

Bradycardia

Mangrum and DiMarco. "The Evaluation and Management of Bradycardia." *NEJM* 2003; 342(10): 703-10.
Arnsdorf and Ganz. "Sinus Bradycardia." *UpToDatev 11.2*
<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 adenylyl 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