Bradycardia

Amsdorf and Ganz. “Sinus Bradycardia.” UpToDate v11.2
https://www.americanheart.org

**Key Points:**
- Bradycardia etiologies can be divided into due to intrinsic and extrinsic causes.
- Management (both acute and chronic) depends on: clinical stability (rate and BP), symptoms, and the rhythm.

**Causes**
- **Intrinsic:**
  - Idiopathic degeneration (aging)
  - Infarction / ischemia
  - Infectious (endocarditis, Chagas’)
  - Infiltrative (sarcoid, amyloid, hemochromatosis)
  - (Auto-) Immunity (SLE, RA, scleroderma)
  - Iatrogenic (heart transplant, surgery)
  - Inherited
  - Myotonic muscular dystrophy
- **Extrinsic:**
  - Autonomic (neurocardiac, carotid-sinus hypersensitivity, situational)
  - Drugs (BB, CCB, clonidine, digoxin, antiarrhythmics)
  - Metabolic
    - Electrolytes (hyper/hypokalemia)
    - Hypothyroidism
    - Hypothermia
  - Neurologic (increased ICP, obstructive sleep apnea)

**Location of block**
- SA node: supplied by RCA 65%, CFX 25%, both 10%
- AV node: RCA 80%, CFX 10%, both 10%
- His-Purkinje system (the real difference between 2nd degree type I and II)

**Diagnosis:** ECG, Telemetry / event monitoring, Tilt table testing, EP

**Management:** (see handbook and ACLS)
- Transcutaneous and transvenous pacing
- Atropine
- Glucagon (for BB, ?CCB – acts on adenyl cyclase and Ca++ influx): 3-10mg IV -> 1-10 mg/hr drip
- Calcium (for CCB) – up to 3g IV total (q 15min dosing); contraindicated with digoxin toxicity
- Treat underlying causes (stop meds, etc.)

**Pacemakers:** (see AHA guidelines)
- What are the symptoms?
  - Bradycardia documented to be associated with symptoms
  - Chronotropic incompetence (rate and rhythm may be “within normal limits” but not sufficient)
- What’s the rhythm? (don’t necessarily need symptoms, often class II indications)
  - 3rd degree AVB with >3sec asystole or <40BPM while awake
  - 2nd degree AVB type II +/− fascicular block
  - Congenital AVB with wide QRS, ventricular dysfunction, rate inappropriate for age
- Can’t stop the meds: need to medically slow tachyarrhythmias