



Vaccine Administration

Pink Book Web-on-Demand Series

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Learning Objectives

- Describe the Advisory Committee on Immunization Practices General Best Practice Guidelines on Immunization.
- Describe an emerging immunization issue.
- For each vaccine-preventable disease, identify those for whom routine immunization is recommended.
- For each vaccine-preventable disease, describe characteristics of the vaccine used to prevent the disease.
- Locate current immunization resources to increase knowledge of team's role in program implementation for improved team performance.
- Implement disease detection and prevention health care services (e.g., smoking cessation, weight reduction, diabetes screening, blood pressure screening, immunization services) to prevent health problems and maintain health.

Continuing Education Information

- CE credit, go to: <https://tceols.cdc.gov/>
- Search course number: **WD4564-080322**
- CE credit expires: **July 1, 2024**
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Overview

Vaccine Administration

- **Vaccine administration involves a series of actions, including:**
 - Assessing patient vaccination status and determining needed vaccines
 - Screening for contraindications and precautions
 - Educating patients
 - Preparing and administering vaccines
 - Documenting the vaccines administered

Vaccine Administration

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 - Preparing and administering vaccines
 - Documenting the vaccines administered

Staff Training

- All health care professionals should receive comprehensive, competency-based training before administering vaccines.
- Policies should be in place to validate health care professional's knowledge of, and skills in, vaccine administration.

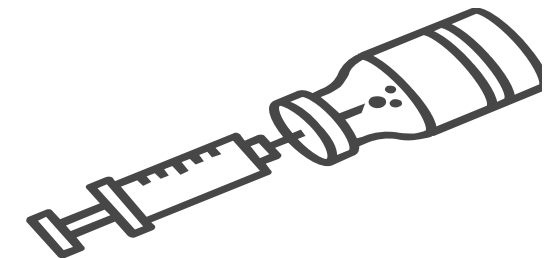
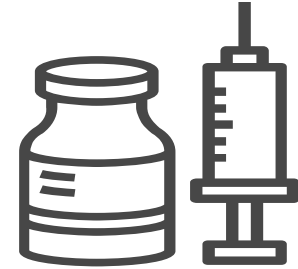


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**Vaccine
Preparation**

Vaccine Preparation Best Practices

- Perform hand hygiene before preparing vaccines.
- Follow strict aseptic medication preparation practices.
- Use a designated, clean medication area.
- Prepare medications for one patient at a time.
 - Use a new needle and syringe for each injection.



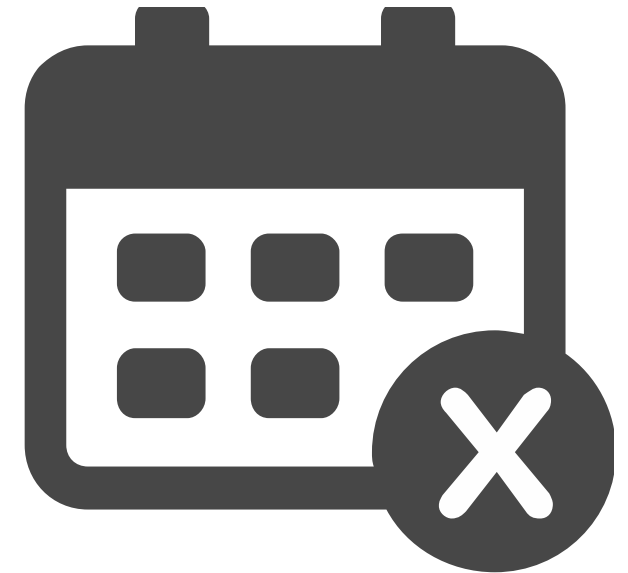
Choose the Correct Vaccine

- **Vaccines are available in different presentations, including:**
 - Single-dose vials (SDV)
 - Manufacturer-filled syringes (MFS)
 - Multidose vials (MDV)
 - Oral applicators
 - Nasal sprayer

- **ALWAYS check the label and the expiration date and/or the beyond-use date/time BEFORE preparing vaccine.**

Expiration Date

- All products have an expiration date
- The expiration date is the final day that the vaccine can be administered
- Determined by the manufacturer
- Guarantee of full potency and safety



Where to Find the Expiration Date



Month, day, and
year of expiration



Month and year
of expiration



QR Code, website, or
phone number



Month and year of
manufacture

Where to Find the Expiration Date



Month, day, and year of expiration



Month and year of expiration



QR Code, website, or phone number



Month and year of manufacture

Where to Find the Expiration Date



Month, day, and year of expiration



Month and year of expiration



QR Code, website, or phone number



Month and year of manufacture

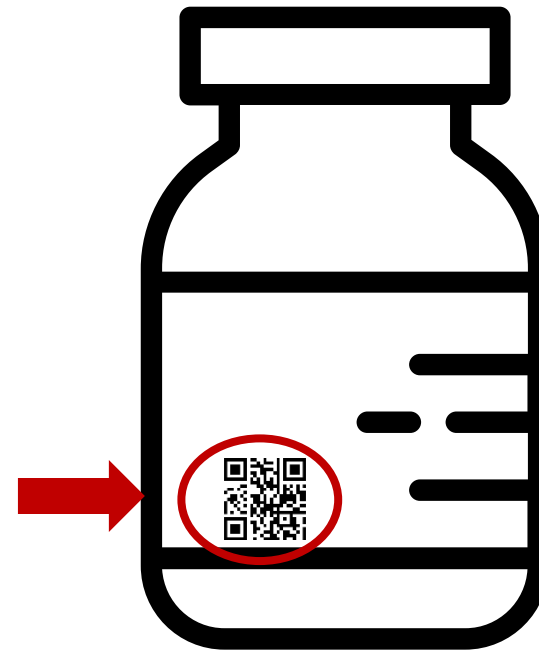
Where to Find the Expiration Date



Month, day, and
year of expiration



Month and year
of expiration



QR Code, website, or
phone number



Month and year of
manufacture

Where to Find the Expiration Date



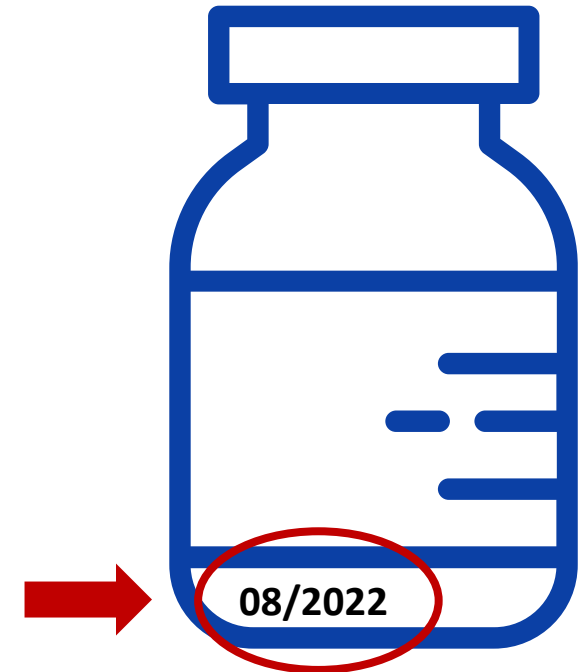
Month, day, and year of expiration



Month and year of expiration



QR Code, website, or phone number



Month and year of manufacture

What Do You Think?

- The expiration date on vial label on indicates the vaccine expires on 8/23. This vaccine should NOT be used after?
 - A. August 1, 2023
 - B. August 31, 2023
 - C. August 23, 2023



What Do You Think? Answer!

- The expiration date on vial label on indicates the vaccine expires on 8/23. This vaccine should NOT be used after?
 - A. August 1, 2023
 - B. August 31, 2023**
 - C. August 22, 2023



What is a Beyond-Use Date/Time (BUD)?

- **Date/time generated when a product is transitioned between storage states or prepared for administration**
- **Set by the provider**
- **Replaces but does not extend the expiration; always use the earlier date**
- **Only some vaccines have a BUD**

How is the BUD Calculated?

- **The designated timeframe is not the same and varies from product to product.**
- **Specific information regarding the BUD and how it is calculated can be found in the vaccine's package insert or Emergency Use Authorization (EUA) Fact Sheet.**

How is the BUD Calculated?

December 2022						
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Day 0: Punctured vial

January 2023						
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Day 28: From puncture

BUD and Vaccine Mixed with a Diluent

- Once mixed with diluent, vaccines have a limited period for use.
- The BUD can vary from minutes to hours.

Vaccines with Diluents: How to Use Them

Be sure to reconstitute the following vaccines correctly before administering them! Reconstitution means that the lyophilized (freeze-dried) vaccine powder or wafer in one vial must be reconstituted (mixed) with the diluent (liquid) in another.

- Only use the diluent provided by the manufacturer for that vaccine as indicated on the chart.
- ALWAYS check the expiration date on the diluent and vaccine. NEVER use expired diluent or vaccine.

Vaccine product name	Manufacturer	Lyophilized vaccine (powder)	Liquid diluent (may contain vaccine)	Time allowed between reconstitution and use, as stated in package insert ¹	Diluent storage environment
ActHIB (Hib)	Sanofi Pasteur	Hib	0.4% sodium chloride	24 hrs	Refrigerator
Hiberix (Hib)	GlaxoSmithKline	Hib	0.9% sodium chloride	24 hrs	Refrigerator or room temp
Imovax (RAB _{MCCV})	Sanofi Pasteur	Rabies virus	Sterile water	Immediately ¹	Refrigerator
M-M-R II (MMR)	Merck	MMR	Sterile water	8 hrs	Refrigerator or room temp
Menveo (MenACWY)	GlaxoSmithKline	MenA	MenCWY	8 hrs	Refrigerator
Pentacel (DTaP-IPV/Hib)	Sanofi Pasteur	Hib	DTaP-IPV	Immediately ¹	Refrigerator
ProQuad (MMRV)	Merck	MMRV	Sterile water	30 min	Refrigerator or room temp
RabAvert (RAB _{ECV})	GlaxoSmithKline	Rabies virus	Sterile water	Immediately ¹	Refrigerator
Rotarix (RV1) ²	GlaxoSmithKline	RV1	Sterile water, calcium carbonate, and xanthan	24 hrs	Refrigerator or room temp
Shingrix (RZV)	GlaxoSmithKline	RZV	AS01 ³ adjuvant suspension	6 hrs	Refrigerator
Varivax (VAR)	Merck	VAR	Sterile water	30 min	Refrigerator or room temp
YF-VAX (YF)	Sanofi Pasteur	YF	0.9% sodium chloride	60 min	Refrigerator or room temp
Zostavax (ZVL)	Merck	LZV	Sterile water	30 min	Refrigerator or room temp

Always refer to package inserts for detailed instructions on reconstituting specific vaccines. In general, follow the steps below.

- For single-dose vaccine products (exceptation is Rotarix), select a syringe and needle of proper length to be used for both reconstitution and administration of the vaccine. For Rotarix, see the package insert.¹
- Before reconstituting, check labels on both the lyophilized vaccine vial and the diluent to verify that
 - they are the correct two products to mix together,
 - the diluent is the correct volume, and
 - neither the vaccine nor the diluent has expired.
- Reconstitute (i.e., mix) vaccine **just prior to use** by:
 - removing the protective caps and wiping each stopper with an alcohol swab,
 - inserting needle of syringe into diluent vial and withdrawing entire contents, and
 - injecting diluent into lyophilized vaccine vial and rotating or agitating to thoroughly dissolve the lyophilized powder.
- Check the appearance of the reconstituted vaccine.
 - Reconstituted vaccine may be used if the color and appearance match the description on the package insert.
 - If there is discoloration, extraneous particulate matter, obvious lack of resuspension, or the vaccine cannot be thoroughly mixed, mark the vial as "DO NOT USE," return it to proper storage conditions, and contact your state or local health department immunization program or the vaccine manufacturer.
- If reconstituted vaccine is not used immediately or comes in a multidose vial, be sure to
 - clearly mark the vial with the date and time the vaccine was reconstituted,
 - maintain the product at 2°–8°C (36°–46°F); do not freeze, and
 - use only within the time indicated on chart above.

¹If the reconstituted vaccine is not used within this time period, it must be discarded.

²For purposes of this guidance, IAC defines "immediately" as within 30 minutes or less.

³Rotarix vaccine is administered by mouth using the applicator that contains the diluent. It is not administered as an injection.

AS01³ is composed of 3-O-deacyl-4'-methylphosphoryl lipid A (MPL) from *Salmonella minnesota* and QS-21, a saponin purified from plant extract Quilaja saponaria Molina, combined in a liposomal formulation. The liposomes are composed of dioleoyl phosphatidylcholine (DOPC) and cholesterol in phosphate-buffered saline solution containing disodium phosphate anhydrous, potassium dihydrogen phosphate, sodium chloride, and water for injection.

BUD and Vaccine in a Multidose Vial

- Some multidose vials (MDV) have a specified time frame they should be used after the vial is first punctured.
- The BUD can vary from hours to days.
- Some MDV have a specific maximum number of doses that can be withdrawn or punctures to the vial stopper.



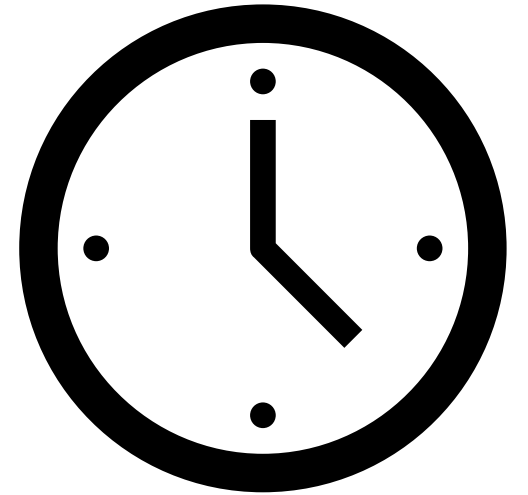
**Never use vaccine
after the
beyond-use
date/time!**

What Do You Think?

- Choose the best response:
- You are preparing a vaccine for administration and in the process, you learn:
 - Expiration date = 8/2024
 - BUD is 6 hours after the vial is first punctured which was 9:00 am today.

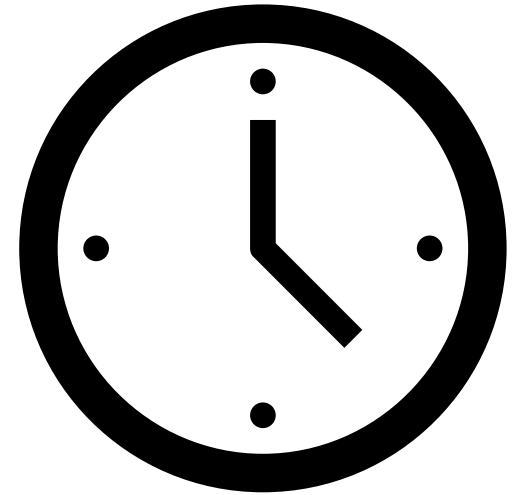
It's 5:00 pm. Can you administer this vaccine?

- A. Yes
- B. No



What Do You Think? Answer!

- Choose the best response:
- You are preparing a vaccine for administration and in the process, you learn:
 - Expiration date = 8/2024
 - BUD is 6 hours after the vial is first punctured which was 9:00 am today.



It's 5:00 pm. Can you administer this vaccine?

A. Yes

B. No

Additional Considerations for Multidose Vials

- Withdraw the indicated number of doses from the vial.
- Discard vial when there is not enough vaccine to obtain a complete dose.
- Do NOT combine residual vaccine from multiple vials to obtain a dose.



Pre-drawing Vaccines

- **Generally not recommended, but if you must**
 - Prepare at site or event in clean area
 - Separate administration stations if multiple vaccines are being offered
 - Monitor patient flow
 - Additional guidance for reconstituted vaccines

- **Best practice: Use manufacturer-filled syringes for large vaccination clinics.**

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**Vaccine
Administration**

Before Administering Vaccines

- Review the immunization history and determine needed vaccines:
 - Use recommended schedule based on the age of the patient.
- Discuss vaccine benefits and risks and vaccine-preventable disease risks using Vaccine Information Statements and other reliable resources.

[Birth-18 Years Immunization Schedule | CDC](#)

[COVID-19 Vaccine Interim COVID-19 Immunization Schedule for 6 Months of Age and Older \(cdc.gov\)](#)

[Vaccine Information Statements \(VISs\) | CDC](#)

Advanced Search

For Healthcare Providers

The COVID-19 pandemic is changing rapidly and requires different strategies to maintain clinical preventive services, including immunization. Find up-to-date guidance on [childhood](#), [adult](#), and [maternal](#) vaccination and clinical practice.

Child and Adolescent Schedule

Recommended vaccination schedule for ages 18 years or younger

Birth to 18 Years

Adult Schedule

Recommended vaccination schedule for ages 19 years or older

19 Years or Older

Additional Resources

Schedule Changes & Guidance

Download Schedules App for Healthcare Provider

Vaccination Resources for Healthcare Providers

Order Hard Copies of the Schedules

VACCINE INFORMATION STATEMENT

DTaP (Diphtheria, Tetanus, Pertussis) Vaccine: What You Need to Know

Many vaccine information statements are available in Spanish and other languages. See [www.immunize.org/vi](#)
 Hoja de información sobre vacunas está disponible en español y en muchas otras idiomas. Visite [www.immunize.org/vi](#)

- Why get vaccinated?**
 DTaP vaccine can prevent diphtheria, tetanus, and pertussis. Diphtheria and pertussis spread from person to person. Tetanus enters the body through cuts or wounds.
 - DIPHTHERIA (D) can lead to difficulty breathing, heart failure, paralysis, or death.
 - TETANUS (T) causes painful stiffening of the muscles. Tetanus can lead to serious health problems, including being unable to open the mouth, having trouble swallowing and breathing, or death.
 - PERTUSSIS (aP), also known as "whooping cough," can cause uncontrollable, violent coughing that makes it hard to breathe, eat, or drink. Pertussis can be extremely serious especially in babies and young children, causing pneumonia, convulsions, brain damage, or death. In teens and adults, it can cause weight loss, loss of bladder control, passing out, and rib fractures from severe coughing.
- DTaP vaccine**
 DTaP is only for children younger than 7 years old. Different vaccines against tetanus, diphtheria, and pertussis (Tdap and Td) are available for older children, adolescents, and adults. It is recommended that children receive 5 doses of DTaP, usually at the following ages:
 - 2 months
 - 4 months
 - 6 months
 - 15-18 months
 - 4-6 years
- Talk with your health care provider**
 Tell your vaccination provider if the person getting the vaccine:
 - Has had an allergic reaction after a previous dose of any vaccine that protects against tetanus, diphtheria, or pertussis, or has any severe, life-threatening allergies
 - Has had a coma, decreased level of consciousness, or prolonged seizures within 7 days after a previous dose of any pertussis vaccine (DTP or DTaP)
 - Has seizures or another nervous system problem
 - Has ever had Guillain-Barré Syndrome (also called "GBS")
 - Has had severe pain or swelling after a previous dose of any vaccine that protects against tetanus or diphtheria

DTaP may be given as a stand-alone vaccine, or as part of a combination vaccine (a type of vaccine that combines more than one vaccine together into one shot). DTaP may be given at the same time as other vaccines.

In some cases, your child's health care provider may decide to postpone DTaP vaccination until a future visit. Children with minor illnesses, such as a cold, may be vaccinated. Children who are moderately or severely ill should usually wait until they recover before getting DTaP vaccine. Your child's health care provider can give you more information.

COVID-19 Vaccine
Interim COVID-19 Immunization Schedule for 6 Months of Age and Older

The table below provides guidance for COVID-19 vaccination schedules based on age and medical condition. Scheduling considerations include:

- Administer the appropriate vaccine product based on the recipient's age and the product's age indications.
- COVID-19 vaccines may be administered on the same day as other vaccines.
- Doses administered at any time after the intervals outlined below are valid.

Detailed information can be found in CDC's Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States, see: [www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html](#)

Table 1. Immunization Schedule for Children 6 Months through 17 Years of Age

Type	Product*	Recipient Age	For Most People		Those Who ARE Moderately or Severely Immunocompromised	
			Doses	Interval Between Doses**	Doses	Interval Between Doses**
Moderna (Blue vial cap with magenta-bordered label)	6 months through 5 years	6 months through 5 years	Total doses: 2 doses		Total doses: 3 doses	
			Dose 1 to 2	At least 4-8 weeks*	Dose 1 to 2	At least 4 weeks
Moderna (Blue vial cap with purple-bordered label)	6 through 11 years	6 through 11 years	Total doses: 2 doses		Total doses: 3 doses	
			Dose 1 to 2	At least 4-8 weeks*	Dose 1 to 2	At least 4 weeks
Moderna	12 through 17 years	12 through 17 years	Total doses: 2 doses		Total doses: 3 doses	
			Dose 1 to 2	At least 4-8 weeks*	Dose 1 to 2	At least 4 weeks
6 months through 4 years	6 months through 4 years	6 months through 4 years	Total number: 3 doses		Total number: 3 doses	
			Dose 1 to 2	At least 3-8 weeks*	Dose 1 to 2	At least 3 weeks
5 through 11 years	5 through 11 years	5 through 11 years	Total number: 3 doses		Total number: 4 doses	
			Dose 2 and 3	At least 8 weeks	Dose 2 to 3	At least 8 weeks
12 years through 17 years	12 years through 17 years	12 years through 17 years	Total number: 3 doses		Total number: 5 doses	
			Dose 1 to 2	At least 3-8 weeks*	Dose 1 to 2	At least 3 weeks
12 years through 17 years	12 years through 17 years	12 years through 17 years	Total number: 3 doses		Total number: 5 doses	
			Dose 2 to 3	At least 5 months	Dose 2 to 3	At least 4 weeks
12 years through 17 years	12 years through 17 years	12 years through 17 years	Total number: 3 doses		Total number: 5 doses	
			Dose 3 to 4	At least 3 months	Dose 3 to 4	At least 3 months
12 years through 17 years	12 years through 17 years	12 years through 17 years	Total number: 3 doses		Total number: 5 doses	
			Dose 4 to 5	At least 4 months	Dose 4 to 5	At least 4 months

* If the vaccine product previously administered cannot be determined or is no longer available, any age-appropriate mRNA COVID-19 vaccine 28 days after the first dose. Any COVID-19 vaccine product (age appropriate) may be administered for a booster dose. † Does not need to be the same action may consider delaying a primary series or booster dose by 3 months from symptom onset or positive test if infection was asymptomatic. ‡ As has shown the small risk of myocarditis associated with mRNA COVID-19 vaccines might be reduced and peak antibody responses and vaccine interval longer than 4 weeks. An 8 week interval may be optimal for people who are not moderately or severely immunocompromised and ages 6-12 years.

Screening for Contraindications and Precautions

- Screen for contraindications and precautions every time a vaccine is given.

- Provide after-care instructions.

Screening Checklist for Contraindications to Vaccines for Children and Teens

For parents/guardians: The following questions will help us determine which vaccines your child may be given today. If you answer "yes" to any question, it does not necessarily mean your child should not be vaccinated. It just means additional questions must be asked. If a question is not clear, please ask your healthcare provider to explain it.

PATIENT NAME _____
DATE OF BIRTH _____/_____/_____

	yes	no	don't know
1. Is the child sick today?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Does the child have allergies to medications, food, a vaccine component, or latex?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Has the child had a serious reaction to a vaccine in the past?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Has the child had a health problem with lung, heart, kidneys (e.g., diabetes), asthma, or a blood disorder? Is he/she or she/it allergic to eggs or gelatin?

5. If the child to be vaccinated is 2 through 4 years of age, he told you that the child had wheezing or asthma in the past 12 months?

6. If your child is a baby, have you ever been told he or she has a seizure?

7. Has the child, a sibling, or a parent had a seizure; has the nervous system problems?

8. Does the child or a family member have cancer, leukemia, or immune system problems?

9. In the past 3 months, has the child taken medications such as prednisone, other steroids, or anticancer drugs; rheumatoid arthritis, Crohn's disease, or psoriasis; or had organ transplant?

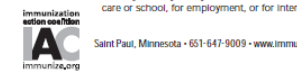
10. In the past year, has the child received a transfusion of blood or been given immune (gamma) globulin or an antiviral drug?

11. Is the child/teen pregnant or is there a chance she could be pregnant during the next month?

12. Has the child received vaccinations in the past 4 weeks?

FORM COMPLETED BY _____
FORM REVIEWED BY _____

Did you bring your immunization record card?
It is important to have a personal record of your child's immunization history. Please bring your record card to your healthcare provider to give you one with all your child's immunization history. If you do not have a record card, please bring one with you every time you seek medical care at a clinic or school, for employment, or for interstate travel.



Prevaccination Checklist for COVID-19 Vaccination

For vaccine recipients: The following questions will help us determine if there is any reason you should not get the COVID-19 vaccine today. If you answer "yes" to any question, it does not necessarily mean you should not be vaccinated. It just means additional questions may be asked. If a question is not clear, please ask your healthcare provider to explain it.

Name _____

	Yes	No	Don't know
1. How old are you?			
2. Are you feeling sick today?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Have you ever received a dose of COVID-19 vaccine? • If yes, which vaccine product(s) did you receive? <input type="checkbox"/> Pfizer-BioNTech <input type="checkbox"/> Moderna <input type="checkbox"/> Janssen (Johnson & Johnson) <input type="checkbox"/> Another Product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• How many doses of COVID-19 vaccine have you received? _____			
• Did you bring your vaccination record card or other documentation?	<input type="checkbox"/>	<input type="checkbox"/>	
4. Do you have a health condition or are you undergoing treatment that makes you moderately or severely immunocompromised? (This would include, but not be limited to, treatment for cancer; HIV; receipt of organ transplant; immunosuppressive therapy or high-dose corticosteroids; CAR-T cell therapy; hematopoietic cell transplant (HCT); or moderate or severe primary immunodeficiency.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Have you received COVID-19 vaccine before or during hematopoietic cell transplant (HCT) or CAR-T-cell therapies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Have you ever had an allergic reaction to: (This would include a severe allergic reaction (e.g., anaphylaxis) that required treatment with epinephrine or EpiPen® or that caused you to go to the hospital. It would also include an allergic reaction that caused hives, swelling, or respiratory distress, including wheezing.)			
• A component of a COVID-19 vaccine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• A previous dose of COVID-19 vaccine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Have you ever had an allergic reaction to another vaccine (other than COVID-19 vaccine) or an injectable medication? (This would include a severe allergic reaction (e.g., anaphylaxis) that required treatment with epinephrine or EpiPen® or that caused you to go to the hospital. It would also include an allergic reaction that caused hives, swelling, or respiratory distress, including wheezing.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Check all that apply to you:			
<input type="checkbox"/> Have a history of myocarditis or pericarditis	<input type="checkbox"/> Have a history of thrombosis with thrombocytopenia syndrome (TTS)		
<input type="checkbox"/> Have a history of Multisystem Inflammatory Syndrome (MIS-C or MIS-A)?	<input type="checkbox"/> Have a history of Guillain-Barré Syndrome (GBS)		
<input type="checkbox"/> History of an immune-mediated syndrome defined by thrombosis and thrombocytopenia, such as heparin-induced thrombocytopenia (HIT)	<input type="checkbox"/> Have a history of COVID-19 disease within the past 3 months?		

Form reviewed by _____ Date _____
05/06/2022 Adapted with appreciation from the Immunization Action Coalition (IAC) screening checklists

[Prevaccination Checklist for COVID-19 Vaccines Information for Healthcare Professionals \(cdc.gov\)](https://www.cdc.gov/immunization/prevaccination-checklist-for-covid-19-vaccines-information-for-healthcare-professionals/)

[Prevaccination Guidance for COVID-19 Vaccines Information for Healthcare Professionals-June 24, 2022 \(cdc.gov\)](https://www.cdc.gov/immunization/prevaccination-guidance-for-covid-19-vaccines-information-for-healthcare-professionals-june-24-2022/)

[Screening Checklists about Vaccine Contraindications and Precautions \(immunize.org\)](https://www.immunize.org/screening-checklists/)

Infection Control

- **Gloves are not required when administering vaccines unless the HCP is likely to come into contact with potentially infectious body fluids or has open lesions on hands:**
 - If gloves are worn, they should be changed between patients.
 - Perform hand hygiene between patients even if wearing gloves.
- **Equipment disposal:**
 - Puncture-proof biohazard container
 - Empty or expired vaccine vials are medical waste.



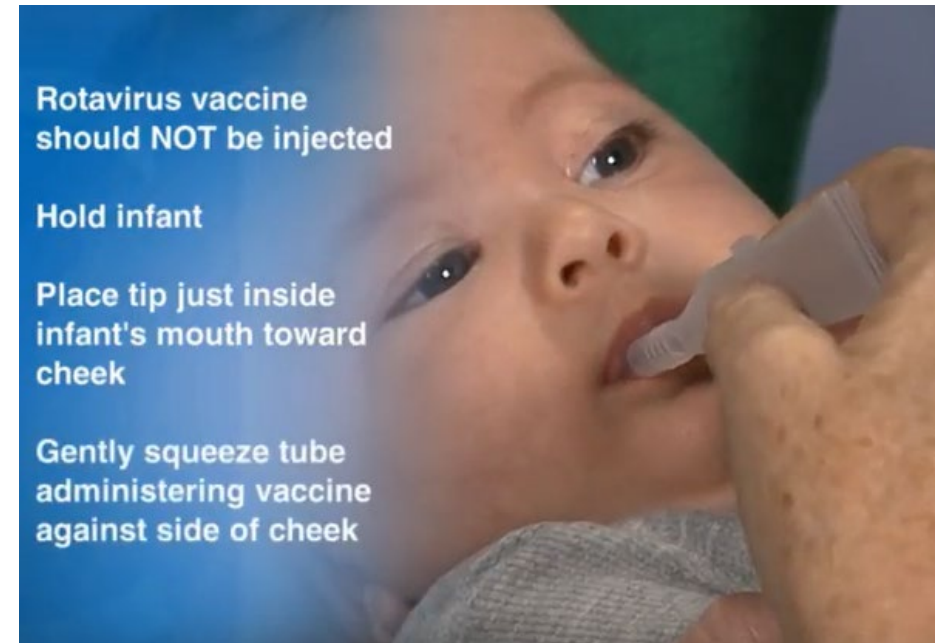
Route and Site

■ Oral (PO):

- Administer liquid inside cheek slowly down one side (between cheek and gum) toward the back of infant's mouth.

■ Intranasal (NAS):

- LAIV4 is the only vaccine administered by the intranasal route.



Subcutaneous Injection Route

■ Site:

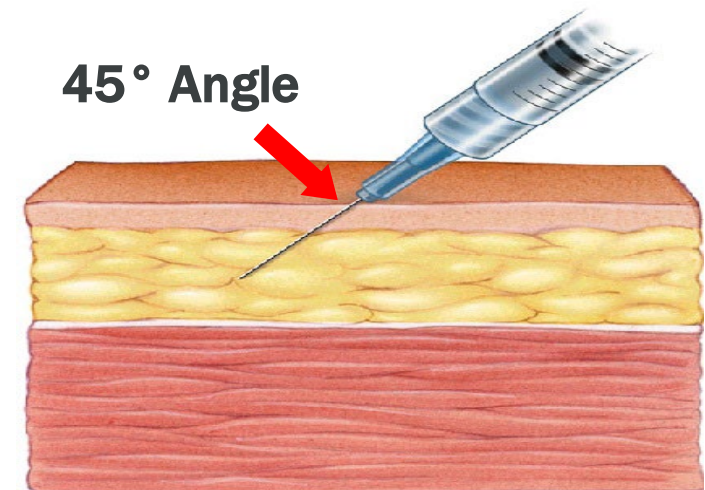
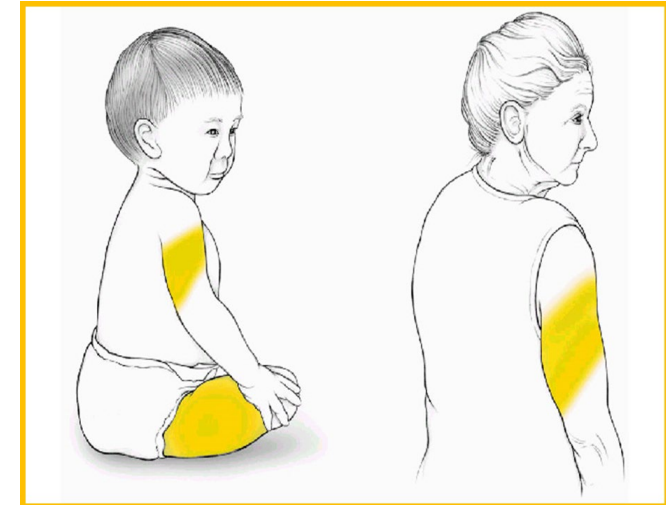
- Thigh for infants younger than 12 months of age
- Upper outer triceps of arm for children older than 12 months and adults (can be used for infants if necessary)

■ Needle gauge and length:

- 23- to 25-gauge needle, 5/8-inch

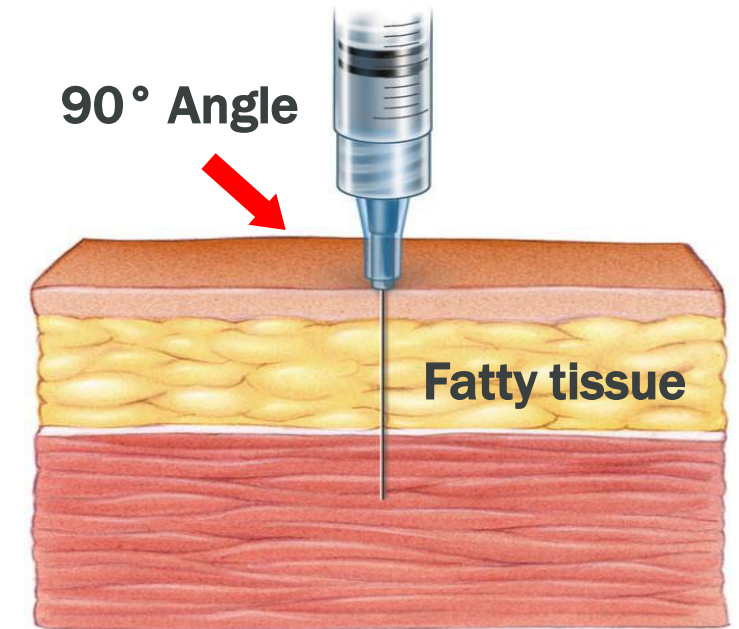
■ Technique:

- To avoid reaching the muscle, pinch up the fatty tissue, insert the needle at a 45° angle, and inject the vaccine into the tissue.



Intramuscular Injection Route

- Spread the skin of the site taut between the thumb and forefinger, isolating the muscle.
- Another technique, acceptable mostly for pediatric and geriatric patients, is to grasp the tissue and “bunch up” the muscle.
- Insert the needle fully into the muscle at a 90° angle and inject.



Aspiration is NOT required

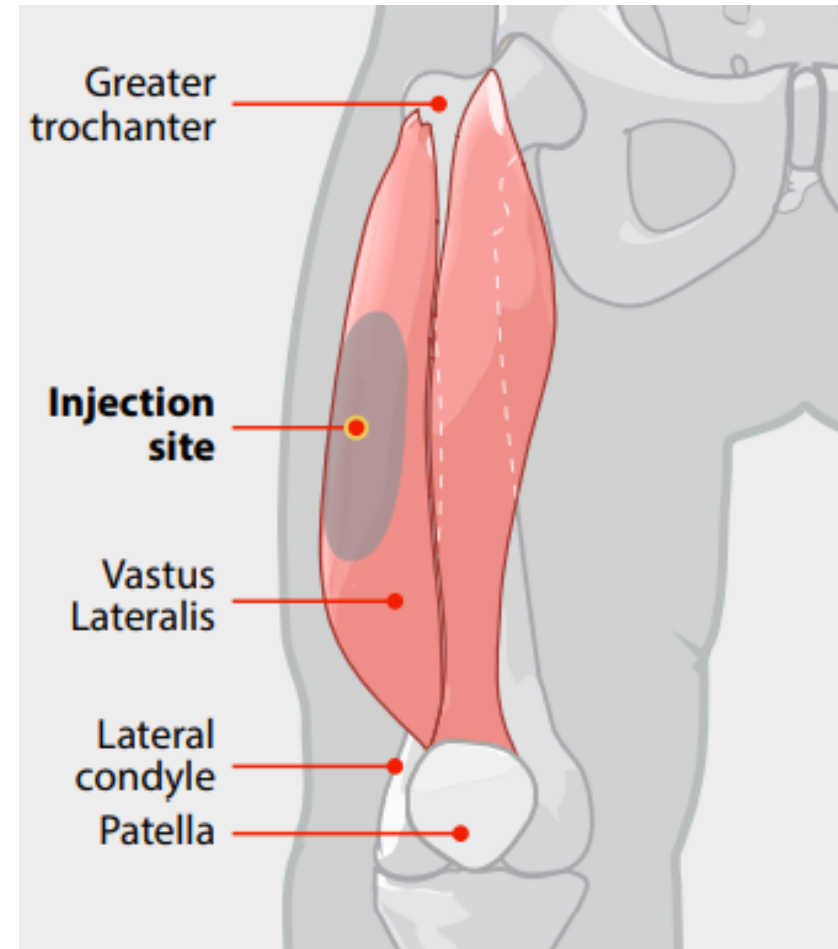
Intramuscular Injection (IM) Route: 11 months and Younger

■ Site:

- Vastus lateralis muscle (anterolateral thigh)

■ Needle gauge and length:

- 22-to 25-gauge
- Neonates and preterm infants: 5/8 inch (adequate only if the skin is stretched flat between thumb and forefinger)
- 1 month and older: 1 inch



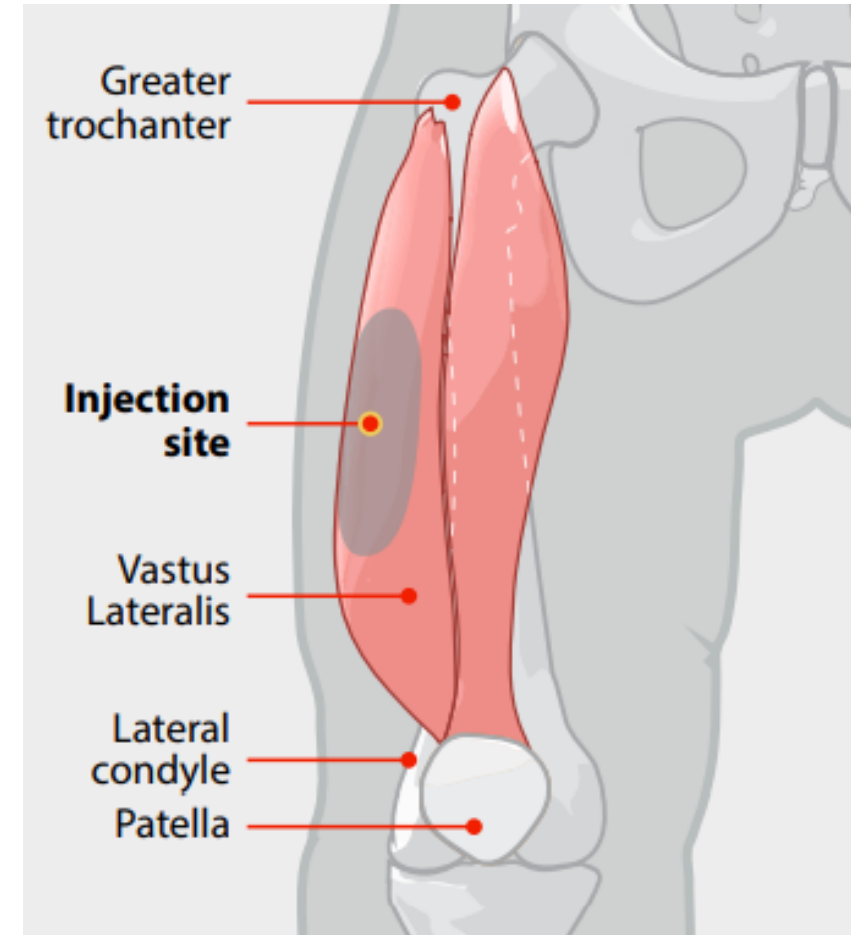
Intramuscular Injection (IM) Route: 1–2 Years

■ Site:

- Vastus lateralis muscle (anterolateral thigh) is preferred.
- Deltoid muscle (upper arm) may be used if the muscle mass is adequate.

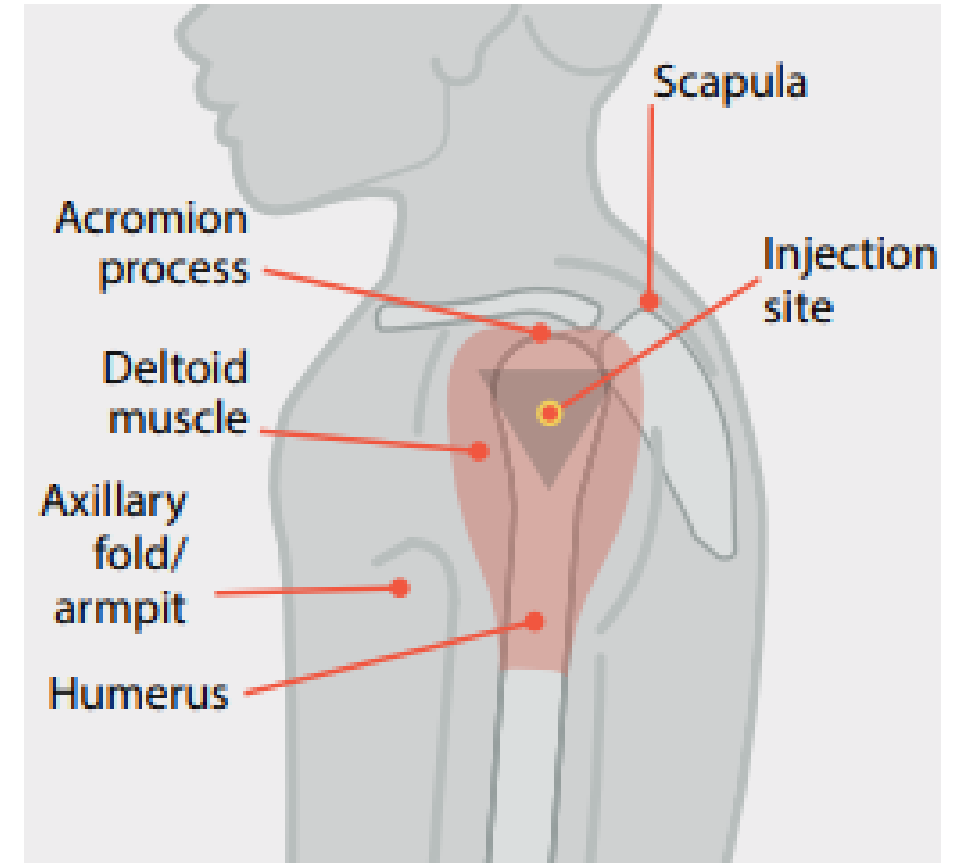
■ Needle gauge and length:

- 22- to 25-gauge
- 5/8 to 1 inch (5/8 inch adequate only for the deltoid muscle and only if the skin is stretched flat between thumb and forefinger)



Intramuscular Injection (IM) Route: 3 through 18 Years

- **Site:**
 - Deltoid muscle (upper arm) is preferred.
 - Vastus lateralis muscle (anterolateral thigh) may be used.
- **Needle gauge and length:**
 - 22- to 25-gauge
 - 5/8–1 inch
- **Most young children in this age range require a 1-inch needle:**
 - 5/8-inch needle is adequate only for the deltoid muscle and only if the skin is stretched flat between thumb and forefinger.
- **Older children and adolescents require a 1-inch needle.**



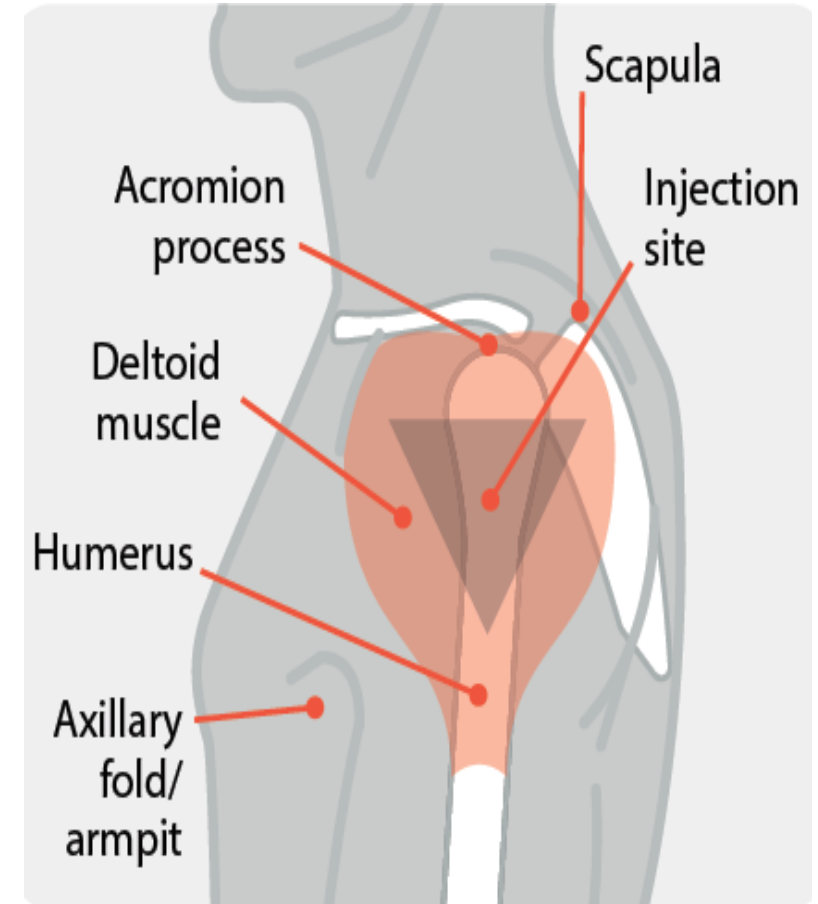
[You Call The Shots - Vaccine Administration: Intramuscular \(IM\) Injection Children 3 through 6 years of age \(cdc.gov\)](https://www.cdc.gov/vaccines/imz/downloads/You-Call-The-Shots-Vaccine-Administration-Intramuscular-IM-Injection-Children-3-through-6-years-of-age.pdf)

[Vaccine Administration: Intramuscular \(IM\) injections: Adults 19 years of age and older \(cdc.gov\)](https://www.cdc.gov/vaccines/imz/downloads/Vaccine-Administration-Intramuscular-IM-injections-Adults-19-years-of-age-and-older.pdf)

[Vaccine Administration: Needle Gauge and Length \(cdc.gov\)](https://www.cdc.gov/vaccines/imz/downloads/Vaccine-Administration-Needle-Gauge-and-Length.pdf)

Intramuscular (IM) Route: Adults 19 Years and Older

- **Site:**
 - Deltoid muscle (upper arm) is preferred.
 - Vastus lateralis muscle (anterolateral thigh) may be used.
- **Needle gauge: 22- to 25-gauge**
- **Needle length varies with patient size.**



Observation After Vaccination: Routinely Recommended Vaccines

- Fainting can occur after vaccination
- Most common among adolescents and young adults
- Providers should take appropriate measures to prevent injuries patients should be:
 - Seated or lying down during vaccination
 - Observed (seated or lying down) for 15 minutes after vaccination



15 minutes

COVID-19 Vaccination and Observation Periods

■ CDC recommends:

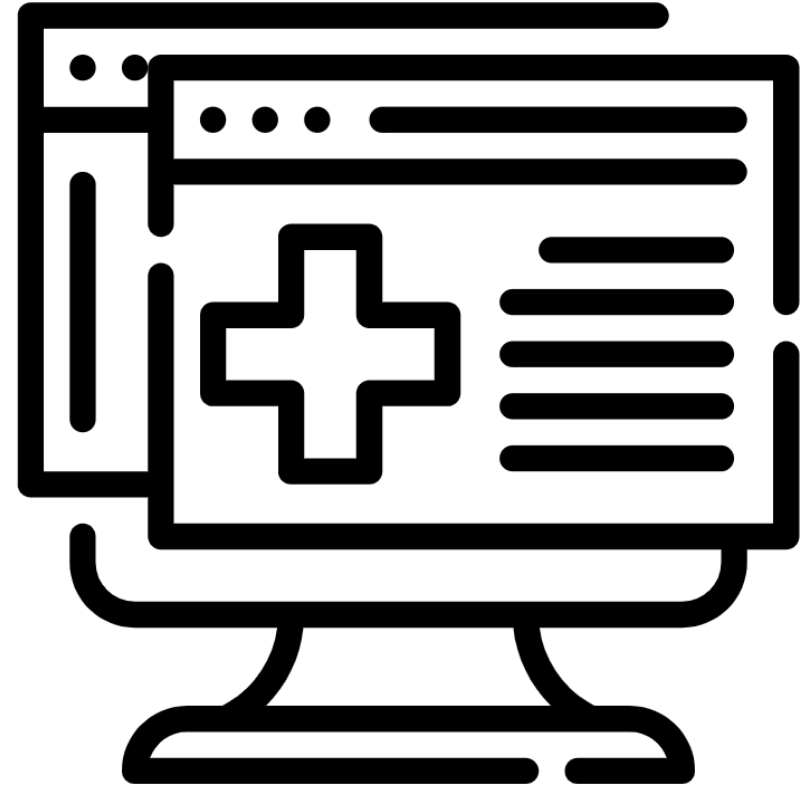
- 30 minutes for people with a:
 - Contraindication to one type of COVID-19 vaccine who are receiving another type that is a precaution
 - History of non-severe, immediate allergic reaction after a previous dose of COVID-19 vaccine.
 - History of an immediate allergic reaction of any severity to other vaccines or injectable therapies.
 - History of anaphylaxis due to any cause.
- 15 minutes for all other people



**30 minutes
or
15 minutes**

After Vaccination: Documentation

- **Federally required documentation:**
 - Date of administration
 - Vaccine manufacturer
 - Vaccine lot number
 - Name and title of person who administered vaccine and address of clinic or facility where permanent record will reside
 - Vaccine information statement (VIS)
 - Date printed on the VIS
 - Date VIS given to patient or parent/guardian
- **Best practice documentation:**
 - Vaccine type (ACIP abbreviation)
 - Route
 - Dosage (volume)
 - Site



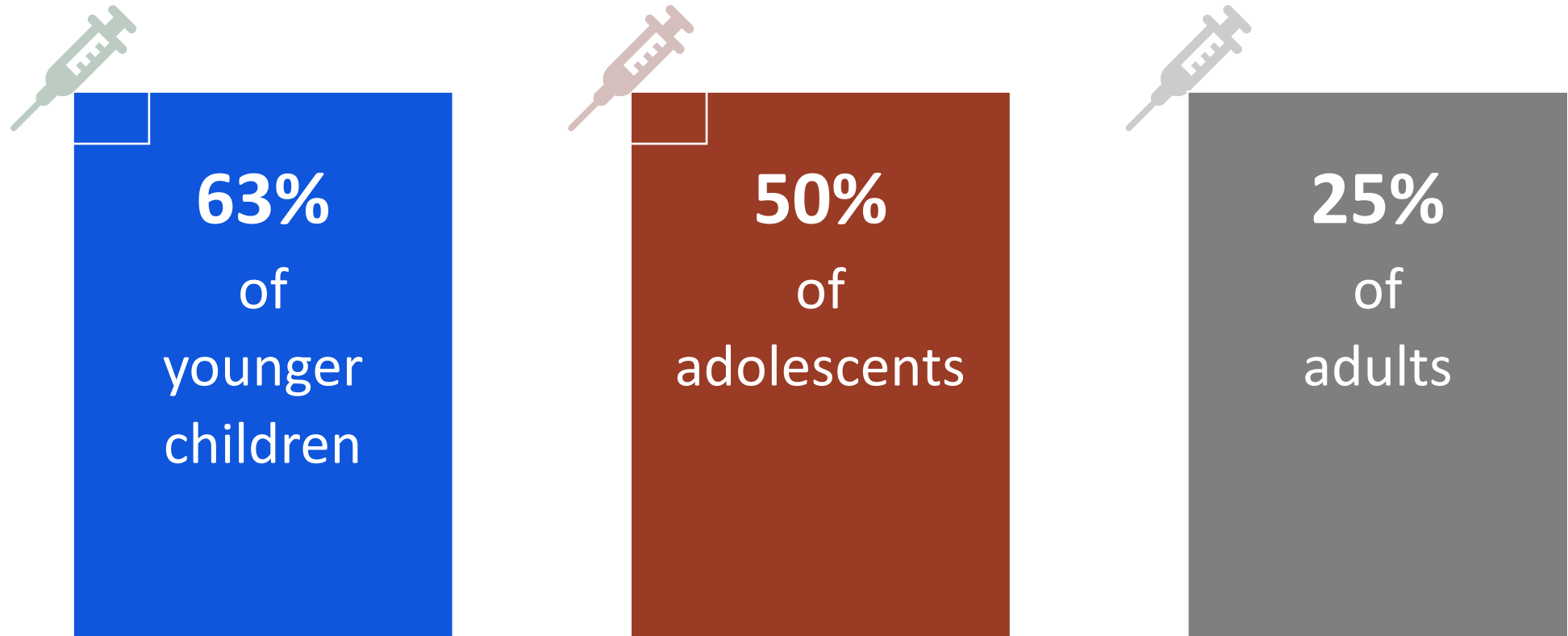
4

**Additional
Clinical
Considerations**

Multiple Vaccinations

- **All routinely recommended vaccines can be given at the same clinical visit**
 - COVID-19 vaccine can be administered at the same time as routinely recommended vaccines.
- **Separate injection sites by at least 1 inch (or more if possible).**
- **Use a separate limb for most reactive vaccines, if possible.**
- **Use combination vaccines when appropriate to reduce the number of injections.**

Needle Anxiety and Procedure Pain



Pain Management and Vaccine Administration

- **Use topical local anesthetics**
- **Inject vaccines:**
 - Rapidly without aspiration
 - That cause the most pain when injected last
- **Breastfeed children 2 years of age and younger during vaccine injections:**
 - Give a sweet-tasting solution if not breastfed
- **Strategies for older children and adults include:**
 - Distraction
 - Breathing techniques

Positioning and Comforting Restraint

- **Encourage parent/guardian to hold child**
- **Sitting rather than lying down (young child)**
- **Think about syncope (fainting):**
 - Have patient seated during vaccination
 - Be aware of symptoms that precede syncope
 - If patient faints, provide supportive care and protect patient from injury
 - Observe patient (seated or lying down) for at least 15 minutes after vaccination

What Do You Think?

- True or False?
- Using pain management strategies during vaccination improves the quality of care and outcomes, increases patient and staff satisfaction.



What Do You Think? Answer!

- Using pain management strategies during vaccination improves the quality of care and outcomes, increases patient and staff satisfaction.
 - True
 - False

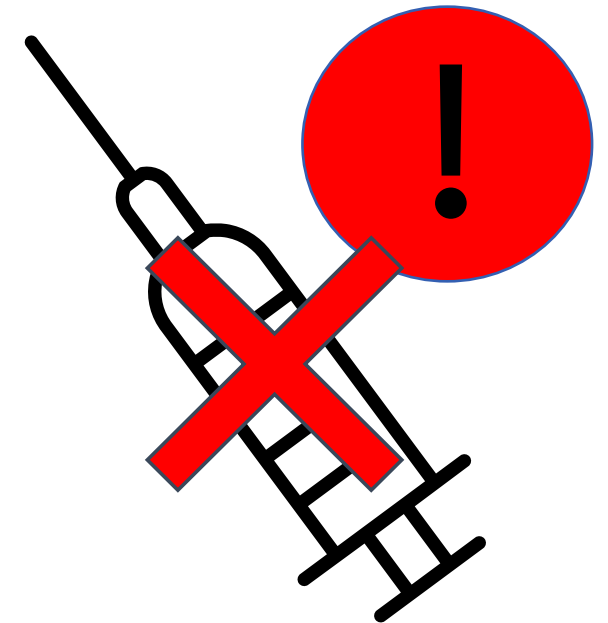


5

**Administration
Errors**

What is a Vaccine Administration Error?

“any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer.”



Vaccine Administration Errors

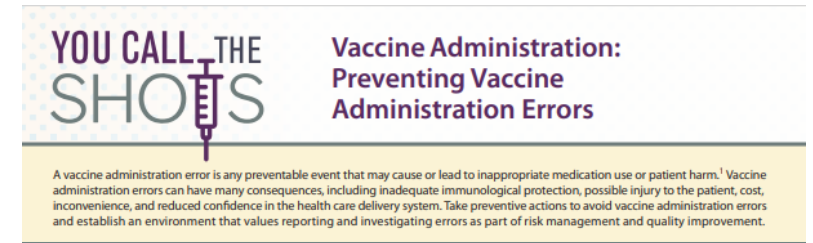
- **Common vaccine administration errors include:**
 - Expired vaccine or diluent administered
 - Vaccine past the BUD administered
 - Improperly stored vaccine administered
 - Wrong dosage (e.g., pediatric formulation of hepatitis B vaccine administered to an adult)
 - Doses administered too early (e.g., before the minimum age or interval)
 - Wrong vaccine (e.g., Tdap instead of DTaP)
 - Vaccine administered to a patient with a contraindication

Potential Causes

- **Vaccine administration errors may be due to multiple causes, including:**
 - Insufficient staff training
 - Distraction
 - Lack of standardized protocols
 - Look-alike or sound-alike products
 - Patient misidentification

Strategies to Prevent Administration Errors

- Create a culture that values the reporting and investigation of errors.
- Investigate and determine the root cause.
- Ensure staff are knowledgeable about best practices for storing, handling, preparing, and administering vaccines.



YOU CALL THE SHOTS Vaccine Administration: Preventing Vaccine Administration Errors

A vaccine administration error is any preventable event that may cause or lead to inappropriate medication use or patient harm.¹ Vaccine administration errors can have many consequences, including inadequate immunological protection, possible injury to the patient, cost, inconvenience, and reduced confidence in the health care delivery system. Take preventive actions to avoid vaccine administration errors and establish an environment that values reporting and investigating errors as part of risk management and quality improvement.

Vaccine administration errors may be due to causes such as:

- Insufficient staff training
- Distraction
- Changes in recommendations
- Lack of standardized protocols
- Patient misidentification
- Using nonstandard or error-prone abbreviations
- Easily misidentified products (e.g. DTaP, DT, Tdap, Td)

If an error occurs, determine how it occurred and take the appropriate actions to put strategies in place to prevent it from happening in the future. The following table outlines common vaccine administration errors and possible preventive actions you can take to avoid errors.

Error(s)	Possible Preventive Actions
Wrong vaccine, route, site, or dosage (amount); or improperly prepared.	Circle important information on the packaging to emphasize the difference between the vaccines.
	Include the brand name with the vaccine abbreviation whenever possible (e.g., PCV13 [Prevnar13]) in orders, medical screens, etc.
	Separate vaccines into bins or other containers according to type and formulation. Use color-coded identification labels on vaccine storage containers.
	Store look-alike vaccines in different areas of the storage unit (e.g., pediatric and adult formulations of the same vaccine on different shelves in the unit).
	Do not list vaccines with look-alike names sequentially on computer screens, order forms, or medical records, if possible.
	Consider using "name alert" or "look-alike" stickers on packaging and areas where these vaccines are stored.
	Consider purchasing products with look-alike packaging from different manufacturers, if possible.
	Establish "Do NOT Disturb" or no-interruption areas or times when vaccines are being prepared or administered.
	Prepare vaccine for one patient at a time. Once prepared, label the syringe with vaccine name.
	Do not administer vaccines prepared by someone else.
	Triple-check work before administering a vaccine and ask another staff member to check.
	Keep reference materials on recommended sites, routes, and needle lengths for each vaccine used in your facility in the medication preparation area.
	Clearly identify diluents if the manufacturer's label could mislead staff into believing the diluent is the vaccine itself.

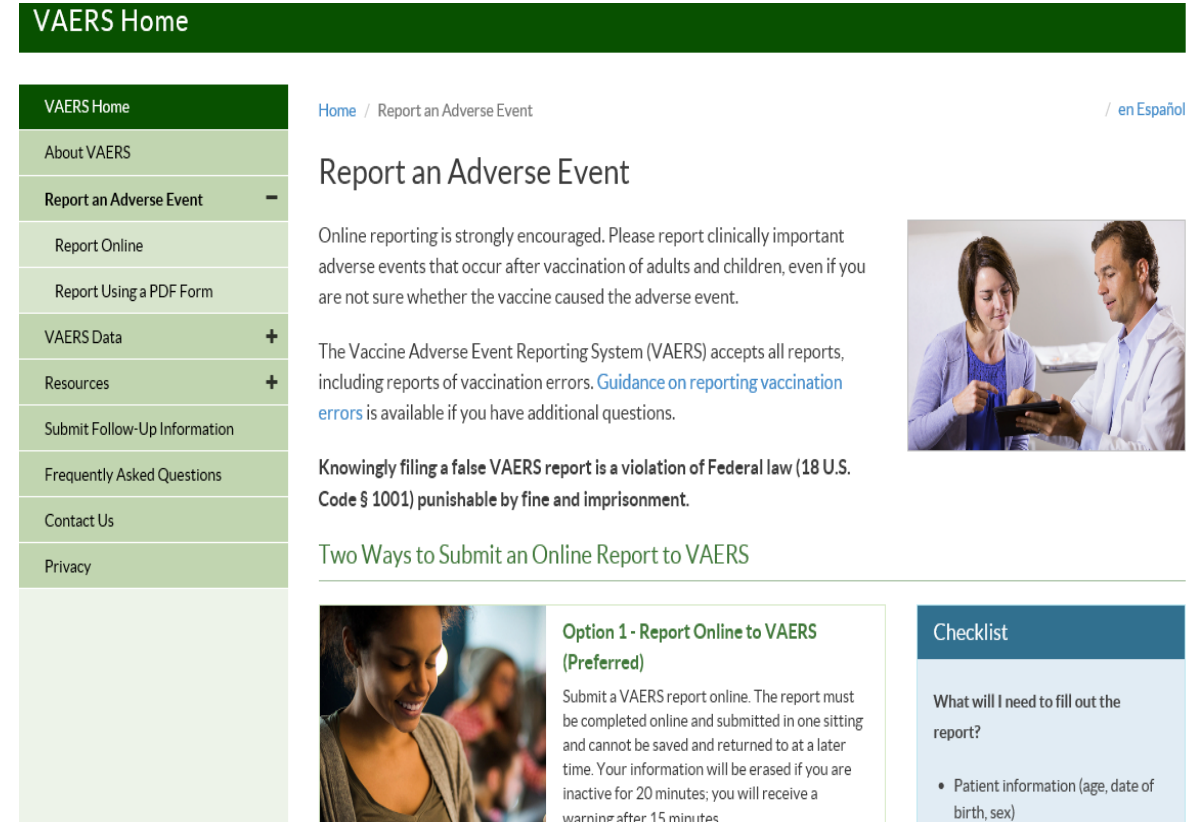
1. National Coordinating Council for Medication Error Reporting and Prevention, <https://www.nccmerp.org/about-medication-errors>
01/05/2021 CS 322033-A

What if a Vaccination Error Occurs?

- **Inform the patient/parent of the error**
- **Determine the patient's status**
- **Explain any needed next steps**
- **Know how to correct the error:**
 - Contact your local health department, vaccine manufacturer, or CDC for guidance.
- **Record the vaccine as it was given on the medical administration record.**

Reporting Vaccination Errors to VAERS

- Providers are encouraged to report ALL vaccination errors with or without adverse health events if they believe the error may pose a safety risk.
- **NOTE: Providers are REQUIRED to report all COVID-19 vaccine administration errors.**



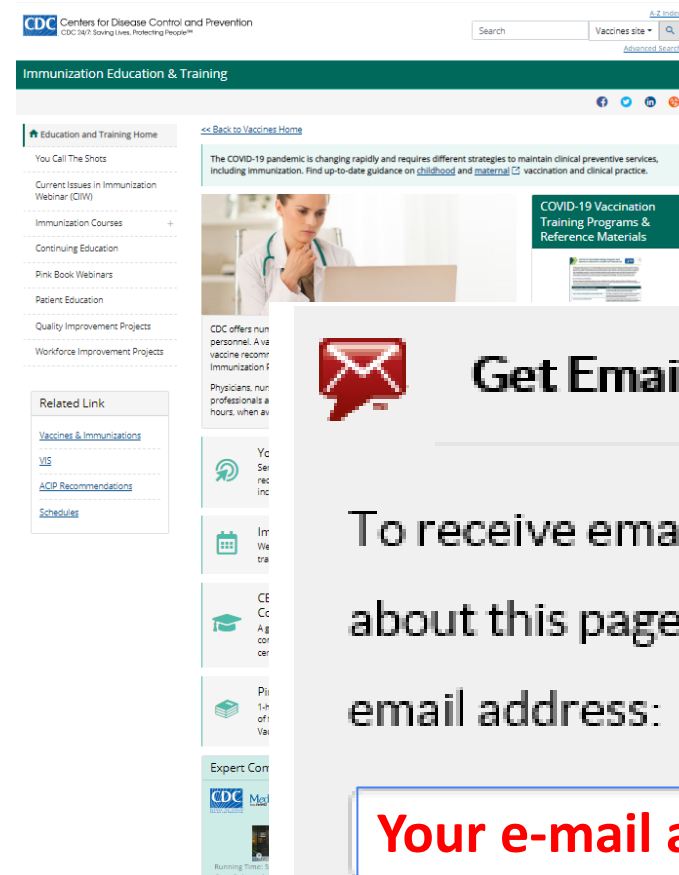
The screenshot displays the VAERS Home page. At the top is a green header with 'VAERS Home'. Below it is a navigation menu with options: 'VAERS Home', 'About VAERS', 'Report an Adverse Event' (highlighted with a minus sign), 'Report Online', 'Report Using a PDF Form', 'VAERS Data' (with a plus sign), 'Resources' (with a plus sign), 'Submit Follow-Up Information', 'Frequently Asked Questions', 'Contact Us', and 'Privacy'. The main content area features a breadcrumb trail 'Home / Report an Adverse Event' and a language link 'en Español'. The title 'Report an Adverse Event' is followed by a paragraph: 'Online reporting is strongly encouraged. Please report clinically important adverse events that occur after vaccination of adults and children, even if you are not sure whether the vaccine caused the adverse event.' Below this is another paragraph: 'The Vaccine Adverse Event Reporting System (VAERS) accepts all reports, including reports of vaccination errors. [Guidance on reporting vaccination errors](#) is available if you have additional questions.' A warning states: 'Knowingly filing a false VAERS report is a violation of Federal law (18 U.S. Code § 1001) punishable by fine and imprisonment.' A section titled 'Two Ways to Submit an Online Report to VAERS' includes a sub-section 'Option 1 - Report Online to VAERS (Preferred)' with a photo of a woman and text: 'Submit a VAERS report online. The report must be completed online and submitted in one sitting and cannot be saved and returned to at a later time. Your information will be erased if you are inactive for 20 minutes; you will receive a warning after 15 minutes.' To the right is a 'Checklist' box with the question 'What will I need to fill out the report?' and a bullet point: 'Patient information (age, date of birth, sex)'.

6

**Clinical
Resources**

CDC Resources for Staff Education

- Multiple education products available free through the CDC website including:
 - *You Call the Shots* self-study modules
 - Vaccine Administration and others
 - Pink Book webinar series
 - Current Issues in Immunization webinars
 - Continuing education available for all
- Sign up for e-mail updates



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Healthcare Providers / Professionals

[Healthcare Professionals / Providers Home](#) > [Administration Tools](#) > [Vaccine Administration](#)



[Home](#) Healthcare Professionals /
Providers Home

Clinical Resources +

Administration Tools -

Vaccine Storage & Handling +

Vaccine Administration -

Review Immunization History

Assess for Needed Immunizations

Screen for Contraindications and
Precautions

Educate the Patient

Prepare the Vaccine(s)

Administer the Vaccine(s)

Document the Vaccination(s)

Temporary, Satellite, or Off-Site
Vaccination Clinics

Resource Library

Vaccines for Children (VFC) +

VIS

Reminder Systems and Strategies

Patient Education +

Immunization Training

Vaccine-Preventable Diseases

Resource Library



Note: The materials listed on this page might be more current than vaccine administration information in previously published CDC documents, including the 13th edition of *Epidemiology and Prevention of Vaccine-Preventable Diseases* (the [Pink Book](#)). Always follow the most up-to-date guidelines in the [Vaccine Storage and Handling Toolkit](#) or more recently dated materials.

Web-based Training Courses

[Vaccine Administration e-Learn](#)

A self-paced vaccine administration course that provides comprehensive training using videos, job aids, and other resources.

[You Call the Shots](#)

An interactive, web-based immunization training course that includes the latest guidelines and recommendations in vaccine practice.

Videos

Title: [Comfort and Restraint Techniques](#)

Short Description: This training demonstrates comfort and restraint techniques. Determine the best position for the patient based on comfort, age, activity level, administration site, and safety. Instruct the parent on how to help the infant or child stay still so you can administer the vaccine(s) safely.

Title: [Assemble a Manufacturer-filled Syringe](#)

Short Description: This training addresses how to assemble a manufacturer-filled syringe, available for a variety of vaccines. CDC recommends that providers only prepare vaccines just prior to administration. Always prepare vaccines in a designated area that is not near any area where potentially contaminated items are placed.

On This Page

[Web-based Training Courses](#)

[Job Aids](#)

[References](#)

[Web Button](#)

Continuing Education Information

- CE credit, go to: <https://tceols.cdc.gov/>
- Search course number: **WD4564-080322**
- CE credit expires: **July 1, 2024**
- CE instructions are available on the **Pink Book Web-on-Demand Series** web page
- Questions and additional help with the online CE system, e-mail CE@cdc.gov

The screenshot shows the TCEO website interface. At the top, there is a blue header with the text "Training and Continuing Education Online (TCEO)". Below this is the TCEO logo, which consists of the letters "TCEO" in a bold, blue font, with a green circular arrow icon to the right. Underneath the logo, the text "TRAINING AND CONTINUING EDUCATION ONLINE" is displayed in a smaller, blue font. On the left side, there is a vertical navigation menu with several blue buttons: "TCEO Home", "Search Courses", "Create Account", "9 Simple Steps to Earn CE", "Frequently Asked Questions", and "Contact TCEO". The main content area on the right has a blue header with the text "New to TCEO?". Below this, there are three sections of text: "Visit Create Account. Once your account has been created, you will be able to search for courses and complete requirements to receive CE.", "Already have a TCEO account from the previous system? To move your account to the new system please sign in above using your existing TCEO username and password. Once signed in, follow the prompts to verify and update your account. After your account forward you will use this email address and password to sign in.", and "Not sure how to get started? Follow these 9 Simple Steps to earn continuing education for the courses you have taken or conferences you have attended!". At the bottom of the page, there is a row of four small images: a woman smiling at a child, a man in a suit looking at a screen, a doctor in a white coat holding a dog, and a woman sitting at a desk with a laptop. Below the images, the text "Welcome to TCEO" is displayed, followed by a small line of text: "Training and Continuing Education Online (TCEO) is a system that provides access to CDC educational activities for continuing education (CE). Use TCEO to search for CE opportunities, complete course e..."

E-mail Your Immunization Questions to Us

- NIPINFO@cdc.gov



Thank You From Atlanta!

