History of urine output (painful, dark, bloody)
- History of abdominal surgery
- History of acute onset of back pain
- SAMPLE history (attention to last meal)

Additional questions should be asked of the female patient regarding OB/GYN history (Adult Protocol 2.7, Adult OB/GYN Emergencies).

All female patients of childbearing age who complain of abdominal pain should be considered to have an ectopic pregnancy (even if vaginal bleeding is absent) until proven otherwise.

An acute abdomen can be caused by appendicitis, cholecystitis, duodenal ulcer perforation, diverticulitis, abdominal aortic aneurysm, kidney infection, urinary tract infection (UTI), kidney stone, pelvic inflammatory disease (PID female), or pancreatitis (Appendix 6.1, Abdominal Pain Differential).

## Treatment Guidelines

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.

**ALS Level 1**

- If the patient is hypotensive (systolic BP less than 100 mm Hg), administer a fluid challenge of normal saline 500 mL.
- See Pain Management Protocol

**ALS Level 2**

- None

**Note**
**General Guidelines**

Sickle cell anemia is a chronic hemolytic anemia occurring almost exclusively in African Americans; it is characterized by the presence of sickle-shaped red blood cells. Sickle cell crisis results from the occlusion of a blood vessel by masses of these misshapen blood cells. Pain is the principal manifestation and represents the most common type of crisis. Typical pain occurs in the joints and back. Hepatic, pulmonary, or central nervous system involvement can occur, with each type being associated with its own group of symptoms. Keep in mind that patients with sickle cell disorder have a high incidence of life threatening disorders at a very young age.

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### TREATMENT GUIDELINES

#### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3. Administer 100% oxygen via non-rebreather mask at 15 L/min.
- Provide emotional support.

#### ALS Level 1

- Fluid challenge of normal saline 500 mL may repeat once to a maximum of 1000 mL IV.
- If pain persists and systolic BP is greater than 100 mm Hg, Administer
  - Morphine Sulfate may be given via slow IV in 5 mg may repeat once in 5-10 minutes, titrated to pain and BP above 90 mm Hg, up to a maximum of 10 mg (a)
  - OR
  - Fentanyl
    - May be given 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM. IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg (a)(b) (Medical Procedure 4.18, Medication Administration). Second dose if needed, maximum total dose of 200 mcg IV, IN, IM.

- Consider Diphenhydramine in conjunction with opioid – 25 mg SLOW IV over 2 minutes or IM

#### ALS Level 2

- None

#### Note

- Extreme caution should be used with administering narcotic analgesics to a patient with a SpO2 less than 94%.
Sepsis is a rapidly progressing, life threatening condition due to systemic infection. Sepsis must be recognized early and treated aggressively to prevent progression to shock and death. Appendix 6.19 Sepsis Alert form.

Definitions **SEPSIS ALERT = Patient Meets the Definition of Sepsis (#2) Below**

1. **Systemic Inflammatory Response Syndrome (SIRS)**
   - Temperature greater than 38° C (100.4° F) OR less than 36° C (96.8° F)
   - Respiratory Rate greater than 20 breaths/min
   - Heart Rate greater than 90 beats/min

2. **Sepsis**
   - SIRS + Documented OR Suspected Infection
     - Documented infections include but are not limited to pneumonia, UTI, wounds, skin and decubitus ulcers.
     - Suspected infection may be determined via the presence of high risk criteria such as a) nursing home resident b) recent surgery c) immunosuppression or d) indwelling device.
     - Symptoms such as cough, increased work of breathing, stiff neck, ALOC, urinary pain or frequency, abdominal pain-distension-firmness, or inflamed joint may determine suspicion of infection.

3. **Severe Sepsis**
   - Sepsis + Sepsis-induced organ dysfunction or tissue hypoperfusion
   - Organ dysfunction or tissue hypoperfusion defined as either
     - Cardiovascular: Hypotension (Mean Arterial Pressure (MAP) less than 65 mmHg)
     - Metabolic: Lactate greater than or equal to \( \geq 4 \) mg/dL (if available)
     - ETCO2 less than 25 mmHg

**TREATMENT GUIDELINES**

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- Apply cardiac monitor: Document rhythm
- Administer oxygen according to following criteria:
  - \( \text{SpO}_2 \geq 94\% \) or above do not administer \( \text{O}_2 \).
  - \( \text{SpO}_2 \) less than 94% administer \( \text{O}_2 \) by nasal cannula at 2 L/min.

**ALS Level 1**
- Utilize the Broward Sepsis Alert Form Section 6.19 or online forms.
- Notify hospital of incoming Sepsis Alert (Meets definition of Sepsis).
- Place one large bore IV (18g or larger).

**FOR SEVERE SEPSIS ONLY**
- Administer Normal Saline 30 mL/kg, may repeat to a maximum of 2 Liters
  - Titrated fluid volume to MAP of at least 70 mmHg.

**ALS Level 2**
- None

**Note**
- Mean Arterial Pressure is located on your monitor can be determined using the grid below.
  - Alternatively it can be calculated using the following formula
    - \( \text{MAP} = [(2 \times \text{diastolic}) + \text{systolic}] / 3 \)
- Monitor for pulmonary edema by clinical status and physical exam (auscultation) especially in the elderly.
### 2.8.7 Acute Adrenal Insufficiency

#### GENERAL GUIDELINES

**NOTE:** Use this protocol for patients confirmed to have Acute Adrenal Insufficiency by either the presence of a medical alert bracelet, designation of medical records or other patient, family or medical confirmation.

- Adrenal insufficiency or Addison’s disease is an endocrine disorder that occurs when the adrenal glands do not produce sufficient amounts of cortisol and other glucocorticoid hormones needed to respond to stress and inflammatory reactions.
- Early signs and symptoms of patients in crisis include pallor, dizziness, headache, weakness/lethargy, abdominal pain, nausea/vomiting and hypoglycemia.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Determine hemodynamic stability and symptoms.

**ALS Level 1**

- Administer Oxygen to maintain a saturation of 94% or above.
- Provide advanced airway management, if necessary (a).
- Initiate cardiac monitoring
- Establish IV access
- Administer a fluid challenge of normal saline 500 cc IV or IO to maintain SBP of >90 mmHg, repeat as needed.
- Check blood glucose level (BGL)
- Administer steroids
  - Assist with administration of patient’s Hydrocortisone Sodium Succinate (Solu-cortef) if present (b) (c).
  - If Solu-cortef not available, administer Methylprednisolone (Solu-medrol) 125 mg slow IVP (if available)
- If the patient has persistent hypotension start Dopamine 5 – 10 mcg/kg/min (1600 mcg/mL infusion concentration = 15 – 60 gtts/min).
  - Titrate to maintain a minimum systolic BP of 90 mm Hg and maximum BP of 120 mm Hg (maximum dose 20 mcg/kg/min).

**ALS Level 2**

- None

**Note**

- (a) Confirm airway adjunct placement with electronic EtCO₂ and waveform on scene, during transport, and during transfer at hospital.
- (b) The patient or family shall provide the medication, dosage and route information.
- (c) Typical stress dose of Hydrocortisone Sodium Succinate is 100 mg IV/IM yet may vary per patient.
### General Guidelines

The following protocols cover a range of problems attributable to the environment, including trauma due to changes in atmospheric pressure, exposure to heat and cold extremes, water submersion, and exposure to electricity. Initial efforts should focus on removing the patient from the harmful environment.
### 2.9.1 Barotrauma/Decompression Illness: Dive Illness

#### GENERAL GUIDELINES

**General Guidelines**

Barotrauma and decompression illness are caused by changes in the surrounding atmospheric pressure beyond the body’s capacity to compensate for excess gas load. These injuries are most commonly associated with the use of SCUBA (Self-Contained Underwater Breathing Apparatus). SCUBA diving emergencies can occur at any depth, with the most serious injuries manifesting symptoms after a dive. If a patient took a breath underwater, from any source of compressed gas (e.g., submerged vehicle, SCUBA) while greater than three (3) feet in depth, the patient may be a victim of barotrauma. Barotrauma may cause several injuries to occur, including arterial gas embolism (AGE), pneumothorax, pneumomediastinum, subcutaneous emphysema, and the “squeeze.” Decompression illnesses may also include decompression sickness (“bends”).

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4. Administer 100% oxygen via non-rebreather mask at 15 L/min.
- Place the patient in a supine position.
- Complete the Dive Accident Signs and Symptoms checklist (Appendix 6.7).
- Obtain a Dive History Profile, if possible (the patient’s dive buddy may be helpful in answering many of these questions).
- Whenever possible, have the legal authority in charge (e.g., police, Florida Marine Patrol, U.S. Coast Guard) secure all of the victim’s dive gear and maintain the proper chain of custody for testing, analysis, and other measures.
- Manage the patient according to the appropriate protocol(s).
- Transport the patient to the closest emergency department or trauma center with a helipad (air transport of diving accident victims must remain at an altitude of less than 1000 feet).
- Contact the Diver’s Alert Network (DAN) at Duke University Medical Center, by calling 919-684-4326, for further assistance (a).
- Bring the dive computer to the hospital if available.

**ALS Level 1**

- None

**ALS Level 2**

- None

**(a) Note**

DAN may be contacted while on scene or after arrival at the hospital. If the contact is made at the hospital, provide DAN with the name of the ED physician and the ED phone number.
## 2.9.2 Cold – Related Emergencies

### GENERAL GUIDELINES

**Factors that predispose and/or cause a patient to develop hypothermia** include geriatric and pediatric age, poor nutrition, diabetes, hypothyroidism, brain tumors or head trauma, sepsis, use of alcohol and certain drugs, and prolonged exposure to water or low atmospheric temperature. Patients can be classified into three categories based on their degree of hypothermia: mild (temperature = 94-97°F), moderate (temperature = 86-94°F), and severe (temperature below 86°F). Most oral thermometers will not register below 96°F. However, some tympanic thermometers (Braun Thermoscan™ Pro-1 and Pro 3000) will register in the range of 68-108°F.

Severe hypothermia patients may be disoriented and confused to the point of stupor and coma. Shivering will usually stop and physical activity will be uncoordinated. In addition, severe hypothermia will frequently produce an Osborn wave or J wave on the ECG, as well as dysrhythmias (bradycardia, ventricular fibrillation).

### TREATMENT GUIDELINES

**Supportive Care**
- Initial Assessment Protocol 2.1.1.
- Airway Management 2.1.2
- Trauma Supportive Care Protocol 2.1.4 (a).
- Remove all wet clothes and dry the patient.
- Protect the patient from heat loss and wind chill.
- Maintain the patient in a horizontal position.
- Avoid rough movement and excess activity.
- Monitor the patient’s temperature.
- Add heat to the patient’s head, neck, chest, and groin.
- For severe hypothermia, warm IV fluids.
- For severe hypothermic cardiac arrest: Start CPR.

*For VF or pulseless VT, (Adult Protocol 2.3.6)*

**ALS Level 1**
- Utilize warm humidified oxygen, if available
- Establish an IV with warm normal saline.

If temperature is above 86°F: Follow the appropriate dysrhythmia treatment (Adult Protocol 2.3).

If temperature is below 86°F: Continue CPR and transport immediately. Do not treat dysrhythmias in patients with severe hypothermia (warm the patient prior to treatment)

**ALS Level 2**
- None

**Note**
(a) Cases of frostbite should be bandaged with dry sterile dressings and transported without attempting rewarming in the prehospital setting.
2.9.3 Heat – Related Emergencies

GENERAL GUIDELINES

Hyperthermia occurs when the patient is exposed to increased environmental temperature and can manifest as heat cramps, heat exhaustion, or heat stroke. Certain drugs may cause an increase in temperature (e.g., cocaine, Ecstasy)

- Heat cramps: Signs and symptoms include muscle cramps of the fingers, arms, legs, or abdomen; hot, sweaty skin; weakness; dizziness; tachycardia; normal BP; and normal temperature.
- Heat exhaustion: Signs and symptoms include cold and clammy skin, profuse sweating, nausea/vomiting, diarrhea, tachycardia, weakness, dizziness, transient syncope, muscle cramps, headache, positive orthostatic vital signs, and normal or slightly elevated temperature.
- Heat stroke: Signs and symptoms include hot dry skin (sweating may be present), confusion and disorientation, rapid bounding pulse followed by slow weak pulse, hypotension with low or absent diastolic reading, rapid and shallow respirations (which may later slow), seizures, coma, and elevated temperature greater than 105°F.

TREATMENT GUIDELINES

HEAT CRAMPS AND HEAT EXHAUSTION
- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Remove the patient from the warm environment; cool the patient.
- Monitor the patient’s temperature.
- For mild to moderate heat cramps and heat exhaustion, if the patient is conscious and alert, encourage the patient to drink salt-containing fluids (e.g., half-strength Gatorade®).

HEAT STROKE
- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Remove the patient from the warm environment; aggressively cool the patient. Remove the patient’s clothing, and wet the patient directly with ice water. Also, turn air-conditioning units and fans on high, and apply ice packs to the patient’s head, neck, chest, and groin.
- Monitor the patient’s temperature. Cool the patient to 102°F, then dry the patient, remove any ice packs, and turn off fans (avoid lowering the patient’s temperature too much).

ALS Level 1

HEAT CRAMPS AND HEAT EXHAUSTION
- If heat cramps are severe or if the patient’s level of consciousness is diminished, administer a fluid challenge of normal saline 500 mL IV.

HEAT STROKE
- Treat hypotension (systolic BP less than 90 mm Hg) with IV fluids. Avoid using vasopressors and anticholinergic drugs; they may potentiate heat stroke by inhibiting sweating. Administer a fluid challenge of normal saline 500 mL IV.

ALS Level 2

- None

Note
### 2.9.4 Drowning

**GENERAL GUIDELINES**

**General Guidelines**

Drowning is a process resulting in primary respiratory impairment from submersion in a liquid medium. Implicit to this definition, is that a liquid-air interface is present at the entrance to the victim's airway, which prevents the individual from breathing oxygen. Outcome may include delayed morbidity or death, death, or life without morbidity. The terms wet drowning, dry drowning, active or passive drowning, near-drowning, secondary drowning, and silent drowning should be discarded. The proper terms should be drowning, fatal or drowning, non-fatal.

Persons who have been submerged in fresh or salt water may or may not be conscious. If the patient is still in the water upon arrival of EMS, a Dive Rescue Team should be used to remove the patient from the water whenever possible. Additional protocols may be needed for treatment decisions (e.g., Adult Protocol 2.9.1, Barotrauma/Decompression Illness: Dive Injuries). Drownings are NOT Trauma Alerts, unless there is a specific traumatic component associated with the event.

### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4 (protect the c-spine).
- Determine any pertinent history (e.g., duration of submersion, depth, water temperature, possible seizure, drug and/or alcohol use).
- Maintain the patient's body temperature; dry and warm the patient.
- All non-fatal drowning patients should be transported to the hospital, regardless of how well they may seem to have recovered. Delayed death or complications due to pulmonary edema or aspiration pneumonia are not uncommon.
- Consider contacting the police department for investigation.

**ALS Level 1**

- Treat dysrhythmias per specific protocol (Adult Protocol 2.3).

**ALS Level 2**

- None

**Note**
### 2.9.5 Electrical Emergencies

#### GENERAL GUIDELINES

**General Guidelines**

A wide range of injuries can be caused by a lightning strike or contact with electricity. Electrical injury can occur from direct contact, an arc, or a flash of the electricity, and from a direct hit or a splash from lightning. The movement of electrical current through the body can cause violent muscle contractions that can lead to fractures; as a consequence, the patient’s c-spine should be protected. The thermal energy can cause external burns, but in many cases the majority of thermal damage is internal, with few external signs of injury. Dysrhythmias are also common (e.g., ventricular fibrillation). The rescuer should be sure that the patient is no longer in contact with the electrical current before initiating treatment.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4 (protect the c-spine) (a).
- Treat burns per Adult Protocol 2.10.8.
- Try to determine the amps, volts, and duration of contact with the electricity, if possible. (500 volts or more should be categorized as high voltage).
- Consider the need to transport the patient to a trauma center (General Protocol 1.10).

**ALS Level 1**

- Treat dysrhythmias per specific protocol (Adult Protocol 2.3).

**ALS Level 2**

- None

**Note**

(a) Asystole is a common presentation with lightning strikes. These patients should be aggressively resuscitated unless their injuries are incompatible with life.
### 2.9.6 Electronic Control Device TASER

#### GENERAL GUIDELINES

All EMS personnel will treat and transport any patient who has been Tasered. At minimum, all electronic control device-event patients will receive the supportive and ALS Level 1 care outlined below. In the event that a patient resists the delivery of care, these actions will be carried out with the safety of the crew in mind. If a patient is violent, a police officer will be required to accompany the patient in the rescue unit during transport and appropriate chemical restraints will be utilized according to Adult Protocol 2.5.2, Violent and/or Combative Patient and Excited Delirium.

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td>- Establish that the scene has been secured and determine which events led up to the individual being subdued with an electronic control device.</td>
</tr>
<tr>
<td>- Determine whether the patient wants to be treated. If the patient refuses treatment, (General Protocol 1.8) (a).</td>
</tr>
<tr>
<td>- Provide general supportive care, including:</td>
</tr>
<tr>
<td>- C-spine precautions, unless a cervical spine injury can be definitively ruled out.</td>
</tr>
<tr>
<td>- Oxygen as needed.</td>
</tr>
</tbody>
</table>

Determine how many 5-second cycles of energy the individual was exposed to, and document this information in the Patient Care Report.

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Initiate cardiac monitoring including 12 Lead EKG if possible. Treat dysrhythmias per specific protocol (Adult Protocol 2.3).</td>
</tr>
<tr>
<td>- Monitor the patient’s glucose.</td>
</tr>
<tr>
<td>- Establish an IV; give normal saline KVO. If patient is exhibiting signs of excited delirium and is hyperthermic, use “cool” normal saline and/or apply ice packs to groin and axilla. (Adult Protocol 2.5.2)</td>
</tr>
<tr>
<td>- If the patients is under police custody then the patient will be automatically transported to a hospital for medical evaluation by EMS.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️ None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Note</th>
</tr>
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</table>
2.10 Adult Trauma Emergencies

GENERAL GUIDELINES

These protocols cover specific types of injuries and their treatment. The initial assessment of the trauma patient should include determination of trauma alert criteria (see General Protocol 1.10, Trauma Transport). When the situation demands it (e.g., when Trauma Alert criteria are met), scene time should be limited as much as possible (e.g., 10 minutes) and the patient should be expeditiously transported to a trauma center. Do not delay transport to establish vascular access or bandage and splint every injury. Priority should be given to airway management and rapid preparation for transport (e.g., full immobilization on a backboard) and control of gross hemorrhage.

If a vascular access is obtained and hypovolemia is suspected (e.g., the patient shows signs and symptoms of shock, such as systolic BP less than 90 mm Hg), a fluid challenge of 1-2 L (20 mL/kg) may be administered until a systolic BP of 90 mm Hg is maintained. If the patient is still in shock after receiving 2 L of fluid, an additional 1 L of fluid may be administered (maximum total fluid administration = 3 L). However, administration of large volumes of IV fluids has been found to be deleterious to the survival of patients with uncontrolled hemorrhage, internally or externally. Studies (NEJM, 1994) have shown that maximal fluid resuscitation may increase the bleeding, thereby preventing the formation of a protective thrombus or dislodging it once the intraluminal pressure exceeds the tamponading pressure of the thrombus. For this reason, consult with the physician should be made prior to the administration of large volumes of IV fluids when the transport time is relatively short (e.g., less than 20 minutes).

A female in her second or third trimester (greater than 20 weeks) of pregnancy should be placed on her left side for transport. If the injuries require the use of a backboard, following full immobilization to the backboard, the backboard should be tilted to the left. Failure to follow this practice may cause hypotension due to decreased venous return.

If history, symptoms, or signs of head or spinal injuries are present, manually immobilize the patient’s head and neck while maintaining a patent airway using a modified jaw-thrust method. Immobilization of the entire spine is indicated following initial stabilization. Cases involving hangings that do not meet Trauma Alert criteria are not considered Trauma Alert patients (e.g., a “suffocation type” patient without c-spine deformity).
### 2.10.1 Head and Spine Injuries

**TREATMENT GUIDELINES**

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td>• Trauma Supportive Care Protocol 2.1.4 (Procedure Spinal Immobilization 4.24).</td>
</tr>
<tr>
<td>• If the patient is not hypotensive (systolic BP greater than 90 mm Hg), elevate the head of the backboard to 30 degrees (12-18 inches).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>• If signs of brain stem herniation exist (e.g., pupillary dilation, asymmetric pupillary reactivity, or motor posturing), consider placement of an advanced airway and hyperventilate the patient to achieve an optimal EtCO2 of 30-40 mm Hg (Medical Procedure 4.4 and Medical Procedure 4.10).</td>
</tr>
<tr>
<td>• If the patient is seizing, refer to Adult Protocol 2.5.3; avoid administration of glucose-containing solutions and medications.</td>
</tr>
<tr>
<td>• Apply a hemostatic gauze on severe wounds to the head, neck, face, or axilla that cannot be controlled by other means (direct pressure) Medical Procedure Hemostatic Gauze 4.27.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
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<tbody>
<tr>
<td>➢ None</td>
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<table>
<thead>
<tr>
<th>Note</th>
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<tbody>
<tr>
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</tr>
</tbody>
</table>
# 2.10.2 Eye Injuries

## General Guidelines

This protocol covers a variety of injuries to the eye. If other injuries to the body exist, priority of care should be given as appropriate.

## Treatment Guidelines

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4 (establish an IV as needed).
- Remove, or ask to the patient to remove, contact lenses, if still in the affected eye(s).
- For a penetrating object, stabilize the object and cover the affected eye with an ocular shield or similar rigid device. Cover both eyes to minimize eye movement. Avoid direct pressure on either the eye or the penetrating object.
- If the eyeball has been forced out of the socket, cover the entire eye area with a rigid container, such as a disposable drinking cup. Avoid contact with the exposed globe. If bleeding is present, control it by administering direct pressure with a sterile dry dressing.
- If there are signs and symptoms or suspicion of ocular exposure to chemicals or foreign body, without obvious or suspected penetrating injury or laceration of the cornea or globe, irrigate the eye with a normal saline IV solution (Medical Procedure 4.19, Morgan Lens).

### ALS Level 1

- If the patient is experiencing eye pain, administer Tetracaine, 1 drop in each affected eye. Tetracaine may NOT be given in penetrating eye injuries or in patients with allergies to Lidocaine.

### ALS Level 2

- None

### Note
### 2.10.3 Chest Injuries

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>This protocol covers both blunt and penetrating chest trauma and should be part of initial resuscitation if the patient’s breathing is compromised.</td>
</tr>
</tbody>
</table>

#### TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td>- Trauma Supportive Care Protocol 2.1.4.</td>
</tr>
<tr>
<td>- Penetrating injuries to the chest or upper back should be covered immediately with a vented chest seal. If needed, “burp” the dressing to prevent/relieve a tension pneumothorax.</td>
</tr>
<tr>
<td>- Do not attempt to remove an impaled object; instead, stabilize it with a bulky dressing or other means. If the impaled object is very large or unwieldy, attempt to cut object to no less than 6 inches from the chest.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- For tension pneumothorax, decompress the chest on the affected side (Medical Procedure 4.9).</td>
</tr>
<tr>
<td>- For massive flail chest with severe respiratory compromise, insert an advanced airway and assist ventilations (Medical Procedures 4.1.5 and 4.4). If flail chest does not cause severe respiratory compromise, stabilize the chest externally by placing the patient’s ipsilateral arm in a sling and swathe.</td>
</tr>
<tr>
<td>- For traumatic asphyxia refer to Crush Protocol 2.10.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ None</td>
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</tbody>
</table>

#### Note

---
### 2.10.4 Traumatic Chest Pain

**GENERAL GUIDELINES**

<table>
<thead>
<tr>
<th>General Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest pain due to blunt trauma may be an indication of underlying injury. Blunt injuries such as pulmonary contusion and cardiac contusion may cause respiratory insufficiency and/or myocardial infarction.</td>
</tr>
</tbody>
</table>

**TREATMENT GUIDELINES**

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td>- Trauma Supportive Care Protocol 2.1.4.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Treat dysrhythmias per specific protocol (Adult Protocol 2.3).</td>
</tr>
<tr>
<td>- Consider the need for other protocols (Adult Protocol 2.4.2).</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>ALS Level 2</th>
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<tbody>
<tr>
<td>➢ None</td>
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</tbody>
</table>

**Note**
### 2.10.5 Abdomino-Pelvic Injuries

#### GENERAL GUIDELINES

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>This protocol covers blunt and penetrating abdomino-pelvic trauma. Penetrating injuries may also include the chest (Adult Protocol 2.10.3, Chest Injuries).</th>
</tr>
</thead>
</table>

#### TREATMENT GUIDELINES

| Supportive Care | • Initial Assessment Protocol 2.1.1.  
• Trauma Supportive Care Protocol 2.1.4.  
• For penetrating injuries, apply an occlusive dressing (e.g., Vaseline gauze).  
• For evisceration, cover the organs with a saline-soaked sterile dressing and then cover it with an occlusive dressing (e.g., foil). Do not attempt to put the organs back into the abdomen.  
• Do not log-roll any patient with a suspected pelvic fracture (may use scoop stretcher).  
• If a pelvic fracture is suspected, stabilize the patient with a “sheet sling” or a commercial available pelvic splint. |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

<table>
<thead>
<tr>
<th>ALS Level 1</th>
<th>• None</th>
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</table>

<table>
<thead>
<tr>
<th>ALS Level 2</th>
<th>• None</th>
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</thead>
</table>

#### Note

- None
# 2.10.6 Extremity Injuries

## GENERAL GUIDELINES

This protocol covers open and closed injuries to the extremities, including amputation.

## TREATMENT GUIDELINES

<table>
<thead>
<tr>
<th>Supportive Care</th>
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</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 2.1.1.</td>
<td></td>
</tr>
<tr>
<td>- Trauma Supportive Care Protocol 2.1.4 (establish an IV as needed).</td>
<td></td>
</tr>
<tr>
<td>- Any fracture or suspected fracture should be splinted appropriately, with ice being applied to the affected area. Remove and secure all jewelry. Check pulse sensation and movement before and after splinting.</td>
<td></td>
</tr>
<tr>
<td>- Closed angulated fractures should be aligned using proximal and distal traction during splinting, except in fractures that involve joints, which should be splinted in the position in which they are found.</td>
<td></td>
</tr>
<tr>
<td>- Traction splints should be used in cases of closed femur fractures, unless a pelvic fracture is suspected.</td>
<td></td>
</tr>
<tr>
<td>- Amputations should be dressed with bulky dressings. The amputated part should be placed in a plastic bag and then the bag placed on ice for transportation to the hospital.</td>
<td></td>
</tr>
<tr>
<td>- Apply direct pressure for hemorrhage control. If direct pressure does not stop the hemorrhage apply a trauma tourniquet (Procedure Wound Care Trauma Tourniquet 4.27.2).</td>
<td></td>
</tr>
<tr>
<td>- Apply a hemostatic gauze on severe wounds to the head, neck, face, axilla, buttocks that cannot be controlled by other means (direct pressure/tourniquet) Medical Procedure Hemostatic Gauze Procedure 4.27.1.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
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</thead>
<tbody>
<tr>
<td>- See Adult Protocol 2.1.5 for pain management guidelines</td>
<td></td>
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</table>

<table>
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<tr>
<th>ALS Level 2</th>
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<tr>
<td>➢ None</td>
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<table>
<thead>
<tr>
<th>Note</th>
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</table>
### 2.10.7 Traumatic Arrest

#### General Guidelines

The decision to attempt resuscitation of a traumatic arrest should be based on the paramedic’s judgment as to the possibility of survival and/or the possibility of organ harvest. There are instances where resuscitation of a traumatic arrest is not warranted (General Protocol 1.4, Death in the Field).

#### Treatment Guidelines

<table>
<thead>
<tr>
<th>Supportive Care</th>
<th>ALS Level 1</th>
<th>ALS Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Initial Assessment Protocol 2.1.1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Trauma Supportive Care Protocol 2.1.4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Rapidly prepare the patient for transport and then expeditiously transport the patient to the trauma center.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- If IV(s) can be established, infuse to a maximum of 3 L of fluid.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Avoid use of vasopressors in cases of suspected hypovolemia.</td>
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<td></td>
</tr>
<tr>
<td>- None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Note
### 2.10.8 Burn Injuries

#### GENERAL GUIDELINES

**Burns** can be caused by thermal, chemical, and electrical sources. If an electrical burn is suspected, also see Adult Protocol 2.9.5, Electrical Emergencies. Remember that burn patients are volume depleted. However, burns do not bleed, so you should look for other sources of bleeding. Many burn injuries are associated with inhalation injury. The signs and symptoms of inhalation injury include nasal and oropharyngeal burns, charring of the tongue or teeth, sooty (blackened) sputum, singed nasal and facial hair, abnormal breath sounds (e.g., stridor, rhonchi, wheezing), and respiratory distress.

In cases of inhalation injury, attention should be given to the patency of the airway. Acute swelling can cause an airway obstruction. The paramedic should consider the need for early intubation to avoid a complete airway obstruction that requires a cricothyroidotomy.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Stop the burning process:
  - Thermal burns: Lavage the burned area with tepid water (sterile, if possible) to cool the skin. Do not attempt to wipe off semisolids (e.g., grease, tar, wax).
  - Dry chemical burns: Brush off dry powder, then lavage with copious amounts of tepid water (sterile, if possible) for 15 minutes.
  - Liquid chemical burns: Lavage the burned area with copious amounts of tepid water (sterile, if possible) for 15 minutes. (When phenol has caused the burn, also see Hazardous Material Exposure Section Phenol 7.1.20.)
- Remove clothing from around the burned area, but do not remove/peel off skin or tissue.
- Remove and secure all jewelry and tight-fitting clothing.
- Assess the extent of the burn using the Rule of Nines and the degree of burn severity (Appendix 6.4, Burn Severity Categorization, and Rule of Nines).
- Apply a dressing to the burned area as follows:
  - If there is greater than or equal to 20% second-degree burns or 5% third-degree burns, cover the burned area with dry sterile dressings or Water Gel™ wraps.
  - If there is less than 20% second-degree burns or 5% third-degree burns, apply wet sterile dressings to the burned areas for 15 minutes to aid in pain control. Alternatively, Burn Free™ gel pads or Water Gel™ wraps may be applied continuously to aid in pain control.
- Prevent hypothermia by keeping the patient warm and ensuring that all outer layers of dressings are dry.

**ALS Level 1**

- Pain Management Protocol (Adult Protocol 2.1.5).

**ALS Level 2**

- None

**Note**
Crush injuries are rarely seen in pre-hospital medicine but are common in times of disaster, both natural and manmade. Early and aggressive treatment of victims suspected of having a crush injury is paramount. Without aggressive pre-hospital treatment, the victim may die during extrication or weeks later from complications of the injury.

In the crush injury syndrome, the initial injury is at the site of the muscle crushed by the mechanical force of an object. The muscle cells die as the result of the following. First, the force of the crushing object ruptures muscle cells. Second, the direct pressure of the object on the limb causes muscle cells to become ischemic. The combination of mechanical force and ischemia can cause muscle death within an hour. Third, the force of the crush injury compresses large vessels, resulting in the loss of blood supply to muscle tissue. Muscles can normally survive circulatory ischemia for up to four hours before the cell death. After four hours, the cells begin to die as a result of the circulatory compromise.

The damaged muscle tissue produces and releases many toxins that can have detrimental effects on the body. The longer the victim is trapped, the longer the toxins are given to build up distal to the crush site. The crushing force acts as a dam that prevents these toxins from being released into the rest of the body. Once the force is removed, the toxins are allowed to run freely throughout the body, causing a myriad of problems. Along with the release of toxins after extrication, the victim can become severely hypovolemic from the third spacing of fluid, and the rapid swelling of the injured area can cause acute compartment syndrome.

<table>
<thead>
<tr>
<th>Toxin</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histamine</td>
<td>Vasodilitation and Bronchoconstriction</td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>Acidosis and dysrhythmias</td>
</tr>
<tr>
<td>Nitric Oxide</td>
<td>Vasodilation</td>
</tr>
<tr>
<td>Potassium</td>
<td>Hyperkalemia</td>
</tr>
<tr>
<td>Thromboplastin</td>
<td>DIC</td>
</tr>
</tbody>
</table>

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Trauma Supportive Care Protocol 2.1.4.
- Spinal immobilization follow 2.10.1
- Apply cardiac monitor
- Administer oxygen according to following criteria:
  - SpO2 94% or above do not administer O2.
  - SpO2 less than 94% administer O2 by nasal cannula at 2 L/min.
- Rapidly prepare the patient for transport and then expeditiously transport the patient to the trauma center.
2.10.9 Crush/Compartment Syndrome (continued)

**TREATMENT GUIDELINES**

### ALS Level 1

**CRUSH INJURY or COMPARTMENT SYNDROME**
- Establish IV access; give Normal Saline 1 Liter.
- Pain management: If patient is normotensive (systolic BP greater than 90 mm Hg), administer
  - Morphine Sulfate 5 mg via slow IV may be repeated once in 5-10 minutes, titrated to pain and BP greater than or equal to 90 mm Hg, up to a maximum of 10 mg.
  **OR**
  - Fentanyl
    May be given 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM. IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg (a)(b) (Medical Procedure 4.18, Medication Administration).
    Second dose if needed, maximum total dose of 200 mcg IV, IN, IM.
- For crush injury release compression and extricate patient

**CRUSH SYNDROME**

If unable to release compression and situation progresses to CRUSH SYNDROME
- Entrapment with compression lasting longer than 4 hours OR on the thorax for 20 minutes.
- Suspicion of hyperkalemia (Peaked T-waves, absent P waves or widened QRS).
- Establish IV access, 2 large bore IVs recommended in order to separate CaCL and Bicarb;
- Pain management: If patient is normotensive (systolic BP greater than 90 mm Hg), administer
  - Morphine Sulfate 5 mg via SLOW IV may be repeated once in 5-10 minutes, titrated to pain and BP greater than or equal to 90 mm Hg, up to a maximum of 10 mg.
  **OR**
  - Fentanyl
    May be given 100 mcg increments every 3-5 minutes to a maximum of 200 mcg IN, IM. IV dose is 1 mcg/kg (slow IV increments every 3-5 minutes, maximum initial dose of 100 mcg, titrated to pain and BP remains above 100 mm Hg (a)(b) (Medical Procedure 4.18, Medication Administration).
    Second dose if needed, maximum total dose of 200 mcg IV, IN, IM.
- Calcium Chloride 1 g into 50 mL or 100 mL bag of normal saline and administer SLOW IV over 10 minutes (follow with minimum of 20 mL flush).
- Sodium Bicarbonate Bolus at 1 meq/kg
- Continue IV fluids at 500 mL/hr
- Administer Albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline (Medical Procedure 4.18.6).

### ALS Level 2

None

### Note

Ideally Calcium and Sodium Bicarb should not be administered through the same IV line due to crystallization within the tubing therefore 2 large bore IVs are recommended. If 2 IVs are not possible administer 20 mL flush in between Calcium and Sodium Bicarb.
These protocols cover specific types of special healthcare needs in adult patients. Adults with special healthcare needs are those who have or are at risk for chronic physical, developmental, behavioral, and emotional conditions that necessitate use of health and related services of a type or amount not usually required by typical adults.

The general approach to adults with special healthcare needs includes the following:
1. Priority is given to the CABs.
2. Do not be overwhelmed by the machines.
3. Listen to the caregiver.
4. If a nurse is present, rely on his/her judgment.
5. Remember that the patient’s cognitive level of function may be altered.
6. Assume that the patient can understand exactly what you say.
7. Bring all medications and equipment to the hospital.

Obtaining a history includes asking the parent/caregiver about the following issues:
1. The patient’s normal vital signs.
2. The patient’s actual weight.
3. Developmental level of the patient.
4. The patient’s allergies, including to latex.
5. Pertinent medications/therapies.
### General Guidelines

Home mechanical ventilators may be indicated for chronically ill adults with abnormal respiratory drive, severe chronic lung disease, or severe neuromuscular weakness. Some patients require continuous mechanical ventilations, whereas others require only intermittent support during sleep or acute illness. Home ventilators may either be volume limited or pressure limited. All are equipped with alarms.

**TYPES OF VENTILATOR ALARMS**
- Low pressure or apnea - may be caused by a loose or disconnected circuit or an air leak in the circuit or at the tracheostomy, resulting in inadequate ventilation.
- Low power - caused by a depleted battery.
- High pressure - can be caused by a plugged or obstructed airway or circuit tubing, by coughing, or by bronchospasm.
- Setting error - caused by ventilator settings outside the capacity of the equipment.
- Power switchover - occurs when the unit switches from alternating-current power to the battery.

### Treatment Guidelines

<table>
<thead>
<tr>
<th>Supportive Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Assessment Protocol 2.1.1.</td>
</tr>
<tr>
<td>Medical Supportive Care Protocol 2.1.3.</td>
</tr>
<tr>
<td>If a ventilator-dependent patient is in respiratory distress and the cause is not easily ascertained and corrected, remove the ventilator and provide assisted manual ventilations with a BVM. Suction as needed.</td>
</tr>
<tr>
<td>Consider the need for other protocols (e.g., Adult Protocol 2.2, Adult Respiratory Emergencies).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALS Level 1</th>
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<tbody>
<tr>
<td>None</td>
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<table>
<thead>
<tr>
<th>ALS Level 2</th>
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</thead>
<tbody>
<tr>
<td>None</td>
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</table>

**Note**
# 2.11.2 Tracheostomy

## General Guidelines

Tracheostomies are indicated for long-term ventilatory support to bypass an upper airway obstruction and to aid in the removal of secretions. Tracheostomies come in a variety of sizes and can either be single lumen or double lumen. Special attachments include a tracheostomy nose (filtration device), tracheostomy collar (for oxygen or humidification), and Passy-Muir valve (speaker valve).

### Signs of Tracheostomy Obstruction
- Excess secretions
- No chest wall movement
- Cyanosis
- Accessory muscle use
- No chest wall rise with bag-valve ventilations

## Treatment Guidelines

### Supportive Care

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.
- If an obstruction is present, inject 1-3 mL of normal saline into the tracheostomy tube and suction as needed.
- If unable to clear the obstruction by suctioning, remove the tracheostomy tube and insert a new tube (either of the same size or one size smaller). Do not force the tube.
- If unable to insert a new tracheostomy tube, or if one is unavailable, insert an endotracheal tube of similar size into the stoma and ventilate with a BVM as needed.
- If unable to insert an endotracheal tube, ventilate with a bag-valve mask over the stoma or over the patient’s mouth while covering the stoma as needed.
- Consider the need for other protocols (e.g., Adult Protocol 2.2, Adult Respiratory Emergencies).

### ALS Level 1

- None

### ALS Level 2

- None

### Note
### 2.11.3 Central Venous Lines

#### GENERAL GUIDELINES

**General Guidelines**

Central venous lines are indicated for administration of medications, delivery of chemotherapy, nutritional support, infusion of blood products, and blood draws. Types of central venous lines include Broviac/Hickman, Port-a-Cath/ Med-a-Port, and percutaneous intravenous catheters (PIC). Central venous line emergencies include the catheter coming completely out, bleeding at the site, the catheter broken in half, blood embolus, thrombus, air embolus, and internal bleeding. Use of SQ ports requires special training; these ports should not be used for IV access.

Signs of blood embolus, thrombus, air embolus, and internal bleeding are as follows:
- Chest pain
- Cyanosis
- Dyspnea
- Shock

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3. CVP and PIC lines may be used for emergency IV access under sterile conditions.
- If the catheter has come completely out, apply direct pressure to the site.
- If there is bleeding at the site, apply direct pressure.
- If the catheter is broken in half, clamp the end of the remaining tube.
- If blood embolus, thrombus, or internal bleeding is suspected, clamp the line.
- If air embolus is suspected, clamp the line and place the patient on his/her left side.
- Consider the need for other protocols (e.g., Adult Protocol 2.2, Adult Respiratory Emergencies).

**ALS Level 1**

- None

**ALS Level 2**

- None

**Note**
### 2.11.4 Feeding Tubes

#### GENERAL GUIDELINES

**General Guidelines**

Feeding tubes are indicated for administration of nutritional supplements and in patients who have an inability to swallow. Types of feeding tubes include nasogastric tubes (temporary) and gastrostomy tubes (G tube). Types of G tubes include those that are surgically placed, percutaneous endoscopic gastrostomy tubes (PEG tubes), and jejunal tubes (J tube). Potential complications include leaks, bleeding around the site, and displacement of the tube.

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.
- If the catheter has come completely out, cover the site with Vasoline gauze and apply direct pressure to the site.
- If there is bleeding at the site, apply direct pressure.

**ALS Level 1**

- None

**ALS Level 2**

- None

**Note**


### 2.11.5 Ventricular-Assist Devices

#### GENERAL GUIDELINES

**General Guidelines**

Ventricular-Assist devices (VADs) also known as heart pumps are surgically implanted circulatory support devices designed to assist the pumping action of the heart. Caring for these patients is complicated, and every effort should be made to contact the patient’s primary caretaker (spouse, guardian etc.) and the VAD coordinator during your evaluation. **Patients with properly functioning VADs may NOT have a detectable pulse, normal blood pressure or oxygen saturation.**

#### TREATMENT GUIDELINES

**Supportive Care**

- Initial Assessment Protocol 2.1.1.
- Medical Supportive Care Protocol 2.1.3.
- Treat non-VAD associated conditions in accordance with the appropriate protocol.
- Determine the type of device, access alarms, auscultate for pump sounds, if needed assist patient (caretaker) in replacing the device’s batteries or cables.
- Contact the VAD coordinator phone number will be on the device and the equipment carrying bag.
- If there is bleeding at the site, apply direct pressure.

**ALS Level 1**

- Monitor capnography to access ventilation and perfusion
- Perform a blood glucose level if any weakness, altered mental status or history of diabetes (Medical Procedure 4.17). If blood glucose is less than 60 mg/dl, refer to Hypoglycemia/Hyperglycemia protocol 2.8.2.
- If signs of hypoperfusion administer 500 mL bolus of normal saline
- Evaluate unresponsive patients carefully for reversible causes
- CPR risks rupturing of the ventricular wall leading to fatal hemorrhage. Only perform CPR when the patient’s VAD has no hand pump and no other option exists.
- Transport to the closest appropriate facility based on the patient’s chief complaint. If a cardiac issue or VAD mechanical issue is identified (alarm sounds) then transport to the most appropriate Broward County VAD receiving center, if possible (see hospital capabilities).

**ALS Level 2**

- None

**Note**

- Take all equipment associated with the VAD system to the ED