COASTAL VALLEYS EMS AGENCY

Dysrhythmias

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Authority: California Health and Safety Code, Division 2.5 EMS, Sections 1797.220 & 1797.221

I. Definition

A. The initial management of resuscitation of cardiac arrest patients is to establish circulation via high quality, uninterrupted chest compressions.

II. Basic Life Support

A. Provide General Medical Care.
B. If cardiac arrest, begin cardiac arrest management per *treatment guideline 7003 Cardiac Arrest Management.*

III. Advance Life Support

A. Establish IV as appropriate.
B. Monitor cardiac rhythm.
1. Obtain 12-Lead EKG as appropriate.

Adult

A. Asystole/PEA:
1. Confirm asystole by increasing gain to 2.0.
   a. If other dysrhythmia found, refer to appropriate dysrhythmia section of this protocol.
2. Administer 1:10,000 Epinephrine 1 mg IV.
   a. Repeat every 3-5 minutes.
   b. Max dose 3 mg.

B. Bradycardia:
1. Stable: Patient with signs of normal perfusion and/or a SBP > 110 mmHg.
   a. Provide General Medical Care.
2. Unstable: Patient with signs of decrease perfusion:
   a. If SBP < 90mmHg and lung sounds are clear:
      (1) Administer NS fluid bolus 10 ml/kg.
         (a) Recheck vitals every 250 ml.
   b. Administer Atropine 1 mg IV.
      (1) May repeat every 3-5 minutes.
      (2) Max dose 3 mg.
   c. If no response to NS fluid bolus and Atropine administration:
      (1) Consider cardiac pacing per *treatment guideline 7919 External Pacing*.
   d. If inadequate response to the above treatment:
      (1) Prepare push-dose Epinephrine:
         (a) Mix 1 ml of 1:10,000 Epinephrine (0.1 mg/ml) with 9 ml NS in a 10 ml syringe.
         (b) Administer push-dose Epinephrine 1 ml IV every 1-4 minutes.
         (c) Titrate to maintain SBP> 90 mmHg.

Pediatric (less than 14 years of age)

A. Asystole:
1. Confirm asystole by increasing gain to 2.0.
   a. If other dysrhythmia found, refer to appropriate dysrhythmia section of this protocol.
2. Administer 1:10,000 Epinephrine IV per pediatric medication administration guide.
   a. Repeat every 3-5 minutes.
   b. Max 3 doses.

B. Bradycardia:
1. Stable: Patients with signs of normal perfusion and age appropriate SBP.
   a. Provide General Medical Care.
2. Unstable: Decreased perfusion or respiratory distress:
   a. Prepare push-dose Epinephrine:
      (1) Mix 1 ml of 1:10,000 Epinephrine (0.1 mg/ml) with 9 ml NS in a 10 ml syringe.
      (2) Administer push-dose Epinephrine 1 ml IV every 1-4 minutes to achieve dose per the pediatric medication administration guide.
      (3) Titrate to maintain age appropriate SBP.
   b. If no response to Epinephrine administration:
      (1) Administer Atropine per the pediatric medication administration guide.
   c. If no response to the above treatment:
      (1) Administer NS fluid bolus 20 ml/kg IV.
   d. Consider external pacing using pediatric pads.

C. Ventricular Fibrillation/Pulseless Ventricular Tachycardia:

1. Defibrillate using cardiac monitor.
   a. Use energy settings recommended by the monitor manufacturer that have been approved by service provider medical director.
   b. Repeat every 2 minutes as indicated.
   c. If VF/Pulseless VT converts then recurs, defibrillate at last successful energy level.
2. Administer 1:10,000 Epinephrine 1 mg (10ml) IV.
   a. Repeat every 3-5 minutes.
   b. Max 3 mg.
3. If dysrhythmia persists after third defibrillation, administer Amiodarone 300 mg IV.
   a. If dysrhythmia persists after 3-5 minutes, administer 150 mg Amiodarone IV.

D. Wide Complex Tachycardia:

1. Stable patient:
   a. Administer Amiodarone 150 mg in 100 ml NS IV over 10 minutes.
      1) May repeat once if dysrhythmia persists.
2. Unstable patient: Dyspnea with SBP < 90mmHg or CHF:
   a. Escalating synchronized cardioversion *per treatment guideline 7920 cardioversion*.
      1) Consider sedation per *treatment guideline 7002 Sedation* if patient is awake and aware.
   b. If rhythm persists after cardioversion, administer Amiodarone 150 mg in 100 ml NS IV over 10 minutes.
      1) May repeat once if dysrhythmia persists.
   c. If Magnesium Sulfate available, administer 2 g in 100 cc NS IV over 10 minutes.
3. If patient becomes pulseless refer to *treatment guideline 7003 Cardiac Arrest Management.*

E. Supraventricular Tachycardia: SVT is general above 150 BPM and is typically a well-tolerated rhythm that does not require aggressive therapy. Assess patient for other possible causes for symptoms.

1. Consider the Valsalva maneuver.

C. Ventricular Fibrillation/Pulseless Ventricular Tachycardia:

1. Defibrillate using cardiac monitor.
   a. 2 Joules/kg.
      1) If dysrhythmia persists after 2 minutes, increase to 4 Joules/kg.
   b. Repeat every 2 minutes as indicated.
2. Administer 1:10,000 Epinephrine IV per the pediatric medication administration guide.
   a. Repeat every 3-5 minutes.
      1) Max 3 doses.
3. If dysrhythmia persists after the third defibrillation, administer Amiodarone IV per pediatric medication administration guide.
   a. Flush tubing with NS 20 ml.
   b. Repeat every 3-5 minutes with persistent VF/Pulseless VT.
      1) Max 2 doses or 15 mg/kg.

D. Wide Complex Tachycardia: P waves absent/abnormal, HR not variable, QRS $\geq$ 0.08 seconds, HR $\geq$ 220 BPM in infants or HR $\geq$ 180 in children.

1. Expeditious transport is a priority.
2. If patient shows signs of decreased perfusion and is responsive:
   a. Administer Adenosine per pediatric medication administration guide.
      1) May repeat once.
   b. If unsuccessful, may consider contacting the Base Hospital for possible administration of Amiodarone per pediatric medication administration guide.
3. If patient is unresponsive:
   a. Synchronized cardioversion per pediatric medication administration guide.
      1) If no change after cardioversion contact base for additional guidance
4. If patient becomes pulseless refer to *treatment guideline 7003 Cardiac Arrest Management.*

E. Supraventricular Tachycardia: SVT is typically a well-tolerated rhythm that does not require aggressive therapy. Assess patient for other possible causes for symptoms.

1. Consider the Valsalva maneuver.

2. A proximal vein is the preferred IV site.
3. Administer Adenosine 6 mg rapid IV push followed by NS flush 10 ml.
   a. If dysrhythmia persists, administer Adenosine 12 mg rapid IV push followed by NS flush 10 ml.
4. If no response and SBP > 90 mmHg continue with transport and monitor for changes.
5. If SBP< 90 mmHg:
   a. Administer NS fluid bolus 250 ml.
      1) Repeat once as indicated to maintain SBP > 90 mmHg.
      2) Recheck vitals every 250 ml.
   b. If dysrhythmia persists and patient becomes unstable with a change in mental status and/or significant hypotension, synchronized cardioversion per *treatment guideline 7920 synchronized cardioversion*.

F. Atrial Fibrillation/Flutter: Atrial Fibrillation/Flutter is typically a well-tolerated rhythm that does not require aggressive therapy. Assess patient for other possible causes if symptomatic. Attempts to convert rhythm should be reserved for the patient in extremis.

1. If SBP < 90 mmHg:
   a. Administer NS fluid bolus 250 ml IV.
      1) Repeat once as indicated to maintain SBP > 90 mmHg.
      2) Recheck vitals every 250 ml.
2. If dysrhythmia persists and SBP < 80 mmHg with acute altered mental status present:
   a. Escalating synchronized cardioversion per *treatment guideline 7920 synchronized cardioversion*.
3. Optional rate reducing treatment for transport times in excess of one hour:
   a. Obtain 12-Lead EKG per procedure guideline 9808 EKG 12-Lead to verify underlying rhythm.
   b. If SBP > 120 mmHg and 12 Lead EKG confirms Atrial Fibrillation/Flutter:
      1) Administer Verapamil 2.5 mg IV.
         a) The absence of fever (38° C or 100.4°F) must be documented.
         b) Repeat every 10 minutes.

2. A proximal vein is the preferred IV site.
3. Administer Adenosine per pediatric medication administration guide.
   a. Max 6 mg.
   b. If dysrhythmia persists after 3 minutes, repeat Adenosine at two times the initial dose.
      1) Max 12 mg.
4. If no response and SBP is within normal limits for patient age/weight, continue with transport and monitor for changes.
5. If hypotension develops NS fluid bolus 20 ml/kg.

F. Atrial Fibrillation/Flutter: Atrial Fibrillation/Flutter is typically a well-tolerated rhythm that does not require aggressive therapy. Assess patient for other possible causes if symptomatic. Attempts to convert rhythm should be reserved for the patient in extremis.

1. If patient is conscious initiate transport and monitor.
2. If patient unconscious consider escalating synchronized cardioversion per pediatric medication administration guide.

c) Max dose 15 mg. d) If heart rate falls below 100 BPM administration should stop. e) If SBP < 90 mmHg: i. Administer NS fluid bolus 10 ml/kg IV. i) Recheck vitals every 250 ml. ii. If hypotension persists, administer Calcium Chloride 250 mg slow IV push. f) Do not use Verapamil in wide complex QRS dysrhythmias or patients with a history of Wolff-Parkinson-White Syndrome (WPW).	
IV. Special Considerations	
A. Ongoing V-Fib/V-Tach should be worked for at least 30 minutes.	
A. None.	A. Pediatric dysrhythmias are very rare events. Expeditious transport should be a high priority and base hospital consult for medical guidance is highly encouraged.
V. Base Orders	
A. None	
VI. Contraindications	
A. None	

VII. Cross Reference	
A. General Medical Care	Policy No. 7001
B. EKG 12-Lead	Policy No. 7103
C. Sedation	Policy No. 7002
D. Cardiac Arrest Management	Policy No. 7003
E. External Pacing	Policy No. 7919
F. Synchronized Cardio Version	Policy No. 7920