Using IV Epinephrine Expertly

Corey M. Slovis, M.D.
Vanderbilt University Medical Center
Metro Nashville Fire Department
Nashville International Airport
Nashville, TN
Mastering Emergency Medicine

- Secure the ABCs
- Consider or give NGT
  - Five Causes
  - Five Steps
  - Five Reasons for almost everything
Five Causes of Dyspnea

- **Cardiac** (AMI, ACS, CHF, Cardiomyopathy)
- **Pulmonary** (Bronchospasm, PE, Pneumonia)
- **CNS** (Anxiety, Metabolic Acidosis)
- **Neuromuscular** (rib fractures, myasthenia, ALS)
- **Abnormal Blood**
  - Hypoxia
  - Hemoglobin (sickle cell, CO)
  - Profound Anemia (acute blood loss or chronic disease)
The Five Causes of Wheezing

- Reactive Airway Disease
- Congestive Heart Failure
- Pulmonary Embolus
- Pneumothorax
- Mass
  - foreign body, tumor, infectious
5 Therapies for Severe Asthma

- $O_2$
- Inhaled Beta Agonist
- Inhaled Anticholinergic
- Steroids
- Magnesium
ED Therapy of Anaphylaxis

- Epi
- Benedryl
- H-2 Blocker
- Steroids
- Volume
5 Therapies for Bradycardia and Heart Block

- Atropine 0.5 mg
- Atropine 1.0 mg
- T Q Pacer
- IV Epinephrine
- TV Pacer
Therapies for Shock Therapy

- Volume
- Levophed
  - Dopamine
  - Vasopressin
  - Epinephrine
  - Phenylephrine
  - Prayer
Epinephrine
Anaphylaxis Dosing

0.3 cc 1mg in 1cc IM

0.1cc/10kg in children (0.01cc/kg).
Up to 0.5 cc in giant people.
• **Epinephrine is the Drug of Choice**

• Use it earlier, not later

• Know the dose

• Say “1 mg in 1 ml” (vs. 1:1000)

• Used in less than 50% of cases
Intravenous Epinephrine in Life-Threatening Asthma

Study objective: Intravenous epinephrine is a potentially vital therapy for patients with life-threatening asthma but is often avoided because of concerns about its safety. We evaluated the safety of intravenous epinephrine in a series of adults with life-threatening asthma.

Methods: We performed an explicit retrospective chart review on a case series of 27 emergency department patients aged 19 to 58 years (mean 25 years) who were treated with intravenous epinephrine for a life-threatening exacerbation of asthma between 1989 and 1997. Explicit criteria for adverse effects, including cardiac arrhythmia or ischemia, hypotension or hypertension, neurologic injury, and death, were defined before chart review.

- 27 Patients, ages 19-58
- No arrhythmias except sinus tachycardia
- No Ischemia, no Seizures
Physicians and paramedics make dosing mistakes in using IM and IV epinephrine, especially when dealing with severe anaphylaxis and asthma.
The starting dose epinephrine by IV infusion is 1-2 micrograms/minute.
The “1” Rule for IV Epi:

- 1 mg
- in
- 1 liter
- at
- 1 cc/min
IV Epinephrine at 1 mcg/min

- 1 mg of Epinephrine in 1000 cc
  - 1 cc of 1:1,000
  - 10 cc of 1:10,000

- Start at 1 cc/min.

- Piggy back into high flow IV

- Titrate to Effect Q 1 minute

- Follow HR and monitor
Dead or Dying  →  IV Epi

IV Epi  →  Dead or Dying
The number one cause of death in anaphylaxis is the failure of patients, family, EMS, RN or MD to give epinephrine in a timely fashion.
Safely Giving IV Epinephrine
The “1” Rule for IV Epi:

- 1 mg
- in
- 1 liter
- at
- 1 cc/min
IV Epinephrine at 1 mcg/min

• 1 mg of Epinephrine in 1000 cc
  - 1 cc of 1:1,000
    or
  - 10 cc of 1:10,000

• Start at 1 cc/min.

• Piggy back into high flow IV

• Titrate to Effect Q 1 minute

• Follow HR and monitor
• Inject 1mg Epi into 1000 cc
• Run IV at 1 cc/min.
  – piggy back into high flow IV
• Titrate to Effect
  – Adjust rate as needed
The “1” Rule for IV Epi:

- 1 mg
- in
- 1 liter
- at
- 1 cc/min