

Medical Management of Vaccine Reactions in Children and Teens

All vaccines have the potential to cause an adverse reaction. To minimize adverse reactions, patients should be carefully screened for precautions and contraindications before vaccine is administered. Even with careful screening, reactions can occur. These reactions can vary from trivial and inconvenient (e.g., soreness, itching) to severe and life threatening (e.g., anaphylaxis). If reactions occur, staff should be prepared with procedures for their management. The table below describes procedures to follow if various reactions occur.

| Reaction | Symptoms | Management |
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| Localized | Soreness, redness, itching, or swelling at the injection site | Apply a cold compress to the injection site. Consider giving an analgesic (pain reliever) or antipruritic (anti-itch) medication. |
| | Slight bleeding | Apply an adhesive compress over the injection site. |
| | Continuous bleeding | Place thick layer of gauze pads over site and maintain direct and firm pressure; raise the bleeding injection site (e.g., arm) above the level of the patient's heart. |
| Psychological fright and syncope (fainting) | Fright before injection is given | Have patient sit or lie down for the vaccination. |
| | Extreme paleness, sweating, coldness of the hands and feet, nausea, light-headedness, dizziness, weakness, or visual disturbances | Have patient lie flat or sit with head between knees for several minutes. Loosen any tight clothing and maintain an open airway. Apply cool, damp cloths to patient's face and neck. |
| | Fall, without loss of consciousness | Examine the patient to determine if injury is present before attempting to move the patient. Place patient flat on back with feet elevated. |
| | Loss of consciousness | Check the patient to determine if injury is present before attempting to move the patient. Place patient flat on back with feet elevated. Call 911 if patient does not recover immediately. |
| Anaphylaxis | Sudden or gradual onset of generalized itching, erythema (redness), or urticaria (hives); angioedema (swelling of the lips, face, or throat); severe bronchospasm (wheezing); shortness of breath; shock; abdominal cramping; or cardiovascular collapse | See "Emergency Medical Protocol for Management of Anaphylactic Reactions in Children and Teens" on the next page for detailed steps to follow in treating anaphylaxis. |

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Supplies you may need at a community immunization clinic

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| <ul style="list-style-type: none"> <input type="checkbox"/> First-line treatment: Aqueous epinephrine 1:1000 dilution, in ampules, vials of solution, or prefilled syringes, including epinephrine auto-injectors (e.g., EpiPen). If EpiPens are to be stocked, both EpiPen Jr. (0.15 mg) and adult EpiPens (0.30 mg) should be available. <input type="checkbox"/> Secondary treatment option: Diphenhydramine (Benadryl) injectable (50 mg/mL solution) or oral (12.5 mg/5 mL liquid, 25 or 50 mg capsules/tablets) | <ul style="list-style-type: none"> <input type="checkbox"/> Syringes: 1 and 3 cc, 22–25g, 1", 1½", and 2" needles for epinephrine and diphenhydramine (Benadryl) <input type="checkbox"/> Alcohol wipes <input type="checkbox"/> Tourniquet <input type="checkbox"/> Pediatric & adult airways (small, medium, and large) <input type="checkbox"/> Pediatric & adult size pocket masks with one-way valve <input type="checkbox"/> Oxygen (if available) <input type="checkbox"/> Stethoscope | <ul style="list-style-type: none"> <input type="checkbox"/> Sphygmomanometer (blood pressure measuring device) child, adult and extra-large cuffs) <input type="checkbox"/> Tongue depressors <input type="checkbox"/> Flashlight with extra batteries (for examination of mouth and throat) <input type="checkbox"/> Wrist watch with ability to count seconds <input type="checkbox"/> Cell phone or access to an onsite phone |
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Emergency medical protocol for management of anaphylactic reactions in children and teens

1. If itching and swelling are confined to the injection site where the vaccination was given, observe patient closely for the development of generalized symptoms.
2. If symptoms are generalized, activate the emergency medical system (EMS; e.g., call 911) and notify the on-call physician. This should be done by a second person, while the primary nurse assesses the airway, breathing, circulation, and level of consciousness of the patient.
3. Drug Dosing Information:
 - a. **First-line treatment:** Administer aqueous epinephrine 1:1000 dilution (i.e., 1 mg/mL) intramuscularly; the standard dose is 0.01 mg/kg body weight, up to 0.3 mg maximum single dose in children and 0.5 mg maximum in adolescents (see chart on next page).
 - b. **Secondary treatment option:** For hives or itching, you may also administer diphenhydramine either orally or by intramuscular injection; the standard dose is 1–2 mg/kg body weight, up to 30 mg maximum dose in children and 50 mg maximum dose in adolescents (see chart on next page).
4. Monitor the patient closely until EMS arrives. Perform cardiopulmonary resuscitation (CPR), if necessary, and maintain airway. Keep patient in supine position (flat on back) unless he or she is having breathing difficulty. If breathing is difficult, patient’s head may be elevated, provided blood pressure is adequate to prevent loss of consciousness. If blood pressure is low, elevate legs. Monitor blood pressure and pulse every 5 minutes.
5. If EMS has not arrived and symptoms are still present, repeat dose of epinephrine every 5–15 minutes for up to 3 doses, depending on patient’s response.
6. Record all vital signs, medications administered to the patient, including the time, dosage, response, and the name of the medical personnel who administered the medication, and other relevant clinical information.
7. Notify the patient’s primary care physician.

For your convenience, approximate dosages based on weight and age are provided in the charts below. Please confirm that you are administering the correct dose for your patient.

| First-Line Treatment: Epinephrine (the recommended dose for epinephrine is 0.01 mg/kg body weight) | | | | | |
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| | Age Group | Range of weight (lb) | Range of weight (kg)* | Epinephrine Dose | |
| | | | | 1 mg/mL injectable (1:1000 dilution) intramuscular Minimum dose: 0.05 mL | EpiPen (Dey, L.P.) Epinephrine auto-injector 0.15 mg or 0.3 mg |
| Infants and Children | 1–6 months | 9–19 lb | 4–8.5 kg | 0.05 mL (or mg) | off label |
| | 7–36 months | 20–32 lb | 9–14.5 kg | 0.1 mL (or mg) | off label |
| | 37–59 months | 33–39 lb | 15–17.5 kg | 0.15 mL (or mg) | 0.15 mg |
| | 5–7 years | 40–56 lb | 18–25.5 kg | 0.2–0.25 mL (or mg) | 0.15 mg |
| | 8–10 years | 57–76 lb | 26–34.5 kg | 0.25–0.3 mL [†] (or mg) | 0.15 mg or 0.3 mg |
| Teens | 11–12 years | 77–99 lb | 35–45 kg | 0.35–0.4 mL (or mg) | 0.3 mg |
| | 13 years & older | 100+ lb | 46+ kg | 0.5 mL (or mg) [‡] | 0.3 mg |

Note: If body weight is known, then dosing by weight is preferred. If weight is not known or not readily available, dosing by age is appropriate.

*Rounded weight at the 50th percentile for each age range

[†]Maximum dose for children

[‡]Maximum dose for teens

| Secondary Treatment Option: Diphenhydramine (the recommended dose for diphenhydramine [Benadryl] is 1–2 mg/kg body weight) | | | | |
|--|------------------|----------------------|-----------------------|---|
| | Age Group | Range of weight (lb) | Range of weight (kg)* | Diphenhydramine Dose 12.5 mg/5 mL liquid 25 mg or 50 mg tablets 50 mg/mL injectable (IV or IM) |
| Infants and Children | 7–36 months | 20–32 lb | 9–14.5 kg | 10 mg–20 mg |
| | 37–59 months | 33–39 lb | 15–17.5 kg | 15 mg–30 mg [†] |
| | 5–7 years | 40–56 lb | 18–25.5 kg | 20 mg–30 mg [†] |
| | 8–12 years | 57–99 lb | 26–45 kg | 30 mg [†] |
| Teens | 13 years & older | 100+ lb | 46+ kg | 50 mg [‡] |

Note: If body weight is known, then dosing by weight is preferred. If weight is not known or not readily available, dosing by age is appropriate.

*Rounded weight at the 50th percentile for each age range

[†]Maximum dose for children

[‡]Maximum dose for teens

Sources

Boyce JA, Assa'ad A, Burks AW, et al. Guidelines for the Diagnosis and Management of Food Allergy in the United States: Report of the NIAID-Sponsored Expert Panel. *Allergy Clin Immunol* 2010; 126(6):S1–S57.

Simons FE, Camargo CA. Anaphylaxis: Rapid recognition and treatment. In: UpToDate, Bochner BS (Ed). UpToDate: Waltham, MA, 2010.

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| <p>These standing orders for the medical management of vaccine reactions in child and teenage patients shall remain in effect for patients of the _____ until rescinded or until _____.</p> <p style="text-align: center;"><i>name of clinic</i> <i>date</i></p> <p>Medical Director's signature _____ Effective date _____</p> |
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