

## L. Epinephrine Hydrochloride (Adrenalin®)

- I. Classification
  - Sympathomimetic agent (catecholamine)
- II. Actions
  - A. Increases cardiac output due to increased inotropy, chronotropy and AV conduction (beta 1)
  - B. Increases systolic blood pressure due to increased cardiac output and vasoconstriction (beta 1, alpha)
  - C. Alleviates wheezing and dyspnea by relaxing smooth muscles of the respiratory tract (beta 2)
  - D. Increases coronary perfusion during CPR due to increased aortic diastolic pressure (alpha)
  - E. Prevents hypotension and loss of intravascular fluid in anaphylactic reactions by counteracting vasodilation and decreasing vascular permeability
- III. Indications
  - A. Cardiopulmonary arrest
    - Ventricular fibrillation / Pulseless ventricular tachycardia
    - Pulseless electrical activity (PEA)      •Asystole
  - B. Acute asthma
  - C. Allergic reaction/Anaphylaxis
  - D. Symptomatic Bradycardia
- IV. Contraindications
  - Hypovolemia      •Hypertension
- V. Adverse Effects
  - A. Cardiovascular
    - Tachycardia**      •Chest Pain      •**Hypertension**      •**Ventricular fibrillation**
  - B. Neurological
    - Seizures      •Dizziness      •Headache      •Anxiety      •Tremors
  - C. Gastrointestinal
    - Nausea/vomiting
- VI. Adult Administration
  - A. Cardiac arrest
    - 1 mg (1:10,000) IV/IO initial dose. No more than 8 doses administered in a cardiac arrest.
    - The second and subsequent doses for patients in VF, pulseless VT, PEA or Asystole is 1 mg (1:1000) IV/IO diluted with 4 ml NS.
  - B. Allergic reaction/Anaphylaxis
    - 0.5 mg (0.5 ml) (1:1000) IM.
  - C. Breathing Difficulty : Wheezes (Asthma/COPD)
    - 0.3 mg (0.3 ml) (1:1000) IM.
  - D. Pressor
    - 2 mg 1:1000/500 ml NS. Manually mix 2mg 1:1000 Epi in 500 ml Normal Saline OR 1 mg 1:1000/250 ml NS. Manually mix 1mg 1:1000 Epi in 250 ml Normal Saline.
    - Start drip at 30 drops/minute IV/IO (2 mcg/min) with 60 drop/ml chamber. Titrate every 5 min. to SBP of 100 mmHg and signs of adequate perfusion OR a maximum rate of 120 drops/min (8 mcg/min).

- E. EpiPen Auto-Injector - 0.3 mg Epi 1:1000 [BLS]
  - For adults, but also for any patient with a weight  $\geq$  25 kg.
  - Inject into anterolateral aspect of thigh, not into the patient's buttocks.
- F. Certadose Epinephrine Convenience Kit [BLS]
  - Determine patient's dosing color by weight or length tape.
  - Draw up Epinephrine included in Kit to the level prescribed by the dosing color.
  - Inject into anterolateral aspect of thigh, not into the patient's buttocks.

## VII. Pediatric Administration

- A. Bradycardia / Cardiac Arrest
  - Neonate/Infant/Child/Adolescent
  - 0.01 mg/kg (1:10,000) IV/IO. No more than 8 doses administered in a cardiac arrest.
- B. Anaphylaxis / Asthma with Impending Respiratory Failure
  - 0.01 mg/kg (1:1000) IM (maximum single dose 0.3 mg).
- C. Croup / Inspiratory Stridor / Bronchiolitis
  - 3 ml solution (1:1000) in nebulizer.
- D. Pressor
  - 2 mg 1:1000/500 ml NS. Manually mix 2mg 1:1000 Epi in 500 ml Normal Saline OR 1 mg 1:1000/250 ml NS. Manually mix 1mg 1:1000 Epi in 250 ml Normal Saline.
  - Start drip at 15 drops/minute IV/IO (1 mcg/min) with 60 drop/ml chamber. Titrate every 5 min. to SBP of 100 mmHg and signs of adequate perfusion OR a maximum rate of 120 drops/min (8 mcg/min) as directed by on-line physician.
- E. EpiPen Jr. Auto-Injector - 0.15 mg Epi 1:1000 [BLS]
  - For patients under < 25 kg. For weights  $\geq$  25 kg, use an EpiPen instead of EpiPen Jr.
  - Inject into anterolateral aspect of thigh, not into the patient's buttocks.
- F. Certadose Epinephrine Convenience Kit [BLS]
  - Determine patient's dosing color by weight or length tape.
  - Draw up Epinephrine included in Kit to the level prescribed by the dosing color.
  - Inject into anterolateral aspect of thigh, not into the patient's buttocks.

## VIII. Onset

- IVP - 1-2 minutes / IM - 5-10 minutes

## IX. Duration

- IVP - 3-5 minutes / IM - 20 minutes

## X. Precautions

- A. Epinephrine is inactivated by sodium bicarbonate. Flush the IV tubing before and after administration of sodium bicarbonate or establish a second venous access site.
- B. There is a high incidence of cardiovascular side effects with epinephrine use. Monitor blood pressure, pulse and ECG rhythm frequently after administration.

## XI. Note

- A. The concentration of epinephrine (1:1000 or 1:10,000) to be used varies depending on patient age, route and indication. (Table 9-1)
- B. If using 1:1000 concentration for IVP, it must be diluted with NS to produce a minimum volume of 5 ml for adults and 2 ml for pediatric patients.

Table 9-1 : Epinephrine Concentration Chart

<b>Age/Route</b>	<b>Concentration</b>
Adult IV/IO 1st Dose	1:10,000
Pediatric IV/IO	1:10,000
Adult IV/IO after 1st Dose	1:1000
Adult/Ped. IM (anaphylaxis)	1:1000
Pediatric Nebulizer (Croup/Bronchiolitis)	1:1000