Bradycardia; Pulse Present

History
- Past medical history
- Medications
  - Beta-Blockers
  - Calcium channel blockers
  - Clonidine
  - Digoxin
- Pacemaker

Signs and Symptoms
- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

Differential
- Acute myocardial infarction
- Hypoxia / Hypothermia
- Pacemaker failure
- Sinus bradycardia
- Head injury (elevated ICP) or Stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (1°, 2°, or 3°)
- Overdose
- Athletes

Heart Rate < 60 / min and Symptomatic:
Hypotension, Acute AMS, Ischemic Chest Pain, Acute CHF, Seizures, Syncope, or Shock secondary to bradycardia
Typically HR < 50 / min

NO → Exit to Appropriate Protocol(s)

YES

Airway Protocol(s) AR 1, 2, 3
if indicated

Respiratory Distress Protocol AR 4
if indicated

Chest Pain: Cardiac and STEMI Protocol AC 4
if indicated

B Search for Reversible Causes

B 12 Lead ECG Procedure

A IV / IO Procedure

P Cardiac Monitor

A **Normal Saline Fluid Bolus**
500 mL – 2 L NS IV / IO
(Unless Acute CHF)
(Maximum 2 L)

P **Atropine 0.5 mg IV / IO**
May repeat every 3 – 5 minutes
(Maximum 3 mg)

P **If No Improvement**
Transcutaneous Pacing Procedure
(Consider earlier in 2nd or 3rd AVB)

P **Epinephrine 1 - 10 mcg/min IV / IO**
Titrate to SBP ≥ 90 mmHg
Or
Dopamine 2 – 20 mcg/kg/min IV / IO
Titrate to SBP ≥ 90 mmHg

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

Tension pneumothorax
Tamponade; cardiac
Toxins
Thrombosis; pulmonary (PE)
Thrombosis; coronary (MI)

P Consider Sedation

Midazolam
0.5 – 2.5 mg IV / IO
5 mg IM / 2 mg IN

(Maximum 10 mg)

Notify Destination or Contact Medical Control

Adult Cardiac Protocol Section

Bradycardia; Pulse Present

Consider Medical Control advice in renal patients presenting with bradycardia.

Pearls

- **Recommended Exam: Mental Status, Neck, Heart, Lungs, Neuro**
- **Identifying signs and symptoms of poor perfusion caused by bradycardia are paramount.**
- **Rhythm should be interpreted in the context of symptoms and pharmacological treatment given only when symptomatic, otherwise monitor and reassess.**
- **Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia.**
- **Hypoxemia is a common cause of bradycardia. Ensure oxygenation and support respiratory effort.**
- **Atropine**
  - **Do NOT delay Transcutaneous Pacing to administer Atropine in bradycardia with poor perfusion.**
  - **Caution in setting of acute MI. Elevated heart rate can worsen ischemia.**
  - **Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.**
- **Transcutaneous Pacing Procedure (TCP)**
  - **Utilize TCP early if no response to atropine. If time allows transport to specialty center because transcutaneous pacing is a temporizing measure. Transvenous / permanent pacemaker will probably be needed.**
  - **Immediate TCP with high-degree AV block (2d or 3d degree) with no IV / IO access.**
- Consider treatable causes for bradycardia (Beta Blocker OD, Calcium Channel Blocker OD, etc.)