

## EM Basic- Anaphylaxis Part 1- Diagnosis and Treatment

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**Initial Assessment-** rapidly evaluate the patient's airway breathing and circulation

Assessment Triangle:

Appearance- overall appearance

Work of Breathing

Color- skin color- hypoxia? Pallor?

**Vitals-** pay attention to hypoxia or low blood pressure

**History-** once you have established that the patient is stable

**Onset of symptoms-** what was the patient doing

**Exposure to known/suspected allergens?-** insects and food most common

**Trouble breathing?-** most will say "tickle" or tightness in throat- not as worrisome if breathing easily and no stridor

**Skin symptoms-** any itching, rash, skin erythema, swelling

**PEARL:** If patient can vocalize a high pitched "EEEE" then airway swelling is unlikely

**GI symptoms-** persistent abdominal pain or vomiting- one of the criteria for anaphylaxis (discussed later)

**Past medical history-** medication, allergies, surgeries, etc. Any new medications or changes in doses?

**Exam-** start with the airway

**Face-** swelling, erythema

**Oropharynx-** swelling, erythema- check a mallampati, mouth opening, vocalize a high pitched "EEEE"

**Lung sounds-** clear vs. stridor/wheezing?

**Skin exam-** rash, urticaria/hives? (don't forget the back!)

**Rest of Head to Toe Exam-** be complete

**Treatment of Mild Allergic Reactions (skin findings only, stable vital signs, don't meet criteria for anaphylaxis)**

**Antihistamines-** Benadryl (diphenhydramine)- 25-50 mg IV, can also give same dose PO if very mild reaction, 1 mg/kg IV for children

**H2 blockers-** Zantac (ranitidine) 50mg IV or Pepcid (famotidine) 20mg IV.

**Steroids-** take 4-6 hours to work, Predisone 50mg PO (1 mg/kg peds), Solumedrol 125mg IV (1 mg/kg IV)

**PEARL:** IV and PO steroids have equal bioavailability, only use IV steroids if patient can't swallow medications

**PEARL:** The above medications have NO place in the treatment of anaphylaxis- we give them as part of the "kitchen sink approach" but the treatment for anaphylaxis is epi, epi, and more epi

## Diagnostic Criteria for Anaphylaxis

**Combination of:**

**Skin findings** (rash, itching, hives) with:

**Low Blood Pressure**

**Respiratory Compromise-** stridor, dyspnea, wheezing

**Persistent GI symptoms-** abdominal pain, N/V

**PEARL:** Skin findings aren't necessary to diagnose anaphylaxis if patient is exposed to a known or suspected allergen and has low BP, respiratory compromise or persistent GI symptoms (don't forget to ask about GI symptoms!)

## Epinephrine (Epi)

**Sub-cutaneous injections (sub-q)-** not done any more- shallow injection- sub-q layer not well perfused when pt is in shock

**Intramuscular (IM)-** 0.3mg IM adult, 0.01 mg/kg peds x3 total doses

**Epi-Pen-** some hospitals stock this in crash cart to avoid confusion about dosing- 0.3mg Epi-Pen IM for adults, 0.15mg Epi-Pen Junior IM for peds

### A word on concentrations of Epi

**1:1,000:** Concentrated Epi for IM injection

**1:10,000:** “Crash cart” Epi- only for patients without a pulse

**1:100,000:** Concentration of Epi in lidocaine with epi and epi drip, won’t cause tissue damage

**IV Epinephrine-** for patients who don’t get better from IM Epi

### Two options- push-dose or drip

#### Push dose Epi

10 cc of normal saline (NS), discard 1 cc = 9cc of NS

Crash cart Epi- 1 cc Epi added to 9 cc of NS

Push 1-2 cc every 2-3 minutes as needed until patient improves

Math:

Crash cart Epi = 1 mg Epi in 10 cc or 1,000 micrograms in 10 cc = 100 micrograms per cc

100 micrograms per cc diluted 10 fold (9 cc NS) = 10 micrograms per CC  
Same concentration as 1:100,000 Epi (safe for local anesthesia and tissues)

#### Epi drip

1 amp crash cart Epi (1mg)

Added to 1 liter of NS

Run at 60 cc/hr, titrate up by multiples of 60 cc/hr (or just start at 600 cc/hr)

Math

1 amp crash cart Epi = 1 mg Epi = 1,000 micrograms Epi

1,000 micrograms of Epi added to 1,000 cc of NS =

1 microgram Epi per cc

Usual Epi drip run at 2-20 micrograms per minute

1 microgram per minute = 1 cc per minute = 60 cc/hr

Even more dilute that 1:100,000 Epi so no concerns about tissue extravasation

**PEARL:** ALWAYS be sure to label your syringes and IV bags if you mix up push-dose or a drip

### Special Situations

**Patient on Beta Blockers-** they inhibit action of Epi, need to give glucagon to counteract (works by different pathway instead of Epi)

**Glucagon-** 1-5mg IV given slowly over 5 minutes, frequently causes vomiting, give with Zofran (ondansetron)

**Fluids-** Give fluid boluses 1-2 liters of NS at a time, anaphylaxis causes vasodilation and capillary leak

**Vasopressors-** If Epi doesn’t work, can try dopamine or norepinephrine

## **Disposition**

**Mild allergic reactions-** skin findings only, no diagnostic criteria for anaphylaxis

## **Discharge medications**

**Benadryl** 25-50mg PO TID PRN itching

**Prednisone** 50mg PO daily for 5 days

**Zantac** 150mg PO BID for 7-10 days

**Patient given Epinephrine-** observe for at least 4-6 hours in the ED to make sure patient doesn't have rebound (repeat) reaction, low threshold to admit

**Must discharge patient with Epi Pens-** prescribe at least 2 Epi-Pens- one for patient to carry with them at all times, one for home/school

If possible- prescribe 3 Epi-Pens to have one on the patient at all times, one at home/school, and one in car (not great to have in hot cars in hot climates but better than nothing)

**PEARL:** Be very clear with your discharge instructions about following up with primary care doctor and how to use Epi-Pen. Tell the patient not to wait for EMS to give Epi or it may be too late.

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