**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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