EPINEPHRINE (Adrenaline)

EMSAC FEBRUARY 2026

ACTION: Sympathomimetic

- Catecholamine stimulates alpha- and beta-adrenergic receptors resulting in:
  - Increases heart rate (chronotropy)
  - Increase force of contraction (inotropy)
  - Bronchodilation

INDICATION	CONCENTRATION	ADULT DOSE	PEDIATRIC DOSE
Adult Cardiac arrest Pediatric Cardiac Arrest/ Bradycardia	**0.1mg/ml**	1 mg IVP/IO every 3-5 minutes ~~at the time ever intervals specified in Protocol 2.04 Cardiac Arres~~	0.01 mg/kg up to 1 mg IVP/IO every 3-5 minutes
Anaphylaxis	**1mg/mL**	0.3 mg IM May repeat x 1 in 5 min.	< 30 kg: 0.15 mg IM ~~for weight - or -~~ ≥ 30 kg: 0.3 mg IM ~~for weight~~ May repeat x1 in 5 min
Severe bronchospasm	**1mg/mL**	0.3 mg IM May repeat x2 q20min	< 30 kg: 0.15 mg IM ~~for weight - or -~~ ≥ 30 kg: 0.3 mg IM ~~for weight~~ May repeat x2 q20min
Hypotension and shock refractory to fluid bolus ~~(e.g. septic shock, anaphylactic shock, cardiogenic shock after ROSC)~~. Symptomatic Bradycardia (Adult Only)	**0.1mg/ml** diluted to: Push Dose: 0.01mg/mL (=10mcg/mL) Infusion: to 0.001 mg/mL (=1mcg/mL)	Push-Dose: Prepare syringe (see Appendix 1). Administer 1.0mL (10mcg) of 0.01mg/mL concentration every 3-5 min PRN to maintain SBP >90mmHg. ~~Max dose 20mcg.~~ Infusion: Prepare 1 mcg/mL infusion (see Appendix 2). Infuse at 1-3 drops/second IV/IO (6-18 mL/min) using 10 drops/mL macrodrip chamber. Titrate to SBP >90mmHg	Push dose: N/A Infusion: Prepare 1 mcg/mL infusion (see Appendix 2)~~see last page of epinephrine reference~~). ~~Connect the liter bag to a buretrol or similar device and fill the buretrol or similar device with 100 mL of the mixed solution.~~ Infuse at **0.3** drops/kg/second IV/IO (0.3 mL/kg/min) using the buretrol or similar device~~.~~ Titrate to goal SBP. (Use ADULT dosing for weight >20 kg) ~~Not to be used in pediatric bradycardia~~

CONTRAINDICATIONS:

- None in cardiac arrest or other life-threatening situations
- ~~Use with caution for severe bronchospasm or allergic reactions in patients with coronary artery disease since myocardial ischemia may be precipitated.~~
- ~~IV epinephrine: should **only** be used in cardiac arrest or hypotension. Use IM initially for patients with anaphylaxis.~~

POTENTIAL SIDE EFFECTS:

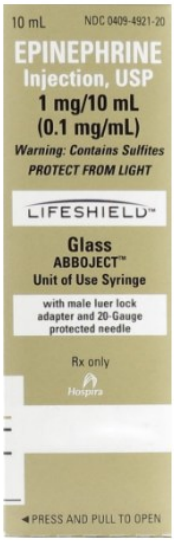
- Tachydysrhythmias including V-Tach and V-Fib
- Hypertension
- ~~Nausea and vomiting~~
- Increased myocardial O2 demand
- Extravasation can cause tissue necrosis
- ~~Headache and dizziness~~

NOTES:

- Ratio expressions of medication concentration (e.g. 1:1000) are no longer preferred –
  - For reference, **1 mg/mL = 1:1000** and **0.1 mg/mL = 1 mg/10 mL = 1:10000**
- Use epinephrine with caution for severe bronchospasm or allergic reactions in patients with coronary artery disease or > 50 years of age since myocardial ischemia may be precipitated
- IM epinephrine: should be used initially for anaphylaxis, ~~preferably in~~ anterolateral thigh preferred
- IV epinephrine: should ~~only~~ be used in cardiac arrest or hypotension
- Do not run continuous infusion in same line as sodium bicarbonate
- ~~Ensure that the Patient is not~~ Hypovolemic patients should be fluid resuscitated before giving epinephrine for hypotension/shock
- **Clearly label** bag/syringe (1 mcg/mL infusion bag or 10mcg/mL push dose epinephrine syringe) with concentration of epinephrine to avoid confusion with normal saline or other syringes
- ~~The anterolateral thigh is the preferred location for IM epinephrine.~~
- Patients given epinephrine should remain on monitor, blood pressure should be cycled every 3-5mins

APPENDIX 1: Push-Dose Epinephrine Preparation

1. Empty 1ml from a 10ml normal saline flush
2. Draw up 1ml from cardiac epinephrine (**0.1mg/mL concentration**) and add it to the normal saline syringe
3. Shake
4. Label syringe: "Push-Dose Epinephrine 0.01mg/ml"
5. Each 1mL in the syringe contains 10mcg of epinephrine. Administer 1mL at a time. Each syringe should have 10 doses.



Appendix 2: Epinephrine 1 mcg/mL infusion preparation

1. Inject 1 mL* of **1 mg/mL** = 1 mg **OR** 10 mL* **of 0.1 mg/mL** = 1 mg into 1000 mL 0.9% sodium chloride
2. Label the infusion to prevent confusion with normal saline
3. For pediatrics: Connect the liter bag to a buretrol or similar device. ~~and fill the buretrol or similar device with 100 mL of the mixed solution~~

Notes:

- The volume of the epinephrine solution is negligible when added to 1000 mL normal saline. There is no need to remove normal saline from the 1000 mL bag as the final concentration of epinephrine is not appreciably less than 1 mcg/mL
- Buretrols and similar devices have 60 drops per mL, therefore
    - 1 drop/second = 1 mL/min,
    - 1 mcg/min =1 mcg/mL
- Intraosseous lines may need a pressure bag to obtain the target number of drops per minute.