



BRADYCARDIA; PULSE PRESENT

History

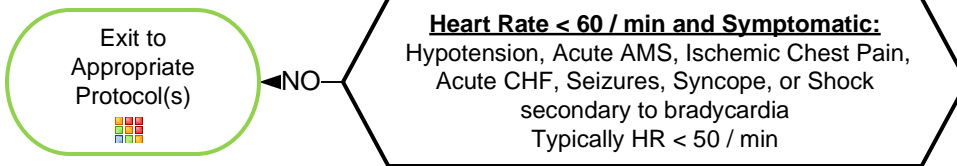
- Past medical history
- Medications
 - Beta-Blockers
 - Calcium channel blockers
 - Clonidine
 - Digoxin
- Pacemaker

Signs and Symptoms

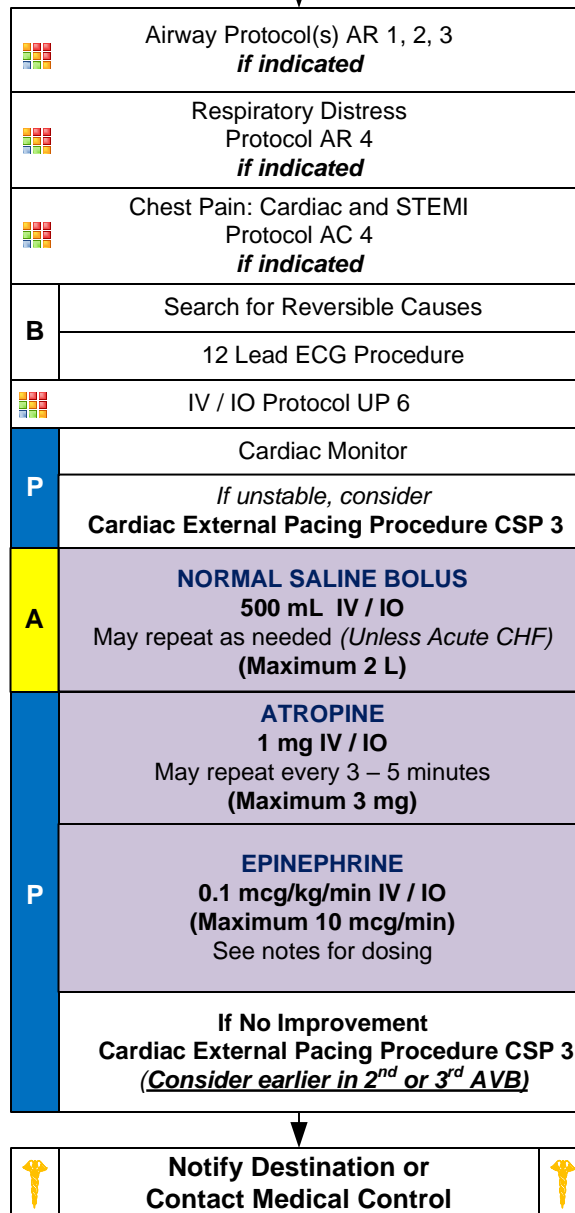
- HR < 60/min with hypotension, acute altered mental status, chest pain, acute CHF, seizures, syncope, or shock secondary to bradycardia
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

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



YES



Suspected Beta-Blocker or Calcium Channel Blocker

Follow Overdose/ Toxic Ingestion Protocol TE 7

Reversible Causes

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypothermia
Hypo / Hyperkalemia

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

Consider Sedation

MIDAZOLAM
2 – 2.5 mg IV / IO,
5 mg IM / IN
(Maximum 10 mg)



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EPINEPHRINE DRIP INSTRUCTIONS:

* 1 mg of Epinephrine = 1 mL of Epinephrine 1:1,000 *

For precise dosing, remove 1 mL of Normal Saline from a 1 L bag
 Inject 1 mg of Epinephrine 1:1,000 into the 1 L of Normal Saline
 This results in a **1 mcg/mL** concentration
 Reminder: Standard unit conversion: **dose (mg/mL) x 1000 (mcg/mg) = dose (mcg/mL)**

Calculation formula for **WEIGHT** based dosing:

$$\frac{\text{desired dose (mcg/kg)} \times \text{weight (kg)} \times \text{drop set (10 gtt/mL)}}{\text{concentration (1 mcg/mL)}} = \text{gtt/min}$$

UTILIZE 10 GTT SET IV TUBING FOR ADULTS

*** REFER TO DRUG CARDS FOR ADDITIONAL INFORMATION AND PRE-CALCULATED DRIP RATES ***

Contact Medical Control for Epinephrine drip dosing guidance **if needed**.

Pearls

- **Recommended Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, 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. Give Calcium Chloride or Gluconate in addition to Sodium Bicarbonate if hyperkalemia suspected.**
- **12-Lead ECG:**
12 Lead ECG not necessary to diagnose and treat
Obtain when patient is stable and/or following rhythm conversion.
- **Unstable condition**
Condition which acutely impairs vital organ function and cardiac arrest may be imminent.
If at any point patient becomes unstable move to unstable arm in algorithm.
- Hypoxemia is a common cause of bradycardia. Ensure oxygenation and support respiratory effort.
- **Atropine:**
Atropine is considered a first line agent in symptomatic bradycardia.
Ineffective and potentially harmful in cardiac transplantation. May cause paradoxical bradycardia.
- **Symptomatic bradycardia causing shock or peri-arrest condition:**
If no IV or IO access immediately available, start Transcutaneous Pacing, establish IV / IO access, and then administer atropine and/or epinephrine.
Epinephrine or Dopamine may be considered if no response to Atropine.
- **Symptomatic condition**
Arrhythmia is causing symptoms such as palpitations, lightheadedness, or dyspnea, but cardiac arrest is not imminent.
Symptomatic bradycardia usually occurs at rates < 50 beats per minute.
Search for underlying causes such as hypoxia or impending respiratory failure.
- **Serious Signs / Symptoms:**
Hypotension. Acutely altered mental status. Signs of shock / poor perfusion. Chest pain with evidence of ischemia (STEMI, T wave inversions or depressions.) Acute CHF.
- **Transcutaneous Pacing Procedure (TCP)**
Indicated with unstable bradycardia unresponsive to medical therapy.
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.)



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EPINEPHRINE CONCENTRATION (1 mcg/mL) 0.1 mcg/kg/min

$$(0.1 \text{ mcg/kg}) \times (\text{kg}) \times (60 \text{ gtt}) \div 1 \text{ mcg/mL}$$

$$(0.1 \text{ mcg/kg}) \times (\text{kg}) \times (10 \text{ gtt}) \div 1 \text{ mcg/mL}$$

PATIENT WEIGHT (kg)	USING 60 gtt SET (≤ 20 kg)	PATIENT WEIGHT (kg)	USING 10 gtt SET (> 20 kg)
	# gtt/min		# gtt/min
3	18	22	22
4	24	24	24
5	30	26	26
6	36	28	28
7	42	30	30
8	48	32	32
9	54	34	34
10	60	36	36
11	66	38	38
12	72	40	40
13	78	42	42
14	84	44	44
15	90	46	46
16	96	48	48
17	102	50	50
18	108	60	60
19	114	70	70
20	120	80	80
		90	90
		100	100 – MAX DOSE