BLS

- O₂ and/or ventilate prn
- O₂ Sat prn

ALS

A. Unstable Bradycardia with Pulse (Systolic BP<90 AND chest pain, dyspnea or altered LOC):

NARROW COMPLEX BRADYCARDIA

- Monitor EKG
- 250 ml fluid bolus IV/IO without rales SO to maintain BP >90, MR SO
- Atropine 0.5 mg IV/IO for pulse <60 bpm SO. MR q3-5 minutes to max of 3 mg SO

If rhythm refractory to a minimum of atropine 1 mg:
- External cardiac pacemaker per SO

If capture occurs and systolic BP ≥100, consider medication for discomfort:
- Treat per Pain Management Protocol (S-141)

For discomfort related to pacing not relieved with analgesics and BP ≥100:
- Midazolam 1-5 mg IV/IO SO

Dopamine 400 mg/250 ml at 10-40 mcg/kg/min IV/IO drip, titrate to systolic BP >90 (after max atropine or initiation of pacing) BHQ

WIDE COMPLEX BRADYCARDIA

- Monitor EKG
- 250 ml fluid bolus IV/IO with clear lungs SO to maintain BP ≥90, MR SO
- External cardiac pacemaker per SO

If capture occurs and systolic BP ≥100, consider medication for discomfort:
- Treat per Pain Management Protocol (S-141)

For discomfort related to pacing not relieved with analgesics and BP ≥100:
- Midazolam 1-5 mg IV/IO SO

Dopamine 400 mg/250 ml at 10-40 mcg/kg/min IV/IO drip, titrate to systolic BP >90 (after initiation of pacing) BHQ

If external pacing unavailable,
- May give atropine 0.5 mg IV/IO for pulse <60 SO. MR q3-5 minutes to max of 3 mg SO

B. Supraventricular Tachycardia (SVT):

- Monitor EKG
- 250 ml fluid bolus IV/IO without rales SO to maintain systolic BP ≥90, MR SO
- VSM SO, MR SO
- Adenosine 6 mg IV/IO, followed with 20 ml NS IV/IO SO (Patients with history of bronchospasm or COPD BHQ)
- Adenosine 12 mg IV/IO followed with 20 ml NS IV/IO SO

If no sustained rhythm change, MR x1 in 1-2 minutes SO
### BLS

<table>
<thead>
<tr>
<th>O₂ and/or ventilate prn</th>
<th>O₂ Sat prn</th>
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<tbody>
<tr>
<td>Assist ventilation</td>
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</table>

### ALS

**Supraventricular Tachycardia (SVT): continued**

- If patient unstable OR rhythm refractory to treatment:
  - **Conscious (Systolic BP <90 and chest pain, dyspnea, or altered LOC):**
    - Midazolam 1-5 mg IV/IO prn pre-cardioversion BHPO. If age >60, consider lower dose with attention to age and hydration status.
    - Synchronized cardioversion at manufacturer’s recommended energy dose BHPO, MR BHPO
  - **Unconscious:**
    - Synchronized cardioversion at manufacturer’s recommended energy dose SO. MR x3 SO. MR BHPO

**C. Unstable Atrial Fibrillation/Atrial Flutter (Systolic BP <90 AND chest pain, dyspnea or altered LOC):**

- Monitor EKG/O₂ Saturation prn
- 250 ml fluid bolus IV/IO without rales SO MR to maintain systolic BP >90 SO

**In presence of ventricular response with heart rate >180:**

- **Conscious:**
  - Midazolam 1-5 mg IV/IO prn pre-cardioversion BHPO. If age >60, consider lower dose with attention to age and hydration status.
  - Synchronized cardioversion at manufacturer’s recommended energy dose BHPO MR BHPO
- **Unconscious:**
  - Synchronized cardioversion at manufacturer’s recommended energy dose SO. MR x3 SO. MR BHPO

**D. Ventricular Tachycardia (VT):**

- Monitor EKG
- 250 ml fluid bolus IV/IO without rales SO to maintain systolic BP ≥90, MR SO
- Lidocaine 1.5 mg/kg IV/IO SO. MR at 0.5 mg/kg IV/IO q 8-10 minutes to max 3 mg/kg (including initial bolus) SO OR
- Amiodarone 150 mg in 100 ml of NS over 10 minutes IV/IO SO MR x1 in 10 minutes SO

**If patient unstable (Systolic BP <90 and chest pain, dyspnea or altered LOC):**

- **Conscious:**
  - Midazolam 1-5 mg IV/IO prn pre-cardioversion SO. If age >60, consider lower dose with attention to age and hydration status.
  - Synchronized cardioversion at manufacturer’s recommended energy dose SO. MR x3 SO. MR BHPO
- **Unconscious:**
  - Synchronized cardioversion at manufacturer’s recommended energy dose SO. MR x3 SO. MR BHPO
<table>
<thead>
<tr>
<th>BLS</th>
<th>ALS</th>
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<tbody>
<tr>
<td>• O₂ and/or ventilate prn</td>
<td>E. Reported/witnessed ≥2 AICD firing, or ≥1 AED shock delivered</td>
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<tr>
<td>• O₂ Sat prn</td>
<td>• Monitor EKG</td>
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<tr>
<td></td>
<td>• 250 ml fluid bolus IV/IO without rales <strong>SO</strong> to maintain systolic BP &gt;90, MR <strong>SO</strong></td>
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<td>If pulse &gt;60:</td>
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<td>• Lidocaine 1.5 mg/kg IV/IO <strong>SO</strong>, MR at 0.5 mg/kg IV/IO q8-10 minutes, to a max of 3 mg/kg (including initial bolus) <strong>SO</strong></td>
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<td>OR</td>
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<td>• Amiodarone 150 mg in 100 ml of NS over 10 minutes IV/IO <strong>SO</strong></td>
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### BLS

**CPR**
- 10:1 compression ratio at a rate of 110/minute continuous compressions with ventilations every 6 seconds
- Rotate compressor every 2 minutes
- Metronome at rate of 110/minute for manual CPR
- Team Leader role: CPR quality, monitor rhythm checks
- If arrest witnessed by medical personnel perform CPR until ready to defibrillate
- If unwitnessed arrest perform CPR for 2 minutes prior to rhythm check
- TAH patients **DO NOT** perform compressions unless instructed otherwise by VAD or TAH coordinator or Base Hospital
- AED
- Assist ventilations with BVM
- Monitor O₂ Sat

### ALS

**F. VF/Pulseless VT**
- Monitor EKG
- Defibrillate when ready every 2 min while VF/VT persists
- Charge monitor prior to rhythm checks, do not interrupt CPR while charging for defibrillation
- Capnography
- Rhythm check–minimize interruption of compressions less than 5 seconds
- IV/IO do not interrupt CPR
- Epinephrine 1:10,000 1 mg IV/IO q 3-5 minutes SO
- After 1st shock if still refractory, 300 mg Amiodarone IV/IO MR 150 mg (max of 450 mg) OR 1.5 mg/kg Lidocaine IV/IO MR x1 in 3-5 minutes (max 3 mg/kg) SO
- Document EtCO₂ during BVM. If zero do not intubate; continue to ventilate with BVM
- Intubate/PAA SO without interrupting compressions
- NG/OG pm SO
- If persistent or shock refractory VF/VT after 3 rounds of drugs, contact base hospital for direction

### ROSC
- Obtain 12 lead
- Ventilate with goal of EtCO₂ of 40
- Check blood pressure
- Transport to closest STEMI Center regardless of 12 lead reading SO

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- For drug administration and intubation perform high quality CPR with goal of appropriate rate (110), depth (1/3 of anterior/posterior chest diameter), allow full recoil, and minimize interruptions.
- Do not interrupt compressions
- Compression ratio 10:1 continuous compressions with ventilations every 6 seconds
- EtCO₂ <10 = Poor survivability
- Use mechanical CPR device if available
- Do not over-ventilate
- Transport traumatic arrests to trauma centers
- Transfer monitor data to QA/QI department if able
- Consider reviewing call with crew post event
## BLS

**CPR**
- 10:1 compression ratio at a rate of 110/minute continuous compressions with ventilations every 6 seconds
- CPR rotate compressor every 2 minutes
- Start metronome at rate of 110/minute for manual CPR
- Team leader role: CPR quality, monitor, rhythm checks
- TAH patients DO NOT perform compressions unless instructed otherwise by VAD or TAH coordinator or Base hospital

**AED**
- Assist ventilation with BVM
- Monitor O₂ Sat

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## ALS

**G. PEA: IF PATIENT DOES NOT MEET TOR CRITERIA:**
- Monitor
- Charge monitor prior to rhythm checks, do not interrupt CPR while charging for defibrillation
- Capnography
- Rhythm check – minimize interruption of compressions less than 5 seconds
- IV/IO do not interrupt CPR
- Epinephrine 1:10,000 1 mg IV/IO may repeat every 3-5 minutes
  - Document EtCO₂ during BVM, if zero do not intubate, continue to ventilate with BVM
  - Intubate/PAA SO without interrupting compressions
  - NG/OG prn SO
  - 250 ml Fluid Bolus IV/IO

If persistent PEA after 3 rounds of Epinephrine, contact base hospital for direction.

**ROSC**
- Obtain 12 lead
- Ventilate with goal of EtCO₂ of 40
- Check blood pressure
- Transport to closest STEMI Center regardless of 12-lead reading SO

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- For drug administration and intubation perform high quality CPR with goal of appropriate rate (110), depth (1/3 of anterior/posterior chest diameter), allow full recoil, and minimize interruptions
- Do not interrupt compressions
- Compression ratio 10:1 continuous compressions with ventilations every 6 seconds
- EtCO₂ <10 = Poor survivability
- Use mechanical CPR device if available
- Do not over-ventilate
- Consider reversible causes of PEA (Hyperkalemia, Hypokalemia, Hypovolemia, Hypoxia, Tamponade, Thrombosis)
- Transport traumatic arrest to trauma centers
- Transfer monitor data to QA/QI department if able
- Consider reviewing call with crew post event
COUNTY OF SAN DIEGO EMERGENCY MEDICAL SERVICES
POLICY/PROCEDURE/PROTOCOL

SUBJECT: TREATMENT PROTOCOL - DYSRHYTHMIAS

Date: 07/01/2019

BLS

CPR
- 10:1 compression ratio at a rate of 110
  continuous compressions with ventilations every 6 seconds
- CPR rotate compressor every 2 minutes
- Start metronome @ rate of 110/minute for manual CPR
- Team leader role-CPR quality, monitor, rhythm checks
- TAH patients DO NOT perform compressions unless instructed otherwise by VAD or TAH coordinator or Base hospital
- AED
- Assist Ventilation with BVM
- Monitor O2 Sat

ALS

H. Asystole:
- Monitor EKG
- Charge monitor prior to rhythm checks, do not interrupt CPR while charging for defibrillation
- Capnography
- Rhythm check—minimize interruption of compressions less than 5 seconds
- IV/IO do not interrupt CPR
- Epinephrine 1:10,000 1 mg IV/IO may repeat every 3-5 minutes SO
- Document EtCO₂ during BVM, if zero, do not intubate, continue to ventilate with BVM
- Intubate/PAA SO without interrupting compressions
- NG/OG prn SO

ROSC
- Obtain 12 lead
- Ventilate with goal of EtCO₂ of 40
- Check blood pressure
- Transport to closest STEMI Center regardless of 12 lead reading SO

This protocol only applies to asystole arrests of presumed cardiac origin. Drowning, Hypothermia, Electrocution are excluded.
Asystolic patients of cardiac origin should not be transported
For drug administration and intubation perform high quality CPR with goal of appropriate rate (110), depth (1/3 of anterior/posterior chest diameter), allow full recoil, and minimize interruptions
Do not interrupt compressions
Compression rate of 110/minute with ventilations every 6 seconds
EtCO₂ <10 = Poor survivability
Use mechanical CPR device if available
Do not over-ventilate
Transport traumatic arrests to trauma centers
Transfer monitor data to QA/QI Department if able
### H. Asystole (continued)

**Termination of Resuscitation (TOR) Criteria**

If all these criteria have been met:

- Victim arrest was not witnessed by EMS AND
- No bystander witness of collapse AND
- No bystander CPR AND
- Never received a rescue shock AND
- Never had a return of pulses

**THEN**

- If there is no improvement and patient is in asystole after continuous resuscitation of less than 20 minutes, base contact is necessary in order to terminate resuscitation **BHPO**.

- If asystolic after 20 minutes resuscitative efforts with no improvement may cease efforts **SO**. Document the Time of Apparent Death and the name of the paramedic.

- If all of the above criteria for TOR are met, Base Hospital Contact not required even if ALS interventions performed.

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- This protocol only applies to asystole arrests of presumed cardiac origin. Drowning, Hypothermia, Electrocution are excluded.
- Asystolic patients of cardiac origin should not be transported
- For drug administration and intubation perform high quality CPR with goal of appropriate rate (110), depth (1/3 of AP chest diameter), allow full recoil, and minimize interruptions
- Do not interrupt compressions
- Compression rate of 110 with ventilations q 6 seconds
- ETCO₂ <10 = Poor survivability
- Use mechanical CPR device if available
- Do not over-ventilate
- Transport traumatic arrests to Trauma Centers
- Transfer monitor data to QA/QI Department if able
- Consider reviewing call with crew post event