ORANGE COUNTY EMERGENCY MEDICAL SERVICES
BASE HOSPITAL TREATMENT GUIDELINES

SYMPTOMATIC BRADYCARDIA – ADULT/ADOLESCENT

BASE GUIDELINES

1. Determine ALS Standing Order treatments/procedures rendered prior to base hospital contact. Use ALS standing order as guidelines for treatments/procedures not initiated prior to base hospital contact.

2. Symptomatic bradycardia is defined as heart rate less than or equal to 60 bpm and at least one of the following:
   - Hypotension
   - Signs of poor perfusion (Poor skin signs)
   - Altered level of consciousness
   - Chest pain
   - Shortness of breath, signs of pulmonary edema

3. Check for Acute MI on 12 lead EKG:
   - If "Acute MI" indicated or suspected, or STEMI is suspected based on paramedic interpretation of 12 lead ECG, patient should be routed to the nearest open Cardiovascular Receiving Center (CVRC).
   - Monitors used in the field provide automated readings of ECGs; paramedics consider an acute MI for the following 12-lead monitor interpretations:
     1. *** ACUTE MI***
     2. ***STEMI***
     3. Acute ST Elevation Infarct
     4. Probable Acute ST Elevation Infarct
     5. Acute Infarction
     6. Infarct, Probably Acute
     7. Infarct, Possible Acute

4. If unable to establish IV/IO access, or 1 mg IV/IO/IM atropine fails to improve heart rate, continue Atropine dosing and deploy cardiac pacing.

5. A symptomatic bradycardic patient requires Base Hospital Contact and CVRC designation.

ALS STANDING ORDER

1. Monitor cardiac rhythm and document with rhythm strip

2. Pulse oximetry; if room air oxygen saturation less than 95%
   - ▶ *Administer High-flow oxygen by mask or nasal cannula at 6 L/min flow rate as tolerated.*

3. Establish IV access. Consider IO if attempts at IV access are unsuccessful or not feasible.

4. If patient without evidence of poor perfusion or other symptoms (see Guidelines below):
   - ▶ Obtain 12-lead ECG if "Acute MI" indicated or a STEMI is suspected based on paramedic interpretation of 12-lead ECG, make Base Hospital contact for CVRC destination with an open cardiac catheterization lab.

5. <u>If symptomatic bradycardia (see Guidelines below):</u>
   - ▶ *Atropine: 1 mg IV/IO/IM* approximately every 3-5 minutes as needed to correct bradycardia to a maximum dose of 3 mg.

6. If unable to attain IV/IO access or 1 mg Atropine fails to improve heart rate, continue Atropine dosing and:
   - ▶ Place transcutaneous pacemaker and initiate pacing (see Procedure Guideline # PR-110).
     - → If paced by pacemaker, stop atropine dosing and contact Base Hospital for potential CVRC destination.
     - → If paced by pacemaker, blood pressure less than 90 systolic and lungs clear to auscultation, contact Base Hospital for potential CVRC destination and:
   - ▶ Administer normal saline, 250 mL IV/IO, repeat up to maximum 1 liter to maintain adequate perfusion
     - → If transcutaneous pacing causes anxiety and extreme discomfort and blood pressure greater than 90 systolic:

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6. If patient has an implanted pacemaker and is bradycardia with heart rate less than 60 bpm, treat in same manner as described in ALS Standing Orders above.

7. Consider common toxicologic and metabolic causes of bradycardia (e.g. hyperkalemia, calcium-channel or beta-blockers, digoxin).

8. For bradycardia with hypotension unresponsive to atropine, pacemaker, and fluid challenge, consider push dose epinephrine:

▶ If available, **Push Dose Epinephrine** (per Procedure #230)

Mixing instructions:

- Take the epinephrine preparation of 1mg in 10ml (0.1mg/ml - cardiac epinephrine) and waste 9 mL of the epinephrine solution.
- Into that syringe, withdraw 9 mL of normal saline from the patient's IV bag. Shake well.
- Mixture now provides 10 mL of Epinephrine at a 10 mcg/mL concentration.

Push Dose:

- Epinephrine 1 mL (10 mcg) IV/IO, every 3 minutes titrate to a SBP>90.

ALS STANDING ORDER

▶ Administer *midazolam (Versed®) up to 5 mg IV slowly titrated* to attain sedation (Assist ventilation and maintain airway if respiratory depression develops)

→ If IV access cannot be established and blood pressure greater than 90 systolic:

▶ Administer *midazolam (Versed®) 5 mg IN* divided between each nostril, may repeat once after approximately 3 minutes (Assist ventilation and maintain airway if respiratory depression develops)

7. For systolic blood pressure less than 90 (paced or if non-capture), no response to atropine, and lungs clear to auscultation:

▶ Administer normal saline, 250 mL, may repeat 3 times (1 total liter) to maintain perfusion.
▶ If BP < 90 after 1 liter of NS or if evidence of CHF, contact Base Hospital.

8. ALS escort with Base Hospital contact CVRC destination.

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SYMPTOMATIC BRADYCARDIA – ADULT/ADOLESCENT

BASE GUIDELINES

ALS STANDING ORDER

TREATMENT GUIDELINES:

- Symptomatic bradycardia is defined as heart rate less than or equal to 60 bpm and at least one of the following:
  - Hypotension
  - Signs of poor perfusion (Poor skin signs)
  - Altered level of consciousness
  - Chest pain
  - Shortness of breath, signs of pulmonary edema
- If patient has an implanted pacemaker and is bradycardia with heart rate less than 60 bpm, treat in same manner as described in ALS Standing Orders above.
- Cardiac pacing, when immediately required to stabilize a patient, should be deployed without waiting if there is a delay in establishing IV/IO access.
- Consider common toxicologic and metabolic causes of bradycardia (e.g. hyperkalemia, calcium-channel or beta-blockers, digoxin). Contact Base Hospital for additional medical direction if these suspected.
- Consider an acute MI is present for the following 12-lead monitor interpretations:
  1. ***ACUTE MI***
  2. ***STEMI***
  3. Acute ST Elevation Infarct
  4. Probable Acute St Elevation Infarct
  5. Acute Infarction
  6. Infarct, Probably Acute
  7. Infarct, Possible Acute
- Base Hospital may order push-dose epinephrine for refractory hypotension, refer to ALS procedure #230 (*Push-Dose Epinephrine*).

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