

## DEFINITION

- Caller believes a child is having a reaction to a recent vaccination (immunization)
- Reactions to Chickenpox (varicella), COVID-19, DTaP (Diphtheria, Tetanus, acellular Pertussis), Haemophilus influenzae type b, Hepatitis A, Hepatitis B, Influenza, MMR (Measles, Mumps, Rubella), Meningococcal, Papillomavirus, Pneumococcal, Polio, Rabies, Rotavirus, Tuberculosis (BCG vaccine) and Typhoid vaccines are covered.
- Synagis reactions are included. Synagis (palivizumab) contains antibodies against RSV and is given IM to high risk preterms.
- **Also Included:** vaccine concerns (hesitancy), travel-related vaccines, reasons to avoid pre-dosing with fever medicine
- **Updated:** August 23, 2021

## INITIAL ASSESSMENT QUESTIONS

1. MAIN CONCERN: "What is your main concern or question?"
2. INJECTION SITE SYMPTOMS : "What are the main symptoms?" (redness, swelling or pain around injection site or none) For redness, ask: "How large is the area of red skin?" (inches or cm)
3. GENERAL WHOLE BODY SYMPTOMS: "What is the main symptom?" (e.g. fever, chills, tired, poor appetite, fussiness for young kids or none)
4. ONSET: "When was the vaccine (shot) given?" "How much later did the \_\_\_\_\_ begin?" (Hours or days) This question mainly refers to the onset of redness or fever.
5. SEVERITY: "How sick is your child acting?" "What is your child doing right now?"
6. FEVER: If a fever is reported, ask: "What is it, how was it measured, and when did it start?"
7. IMMUNIZATIONS GIVEN (optional question): "What shot(s) did your child receive?" Only ask this question if the child received a single vaccine such as COVID-19, influenza, or a tetanus booster. For the standard childhood immunizations given at 2, 4 and 6 months, 12-18 months and 4 to 6 years, the main reaction symptoms are usually due to the DTaP vaccine.
8. PAST REACTIONS: "Has he reacted to immunizations before?" If so, ask: "What happened?"

- Author's note: IAQ's are intended for training purposes and not meant to be required on every call.

## TRIAGE ASSESSMENT QUESTIONS

### Call EMS 911 Now

[1] Difficulty with breathing or swallowing AND [2] starts within 2 hours after injection

*R/O: anaphylactic reaction*

*CA: 50, 5*

Unconscious or difficult to awaken

*R/O: acute encephalopathy*

*CA: 50, 5*

Very weak or not moving

*R/O: acute encephalopathy*

*CA: 50, 5*

Sounds like a life-threatening emergency to the triager

CA: 50, 5

### See More Appropriate Guideline

[1] Fever starts over 2 days after the shot (Exception: MMR or varicella vaccines) AND [2] no signs of cellulitis or other symptoms AND [3] older than 3 months

*Go to Guideline: Fever - 3 Months or Older (Pediatric)*

[1] Fainted following a vaccine shot AND [2] no other symptoms

*Go to Guideline: Fainting (Pediatric)*

### Go to ED Now (or PCP triage)

[1] Newborn < 4 weeks AND [2] fever 100.4° F (38.0° C) or higher rectally

*R/O: sepsis*

CA: 52, 16, 5

[1] Age < 12 weeks old AND [2] fever > 102 F (39 C) rectally following vaccine

*R/O: sepsis*

CA: 52, 16, 5

[1] Age < 12 weeks old AND [2] fever 100.4 F (38 C) or higher rectally AND [3] starts over 24 hours after the shot OR lasts over 48 hours

*R/O: sepsis*

CA: 52, 16, 5

[1] Age < 12 weeks old AND [2] fever 100.4 F (38 C) or higher rectally following vaccine AND [3] has other RISK FACTORS for sepsis

*Note to triager: Risk Factors include baby acting SICK (not feeding or breathing normally, etc) OR high risk newborn (preterm, on oxygen, etc)*

CA: 52, 16, 5

[1] Age < 12 weeks old AND [2] fever 100.4 F (38 C) or higher rectally AND [3] only received Hepatitis B vaccine

*Reason: fever rare (3%) with Hep B vaccine*

CA: 52, 16, 5

[1] Fever AND [2] > 105 F (40.6 C) by any route OR axillary > 104 F (40 C)

*R/O: severe reaction*

CA: 52, 15, 5

[1] Rotavirus vaccine AND [2] vomiting 3 or more times, bloody diarrhea or severe crying

*R/O: intussusception*

CA: 52, 5

[1] Measles vaccine rash (begins 6-12 days later) AND [2] purple or blood-colored

*R/O: purpura or petechiae, low platelets*

*CA: 52, 5*

[1] COVID-19 vaccine AND [2] sounds like a severe, unusual systemic reaction to the triager

*R/O: serious complication (e.g., myocarditis, blood clot, etc)*

*CA: 52, 5*

Child sounds very sick or weak to the triager (Exception: severe local reaction)

*Reason: serious complication suspected*

*CA: 52, 5*

### **See HCP within 4 Hours (or PCP Triage)**

[1] Crying continuously AND [2] present > 3 hours (Exception: only cries when touch or move injection site)

*R/O: unrelated severe pain*

*CA: 53, 17, 5*

### **Call PCP Now**

[1] Fever AND [2] weak immune system (sickle cell disease, HIV, splenectomy, chemotherapy, organ transplant, chronic oral steroids, etc)

*Reason: PCP will decide if vaccine-related fever or needs to be seen*

*CA: 59, 5*

### **See PCP within 24 Hours**

Fever present > 3 days (72 hours)

*R/O: bacterial infection, unrelated cause*

*CA: 54, 87, 3, 17, 5*

[1] General symptoms (such as muscle aches, headache, fussiness, chills) present more than 3 days AND [2] getting WORSE

*R/O: unrelated cause*

*CA: 54, 87, 22, 20, 5*

[1] Widespread hives, widespread itching or facial swelling AND [2] no other serious symptoms AND [3] no serious allergic reaction in the past

*CA: 54, 32, 33, 34, 35, 36, 37, 38, 5*

### **Call PCP within 24 Hours**

[1] Over 3 days (72 hours) since shot AND [2] redness is getting WORSE (including too painful to touch)

*Reason: PCP will decide if needs to be seen; probably normal reaction*

*CA: 60, 86, 40, 20, 5*

[1] Over 3 days (72 hours) since shot AND [2] redness is larger than 2 inches (5 cm)

*Reason: PCP will decide if needs to be seen; probably normal reaction*

CA: 60, 86, 40, 20, 5

### See PCP within 3 Days

[1] Deep lump follows DTaP (in 2 to 8 weeks) AND [2] becomes red or tender to the touch

*R/O: low grade bacterial infection*

CA: 55, 19, 18, 20, 5

[1] Measles vaccine rash (begins 6-12 days later) AND [2] persists > 4 days

*R/O: wrong diagnosis*

CA: 55, 6, 15, 17, 5

### Call PCP when Office is Open

Immunizations needed, questions about

CA: 61, 26, 5

### Home Care

[1] Age < 12 weeks old AND [2] fever 100.4 F (38 C) or higher rectally starts within 24 hours of vaccine AND [3] baby acts WELL (normal suck, alert, etc) AND [4] NO risk factors for sepsis

CA: 58, 39, 82, 41, 5

[1] Huge redness and swelling of thigh or upper arm AND [2] follows 4th or 5th DTaP vaccine injection

CA: 58, 85, 31, 2, 22, 3, 4, 5

[1] Lump at DTaP vaccine injection site AND [2] onset 1 or 2 weeks later

CA: 58, 14, 19, 5

DTaP vaccine reactions (included with shots given at most Well Visits)

CA: 58, 85, 1, 31, 2, 22, 3, 4, 5

COVID-19 vaccine reactions

CA: 58, 85, 23, 2, 22, 3, 4, 5

COVID-19 vaccine answers to common questions

CA: 58, 44, 45, 46, 90, 5

Injection site NORMAL reaction to ANY VACCINE

CA: 58, 85, 2, 3, 4, 5

Generalized NORMAL body symptoms (such as fever, chills muscle aches, mild fussiness or drowsiness) with ANY VACCINE

CA: 58, 85, 22, 2, 3, 4, 5

Measles vaccine reactions

CA: 58, 85, 6, 2, 3, 84, 5

Mumps or rubella vaccine reactions

CA: 58, 85, 7, 2, 3, 17, 5

Polio vaccine reactions

CA: 58, 85, 8, 2, 3, 4, 5

HIB vaccine reactions

CA: 58, 85, 9, 2, 3, 4, 5

Hepatitis A vaccine reactions

CA: 58, 85, 21, 2, 22, 3, 4, 5

Hepatitis B (HBV) vaccine reactions

CA: 58, 85, 10, 2, 22, 3, 4, 5

Influenza injected vaccine reactions

CA: 58, 85, 11, 2, 22, 3, 4, 5

Influenza nasal vaccine reactions

CA: 58, 85, 27, 22, 3, 84, 5

Chickenpox (varicella) vaccine reactions

CA: 58, 85, 12, 2, 3, 84, 5

Pneumococcus vaccine reactions

CA: 58, 85, 13, 2, 22, 3, 4, 5

Meningococcal vaccine reactions

CA: 58, 85, 24, 2, 22, 3, 4, 5

Rotavirus vaccine reactions

CA: 58, 28, 17, 5

Papillomavirus vaccine reactions

CA: 58, 85, 29, 2, 22, 3, 4, 5

Rabies vaccine reactions

CA: 58, 85, 42, 43, 2, 22, 3, 4, 5

Synagis (RSV vaccine) reactions

CA: 58, 85, 30, 2, 3, 4, 5

BCG vaccine for Tuberculosis (TB) reactions

CA: 58, 47, 48, 5

Typhoid vaccine reactions

CA: 58, 85, 81, 83, 2, 22, 3, 4, 5

[1] Travel, questions about vaccines AND [2] no current symptoms

CA: 58, 25, 90, 5

[1] Received extra dose of a vaccine by mistake AND [2] caller concerned

Reason: *harmless*

CA: 58, 80, 90, 5

Vaccine concerns and worries, questions about

CA: 58, 89, 90, 5

Pre-dosing with fever medicine, questions about

CA: 58, 49, 90, 5

## CARE ADVICE (CA) -

- DTaP or Td - Common Harmless Reactions:**
  - Pain, swelling and redness at the injection site occur in 25% of children.
  - Lasts for 3 to 7 days.
  - Very swollen thigh or upper arm following 4th or 5th DTaP occur in 3%. There are no complications and future vaccines are safe.
  - Fever (in 25% of children) and lasts for 24 to 48 hours.
  - Mild drowsiness (30%) , fretfulness (30%) or poor appetite (10%). These symptoms last for 24 to 48 hours. Vomiting (2%) can occur once or twice.
- Vaccine Injection Site Reactions - Treatment:**
  - Some pain, redness and swelling at the injection site is NORMAL. It means the vaccine is working. Redness does not mean there's any infection.
  - **Heat:** For redness and pain, apply a heating pad or a warm wet washcloth to the area for up to 20 minutes. Repeat as needed. Reason: will increase blood flow to the area.
  - Exception: can use a cold pack if your PCP recommends it, but only on the day of the shot.
  - **Massage:** Gently massage the injection site during the first few days. Do so several times a day.
  - **NO Pain Medicine:** Try not to give any pain medicines for local reactions. Reason: pain medicines may reduce the body's normal immune response. Use local heat instead. The local pain rarely becomes bad.
  - **Hives at Injection Site:** If very itchy, can apply a 1% hydrocortisone cream OTC twice daily as needed.

3. **Fever with Vaccines - Treatment:**
  - Fever with vaccines is NORMAL, harmless and probably beneficial. Reason: Fever speeds up your body's immune system.
  - Fever with most vaccines begins within 12 hours and lasts 1 or 2 days.
  - For low grade fevers 100-102 F (37.8 to 39 C), do not give fever medicines. Reason: research has shown these meds may reduce the body's normal immune response.
  - For fever above 102 F (39 C), can give medicine for discomfort if needed. Use acetaminophen (See Dosage table).
  - **Fluids.** Encourage cool fluids in unlimited amounts. Reason: prevent dehydration. Fluids can also lower high fevers. Age younger than 6 months, only give formula or breastmilk.
  - **Clothing.** Dress in normal clothing. For shivering or chills, use a blanket until it stops.
  - **Caution:** For babies under 1 year, do not overdress or bundle up. Reason: Babies can get over-heated more easily than older children.
4. **Call Back If:**
  - Fever lasts over 3 days
  - Redness becomes larger than 2 inches (5 cm)
  - Redness gets worse after 3 days
  - Your child becomes worse
5. **Care Advice** given per Immunization Reactions (Pediatric) guideline.
6. **Measles Vaccine - Common Harmless Reactions:**
  - The measles vaccine can cause a fever (10% of children), and rash (5% of children)
  - Onset: 6 to 12 days following the injection
  - The fever is usually between 101 F and 103 F (38.3 C and 39.5 C) and lasts 2 to 3 days.
  - The mild pink rash is mainly on the trunk and lasts 2 to 3 days.
  - No treatment is necessary.
  - Your child is not contagious.
7. **Mumps Or Rubella Vaccine - Common Harmless Reactions:**
  - There are no reactions except for an occasional sore injection site.
  - No serious reactions reported.
8. **Polio Vaccine - Common Harmless Reactions:**
  - Polio vaccine (IPV) may cause a sore injection site. There are no serious reactions.
  - Oral polio vaccine (OPV) is no longer used in the U.S. or Canada. Generally caused no symptoms.
9. **HIB Vaccine** (Hemophilus Influenza Type B Vaccine) - **Common Harmless Reactions:**
  - Sore injection site or mild fever only occurs in 1.5% of children.
  - No serious reactions reported.
10. **Hepatitis B Vaccine (HBV) - Common Harmless Reactions:**
  - Sore injection site occurs in 30% of children.
  - Fever (100-103 F) occurs in 3% of children.
  - No serious reactions reported.

11. **Influenza Virus Vaccine (Injected) - Common Harmless Reactions:**
  - Pain, tenderness or swelling at the injection site or armpit occurs within 6 to 8 hours in 10% of children.
  - Fever 101 F to 103 F (38.3 C to 39.5 C) occurs in 18% of children. Fevers mainly occur in young children.
  - General reactions: Occasionally headache, muscle aches, red eyes, nausea
  - If these symptoms occur, they usually last 1 or 2 days.
  - It is impossible to get flu from the injected vaccine. Reason: There is no live influenza virus in the vaccine.
  - Severe allergic reactions are very rare.
12. **Chickenpox Vaccine- Common Harmless Reactions:**
  - Pain or swelling at the injection site for 1 to 2 days (in 19% of children with first dose; 33% with 2nd dose).
  - Fever lasting 1 to 3 days begins 14 to 28 days after the vaccine in 10% of children.
  - Chickenpox-like rash (usually 2 lesions) at the injection site in 3% of children.
  - Chickenpox-like rash (usually 5 lesions) scattered over the body in 4%. This mild rash begins 5 to 26 days after the vaccine and usually lasts a few days.
  - **Rash Not Contagious:** Children with these vaccine rashes can go to daycare or school. (Reason: no evidence that vaccine rash is really contagious. Only 3 cases of transmission have occurred in over 14 million vaccines.)
  - **Precaution:** If vaccine rash contains fluid, cover it with clothing or Band-Aid.
  - **Added Precaution:** Avoid school if widespread weepy lesions (R/O actual chickenpox).
13. **Pneumococcal Vaccine - Common Harmless Reactions:**
  - Pain, tenderness swelling **Or** redness at the injection site in 15-30%.
  - Mild fever under 102 F(39 C) in 15% for 1-2 days.
  - Fever above 102 F in 1-2%.
  - There are no serious reactions.
14. **DTaP Lump:**
  - For a painless lump (or sterile nodule) at the DTaP injection site that begins 1 or 2 weeks later, give reassurance.
  - It is harmless and usually will disappear in about 2 months.
  - **Call Back If:** It turns red or tender to the touch.
15. **Fever Medicine:**
  - For fever, give acetaminophen every 4 hours **Or** ibuprofen every 6 hours (See Dosage table).
16. **Fever Under 3 Months Old - Don't Give Fever Medicine:**
  - Don't give any acetaminophen before being seen.
  - Need accurate documentation of temperature in medical setting to decide if fever is really present. (Reason: may require septic work-up.)
17. **Call Back If**
  - Your child becomes worse
18. **Pain Medicine:**
  - For pain relief, may give acetaminophen every 4 hours **Or** ibuprofen every 6 hours as needed. (See Dosage table.)
19. **Local Heat or Warm Pack:**
  - Apply a warm wet washcloth or a heating pad on low to the area for 15 minutes. Use up to 3 times per day. Reason: Helps the area heal.



20. **Call Back If**
- Fever occurs
  - Your child becomes worse
21. **Hepatitis A Vaccine - Common Harmless Reactions:**
- Sore injection occurs in 20% of children, loss of appetite in 10%, and headache in 5%. Usually no fever.
  - If these symptoms occur, they usually last 1-2 days.
  - No serious reactions reported.
22. **General Body Symptoms from the Vaccine - Treatment:**
- General symptoms usually start about 12 to 24 hours after the shot. They mean the immune system is turned on and doing its job.
  - General symptoms of feeling sick usually only last for one day, sometimes 2.
  - Follow the tips below to help your child feel better.
  - *Tiredness*: Encourage your child to rest or even sleep. Reason: The body needs all its energy going towards building antibodies against the vaccine. If we rest, the symptoms may pass sooner.
  - *Poor appetite or even nausea*: Drink extra fluids. Stay well hydrated. Reason: Good hydration keeps the body working at peak performance.
  - *Chills*: Wrap your child in a blanket. Reason: Warmth speeds up blood flow.
  - *Muscle aches*: Take a warm bath or shower.
  - *Fussiness*: Younger children may be more fussy than normal. They need extra holding and comforting.
23. **COVID-19 Vaccine - Common Harmless Reactions:**
- Injection site reactions (adult data). Pain and tenderness start within 8 hours (90% of patients). Other local reactions are some swelling (10%) or skin redness (5%). Local symptoms usually last 1 to 3 days.
  - General body symptoms (adult data). Fever (15%), chills (40%), tiredness (70%), muscle aches (50%) and headaches (60%). General symptoms start at about 24 hours. They usually last 1 day, sometimes 2.
  - Vaccines with 2 doses. Symptoms are more frequent after the 2nd vaccine. The above percentages are for the 2nd dose.
  - Vaccines with one dose. Side effects were the same type, but a little less frequent.
  - The vaccine does not cause any respiratory symptoms such as cough, runny nose or shortness of breath.
  - It is impossible to get COVID-19 from the vaccine. Reason: there is no live COVID-19 virus in the vaccine.
  - A serious allergic reaction is very rare. It usually occurs within 20 minutes after the shot.
24. **Meningococcal Vaccines - Common Harmless Reactions:**
- Sore injection site for 1 to 2 days occurs in 50%, with limited use of the arm in 15%.
  - Fever occurs in 4%, headache in 40% and joint pain in 20%.
  - MenB (optional meningitis vaccine) may also cause nausea, vomiting or diarrhea.
  - These symptoms only last a few days.
  - It is impossible to get meningitis from the vaccine. Reason: There is no live meningococcal bacteria in the vaccine.
  - No serious reactions.

25. **International Travel Resources and Precautions:**
- Visit the CDC's website at [www.cdc.gov](http://www.cdc.gov) (U.S.)
  - Choose topic "traveler's health" to access information on specific destinations and what to know before you go as well as information on outbreaks of concern to international travelers.
  - This site also lists the CDC's vaccination recommendations for travelers of all ages.
  - Traveler's Health Hotline toll-free number is 877-394-8747.
  - Canada: <http://www.hc-sc.gc.ca/> or <http://www.phac-aspc.gc.ca/tmp-pmv/index-eng.php>. No toll free number.
26. **Immunization Schedule:**
- The American Academy of Pediatrics regularly updates the immunization requirements for each age group (U.S.). Call your child's doctor during office hours to see if any vaccines are needed.
  - **Canada:** Call your local Public Health office for the most current immunization schedule for your child.
27. **Nasal Influenza Vaccine - Common Harmless Reactions:**
- For each influenza season, follow the CDC current recommendation regarding the nasal flu vaccine.
  - It can be an option for vaccination of healthy persons age 2 years and older.
  - Congested or runny nose is the main symptom.
  - May cause mild fever especially in younger children.
  - Occasionally cough, headache, or muscle aches.
  - Since the vaccine is made from a live but very weakened virus, your child can develop a mild flu-like illness.
28. **Rotavirus Vaccine - Common Harmless Reactions:**
- Mild diarrhea during the 7 days following the vaccine in 1 to 3 %
  - Mild vomiting even less common
  - No fever
  - **Rare serious reaction:** intussusception risk 1 in 100,000 (CDC). Presents with vomiting, bloody diarrhea or severe crying.
29. **Papillomavirus Vaccine- Common Harmless Reactions:**
- Sore injection site for few days in 90%
  - Redness and swelling at the injection site (in 50%)
  - Fever over 100.4 F (38.0 C) in 10% and fever over 102 F (39 C) in 1- 2%
  - Headache in 30%
  - No serious reactions reported
30. **Synagis (RSV vaccine) Injection - Common Harmless Reactions:**
- Sore injection site is usually mild
  - Runny nose, fever, and vomiting occurred 2% more commonly than in placebo group
  - No serious reactions

31. **Huge Swelling with DTaP:**
  - A huge swelling of the entire thigh or upper arm can follow the 4th or 5th dose of DTaP in 3% of children.
  - A large swelling over 4 inches (10 cm) occurs in 5% of children with thigh injections (13% for arm injections).
  - The area of redness is smaller.
  - Most children can still move the arm or leg normally.
  - The large thigh or upper arm swelling resolves without treatment by day 3 (60%) to day 7 (90%).
  - There are no complications. This is not an allergy nor an infection.
  - Future DTaP vaccines are safe to give.
32. **Reassurance and Education - Widespread Hives:**
  - The onset of hives or itching elsewhere on the body may or may not be an allergic reaction.
  - Your child's doctor will help you answer that question.
  - In the meantime, we can treat the hives at home.
33. **Benadryl:**
  - Give Benadryl (OTC) 4 times per day for hives, swelling or itching (See Dosage table). Teens 50 mg/dose
  - Note: If the caller only has another antihistamine at home, use that.
  - Continue the Benadryl 4 times per day until the hives are gone for 12 hours.
34. **Benadryl For 6-12 Month Infants:**
  - General: Benadryl not recommended under 1 year (Reason: a sedative).
  - **Exception:** use for serious allergic reactions or widespread hives.
  - Dosage: 1/2 tsp or 2.5 ml of liquid Benadryl (12.5 mg/5 ml) every 8 hours for 2 doses.
  - If weight over 20 lbs, use the dosage chart.
35. **Cool Bath for Hives:**
  - Give a cool bath for 10 minutes to relieve itching. (Caution: avoid causing a chill.)
  - Rub very itchy areas with an ice cube for 10 minutes.
36. **Local Cold for Face Swelling:**
  - Apply ice wrapped in a wet washcloth to the swollen area for 20 minutes.
37. **Note to Triager - Call 911 If:** (Discuss only if current time is less than 2 hours since the vaccine)
  - Develops difficulty breathing or swallowing
  - Faints or becomes too weak to stand
38. **Call Back If:**
  - Severe hives or severe itching lasts over 24 hours on continuous Benadryl
  - Your child becomes worse
39. **Normal Vaccine Reactions in Young Babies:**
  - Pain, tenderness, swelling or redness at the injection site is NORMAL (in 25%). It means the vaccine is working. Redness does not mean there's any infection. It should start to improve in a few days.
  - Fever (in 22%). This low-grade fever is harmless and means the vaccine is working. It will go away in 24 to 48 hours. For low grade fevers 100-102 F (37.8 to 39 C), do not give fever medicines. Reason: Research has shown these meds may reduce the body's normal immune response.

40. **Vaccine Injection Site Redness - Treatment:**
- Some redness at the injection site is NORMAL. It means the vaccine is working. Redness does not mean there's any infection.
  - **Heat:** For redness and pain, apply a heating pad or a warm wet washcloth to the area for up to 20 minutes. Repeat as needed. Reason: warmth will increase blood flow to the area. It will also speed up healing.
  - **Itchy Injection Site:** If very itchy, can apply a 1% hydrocortisone cream OTC twice daily as needed.
  - Note to Triager: Itchiness suggests a normal reaction.
41. **Call Back If:**
- Fever above 102 F (39 C)
  - Fever lasts over 48 hours
  - Redness gets worse after 3 days
  - Redness becomes larger than 2 inches (5 cm)
  - Your baby starts to act sick or abnormal (e.g., poor suck, not alert)
42. **Rabies Vaccine:**
- Several brands of rabies vaccine are available.
  - Reactions may vary between brands.
  - Rabies shots are given on days 0, 3, 7, and 14 following exposure.
43. **Rabies Vaccine - Common Reactions:**
- Pain, redness, swelling or tenderness at the injection site (in 20% adults).
  - Malaise, nausea, headache, abdominal pain, dizziness, muscle aches (in 15% adults).
  - These reactions are uncommon in children.
44. **COVID-19 Vaccines - Efficacy and Safety Questions:**
- **Vaccine Efficacy:** All the vaccines approved by the FDA for use in the US are highly effective at preventing COVID-19. The protection against getting the new variants has gone down some, but most people have mild symptoms or none. The vaccines continue to prevent serious symptoms, complications and the need for hospital or ICU admission, even for the variants. They are much more effective than flu vaccines.
  - **Other Major Benefits:** Vaccines also prevent the rare serious delayed onset complications from COVID-19 infections that can occur in some unlucky people. One example is multisystem inflammatory syndrome in children (also called MIS-C). Another is "long hauler" symptoms (such as brain fog or chronic breathing problems). Key: Vaccines prevent death from COVID-19 infections.
  - **Vaccine Safety:** Very safe. Most people get a sore arm for a few days. About half get some general symptoms for about 24 hours, such as feeling tired and achy. A smaller number have a fever. These are the normal side effects seen with most vaccines and they go away quickly. They show your immune system is working. Serious reactions are extremely rare.
  - **Blood Clot Concerns:** Very rare. Occur in about 1 person per million vaccinated people. Blood clots occur much more commonly in people who get the natural COVID-19 infection. (Note: have NOT occurred with Moderna or Pfizer vaccines)
  - **Myocarditis Concerns:** Myocarditis is inflammation of the heart muscle. Main symptoms are chest pain and shortness of breath. Very rare side effect of the COVID-19 vaccines. Occurs in about 6 per million vaccinated people. Mainly in teen or young adult males. Myocarditis occurs much more commonly in people who get the natural COVID-19 infection. Plus it is more severe in them. (CDC June 2021)
  - **Best Vaccine:** Any vaccine approved by the FDA is highly effective and safe. Get the first one that becomes available to you, the caller. They will protect you and your family.

45. **COVID-19 Vaccines - Protection Questions:**
- **Start of Vaccine Protection:** Full protection is reached about 2 weeks after you complete the vaccine series.
  - **Duration of Vaccine Protection:** Research data has confirmed that protection is still high at 6 months after completing the vaccine series (April 2021). Experts predict the protection may last for 12 months or longer, but we need to wait for more data.
  - **Booster Shots:** Experts predict we may need them yearly, just like flu vaccine boosters. Ongoing studies will tell. The CDC now recommends a booster shot for people with weak immune systems. (August 2021).
  - **COVID-19 Variants and Vaccine Protection:** For now, the current vaccines protect against the current variants in the US. The vaccinated person usually does not get infected. If they do, they develop either a mild illness or an asymptomatic infection. They are protected against serious symptoms and any complications. By contrast, natural immunity does not protect against some of the variants.
  - **Re-infections:** Reinfections can occur after natural infections. Vaccination provides much better protection against future infections.
  - **Quarantine after Exposure:** If you are vaccinated and 2 weeks have passed since your final dose, you do not have to quarantine for 10 days after close contact with a COVID-19 infected person. However, fully vaccinated people should get tested 3 to 5 days after an exposure to COVID-19. You should also wear a mask (for 14 days), when you are around other people, until you know that your test result is negative.
46. **COVID-19 Vaccines - Special Patient Questions:**
- **Children and Teens:** Currently approved for 12 years and older. Results: strong protection and also safe (normal side effects). Trials on children younger than 12 years have started (June 2021). Importance: while most children have mild or asymptomatic infections, they can get rare complications such as MIS-C. Also, they can innocently transmit the disease to others.
  - **Pregnant Women:** Vaccines are approved and safe.
  - **Breastfeeding Mothers:** Vaccines are approved and safe. Studies show that breastmilk passes antibody protection against COVID-19 to the baby.
  - **Underlying High Risk Conditions:** Vaccines are approved and safe. These patients need the vaccine protection the most. If you have questions about a specific condition, discuss with your doctor.
  - **Person Already had the Disease:** Get the vaccine. It provides higher levels of antibodies and better protection than the natural disease. Restriction: not approved until you are over any acute symptoms and the 10 days of isolation have passed.
  - Go to CDC website for other questions: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines>.
47. **BCG vaccine for Tuberculosis (TB) Reactions:**
- A vaccine used to prevent TB in high risk groups or countries. Not used in the US or most of Canada. Note: This is different than the PPD skin test to detect TB.
  - Given into the skin of the right shoulder area.
  - Timing: Mainly given to infants and young children.
  - Normal reaction: After 6 to 8 weeks a blister forms. It gradually enlarges and eventually drains a whitish yellow liquid. The blister then heals over leaving a scar. The raised scar is proof of BCG protection.
  - Abnormal reaction: Abscess (infected lump) occurs in the shoulder or under the arm. Occurs in 1% of patients.
48. **Call Back If:**
- Blister turns into a large red lump
  - Lymph node in the armpit becomes large

49. **Pre-Dosing Questions with a Fever Medicine - Not Recommended:**
- Giving a fever or pain medicine before getting a vaccine is not advised.
  - Reason: Only 25% of children will develop a fever. Also only 25% of children will develop a painful injection site. There's no point in treating every child.
  - Fever medicine is usually not needed. Consider only if the fever goes above 102 F (39 C) and your child is uncomfortable. Lower fevers help the body's immune system build antibodies.
  - If given, do not repeat the dose at regular intervals. Give only if needed.
  - Exception: Rarely, a child may have had a previous severe vaccine reaction and your child's doctor may recommend pre-dosing. Talk with your child's doctor about this before a repeat vaccine.
50. **Call EMS 911 Now:**
- Your child needs immediate medical attention. You need to hang up and call 911 (or an ambulance).
  - Triager Discretion: I'll call you back in a few minutes to be sure you were able to reach them.
51. **Go To ED Now:**
- Your child needs to be seen in the Emergency Department immediately.
  - Go to the ED at \_\_\_\_\_ Hospital.
  - Leave now. Drive carefully.
52. **Go To ED Now (or PCP Triage):**
- **If No PCP (Primary Care Provider) Second-Level Triage:** Your child needs to be seen within the next hour. Go to the ED/UCC at \_\_\_\_\_ Hospital. Leave as soon as you can.
  - **If PCP Second-Level Triage Required:** Your child may need to be seen. Your doctor (or NP/PA) will want to talk with you to decide what's best. I'll page the on-call provider now. If you haven't heard from the provider (or me) within 30 minutes, go directly to the ED/UCC at \_\_\_\_\_ Hospital.
53. **See HCP Within 4 Hours (or PCP triage):**
- **If Office Will Be Open:** Your child needs to be seen within the next 3 or 4 hours. Call your doctor's (or NP/PA) office as soon as it opens.
  - **If Office Will Be Closed and No PCP (Primary Care Provider) Second-Level Triage:** Your child needs to be seen within the next 3 or 4 hours. A nearby Urgent Care Center (UCC) is often a good source of care. Another choice is to go to the ED. Go sooner if your child becomes worse.
  - **If Office Will Be Closed and PCP Second-Level Triage Required:** Your child may need to be seen. Your doctor (or NP/PA) will want to talk with you to decide what's best. I'll page the on-call provider now. If you haven't heard from the provider (or me) within 30 minutes, call again. **Note:** If on-call provider can't be reached, send to UCC or ED.
- Note to Triager:**
- Use nurse judgment to select the most appropriate source of care.
  - Consider both the urgency of the patient's symptoms AND what resources may be needed to evaluate and manage the patient.
- Sources of Care:**
- **ED:** Patients who may need surgery or hospital admission need to be sent to an ED. So do most patients with serious symptoms or complex medical problems.
  - **UCC:** Some UCCs can manage patients who are stable and have less serious symptoms (e.g., minor illnesses and injuries). The triager must know the UCC capabilities before sending a patient there. If unsure, call ahead.
  - **OFFICE:** If patient sounds stable and not seriously ill, consult PCP (or follow your office policy) to see if patient can be seen NOW in office.

54. **See PCP Within 24 Hours:**
- **If Office Will Be Open:** Your child needs to be examined within the next 24 hours. Call your child's doctor (or NP/PA) when the office opens and make an appointment.
  - **If Office Will Be Closed:** Your child needs to be examined within the next 24 hours. A clinic or an urgent care center is often a good source of care if your doctor's office is closed or you can't get an appointment.
  - **If Patient Has No PCP:** Refer patient to a clinic or urgent care center. Also try to help caller find a PCP (medical home) for future care.
- Note to Triager:**
- Use nurse judgment to select the most appropriate source of care.
  - Consider both the urgency of the patient's symptoms AND what resources may be needed to evaluate and manage the patient.
55. **See PCP Within 3 Days:**
- Your child needs to be examined within 2 or 3 days.
  - **PCP Visit:** Call your doctor (or NP/PA) during regular office hours and make an appointment. A clinic or urgent care center are good places to go for care if your doctor's office is closed or you can't get an appointment. **Note:** If office will be open tomorrow, tell caller to call then, not in 3 days.
  - **If Patient Has No PCP (Primary Care Provider):** Try to help caller find a PCP for future care (e.g., use a physician referral line). Having a PCP or "medical home" means better long-term care.
56. **See PCP Within 2 Weeks:**
- Your child needs an evaluation for this ongoing problem within the next 2 weeks.
  - **PCP Visit:** Call your child's doctor (or NP/PA) during regular office hours and make an appointment.
  - **If Patient Has No PCP (Primary Care Provider):** A primary care clinic is where you need to be seen for chronic health problems. **Note:** Try to help caller find a PCP (e.g., use a physician referral line). Having a PCP or 'medical home' means better long-term care.
58. **Home Care:**
- You should be able to treat this at home.
59. **Call PCP Now:**
- You need to discuss this with your child's doctor (or NP/PA).
  - I'll page the on-call provider now. If you haven't heard from the provider (or me) within 30 minutes, call again.
60. **Call PCP Within 24 Hours:**
- You need to discuss this with your child's doctor (or NP/PA) within the next 24 hours.
  - **If Office Will Be Open:** Call the office when it opens tomorrow morning.
  - **If Office Will Be Closed:** I'll page the on-call provider now. Exception: From 9 pm to 9 am. Since this isn't urgent, we'll hold the page until morning.
61. **Call PCP When Office Is Open:**
- You need to discuss this with your child's doctor (or NP/PA) within the next few days.
  - Call the office when it is open.

80. **Reassurance and Education - Extra Dose Given:**
- Receiving an extra dose of vaccine is safe and harmless.
  - The most that could happen is that your child will have the normal symptoms that sometimes follow that vaccine.
81. **Typhoid (shot) Vaccine - Common Harmless Reactions:**
- Mild redness and swelling at the injection site (in 7%)
  - Fever (in 1%)
  - Headache (in 1%)
82. **Other Common Harmless Vaccine Reactions in Young Babies - Treatment:**
- *Fussiness:* Younger children may be more fussy than normal. They need extra holding and comforting. If your baby's fussiness interferes with sleeping or feeding, give a dose of acetaminophen. If needed, it can be repeated every 4 to 6 hours. Don't use for more than 24 hours (See Dosage table). Reason: Pain medicines may reduce the body's normal immune response to the vaccine.
  - *Tiredness:* Encourage your baby to sleep. Reason: The body needs all its energy going towards building antibodies against the vaccine.
  - *Redness or Pain around Injection Site:* For redness or pain around the injection site, apply a warm wet washcloth to the area for up to 20 minutes. (Caution: Avoid burns). You can also use a warm bath. Gently massage around the injection site. Reason: will increase blood flow to the area. Repeat a few times a day for the first few days. Try not to give any pain medicines for local reactions around the injection site.
83. **Typhoid (oral) Vaccine - Common Harmless Reactions:**
- Fever or headache (in 5%)
  - Abdominal discomfort, nausea or vomiting less commonly
84. **Call Back If:**
- Fever lasts over 3 days
  - Your child becomes worse
85. **Reassurance and Education - Normal Reactions:**
- Vaccines protect us against serious diseases.
  - Having some temporary symptoms from the shot is normal.
  - The symptoms mean the vaccine is working. They mean your immune system is building antibodies against the vaccine. The antibodies will protect you against the real disease.
  - These brief side effects do not cause any risks to your health
  - There is no need to see your doctor for normal reactions, such as pain, swelling, redness or fever.
86. **Reassurance and Education - Unusual Local Reaction:**
- Local reactions at the injection site are common and mean the vaccine is working. What you describe is more than the average injection site reaction.
  - However, it's still probably normal. (Reason: infections at vaccine injection sites are extremely rare).
  - Your doctor's office will decide if your child needs to be seen.
87. **Reassurance and Education - Prolonged General Symptoms:**
- Feeling a little sick for a day or so after getting a vaccine is normal.
  - What you describe is lasting a little longer than the average reaction.
  - Your child needs to be examined to rule out any other causes of the symptoms.



88. **Call Back If:**

- Fever lasts over 3 days
- New fever starts 48 hours after the shot
- Your child becomes worse

89. **Vaccine Concerns And Worries - Questions About:**

- Importance: Vaccines are the most powerful tool we have to prevent serious infections such as meningitis. With increasing antibiotic resistance, vaccines are becoming even more important.
- The AAP and CDC encourage universal vaccination of all children.
- Perspective: 99% of doctors and nurses protect their own children with vaccines.
- Autism: Vaccines are safe and do not cause autism. The autism-vaccine connection has been completely disproven. Autism is probably a genetic disorder.
- Thimerosal: It has been removed from all vaccines. After its removal, the autism rate did not change.
- Outbreaks: Most outbreaks of preventable infection occur in unvaccinated children (such as whooping cough or measles).
- Getting your child vaccinated can be a life-saving decision.
- If you have other questions about vaccines, talk with your child's doctor during office hours or go to [www.cdc.gov/vaccines](http://www.cdc.gov/vaccines)

90. **Call Back If:**

- You have other questions or concerns

**FIRST AID**



N/A

**BACKGROUND INFORMATION**

**Types of Reactions**

- **Local Injection Site Reaction:** Most local swelling, redness and pain at the injection begins within 24 hours of the shot (rarely 24 to 48 hours.) Usually lasts 2 or 3 days. Occasionally, localized hives or itching occurs at the injection site. They usually last less than 24 hours. Localized hives do not mean your child is allergic to the vaccine.
- **Systemic (General) Reaction:** Fever with vaccines (e.g., DTaP) usually begins within 24 hours (sometimes starts between 24-48 hours). Headache, myalgias, malaise and poor appetite can also be seen. Systemic symptoms usually last 1 to 2 days. Exception: With live vaccines (MMR and chickenpox), fever and systemic reactions usually begin between 1 and 4 weeks later.
- **Anaphylactic Reaction:** Anaphylactic reactions can occur with any vaccine but they are very rare (1:500,000). In addition, they usually start while the child is still in the office where the injection was given, so calls about them are extremely rare.

**DTaP Vaccine - Local Swelling and Redness can be Severe but Harmless**

- It's important to understand DTaP reactions because DTaP is given as part of most shot visits ( 2, 4, 6, 12-18 mo and 4-6 years). Also, it causes the largest local reactions.
- The new acellular pertussis vaccine in DTaP causes substantially less systemic reactions (e.g., fever) than the whole cell pertussis vaccine used in the past (25% vs 50%).
- The frequency of local reactions (redness, swelling, tenderness) has also improved (25% vs 50%).
- Sometimes huge swelling and redness of the entire thigh or upper arm in which the shot was given follows the 4th or 5th dose of DTaP (3%).

- Large swelling over 4 inches (10 cm) occurred 5% with injections in the thigh and 13% with injections in the arm. The size of redness was smaller.
- This large swelling resolves by day 3 (60%) to day 7 (90%).
- Severe limb swelling with the 4th dose of DTaP (at 12 to 18 months of age) is not a contraindication for giving the 5th dose at school entry (4 to 6 years). (AAP Red Book).

### **Redness at the Injection Site (Normal Vaccine Reaction) - Rarely Cellulitis**

- Local vaccine reactions are normal and a good sign that the vaccine is working.
- Bacterial superinfections (e.g., cellulitis, lymphangitis, abscess) at the injection site are extremely rare. Abscesses are more common than cellulitis. In the 1993 report by Simon, 8 out of 9 abscesses required surgical drainage. These were caused by nonsterile vaccine injections contaminated with Group A Strep bacteria. To further document how rare bacterial cellulitis is following a vaccine, there have been no culture confirmed cases of vaccine associated bacterial cellulitis reported in the medical literature in over 20 years. UpToDate lists vaccine reactions as a masquerader of cellulitis and not as a potential cause. (April 2021 access).
- Clues from Appearance: Local vaccine reactions usually are blotchy red with indistinct borders. Vaccine reactions also are usually mildly tender, sometimes itchy. Cellulitis usually has confluent spreading redness with sharp borders. It also is very tender to the touch.
- Clues from Size of Redness: Redness over 1 inch (2.5 cm) for the first 3 DTaP doses occurs in less than 1% of children. Redness over 2 inches (5 cm) after dose 4 occurs in 3% and after dose 5 in 15%. All of these are normal vaccine reactions, not bacterial cellulitis. (Data from DAPTACEL package insert)
- Clues from Onset: Redness and fever from a vaccine reaction usually begins within 24 hours following the shot (rarely 24-48 hours). Redness and fever from a bacterial infection usually begins more than 48 hours after the shot (Reason: it takes time for the bacteria to become established and multiply).
- Clues from Duration: Redness that is getting worse after 72 hours also could mean that a bacterial infection has occurred. However, this has been reported as a normal finding after COVID-19 vaccine. It's been called "COVID arm".
- Reassurance if No Redness: Huge swelling without redness is always an atypical vaccine reaction. Cellulitis always has redness.
- Unproven Theory: Excessive redness may occur when an IM vaccine is injected SC rather than IM.

### **Muscle Pain and Site of Vaccine Injection**

- Most vaccines are given intramuscular (IM). Part of the local reaction is muscle pain.
- Most shots are given into the vastus lateralis muscle (anterior-lateral thigh). Muscle pain in this site can cause a painful gait (limp). Having the needle touch the femur may contribute.
- After 5 years old, some shots can be given into the deltoid muscle. Muscle pain in this site can cause painful use of the shoulder. Local reactions are worse in the deltoid muscle than the thigh.
- Most muscle pain and limp resolves in 3 to 5 days.

### **Limp Severity Scale**

- **Mild:** intermittent painful gait
- **Moderate:** constant painful gait
- **Severe:** can't or won't walk

### **Vaccine Injection Site Redness and Pain: Advice to Apply Heat Rather than Cold** (Author's reasoning to support this care advice change)

- This guideline now recommends applying warm compresses or a heating pad for local vaccine reactions. This advice applies to local reactions from all injected vaccines. Reason: The goal is to increase blood flow to the injection site. Blood brings lymphocytes and other immune helpers. Warmth

may speed up the release of the vaccine into the lymphatic system, making it less concentrated at one site. Heat speeds healing of inflamed tissues.

- Boils and Cellulitis: Skin infections are examples where applying heat is standard advice.
- Sports Injuries and Ice: The advice to treat with ice or cold compresses comes from how sports injuries are generally treated. But injuries are different. Usually there is some bleeding and cold is thought to prevent the bleeding from recurring. Injuries cause muscle or other tissue damage. Cold is thought to reduce swelling of the damaged tissue. Neither of these reasons apply to vaccine injections. In addition, sports medicine specialists and athletic trainers recommend switching to heat after the first 24 to 48 hours to speed healing.
- Research: There is no study comparing the application of heat versus cold for local vaccine reactions. Facts from pathophysiology and the normal inflammatory response would support the use of heat.
- Physician Preferences: If the caller states that their PCP recommends treating with cold, the triage nurse should support the PCP's preferred advice. Also, office-based pediatricians and call center medical directors can customize the care advice in this guideline for their facility.

### **Consultants for Heat versus Cold for Vaccine Injection Reactions:**

This approach of applying heat to local vaccine reactions was reviewed and is supported by the following vaccine specialists:

- Paul Offit MD, Professor of Pediatrics, pediatric infectious disease specialist, medical director of the Vaccine Education Center at Children's Hospital of Philadelphia.
- Sean O'Leary MD, Professor of Pediatrics, pediatric infectious diseases specialist, Children's Hospital Colorado, and Vice Chair of the Committee on Infectious Diseases, American Academy of Pediatrics

### **Frequency of Fevers in Young Babies Following the First Vaccines**

- Fevers that occur after immunizations during the first 12 weeks of life can present a dilemma for the telephone triager (Reason: fevers at this age are usually referred in for evaluation)
- These fevers usually have an onset within 24 hours after the vaccine (rarely 48 hours)
- The first series of vaccines can be given between 6 and 8 weeks old.
- DTaP vaccine causes a fever in 8% of 2 month olds (Note: from 4 m.o. onward , it causes a fever in over 20% of children)
- The first Hib vaccine causes a fever in 15% of infants
- The first Pneumococcal vaccine causes a fever in 15% of infants
- The first Hepatitis B vaccine causes a fever in 3% of infants
- When these 4 vaccines are given together as a first dose, a fever occurs in 22% of infants
- Source: Lederle Laboratories data and vaccine package inserts

### **Management of Fevers in 6 to 8 Week Olds Following the First Vaccines**

- The following recommendations come from a survey of 10 pediatric groups in Denver (August 2007)
- See all of these infants: none
- See selected infants: 100%, but criteria varied
- RISK FACTORS for SEPSIS: Criteria for seeing these infants urgently include baby acts sick or abnormal (e.g., poor suck, decreased movement, not alert, abnormal breathing), systemic symptoms occur (e.g., vomiting), high risk newborn (preterm or on oxygen), Hep B was only vaccine given, fever begins over 24 hours after vaccine injection, fever above 102 F (39 C), fever lasts over 48 hours.
- The infants who act normal, are feeding adequately, and have consolable fussiness don't need to be seen. They can receive acetaminophen for their injection pain or fevers if the triage nurse thinks it is necessary.
- Some call centers may decide to put all these calls back to the PCP. However, sending in all infants under 12 weeks old with a fever following a vaccine would be over-referral and a disservice to parents

(Reason: occurs in 22% of infants and co-payments are expensive).

### **Fever Definitions in Age < 12 Week Old Infants Following Vaccines**

- Rectal temperature > 100.4 F (38.0 C)
- Axillary temperature > 99 F (37.2 C), but rectal temperatures always preferred (Reason: axillary often inaccurate). If baby looks well and it's convenient to take a rectal temperature, have caller do so.
- EXCEPTION in this guideline: Axillary temp > 101 F (38.3 C). Either have the caller take a rectal temperature or just see the child with the triage question, "Age under 12 weeks old AND fever over 102 F (39 C) rectally following vaccine").
- Comment: Most studies define fever as 100.4 F (38.0 C) or higher in this age group. The safest approach includes 100.4 F (38.0 C) in referrals for evaluation.

### **Severe Vaccine Reactions: Very Rare and Only Discuss as Needed**

- Caution to Triager: Do not discuss potential RARE serious reactions with most callers.
- Reason: discussing them with callers may cause or increase vaccine hesitancy or refusal.
- They are purposely listed here in Background Information rather than in Care Advice. Reason: to prevent inexperienced triagers from inadvertently bringing them up with the caller.
- If the caller specifically asks about severe allergic reactions, honestly state that they are very rare. (See below)
- As for completely disproven adverse side effects, be a vaccine advocate. The big one is the myth that the measles vaccine can cause autism. Extensive research has totally disproven any association.
- If they want more details, suggest they call their PCP during office hours.
- Source for severe vaccine reactions: AAP Red Book and CDC

### **Anaphylactic Reactions from Vaccines - Rare Adverse Reaction**

- A severe life-threatening reaction is called anaphylaxis.
- Most serious anaphylactic reactions to vaccines occur in a physician's office because it's standard practice to observe the child for 20 minutes following injection of a vaccine. Because they usually start within that timeframe, calls about them are even more unlikely.
- Anaphylactic reaction (acute severe allergic reaction with wheezing, urticaria, shock) can occur with most vaccines. However, they are very rare.
- Incidence is 1 per 500,000 doses of vaccine.
- Such reactions are usually caused by vaccine stabilizers (gelatin) or vaccine components (egg protein), rather than the infectious agent in the vaccine.
- Egg protein is in the influenza vaccine. MMR does not contain significant amounts of egg cross-reacting proteins. Children with egg allergy can receive the MMR vaccine, without any need for prior skin testing. They should receive the influenza vaccine in a medical setting if they ever had an anaphylactic reaction to eggs.
- Vaccines that contain gelatin are MMR, varicella, DTaP, and influenza.
- Gelatin-induced anaphylaxis (very rare) requires strict avoidance of many foods that contain gelatin (e.g., ice cream, yogurt, gel desserts, frostings).
- Reference: Bohlke, K. Pediatrics, 2003.

### **Chickenpox Vaccine - Rare Adverse Reactions**

- Possible association with Guillain Barre Syndrome, ataxia, neuropathy, seizures, encephalitis, pneumonia and thrombocytopenia.
- These adverse events are most likely coincidental and not causal.

### **COVID-19 Vaccines - Rare Adverse Reactions**

- Severe allergic reactions with the COVID-19 vaccine are very rare. Moderna vaccine: 2.5 cases per

million doses. Pfizer vaccine: 11 cases per million doses. (CDC report, January 2021)

- Onset: Severe allergic reactions usually occur within 20 minutes after getting the vaccine injection.
- **Blood Clot Concerns:** Very rare. Occur in about 1 person per million vaccinated people. Blood clots occur much more commonly in people who get the natural COVID-19 infection. (Note: have NOT occurred with Moderna or Pfizer vaccines)

### **DTaP Vaccine - Rare Adverse Reactions**

- Rare systemic reactions include severe inconsolable crying lasting over 3 hours (1 per 100 doses) or a shock-like state called hypotonic-hyporesponsive episode (1 per 1750 doses).
- The above rates were seen with the DTP vaccine. The rates are far lower with DTaP vaccine.
- These systemic reactions are attributed to the Pertussis component of the vaccine and are not seen with the DT (Diphtheria-Tetanus) vaccine alone.
- Long-term follow-up of children who had severe systemic reactions (other than anaphylaxis) found no neurological damage or other complications (sequelae).
- Seizures occur rarely (1 per 1750 doses) and are usually simple fever-related seizures.

### **Influenza Vaccine - Rare Adverse Reactions**

- Rare association with Guillain Barre Syndrome (1-2 cases per million doses of vaccine) is more likely coincidental than causal.

### **Measles Vaccine - Rare Adverse Reactions**

- Rare association with encephalitis and encephalopathy is more likely coincidental than causal.
- Temporary low platelet count (1 in 30,000 vaccine doses).
- The MMR vaccine does not cause autism.

### **Rabies Vaccine - Rare Adverse Reactions**

- Serum sickness reaction occurs in 6% of adults. It causes hives, joint pain and fever. Onset after 7 to 14 days. Treated with oral steroids.
- Illness resembling Guillain-Barré Syndrome, with complete recovery in 12 weeks. Very rare and probably coincidental; not caused by the vaccine.

### **Typhoid Vaccine - Rare Adverse Reactions**

- Low blood pressure (rare)
- Chest pain (rare)

### **Non-Immunized or Under- Immunized Children with a Fever: Doesn't Change Triage**

- In 2011, 2% of US parents refused all vaccines and 10% postponed some vaccines until the child is older. (Dempsey, Pediatrics 2011)
- Some physicians recommend that “nurses should routinely ask about immunization status on every phone call where the child has a fever”. I disagree with this suggestion for the following reasons:
  - The immunization status does NOT change after-hours or office-hours telephone triage about which febrile children need to be seen. Serious symptoms and specific disease complications are thoroughly covered in all guidelines. Nurses also can always opt to bring in a child who sounds seriously ill based upon their professional judgment.
  - The immunization status, however, may impact the medical work-up of a child who is being evaluated within the office or ED setting. It may change the differential diagnoses for the child's symptoms or what testing might be needed for a febrile child.
  - Our main concern is children who have not received their “Meningitis” vaccines (Pneumo, Hib and Meningococcal vaccines). Their risk for sepsis, meningitis, pneumonia and other SBI is higher. The

guidelines, however, are already structured to detect symptoms of these serious diseases and to send positive children in for evaluations. In addition, even though the bacteremia rate has gone down with vaccines, the guideline continues to include a question for detecting bacteremia, in children who have no symptoms except fever. (See Acute Fever Without a Source in the Background Information of the Fever guideline).

- The main scenario in which knowing the immunization status becomes a factor in telephone triage is for tetanus-prone wounds. Under-immunized children are covered in every Injury guideline with triage questions.
- Any child with a measles-like rash is seen whether or not they have received the MMR vaccine. Likewise, any child with varicella complications is seen whether or not they have received the Varicella vaccine.
- Any child with suspected influenza is seen if they develop any signs of complications (e.g. work of breathing or signs of dehydration), whether or not they have received the influenza vaccine
- Trying to cover over the telephone which immunizations the child may or may not have received, can be time-consuming (adding unnecessary time per call and something a parent may not automatically know without looking at a child's immunization record). For the majority of calls, this added time will not change the disposition of the call and is largely non-essential to phone triage.
- For practices that have a different view, the call center may need to develop a separate policy for detecting and managing their partially and non-immunized children.

### **Prophylactic Acetaminophen Causes Reduced Vaccine Response - AVOID**

- In 2009, a Czech Republic study looked at prophylactic acetaminophen administration after vaccinations. (Pyrmula 2009)
- The study included 460 healthy children 9-16 weeks and 12-15 months receiving booster vaccinations.
- Children were randomly assigned to 2 groups: those who were given acetaminophen in 3 doses during the 24 hours post-vaccine versus no post-vaccine antipyretic treatment.
- Blood samples were drawn to determine the immunogenicity of vaccinations at 1 month after the injection.
- The study concluded that acetaminophen led to reduced immunogenic responses regardless of the presence of fever.
- In 2018, an Australian study on 3300 children confirmed the Czech study results. Children who received antipyretics after an influenza vaccine had a lower antibody response. (Li-Kim-Moy, *Pediatr Infect Dis J*, 2018).
- Application: This Immunization Reaction guideline has never recommended giving antipyretics prophylactically before receiving vaccines. Antipyretics are only recommended for fever over 102 F or for severe pain following immunizations. Furthermore, it is only recommended as needed based on symptoms, not dosed at regular intervals.
- Summary: No national organization (e.g., the AAP) has changed their recommendations for pre- or post-immunization care based on these 2 studies. For now, this guideline is in compliance with the findings. More research is needed to further confirm that these findings are valid and clinically important.

### **Extra Dose of a Vaccine by Mistake**

- Receiving an extra dose of vaccine is safe and harmless.
- The most that could happen is that the child will have the normal symptoms that sometimes follow that vaccine.

### **Vaccine Information Statements from the CDC**

Vaccine Information Statements (VIS) are information sheets produced by the Centers for Disease Control and Prevention (CDC) that explain to vaccine recipients the benefits and risks of a vaccine. U.S. federal law requires that a VIS be handed out at the time certain vaccinations are administered. Each VIS is available for viewing and downloading on the internet at:

<http://www.cdc.gov/vaccines/hcp/vis/index.html>. Refer callers to the CDC website for detailed fact sheets for each specific type of vaccine.

### **Matching Pediatric Handouts for Callers**

Printed home care advice instructions for patients have been written for this guideline. If your software contains them, they can be sent to the caller at the end of your call. Here are the names of the pediatric handouts that relate to this topic:

- Vaccine Reactions - Normal
- Vaccine Concerns - You're Undecided
- Vaccines - Infections They Prevent
- Fever - How to Take the Temperature
- Fever - Myths Versus Facts
- Acetaminophen (Tylenol) Dosage Table - Children
- Ibuprofen (Advil, Motrin) Dosage Table - Children

### **CDC U.S. National Immunization Hotline (Canada: Not applicable)**

- Trained specialists provide vaccine information; available to patients, nurses, doctors
- Open 8 AM - 8 PM EST, Monday - Friday
- Toll-Free phone number: 800-232-2522 (English)
- Toll-Free phone number: 800-232-2233 (Spanish)

### **Vaccines on the Go - a Free App from CHOP**

- This is a consumer app for vaccine facts.
- This free app answers any vaccine question a parent might have.
- It is evidence-based and up-to-date.
- Source: Children's Hospital of Philadelphia (CHOP)
- Recommend it to your worried callers.

## **REFERENCES**

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## SEARCH WORDS

BCG  
 BOOSTER  
 BOOSTER SHOT  
 CHICKENPOX VACCINES  
 COVID VACCINE  
 COVID-19 VACCINE  
 COVID-19 VACCINE REACTION  
 DIPHTHERIA VACCINE  
 DTaP  
 EXTRA IMMUNIZATION  
 EXTRA VACCINE  
 FLU  
 H1N1 VACCINE  
 HBV  
 HEMOPHILUS INFLUENZA TYPE B  
 HEPATITIS A  
 HEPATITIS B  
 HIB  
 HPV VACCINE  
 IMMUNIZATION REACTION  
 IMMUNIZATION REACTIONS  
 IMMUNIZATIONS  
 INFLUENZA VIRUS  
 INJECTION SITES  
 INJECTIONS  
 MEASLES VACCINES  
 MENINGOCOCCAL VACCINE  
 MMR  
 MUMPS VACCINE  
 OPV

PERTUSSIS VACCINE  
PNEUMOCOCCAL VACCINE  
POLIO  
POLIO VACCINES  
RABIES  
RABIES SHOTS  
RABIES VACCINE  
ROTAVIRUS  
ROTOVIRUS VACCINE  
RSV IMMUNIZATION  
RSV SHOT  
RSV VACCINE  
RUBELLA VACCINE  
SHOTS  
SWINE FLU VACCINE  
SYNAGIS  
TB  
TETANUS VACCINE  
TRAVEL  
TRAVELERS  
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