Asystole

**Assessment/Indications**
- No pulse or respirations
- Confirm cardiac rhythm with combo pads or electrodes
- Record in two leads to confirm Asystole and to rule out fine V-Fib.

**Treatment**

**EMR**
- Basic assessment and management (up to your scope of practice)
- Apply and utilize AED
- Use CPR/AED according to current AHA guidelines for patient age
- **EMR STOP Ø**

**EMT**
- If BLS ambulance consider ALS intercept
- **EMT STOP Ø**

**AEMT**
- Vascular access
- **AEMT STOP Ø**

**PARAMEDIC**
- **ADULT** -- Epinephrine 1:10,000, 1 mg IV/IO or 2.0 mg ET every 3 - 5 minutes.
- **Peds** -- Epinephrine 1:10,000, 0.01 mg/kg IV/IO every 3-5 minutes or Epinephrine 1:1000, 0.1mg/kg ET every 3 - 5 minutes.
- Vasopressin 40 units IO/IV may replace the first or second dose of epinephrine.
- **ADULT** -- Sodium Bicarbonate (8.4%) 1 mEq/kg IV/IO followed by 0.5 mEq/kg every 10 minutes. For prolonged resuscitation.
- **Peds** -- 4.2% -1 mEq/kg may repeat at 0.5 mEq/kg every 10 minutes (Less than 1 month old)
- Consider: Calcium Chloride
  - **ADULT** – 500 – 1000 mg IV/IO if arrest secondary to renal failure, history of hemodialysis, or calcium channel blocker overdose
  - **Peds** - 20 mg/kg
  - **B.** Treat reversible causes, refer H’s & T’s in “Basic Assessment & Management” A - 3 page 8.
  - **C.** ADULT – NARCAN IV/IN/IO/IM slow IV (increments of 0.5 mg) to obtain desired effects with a max single dose of 2 mg. This may be repeated once for a max total dose of 4 mg. **Peds 0.1 mg/kg.**
- **PARAMEDIC STOP Ø**

**Special Notes**
- Pediatric Epinephrine doses can be calculated at 0.1 ml/kg regardless of the concentration for easier calculations.
- AHA algorithm for Asystole is located in the reference section of this manual.
**Atrial Fibrillation and Flutter**

**Assessment/Indications**
- Paroxysmal Atrial Tachycardia
- Atrial Flutter/Fibrillation
- Dyspnea
- Chest pain
- Altered mental status, secondary to possible thrombus or emboli
- Diaphoresis

**Treatment**

<table>
<thead>
<tr>
<th>EMR</th>
<th>EMT</th>
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</table>
| • Basic assessment and management (up to your scope of practice)  
• Supportive care  
• EMR/EMT STOP Ø |

<table>
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<tr>
<th>AEMT</th>
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</table>
| • Vascular access  
• AEMT STOP Ø |

<table>
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<tr>
<th>PARAMEDIC</th>
</tr>
</thead>
</table>
| • 12 lead EKG, transmit if time permits  
• Stable patient, observe and transport |

**STABLE PATIENT - ADULT** – (NEW or MEDICAL HISTORY)
- If complex width is narrow and blood pressure is normal or elevated,  
- Cardizem (Diltiazem) 0.25 mg/kg, infusion over 10 minutes, max single dose is 25 mg. Refer to “Cardizem Mixture” Procedure I – 5.1  
- Monitor blood pressure continuously  
- If not resolved after 10 minutes dose may be repeated once  
- Monitor blood pressure continuously

**UNSTABLE PATIENT**
ATRIAL FIB & FLUTTER
ADULT -- 70j, 120j, 150j, & 200j  
**PEDS -- 0.5 j/kg then 1 j/kg**
Consider using synchronized cardioversion. Refer to “Electrical Therapy Procedure” I – 15  
Pre-medicate if time permits, Refer to “Cardioversion & Pacing Sedation” Protocol G – 2  
• PARAMEDIC STOP Ø

**Special Notes**
Immediate synchronized cardioversion is recommended when there is an unstable rhythm with serious s/s.

<table>
<thead>
<tr>
<th>Approved</th>
<th>Date</th>
<th>Version</th>
<th>Revision(s)</th>
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</thead>
<tbody>
<tr>
<td>Roger McKinney, MD</td>
<td>6/1/15</td>
<td>3.1</td>
<td>8-25-15</td>
</tr>
</tbody>
</table>
Automatic External Defibrillator (AED)

Assessment/Indications

- Patient in Cardiopulmonary Arrest
- Basic Life Support in progress
- AED in use

Treatment

<table>
<thead>
<tr>
<th>EMR</th>
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</table>
| - Basic assessment & management (up to your scope of practice).  
- AED available, apply to patient and follow prompts.  
- Continue CPR according to current AHA – Healthcare Provider Guidelines, specific for patient’s age.  
- If AED is in use (defibrillating) prior to arrival, allow shock to be completed, start chest compressions immediately.  
- If no pulse, continue to provide CPR and basic life support, starting back with chest compressions  
- If a pulse is present, evaluate respirations and provide supportive care appropriate for the patient’s condition.  
- If a patient has not received CPR for at least 5 minutes prior to arrival or received ineffective CPR, two (2) minutes of CPR should be performed to oxygenate the heart prior to defibrillation.  
- If BLS ambulance consider ALS intercept. Be aware of scene time, do not delay transport.  
- EMT STOP Ø |

<table>
<thead>
<tr>
<th>AEMT</th>
<th>PARAMEDIC</th>
</tr>
</thead>
</table>
| - Vascular access  
- AEMT STOP Ø |
| - Normally the paramedic would not be utilizing the AED.  
- PARAMEDIC STOP Ø |
**Special Notes**

1. AED is **contraindicated** in the following situations:
   a. If the victim is in standing water, remove the victim from the water, and ensure that chest and surrounding area is dry.
   b. Victims with implanted pacemakers, place pads 1 inch from device. If ICD/AICD is delivering shock to the patient allow 30 to 60 seconds for ICD/AICD to complete the treatment cycle before using the AED.
   c. Transdermal medication patch at site of AED pads: If a medication patch is in the location for an AED pad, remove the medication patch and wipe the area clean before attaching the AED electrode pad.
   d. Patient lying on metal surface such as bleachers.

2. If the AED in use is a Zoll, the pads will plug into the multifunction cable on the Zoll cardiac monitor with the AED block or straight to the multifunction cable, if the unit is another brand, EMS should take the AED attached to the patient and return the unit once the call is complete. This will prevent the AED from “starting over” using a secondary AED. If it is not practical to take the AED in place, prep the Zoll AED and remove the pads and replace with the Zoll pads and follow the prompts.

3. Remember the Zoll AED has some delay to catch up if you are doing CPR when the unit is first turned on.
Bradycardia

Assessment/Indications

- Heart rate less than 60 beats per minute and symptomatic
- Decreased / altered LOC
- Chest pain / discomfort
- CHF/ pulmonary edema
- Head trauma
- Dyspnea
- Hypothermia, hypoglycemia, drug overdose
- Signs of decreased perfusion
- Rhythm may be sinus bradycardia, junctional, or heart block
- Heart rates less than 80 bpm for infant or less than 60 bpm for child

Treatment

<table>
<thead>
<tr>
<th>EMR</th>
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<tbody>
<tr>
<td>Basic assessment &amp; management (up to your scope of practice)</td>
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<tr>
<td>Supportive care</td>
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<tr>
<td>If BLS ambulance consider ALS intercept</td>
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<tr>
<td>EMR/EMT STOP Ø</td>
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</tbody>
</table>

AEMT

- Vascular access
- AEMT STOP Ø

PARAMEDIC

- 12 lead EKG, transmit if time permits
- If patient is asymptomatic and heart rate is less than 60 beats per minute, transport and observe
- Poor perfusion - Atropine 0.5 - 1.0 mg IV/IO every 3 - 5 minutes up to 0.04 mg/kg or 3 mg if symptomatic (see peds section on the next page)
- If PVC’s are present with bradycardia, DO NOT administer Anti-Arrhythmic medications.
- ADULT – If systolic BP less than 90 mmHg and heart rate is less than 60 beats per minute
  A. If 2nd degree Type II or 3rd degree block is present with poor perfusion, apply pacing/combo pads and start external pacing, refer to the “Pacing” Procedure I - 27
  B. If systolic BP is less than 90 mmHg and heart rate is less than 60 beats per minute, if condition continues, administer Atropine 0.5 mg up to 0.04 mg/kg (3 mg maximum for adults)
  C. If systolic BP is less than 90 mmHg and heart rate is less than 60 beats per minute, if condition continues,
     1. Consider Dopamine (unrelated to hypovolemia) 2 - 20 mcg/kg/min, refer to the “Dopamine Chart” H – 3 or Epi 2 - 10 mcg/min, refer to the “Adult Epi Drip Bradycardia Chart H – 5” Refer to the “Dosemedic book” for pediatric epi dose.
     2. Continuous IV infusions to increase heart rate especially if taking Beta blockers.
     3. If absolute beta blocker overdose is suspected contact online medical control for direction on administration of Glucagon.
     4. If known calcium channel blocker overdose, contact medical control/direction.
- Consider H’s & T’s refer to “Basic Assessment & Management” A - 3 page 8.
• **PEDS**
  
a. Heart rates less than 80 beats per minute for an infant or less than 60 beats per minute for a child with signs of poor perfusion, respiratory distress, hypotension, decreased LOC start chest compressions
  
  If no improvement after 30 – 60 seconds of basic management including Oxygen and chest compressions consider
  
  (a) Epinephrine (1:10,000) 0.01 mg/kg IV/IO every 3 - 5 minutes or Epinephrine (1:1000) 0.1 mg/kg ET every 5 minutes (if intubated and IV/IO is not available)
  
  (b) Atropine 0.02 mg/kg IV/IO. Minimum dose of 0.1 mg, max single dose 1 mg, repeat in 3 minutes. Max overall dose 0.04 mg/kg.
  
  (c) Consider Dopamine (unrelated to hypovolemia) 2 - 20 mcg/kg/min as a continuous IV infusion to increase heart rate. Refer to “Dopamine Chart” H – 3
  
  (d) Contact on line medical control/direction if needed.

  b. If known calcium channel blocker overdose, contact medical control/direction.

• **PARAMEDIC STOP Ø**

**Special Notes**

- Pediatric Epinephrine doses can be calculated at 0.1 ml/kg regardless of the concentration for easier calculations.
- Refer to “AHA Algorithms” J - 3 for additional treatments/details located in the reference section of this manual.
- Hypoxia should always be considered the cause of Bradycardia in pediatrics until proven otherwise.
- Medications are rarely needed for Bradycardia, refer to the “Inverted Pyramid” J - 31 in the reference section of this manual.
- Do NOT delay pacing for vascular access if the patient is unstable.
- Atropine is rarely effective for high degree heart block & heart transplant patients, TCP should be utilized. The AHA does not have enough evidence for or against TCP in pediatrics.

---

**Approved**
Roger McKinney, MD  

**Date**  
6/1/15  

**Version**  
3.0  

**Revision(s)**
Neonatal Resuscitation

Assessment/Indications
Newborn with respiratory and/circulatory distress or arrest

Treatment

<table>
<thead>
<tr>
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<tr>
<td>Basic assessment &amp; management (up to your scope of practice)</td>
<td></td>
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<tr>
<td>If BLS ambulance consider ALS intercept</td>
<td></td>
</tr>
<tr>
<td>Dry newborn, <strong>KEEP NEWBORN WARM</strong></td>
<td></td>
</tr>
<tr>
<td>Keep infant level with mother until cord is clamped</td>
<td></td>
</tr>
<tr>
<td>Suction airway (bulb syringe) suction the mouth then the nose. Suction as early as possible.</td>
<td></td>
</tr>
<tr>
<td>Respirations.</td>
<td></td>
</tr>
<tr>
<td>a. If spontaneous and adequate</td>
<td></td>
</tr>
<tr>
<td>1. complete clamping cord (6” from umbilicus) and cut between clamps</td>
<td></td>
</tr>
<tr>
<td>2. cover infant’s head after drying it thoroughly</td>
<td></td>
</tr>
<tr>
<td>3. wipe dry, wrap and keep warm, remove any wet linen</td>
<td></td>
</tr>
<tr>
<td>4. provide oxygen as necessary to maintain centrally pink color</td>
<td></td>
</tr>
<tr>
<td>5. transport without delay</td>
<td></td>
</tr>
<tr>
<td>b. If no respirations or pulse rate less than 100 per minute:</td>
<td></td>
</tr>
<tr>
<td>1. Administer positive pressure ventilation via bag mask and high flow oxygen at a rate of 40 - 60 breaths per minute using an infant/neonate BVM &amp; neonate mask</td>
<td></td>
</tr>
<tr>
<td>• Pulse:</td>
<td></td>
</tr>
<tr>
<td>a. If pulse rate is less than 60 bpm, start compressions at a rate of 120 “events” per minute (90 compressions plus 30 breaths). One cycle of events will consist of three (3) compressions then one (1) ventilation. (One and Two and Three and Breathe)</td>
<td></td>
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<td></td>
<td>EMR/EMT STOP Ø</td>
</tr>
</tbody>
</table>

AEMT

| Vascular access, if hypotensive (based on age/weight) administer 10 ml/kg NS bolus and reassess. Buretrol IV set should be used. |                         |
| EZ-IO should not be used in patients less than 3 KG                                               |                         |
| AEMT STOP Ø                                                                                      |

PARAMEDIC

| Cardiac monitor and treat the arrhythmia/dysrhythmia present |                         |
| If the heart rate remains less than 60 beats per minute after 30 seconds of combined chest compressions and positive pressure ventilations Epinephrine (1:10,000 concentration) 0.01 – 0.03 mg/kg IV/IO (0.1 - 0.3 ml/kg) should be administered every 3 - 5 minutes; administer epinephrine (1:10,000 concentration) 0.3 – 1.0 ml/kg may be administered via endotracheal tube while IV access is being obtained |                         |
| Indication(s) for intubation of a newborn are: |                         |
| Bag mask ventilation ineffective |                         |
| Extreme prematurity |                         |
| Prolonged resuscitation required |                         |
| Route of administration for ETT drugs while vascular access being obtained |                         |
| Presumed or known diaphragmatic hernia |                         |
| PARAMEDIC STOP Ø                                                                                   |
Neonatal Resuscitation - Meconium Staining

**Treatment**

<table>
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<tr>
<th>EMR</th>
<th>EMT</th>
<th>AEMT</th>
<th>Paramedic</th>
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</table>

- Follow other basic neonatal resuscitation measures, refer to the “Meconium Stain” Protocol F - 5
- Suction the mouth, nose, and posterior pharynx after the delivery of the head but before the delivery of the shoulders.

Baby Vigorous? (strong respiratory effort, good muscle tone, heart rate greater than 100 bpm)

**YES** – Continue with remainder of initial steps, clear mouth and nose of secretions, dry, stimulate and reposition, apply oxygen as needed.

**NO** – EMT suction mouth
  - Paramedic ONLY – suction mouth and trachea (ETT & Meconium aspirator). Do this before stimulating the neonate to take any breaths, this may increase the chance for the newborn to aspirate the Meconium.

**Neonatal Resuscitation Overview**

1. Initial Steps (Drying, Positioning, Suctioning, Stimulation)
2. Assess Respirations, Heart Rate, and Color
3. If apneic, gasping, or HR < 100 – Provide PPV at a rate of 40-60 BPM
4. After 30 seconds of PPV, check the HR.
   - If less than 60 - begin chest compressions.
   - Compressions and PPV are given in a 3:1 ratio – 3 compressions and then 1 breath. Reassess the patient every 30 seconds.
5. Consider epinephrine if HR is less than 60 after 30 seconds of positive pressure ventilations & compressions.
   - Consider the other drugs as they are indicated. Consider intubation if the patient is going to require PPV for a prolonged amount of time or positive pressure ventilations are not effective.
## ETT SIZES AND INSERTION DEPTH

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>ETT SIZE</th>
<th>CM MARK AT LIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 kilogram</td>
<td>2.5</td>
<td>6 - 7 cm</td>
</tr>
<tr>
<td>1 – 2 kilograms</td>
<td>3.0</td>
<td>7 - 8 cm</td>
</tr>
<tr>
<td>2 – 3 kilograms</td>
<td>3.5</td>
<td>8 - 9 cm</td>
</tr>
<tr>
<td>Greater than 3 kilograms</td>
<td>3.5 or 4.0</td>
<td>9 - 10 cm</td>
</tr>
</tbody>
</table>

**Special Notes**
- Repeat suction of the trachea as necessary with little additional Meconium is removed or until the heart rate indicates resuscitation must proceed without delay.
- To maintain correct airway position you may place a rolled blanket or towel under the shoulders.
- Refer to the “Neonatal Resuscitation Medication Chart” H - 10
- Refer to the “Pediatric Assessment Overview” J - 31
- Refer to “Meconium Aspirator” J – 28
- EZ-IO access should NOT be done less than 3kg
Post Resuscitation

Assessment/Indications
Successful conversion of an arrhythmia.

Treatment

<table>
<thead>
<tr>
<th>EMR</th>
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<tbody>
<tr>
<td>• Basic assessment &amp; management (up to your scope of practice)</td>
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<tr>
<td>• Supportive care</td>
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</tr>
<tr>
<td>• If BLS ambulance consider ALS intercept</td>
<td></td>
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<tr>
<td>• EMR/EMT STOP Ø</td>
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<tr>
<th>AEMT</th>
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<tbody>
<tr>
<td>• Vascular access</td>
</tr>
<tr>
<td>• AEMT STOP Ø</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PARAMEDIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Treat arrhythmia/dysrhythmia as indicated.</td>
</tr>
<tr>
<td>• Maintain adequate blood pressure and perfusion, consider Dopamine if hypotensive after fluid bolus.</td>
</tr>
<tr>
<td>• If the patient does not tolerate an established advanced airway and needs to maintain airway support.</td>
</tr>
</tbody>
</table>

ADULT - Ketamine 1 mg / kg IV (MAX DOSE 200 mg) **ONE TIME DOSE***
PEDS – 1 mg / kg (MAX DOSE 40 mg)

----OR----

ADULT -- Versed (Midazolam) 2 - 5 mg IV (see notes below).
PEDS -- 0.1 mg/kg for sedation, 4 mg single max dose.
This is a one (1) time dose; additional doses must be approved by medical control/direction.
• PEDS – Consider Atropine prior to sedation to block reflex Bradycardia, 0.02 mg/kg, minimum dose of 0.1 mg and maximum dose of 0.5 mg.
• Consider the use of soft restraints if necessary for patient safety (to prevent extubation).
• Consider any maintenance drips to maintain perfusion and adequate levels of bolus medications, a copy of these reference charts can be located in the drug reference section of this manual.
• Refer to the AHA “Immediate Post Cardiac Arrest Care Algorithm” J – 21.1
• PARAMEDIC STOP Ø

Special Notes
• Use caution with Versed (Midazolam) due to the hemodynamic effects.
• Consider continuing chest compressions if the patient is hemodynamically unstable and not perfusing adequately.

Approved
Roger McKinney, MD

Date 6/1/15
Version 3.0
Revision(s)
Premature Ventricular Contractions (PVC)

Assessment/Indications
- Multi-focal PVCs
- Unifocal and greater than 15 per minute
- Salvo's / couplets / runs of V-Tach (three or more PVC’s in a row) and symptomatic
- PVCs occurring near the “T-wave”
- Any PVC in acute MI setting with associated chest pain

Treatment

<table>
<thead>
<tr>
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<td>• Basic assessment &amp; management (up to your scope of practice)</td>
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<tr>
<td>• Supportive care</td>
<td></td>
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<td>• If BLS ambulance consider ALS intercept</td>
<td></td>
</tr>
<tr>
<td>• EMR/EMT STOP Ø</td>
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</tbody>
</table>

AEMT
- Vascular access
- AEMT STOP Ø

PARAMEDIC
- Cardiac monitor, 12 lead EKG, transmit to the receiving emergency room if time permits
- TREATMENT GUIDELINES – The patient must have one (1) of the indications listed at the top of this protocol. Any other type/amount of PVC’s treatment should be directed by medical control/direction.
- If PVC’s are present with heart rate greater than 60 per minute, either antiarrhythmic may be utilized
- ADULT – Lidocaine 1.0 - 1.5 mg/kg over 1 minute, repeat up to 3 mg/kg max
  Peds – 1.0 mg/kg, may be repeated once.
- If PVCs resolve
  ADULT -- Lidocaine drip @ 1 - 4 mg/min. Refer to the “Lidocaine Drip Chart” H – 7”
  Peds – 20 - 50 mcg/kg/min, refer to the “Lidocaine IV Infusion Dose Medic book p.47”
- If Lidocaine is contraindicated or Amiodarone is preferred give 150 mg over 10 minutes. Refer to the “Amiodarone Procedure” I - 1
- If PVC’s resolve after Amiodarone, refer to the “Amiodarone Infusion” H - 2
- PARAMEDIC STOP Ø

Special Notes
- Use ½ of initial dose for subsequent doses for patients over 70 years old or with history of hepatic disease.
- If the heart rate is less than 60 with PVC’s present increase the heart rate before treatment of PVC’s. Refer to the “Bradycardia Protocol B - 4”.
- Try oxygen prior to medication
Pulseless Electrical Activity (PEA)

**Assessment/Indications**
- Presence of electrical cardiac rhythm without palpable pulse
- Confirm rhythm and no pulse

**Treatment**

<table>
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<th>EMR</th>
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</thead>
<tbody>
<tr>
<td>• Basic assessment and management (up to your scope of practice)</td>
<td>• Start/continue CPR, utilize AED,</td>
</tr>
<tr>
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</tbody>
</table>

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<th>PARAMEDIC</th>
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<tbody>
<tr>
<td>• Cardiac monitor and treat the arrhythmia/dysrhythmia present</td>
</tr>
<tr>
<td>• ADULT: Epinephrine 1:10,000, 1 mg IV/O or 2.0 mg ET (last resort) every 3 - 5 minutes</td>
</tr>
<tr>
<td>Peds: -- Epinephrine 1:10,000, 0.01 mg/kg IV/I/O every 3 - 5 minutes or Epinephrine 1:1000, 0.1 mg/kg ET every 3 - 5 minutes</td>
</tr>
<tr>
<td>• Vasopressin 40 units may be given in place of the first or second dose of epinephrine</td>
</tr>
<tr>
<td>• Search for underlying cause of arrest and provide the related therapy, see below</td>
</tr>
<tr>
<td>• PEA continues: Continue CPR and transport</td>
</tr>
<tr>
<td>• PARAMEDIC STOP Ø</td>
</tr>
</tbody>
</table>

**Special Notes**
- Refer to “AHA algorithms” J - 3
- If traumatic cardiac arrest, refer to the “Traumatic Cardiac Arrest” Protocol E – 29”
  - Hypovolemia - fluid administration /fluid challenge (adult & peds 20 ml/kg bolus)
  - Hypoxia - ensure adequate ventilation by any means necessary
  - Hydrogen Ions (Acidosis) - consider Sodium Bicarbonate 1-1.5 mEq/kg IV (peds 0.5 mEq/kg)
  - Hyperkalemia - (Known) - Sodium Bicarbonate 1 mEq/kg, may repeat @ 0.5 mEq/kg every 10 minutes (peds 1 mEq/kg may repeat at 0.5 mEq/kg every 10 minutes) and Calcium Chloride 500 mg - 1000 mg IV (peds 20 mg/kg)
  - Hypothermia - Initiate patient re-warming, avoid chest compressions if spontaneous circulation
  - Toxin - Drug overdose: NARCAN IV/IN/O/I/IM slow IV (increments of 0.5 mg) to obtain desired effects with a max single dose of 2 mg. This may be repeated once for a max total dose of 4 mg (peds 0.1 mg/kg).
  - Tamponade (adult up to 2 liter bolus (peds 20 ml/kg bolus)
  - Tension pneumothorax - needle decompression
  - Thrombosis (MI) – Fibrinolytic agent
  - Thrombosis (PE) – Fibrinolytic agent

---

**Approved**
Roger McKinney, MD

**Date**
6/1/15

**Version**
3.0

**Revision(s)**

SVT / Narrow Complex Tachycardia

Assessment/Indications

- Adult patients with heart rates in excess of 150 bpm (*infants greater than 220 bpm, children greater than 180 bpm*) (QRS width less than 0.12 seconds or 3 small blocks).
- Patients may exhibit symptoms of dyspnea, chest pain, radiating pain, altered mental status, hypotension (systolic BP less than 90 mmHg) and/or syncope.
- Palpations

Treatment

<table>
<thead>
<tr>
<th>EMR</th>
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</tr>
</thead>
</table>
| - Basic assessment and management (up to your scope of practice)  
- If BLS ambulance consider ALS if heart rate is greater than 150 bpm and any s/s listed above or a history of SVT  
- Supportive care  
- EMR/EMT STOP Ø |

<table>
<thead>
<tr>
<th>AEMT</th>
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</thead>
</table>
| - Vascular access (Antecubital Fossa is possible)  
- AEMT STOP Ø |

<table>
<thead>
<tr>
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</thead>
</table>
| - Cardiac monitor, 12 lead EKG, transmit to the receiving emergency room if time permits.  
- ADULT (Stable)  
  Adenosine 12 mg rapid IV, if no conversion another 12 mg rapid IV. The 12 mg dose may be repeated again if no conversion (36 mg total). Flush with 20 ml NS quickly after each dose and raise the extremity  
  Peds – peds 0.1 mg/kg (6 mg max), if no conversion 0.2 mg/kg 12 mg max). Flush with 20 ml NS quickly after each dose and raise the extremity. Refer to the “Dosemedic book” for pediatric doses.  
** OR**  
  Cardizem (Diltiazem) 0.25 mg/kg (25 mg max single dose), infuse over 10 minutes, monitoring blood pressure continuously. Same dose may be repeated after 10 minutes, monitor blood pressure continuously. Not recommended for pediatrics.  
- ADULT (Stable) – If induced by energy drinks/caffeine, drug use, etc. Consider Valium, 2 – 5 mg. This dose may be repeated once after 5 – 10 minutes if symptoms persist. |
• ADULT (Unstable) - If rhythm does not convert to less than 150 bpm, or if patient is unstable or significantly symptomatic prepare for immediate synchronized cardioversion. Refer to the “Cardioversion Procedure” I - 5
  a. Sedate as necessary, refer to the “Cardioversion & Pacing Sedation” Protocol G - 2
  b. Synchronized cardioversion
     ADULT -- 70j, 120j, 150j, 200j
     PEDS -- 0.5 j/kg, then 1j/kg, cardiovert until heart rate is less than 150 bpm
  c. If rhythm converts to rate less than 150 bpm: reassess for changes, maintain systolic BP greater than 90 mm Hg.

• PARAMEDIC STOP Ø

Special Notes

• Adenosine should be administered in a large bore IV in the antecubital fossa.
• Other vagal maneuvers may include asking the patient to hold their breath as they are having a bowel movement.
• Unstable rhythms should be synchronized cardioverted immediately prior to IV access. Assess the situation and make a good decision. Cardioversion hurts!
• In heart transplant patients and those on Tegretol, administer ½ the normal dose of Adenosine.
• Caffeine induced SVT may self resolve, it may be refractory to normal treatment.

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<tr>
<td>Roger McKinney, MD</td>
<td>6/1/15</td>
<td>3.0</td>
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Torsades de Pointes / Polymorphic V Tach

Assessment/Indications
- Decreased / altered LOC
- Dyspnea
- Chest Pain / discomfort, suspected AMI
- Hypotension (systolic BP less than 90 mmHg)
- CHF / Pulmonary edema
- Heart rate greater than 160 bpm with QRS greater than 0.12 sec (3 small blocks) and twisting of points

Treatment

<table>
<thead>
<tr>
<th>EMR</th>
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<tbody>
<tr>
<td>• Basic assessment and management (up to your scope of practice)</td>
<td></td>
</tr>
<tr>
<td>• Supportive care</td>
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<tr>
<td>• If BLS ambulance consider ALS intercept</td>
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<td>• EMR/EMT STOP Ø</td>
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<thead>
<tr>
<th>AEMT</th>
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<tbody>
<tr>
<td>• Vascular access</td>
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<tr>
<td>• AEMT STOP Ø</td>
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</table>

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<tr>
<th>PARAMEDIC</th>
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<tbody>
<tr>
<td>• Cardiac monitor, 12 lead EKG, transmit if time permits</td>
</tr>
<tr>
<td>• If no pulse treat as Ventricular Fibrillation/Pulseless Ventricular Tachycardia</td>
</tr>
<tr>
<td><strong>IF VASCULAR ACCESS IS AVAILABLE TREAT WITH MAG SULFATE BEFORE DEFIB</strong></td>
</tr>
<tr>
<td>a. Unstable / symptomatic:</td>
</tr>
<tr>
<td>i. prepare for defibrillation at 120j, 150j, 200j, escalate as needed.</td>
</tr>
<tr>
<td>ii. if rhythm converts:</td>
</tr>
<tr>
<td>a. rate is less than 160 bpm</td>
</tr>
<tr>
<td>ADULT -- Magnesium Sulfate 1 - 2 grams IV over 2 minutes</td>
</tr>
<tr>
<td>PEDS -- 25 – 50 mg/kg, 2 gram max</td>
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<tr>
<td>b. rate is greater than 160 bpm – contact medical control/direction, consider</td>
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<tr>
<td>Amiodarone ADULT -- 150 - 300 mg IV/IO</td>
</tr>
<tr>
<td>PEDS -- 5mg/kg IV/IO</td>
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<td>b. Stable / asymptomatic:</td>
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<tr>
<td>i. Rhythm converts to rate less than 160 bpm</td>
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<td>PEDS -- 5 mg/kg IV/IO</td>
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<td>maintain systolic BP greater than 90 mmHg and transport</td>
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Ventricular Fibrillation / Pulseless Ventricular Tachycardia

Assessment/Indications
- Ventricular Fibrillation, Pulseless Ventricular Tachycardia
- Pulseless, apneic
- Confirm and record cardiac rhythm

Treatment

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<td>- Apply AED</td>
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<tr>
<td>- If CPR is being performed or “down time” is less than 5 minutes, or witnessed arrest, defibrillate</td>
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<tr>
<td>- If CPR is not being performed or not being performed effectively do 2 minutes of CPR prior to defibrillation</td>
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AEMT

- Vascular access
- AEMT STOP Ø

PARAMEDIC

- Follow current AHA guidelines for V-FIB/Pulseless V-Tach (drug/shock)
- **Defibrillation settings**
  - ADULT -- 120j, 150j, 200j
  - Peds -- 2j/kg, then 4j/kg
- **Medications**
  - ADULT -- Epinephrine 1:10,000, 1 mg IV/IO as soon as practical after defibrillation.
    - Vasopressin 40 units may be given in place of the first or second dose of epinephrine
  - Peds -- Epinephrine 1:10,000, 0.01 mg/kg IV/IO every 5 minutes or Epinephrine 1:1000, 0.1 mg/kg ET every 3 – 5 minutes.
- **Anti-arrhythmics**
  - ADULT -- Amiodarone 300 mg
  - Peds -- 5 mg/kg IV/IO
- **OR**
  - ADULT -- Lidocaine 1.0 - 1.5 mg/kg
  - Peds -- 1 mg/kg
- Calcium Chloride (if arrest secondary to renal failure, history of hemodialysis, or calcium channel blocker overdose).
  - ADULT – 500 – 1000 mg IV/IO over 1 – 2 minutes
  - Peds – 20 mg/kg
For prolonged resuscitation consider: Sodium Bicarbonate
ADULT -- 8.4%, 1 mEq/kg IV/IO
PEDS -- 4.2%, 1 mEq/kg, may repeat at 0.5 mEq/kg every 10 minutes (less than 1 month old)

PARAMEDIC STOP Ø

Special Notes

- Patients should be treated aggressively upon initial patient contact prior to movement of patient.
- Consider transport of patient after performing CPR/defibrillation cycles, securing the airway, obtaining IV/IO access, and administering two rounds of drugs. This will provide the best chance of return of a perfusing rhythm.
- Refer to “AHA Algorithms” J - 3 for additional treatments/details located in the reference section of this manual.
- Rhythm analysis, CPR swaps, drug administration evolves around every 2 minutes, as soon as an IV/IO or ETT (last resort) is in place ACLS drug administration should begin. The drug/shock sequence should continue.
- Continue drug/shock sequence as long as rhythm continues, alternating epinephrine and anti-arrhythmic.
Wide Complex Tachycardia / Ventricular Tachycardia with a Pulse

Assessment/Indications
- Confirm and record cardiac rhythm combo pads (preferred) or electrodes
- Check for palpable carotid pulse
- Decreased/altered mental status
- Dyspnea, chest pain/discomfort, suspected AMI
- Hypotension (systolic BP less than 90 mm Hg)
- CHF/pulmonary edema
- Heart rate greater than 150 bpm and QRS greater than 0.12 sec (3 small blocks)

Treatment

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<td>• If BLS ambulance consider ALS intercept if the patient has a heart rate greater than 150 bpm with s/s of AMI and/or a history of Ventricular Tachycardia</td>
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AEMT
- Vascular access
- AEMT STOP Ø

PARAMEDIC
- Cardiac monitor, 12 lead, transmit to receiving emergency room if time permits
- If rhythm possibly Torsades de Pointes – Refer to the “Torsades de Pointes” Protocol B - 10
- Unstable / symptomatic - prepare for synchronized cardioversion.
  a. Administer sedative as necessary refer to the “Cardioversion & Pacing Sedation” Protocol G – 2
  b. Synchronize cardiovert
     ADULT - 70j, 120j, 150j, 200j until heart rate less than 150 bpm
     PEDS - 0.5 j/kg then 1 j/kg until heart rate is within an acceptable range for patient’s age.
     If rhythm converts, monitor for changes, transport.

If rhythm does not convert
ADULT - Amiodarone 150 mg over 10 minutes

“OR”

Lidocaine 1.0 mg/kg IV, reattempt cardioversion at 200j

PEDS - Amiodarone 5 mg/kg over 20 - 60 minutes, refer to the “Amiodarone Mixture” Procedure I – 1

“OR”

Lidocaine 1.0 mg/kg, reattempt cardioversion peds 2j/kg.
• Stable / asymptomatic.
  ADULT -- Lidocaine 1.0 mg/kg IV
  **PEDS - 1.0 mg/kg,**

  **"OR"**
  ADULT -- Amiodarone 150 mg over 10 minutes, refer to the “Amiodarone Mixture (Adult)”
  Procedure I – 1
  **PEDS -- 5 mg/kg over 20 – 60 minutes;**

• If rhythm converts, start a maintenance drip, monitor for changes, and transport
• If rhythm does not convert, administer another
  ADULT - Amiodarone 150 mg over 10 minutes (maximum is three (3) 150 mg doses)
  **PEDS - Amiodarone max single dose is 300 mg, max overall dose is 15 mg/kg**

  **"OR"**
  ADULT - Lidocaine 1.0 mg/kg
  **PEDS - Lidocaine 1.0 mg/kg**

• PARAMEDIC STOP Ø

Special Notes
• “Refer to AHA Algorithms” J – 3