COUNTY OF SAN DIEGO EMERGENCY MEDICAL SERVICES POLICY/PROCEDURE/PROTOCOL

No. S-127

SUBJECT: TREATMENT PROTOCOL - DYSRHYTHMIAS

Date: 07/01/2018

<table>
<tr><th>BLS</th><th>ALS</th></tr>
<tr><td>
• O2 and/or ventilate prn

• O2 Sat prn
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A. <u>Unstable Bradycardia with Pulse (Systolic BP<90 AND chest pain, dyspnea or altered LOC)</u>:
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:
o External cardiac pacemaker per SO
If capture occurs and systolic BP ≥100, consider medication for discomfort:
o Treat per Pain Management Protocol (S-141)
For discomfort related to pacing not relieved with analgesics and BP ≥100:
o Versed 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) BHO

WIDE COMPLEX BRADYCARDIA
• Monitor EKG
• 250 ml fluid bolus IV/IO with clear lungs SO to maintain BP >90, MR SO
o External cardiac pacemaker per SO
If capture occurs and systolic BP ≥100, consider medication for discomfort:
o Treat per Pain Management Protocol (S-141)
For discomfort related to pacing not relieved with analgesics and BP ≥100:
o Versed 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) BHO

If external pacing unavailable,
o May give Atropine 0.5 mg IV/IO for pulse <60 SO. MR q3-5 minutes to max of 3 mg SO
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<tr><td>
• O2 and/or ventilate prn

• O2 Sat prn
</td><td>
B. <u>Supraventricular Tachycardia (SVT)</u>:
• 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 BHO)
• 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
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BLS	ALS
	Supraventricular Tachycardia (SVT): continued **If patient unstable OR rhythm refractory to treatment:** **Conscious (Systolic BP <90 and chest pain, dyspnea, or altered LOC):** o Versed 1-5 mg IV/IO prn pre-cardioversion BHO. If age ≥60, consider lower dose with attention to age and hydration status. o Synchronized cardioversion at manufacturer's recommended energy dose BHO, MR BHO **Unconscious:** o Synchronized cardioversion at manufacturer's recommended energy dose SO. MR x3 SO. MR BHO
• O_2 and/or ventilate prn • O_2 Sat prn	**C. Unstable Atrial Fibrillation/Atrial Flutter (Systolic BP <90 AND chest pain, dyspnea or altered LOC):** • Monitor EKG/O_2 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:** o Versed 1-5 mg IV/IO prn pre-cardioversion *BHPO*. If age ≥60, consider lower dose with attention to age and hydration status. o Synchronized cardioversion at manufacturer's recommended energy dose *BHPO* MR *BHPO* **Unconscious**: o Synchronized cardioversion at manufacturer's recommended energy dose SO. MR x3 SO. MR BHO
• Assist ventilation • O_2 Sat prn	**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 BHO **If patient unstable (Systolic BP <90 and chest pain, dyspnea or altered LOC):** **Conscious:** o Versed 1-5 mg IV/IO prn pre-cardioversion SO. If age ≥60, consider lower dose with attention to age and hydration status. o Synchronized cardioversion at manufacturer's recommended energy dose SO. MR x 3 SO. MR BHO **Unconscious**: o Synchronized cardioversion at manufacturer's recommended energy dose SO. MR x 3 SO. MR BHO

BLS	ALS
• O_2 and/or ventilate prn • O_2 Sat prn	**E. Reported/witnessed >x2 AICD** • Monitor EKG • 250 ml fluid bolus IV/IO without rales SO to maintain systolic BP ≥90, MR SO **If pulse ≥60:** • Lidocaine 1.5 mg/kg IV/IO SO. MR at 0.5 mg/kg IV/IO q8-10 minutes, to a max of 3 mg/kg (including initial bolus) SO **OR** • Amiodarone 150 mg in 100 ml of NS over 10 minutes IV/IO BHO

BLS	ALS
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 O_2 Sat	**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 $EtCO_2$ during BVM. If zero do not intubate; continue to ventilate with BVM • Intubate/PAA SO without interrupting compressions • NG/OG prn SO • If persistent or shock refractory VF/VT after 3 rounds of drugs, contact base hospital for direction ROSC • Ventilate with goal of $EtCO_2$ of 40 • Obtain 12 lead/Check blood pressure • Transport to closest STEMI Center regardless of 12 lead reading SO

- 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
- $EtCO_2$ <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	ALS
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 O_2 Sat	**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 SO • Document $EtCO_2$ 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 $EtCO_2$ of 40 • Check blood pressure • Transport to closest STEMI Center regardless of 12 lead reading SO

- 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
- $EtCO_2$ <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

BLS	ALS
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 O_2 Sat	**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 $EtCO_2$ 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 $EtCO_2$ 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
- $EtCO_2$ <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

BLS	ALS
	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 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.

- 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
- $ETCO_2$ <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

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