

This document is for **reference only**. Please refer to SWO's for specific indications, dosages, and applications

RX

Drug Name: Epinephrine
Trade Name: Adrenalin, Epi

REVISED: 01MAY2018

Class:

- Adrenergic Catecholamine
- Sympathomimetic

Mechanism of Action:

- β_1 —increases contractility (positive inotrope), AV conduction (positive dromotrope), and automaticity
- β_2 --bronchodilation, skeletal muscle vasodilation
- α --peripheral vasoconstriction, fight or flight response
- Small doses, beta effects dominate--vasodilation
- Large doses, alpha effects dominate--vasoconstriction, increases systemic vascular resistance and blood pressure

Indications:

- Hypersensitivity reactions (anaphylaxis)
- Acute bronchospasm associated with asthma or COPD (refractory to first-line agents)
- Asystole, VF, pulseless VT, PEA
- Croup & epiglottitis

Contraindications:

- None in cardiac arrest or severe anaphylaxis
- Hypersensitivity

Precautions:

- HTN
- Ischemic heart disease
- Cerebrovascular insufficiency
- Deactivated/precipitates with alkaline solutions (NaHCO₃)
- Increases myocardial oxygen demand
- Pulmonary edema
- Pregnancy (C)
- Geriatrics
- Protect from light

Dosage:

Adults:

Pulseless Rhythms

- **IV/IO:** 1 mg (1:10,000) every 3-5 minutes

Anaphylaxis

- **IM/SQ:** 0.3-0.5 mg (1:1,000), repeat once at 10 minutes if s/s do not improve
- **IV Infusion:** *For refractory cases*, 2-10 mcg/min titrated to BP response
- **Neb:** *For laryngeal edema only*, 3 mg epinephrine 1:1,000 (3 ml) mixed with 3 ml NS for 6ml solution total

Acute bronchospasm associated with asthma or COPD (refractory to first-line agents)

- **IM/SQ:** 0.3-0.5 mg (1:1,000)

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Persistent/Refractory Hypotension

- Mix 1 mg epinephrine in a 100 cc buretrol or 250 cc NS bag
- **IV:** 2-10 mcg/min, titrate for effect

Symptomatic Ca Channel Blocker/Beta Blocker OD refractory to other interventions

- Mix 1 mg epinephrine in a 100 cc buretrol or 250 cc NS bag
- **IV: 2-10 mcg/min, titrate for effect (requires Medical Control contact)**

Pediatrics:

Pulseless Rhythms:

- **IV/IO:** 0.01 mg/kg (1:10,000) every 3-5 minutes
- **NEONATES:** 0.01-0.03 mg/kg (1:10,000) IV/IO every 3-5 minutes

Anaphylaxis

- **IM/SQ:** 0.01 mg/kg (1:1,000), **MAX: 0.3 mg**
- **Neb:** *For laryngeal edema only*, 3 mg epinephrine 1:1,000 (3 ml) mixed with 3 ml NS for 6ml solution total

Persistent/Refractory Hypotension

- Refer to the pediatric "Rule of 6" quick reference table below for infusion preparation guidance
- **IV:** 0.1-1 mcg/kg/min, **not to exceed 10 mcg/min**

Croup & Epiglottitis:

- **Neb:** *For laryngeal edema only*, 3 mg epinephrine 1:1,000 (3 ml) mixed with 3 ml NS for 6ml solution total

Refractory Bronchospasm (Severe):

- **IM/SQ:** 0.01 mg/kg (1:1000, 0.1 ml/kg)

Onset:

- IV/IO: 1-2 min
- IM/SQ: 5-10 min

Duration:

- IV/IM/SQ: 5-10 min

Side Effects:

- Anxiety
- Tachycardia
- HTN
- Angina
- Arrhythmias
- V-Fib
- N/V
- Fear
- Headache
- Pallor
- Dizziness
- Tremors

Interactions:

- Potentiated by MAOIs and TCAs
- Antagonized by beta blockers
- Precipitates in alkaline solutions

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PEARLS:

CAUTION: All patients receiving inhaled beta agonists and/or anticholinergic medications should be observed for a least one hour following treatment for return of symptoms. * Not for Treat and Release patients.

ALS evaluation is indicated if Epi administered either PTA or by EMS, and transport strongly encouraged. Refusals require medical control contact.

- **I.M. Epi may be more effective than SQ Epi in shock situations.**
- **Sodium bicarbonate or Furosemide will inactivate epinephrine; flush line well between administration.**

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Epinephrine Infusion Matrix

Recommended Infusion Rate for Epinephrine		
DOSE mcg/min	1 mg/250 ml with microdrip 4 mcg/ml concentration	1 mg/100 ml Buretrol 10 mcg/ml concentration
2	30 gtt/min (ml/hr)	12 gtt/min (ml/hr)
3	45 gtt/min (ml/hr)	18 gtt/min (ml/hr)
4	60 gtt/min (ml/hr)	24 gtt/min (ml/hr)
5	75 gtt/min (ml/hr)	30 gtt/min (ml/hr)
6	90 gtt/min (ml/hr)	36 gtt/min (ml/hr)
7	105 gtt/min (ml/hr)	42 gtt/min (ml/hr)
8	120 gtt/min (ml/hr)	48 gtt/min (ml/hr)
9	135 gtt/min (ml/hr)	54 gtt/min (ml/hr)
10	150 gtt/min (ml/hr)	60 gtt/min (ml/hr)

To calculate a **pediatric** epinephrine drip, a simple formula for children uses **0.6** multiplied by the child's weight in kg. This amount (in mg) is then added to enough IV solution to equal a total of 100 ml.

When the resulting solution is infused at a rate of 1 ml/hr, it will deliver a dosage of 0.1 mcg/kg/min. Administration of 2 ml/hr equals a dosage of 0.2 mcg/kg/min.

Rule of 6 Quick Reference

KG	1	2	4	6	8	10	12	14	16	18	20
Pounds	2.2	4.4	8.8	13.2	17.6	22	26.4	30.8	35.2	39.6	44
Epi added to buretrol	0.6	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0

KG	22	24	26	28	30	32	34	36	38	40
Pounds	48.4	52.8	57.2	61.6	66	70.4	74.8	79.2	83.6	88
Epi added to buretrol	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	22.8	24.0

KG	42	44	46	48	50	52	54	56	58	60
Pounds	92.4	96.8	101.2	105.6	110	114.4	118.8	123.2	127.6	132
Epi added to buretrol	25.2	26.4	27.6	28.8	30.0	31.2	32.4	33.6	34.8	36.0

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