



# Foundations Frameworks

## Approach to Bradycardia

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1. **Initial Stabilization:** The first priority in the approach to bradycardia is to stabilize the unstable patient
  - a. Put pads on patient, obtain the crash cart and ACLS medications, get airway equipment set up
  - b. Obtain an EKG: determine type of bradycardia.
    - i. Sinus vs AV nodal block (Mobitz I and II, 3<sup>rd</sup> degree complete heart block). Wide (> 120 msec) vs narrow complex. Evaluate for STEMI, evidence of hyperkalemia.
  - c. Atropine: 0.5-1 mg. May not work in 2<sup>nd</sup> and 3<sup>rd</sup> degree blocks but is a reasonable first treatment
    - i. Can temporize situation until pressors/TC pacing available
  - d. If patient is hypotensive, altered, has chest pain must intervene emergently skip ahead to step 3's general treatments (fluids, TC pacing, inotropes/pressors to stabilize patient)
2. **Evaluate for 3 Immediate Life Threats:** Evaluate for these three emergent causes of bradycardia
  - a. Hyperkalemia
    - i. Can cause severe bradycardia and hypotension, typically wide complex
    - ii. Determine if history of dialysis, presence of a fistula
    - iii. Evaluate EKG for wide QRS, loss of P waves, peaked T waves
    - iv. Send VBG with electrolytes
    - v. Consider empirically giving calcium gluconate
  - b. Calcium Channel Blocker (CCB)/Beta Blocker (BB) Overdose
    - i. CCB
      1. Typically verapamil or diltiazem (peripherally acting CCB can cause hypotension with reflex tachycardia)
      2. Hyperglycemic – CCB overdose causes hyperglycemia by inhibiting insulin release from pancreatic islet cells, helps to differentiate from BB toxicity
    - ii. BB
      1. Metoprolol, atenolol, carvedilol, propranolol, sotalol
    - iii. Also evaluate for possible digoxin or clonidine overdose
  - c. STEMI
    - i. Generally an RCA lesion taking out the AV node, look for inferior STEMI distribution

### 3. Treatment

- a. General: Goal to improve HR and BP
  - i. Fluid bolus
  - ii. Inotropes/Vasopressors: epinephrine, isoproterenol, dopamine, NE, dobutamine
  - iii. Transcutaneous Pacing/Transvenous pacing
    1. Transcutaneous: set HR to 80 and pacing threshold usually between 40-80 mA, observe for capture with QRS complex following pacer spike, check for a pulse to match pacemaker
    2. Transvenous: place as right internal jugular or left subclavian, ideally use 7 French cordis/pacemaker kit, inflate balloon at 20 cm, set to VOO (pacing, no sensing), turn to 20 mA, and advance until ventricular capture/pulse
- b. Disease Specific Treatments
  - i. Hyperkalemia
    1. Calcium gluconate/chloride
    2. Insulin/glucose, beta agonists, furosemide, bicarb (if acidotic)
    3. Dialysis
  - ii. CCB/BB
    1. Glucagon (BB specific)
    2. High dose insulin therapy (1U/kg insulin bolus)
    3. Intralipid
    4. Consider ECMO if available
  - iii. STEMI:
    1. Aspirin, heparin gtt
    2. Cath Lab
    3. Lytics if cath lab unavailable
  - iv. Stable heart block management:
    1. Mobitz Type I: generally benign
    2. Mobitz Type II: consider as precursor of complete HR, admit for pacemaker
    3. 3<sup>rd</sup> degree complete heart block: admit for pacemaker

#### References:

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