# Anaphylaxis

Last Revision 5/2025

**Anaphylaxis Definition: symptoms occuring within 30 minutes to several hours of allergen exposure and meet one of the following criteria:**

1. Exposure to an unknown allergen with skin/mucosa involvement (hives, rash, itching, swelling of lips, tongue, eyes) AND one of the following:
   - Respiratory compromise (wheezing, stridor, dyspnea, hypoxia, chest tightness, hoarseness)
   - Hypotension and/or altered mental status
   - Persistent GI symptoms (severe abdominal pain, vomiting, diarrhea)
2. Exposure to a likely allergen with 2 or more of the following:
   - Skin/mucosa (hives, rash, itching, swelling of lips, tongue, eyes)
   - Respiratory compromise (wheezing, stridor, dyspnea, hypoxia, chest tightness, hoarseness)
   - Hypotension and/or altered mental status
   - Persistent GI symptoms (severe abdominal pain, vomiting, diarrhea)
3. **Hypotension ALONE after exposure to a known allergen**

Anaphylaxis is diagnosed with focused history and physical
Place on monitors, assess ABCs

YES / NO

Stop the offending agent
Give IM EPINEPHRINE (1mg/mL) in thigh immediately

DOSE:
< 7.5 kg: 0.01 mg/kg
7.5-25 kg: 0.15 mg
26-50 kg: 0.3 mg
>50 kg: 0.5 mg

Does not meet criteria for anaphylaxis - Consider alternative diagnoses
Anaphylaxis mimickers

**Reassess within 5-15 minutes**

**Resolution of symptoms / no longer meeting criteria for anaphylaxis? (Skin/mucosa findings may persist)**

NO → Give epinephrine
Reassess again within 5-15 minutes

YES

**No additional epinephrine**

Complete History and Physical
Consider the needs for IV fluids.
Consider adjunct medications

**Continues to meet criteria for anaphylaxis**

**Observe 2 hours after serious symptom resolution**

**Does patient have recurrent symptoms of anaphylaxis?**

NO → **Any risk factors?**

YES → Give epinephrine and review management & admission criteria

**Disposition**

Admit to/remain on pediatric floors

Admit to ICU

YES → Consider longer observation or admission

NO → **Meets all discharge criteria?**

NO → Review admission criteria

YES → Discharge with meds to bed for EpiPen® after 2 hours observation

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## Consider longer observation or admission for patients with the following risk factors:

- Medication-related anaphylaxis
- Presence of underlying cardiac or pulmonary disease (e.g. asthma)
- Refractory, biphasic, or persistent anaphylaxis requiring multiple epinephrine doses (including pre-hospital administration)
- Delay in epinephrine administration > 60 min from symptom onset
- Cardiovascular involvement
- History of emergency department visits for anaphylaxis
- Patients with mast cell disorders

## Admission Criteria Guidance

Additional patient specific information should guide decision making

| | |
|---|---|
| **Medical CDU** | • Concerns for poor follow up or access to ED<br>• Stable vital signs<br>• No bolus required |
| **Inpatient Floor** | • Recurrence of anaphylaxis that resolved with additional epinephrine<br>• Concerns for poor follow up or access to ED<br>• Hypotension that resolved with fluids<br>• Stable vital signs |
| **PICU** | • Hemodynamic instability (multiple boluses required and/or pressors)<br>• Respiratory support requirement or concern for upper/lower airway issue<br>• Mental status concerns |

## Discharge Criteria Guidance

- Complete clinical resolution of all serious symptoms (rash may persist) without recurrence after at least 2 hours of observation
- Successful PO trial after food allergen trigger
- Parental comfort with discharge with good access to ED if symptoms recur
- Epinephrine auto-injector physically available to family
- Counseling regarding use of medic allergy alert tag
- Counseling regarding allergen avoidance
- Completion of anaphylaxis discharge instructions

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## Consider Adjuncts based on H&P (for symptom relief, does NOT change course of anaphylaxis)

| | | |
|---|---|---|
| **Itching/Hives** | Diphenhydramine | 1 mg/kg IV/IM/PO (max 50 mg) |
| | Cetirizine | 6 months to < 5 years : 2.5 mg<br>6 years to < 11 years: 5 mg<br>12 years and older: 10 mg |
| **Wheezing, Shortness of breath** | Albuterol | 2.5 mg nebulization |
| **Nausea, vomiting** | Famotidine | 0.5 mg/kg PO (max 40 mg)<br>0.25 mg/kg IV (max 20 mg) |
| **Patients with asthma AND wheezing** | Dexamethasone | 0.6 mg/kg PO/IM (max 12 mg) |
| | Prednisolone | 2 mg/kg PO (max 60 mg) |
| **Patients meeting ICU criteria** | Methylprednisolone | 2 mg/kg IV (max 60 mg) |

## Helpful Definitions

**Persistent Anaphylaxis:**
Signs and symptoms persist for >4 hours

**Refractory Anaphylaxis:**
Persistent symptoms despite epinephrine (greater than 2 doses) and symptoms-based treatment

**Biphasic Anaphylaxis:**
Recurrence of symptoms and/signs with initial symptoms completely resolved before onset of new symptoms. No new exposures to the allergen and must occur within 48 hours.

## Mimickers of Anaphylaxis (not exhaustive)

- Mastocytosis
- Angioedema (hereditary, with urticaria, ACE Inhibitor, etc.) Marcella
- Sepsis
- DKA
- Croup with viral exanthem
- Scombroid food poisoning
- Flushing disorders (Carcinoid Syndrome)
- FPIES

## Tryptase testing indications and information

- Send for unknown, non-food induced trigger
- Must draw within 6 hours of symptom onset
- Test result will not impact management in the ED
- Do not need to send if otherwise not placing IV

## Goals

- Correctly diagnose anaphylaxis
- Administer epinephrine to patients with anaphylaxis in a timely manner
- Decrease overall ED LOS for patients with anaphylaxis
- Provide EpiPen® in hand at ED discharge

## Metrics

- Time from triage to epinephrine
- %patients receiving epinephrine
- %patients receiving EpiPen® at discharge
- ED LOS

# Management of Refractory Anaphylaxis and/or Shock

## Recurrent anaphylaxis

- If second intramuscular dose required, admit patient and continue to give intermittent intramuscular epinephrine dosing as needed.
- If refractory anaphylaxis or shock develops, manage as indicated below

## Refractory anaphylaxis without response to 2 doses of intramuscular epinephrine

- Give 3rd dose of intramuscular epinephrine and prepare epinephrine drip
- If no response, start IV epinephrine drip at 0.05 mcg/kg/min and titrate to clinical effect (0.05 mcg/kg/min – 1 mcg/kg/min)

## Anaphylactic shock

- Start IV epinephrine drip at 0.05 mcg/kg/min and titrate to clinical effect (0.05 mcg/kg/min – 1 mcg/kg/min)
- Consider additional pressor (Norepinephrine or vasopressin if unresponsive to max epinephrine drip)
- Consult PICU early
- If patient becomes bradycardic/cardiac arrest, follow PALS algorithm
- Consider ECMO

# References

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