National Center for Immunization and Respiratory Diseases

Vaccine Administration: Avoid Being in the News, Preventing Vaccine Administration Errors

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Beyond the Headlines

2024 New Hampshire Immunization Conference

Disclosures

- **JoEllen Wolicki is a federal government employee with no financial interest or conflict with the manufacturer of any product named in this presentation.**
- **She will not discuss off-label use of any vaccines during this presentation.**
- **The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.**

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

Pink Book: Vaccine Administration | CDC

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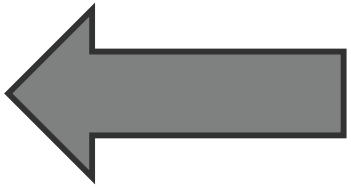
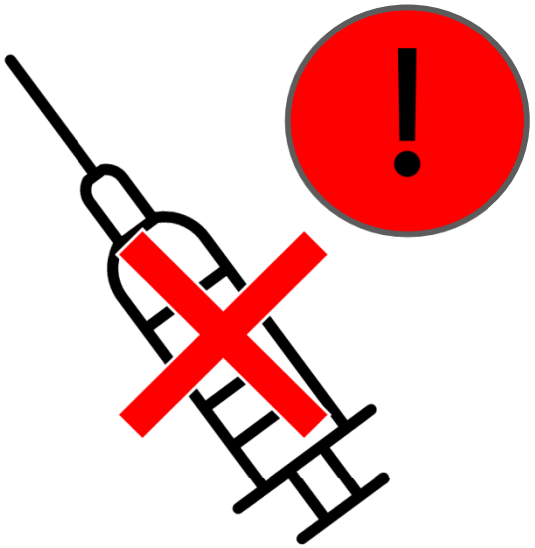


Errors can be introduced anywhere in this process

Pink Book: Vaccine Administration | CDC

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.”*



*National Coordinating Council for Medication Error Reporting and Prevention
Pinkbook: Vaccine Administration | CDC

Common Vaccine Administration Errors

	Administering vaccines:
• **Storage errors**	Stored outside the proper temperatures
• **Preparation errors**	After the beyond-use-date* (BUD), reconstituted with the wrong diluent
• **Administration errors**	Wrong route, wrong injection site

*Beyond-use-date can refer to vaccine that has been moved from one storage temperature to another or altered for patient use; e.g. mixed with a diluent.

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.

Injection Safety | CDC

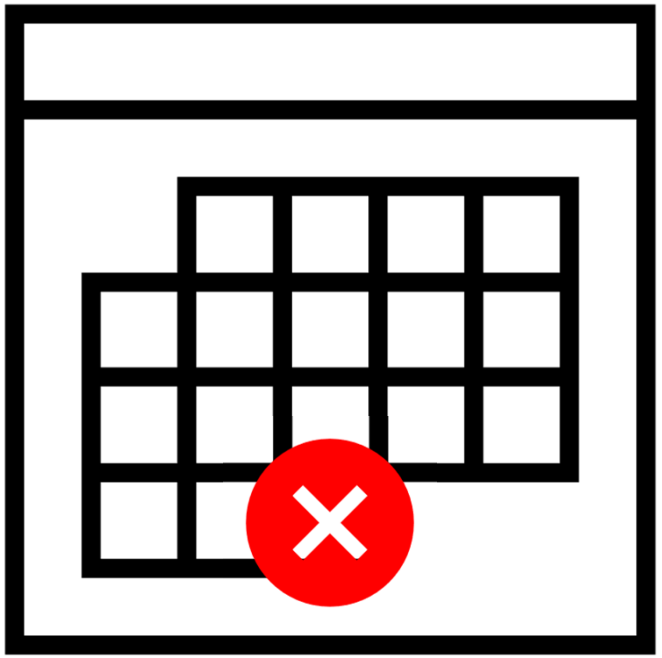
Choose the Correct Vaccine

- ALWAYS check the label and the expiration date and/or the beyond-use date/time BEFORE preparing vaccine.
- Ensure you have the RIGHT vaccine for your patient.
- Vaccines are available in different presentations, including:
  - Single-dose vials (SDV)
  - Manufacturer-filled syringes (MFS)
  - Multidose vials (MDV)
  - Oral applicators
  - Nasal sprayer

Pink book: Vaccine Administration | CDC

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



Expiration Dates - Questions and Answers | FDA
Vaccines Storage and Handling Toolkit | CDC

Where to Find the Expiration Date

Month, day, and
year of expiration

Month and year
of expiration

QR Code, website, or
phone number

[Vaccines Storage and Handling Toolkit | CDC]

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[Vaccines Storage and Handling Toolkit | CDC]

What Do You Think?

- **The expiration date on vial label on indicates the vaccine expires on 8/24. This vaccine should NOT be used after?**

A. August 1, 2024
B. August 31, 2024
C. August 23, 2024

What Do You Think? Answer!

- **The expiration date on vial label on indicates the vaccine expires on 8/24. This vaccine should NOT be used after?**

A. August 1, 2023

B. August 31, 2024

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**

- **Calculated by the provider based on guidance in the vaccine's package insert**
- **Replaces but does not extend the expiration; always use the earlier date**

- **Only some vaccines have a BUD**

Vaccines Storage and Handling Toolkit | CDC

How is the BUD Calculated?

- **The designated timeframe varies from product to product.**

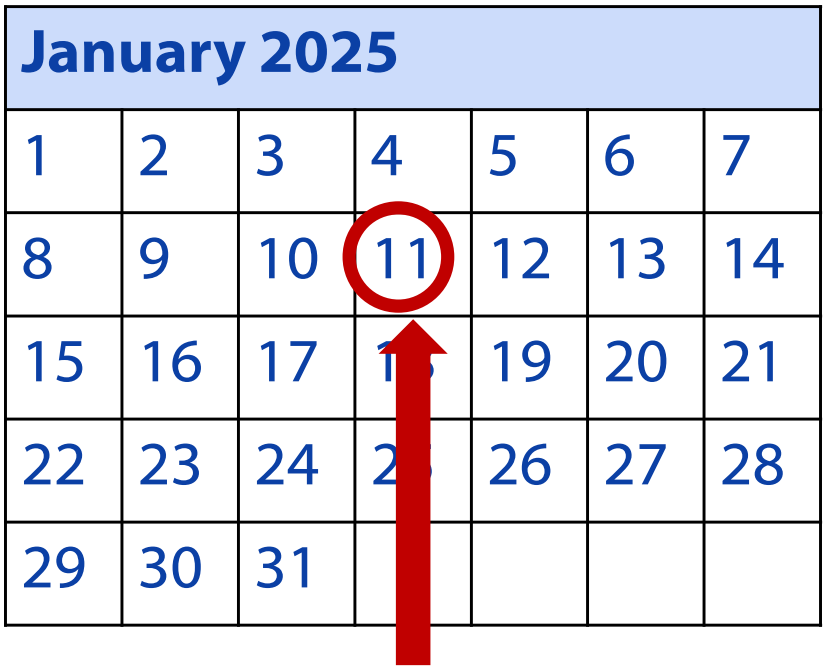
- **Specific information regarding the BUD and how it is calculated can be found in the vaccine's package insert or Emergency Use Authorization (EUA) Fact Sheet.**

Vaccines Storage and Handling Toolkit | CDC)

How is the BUD Calculated?

Example for a multi-dose vial for some influenza vaccine products

Day 0: Punctured vial

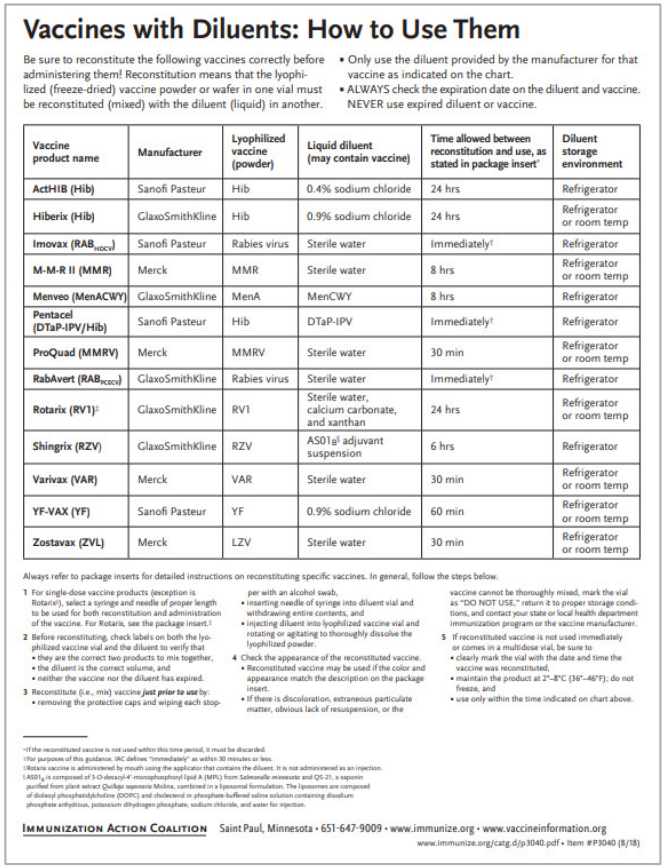


Day 28: From puncture

[Vaccines Storage and Handling Toolkit | CDC]

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*	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_{HDCV})	Sanofi Pasteur	Rabies virus	Sterile water	Immediately†	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†	Refrigerator
ProQuad (MMRV)	Merck	MMRV	Sterile water	30 min	Refrigerator or room temp
RabAvert (RAB_{PCECV})	GlaxoSmithKline	Rabies virus	Sterile water	Immediately†	Refrigerator
Rotarix (RV1)‡	GlaxoSmithKline	RV1	Sterile water, calcium carbonate, and xanthan	24 hrs	Refrigerator or room temp
Shingrix (RZV)	GlaxoSmithKline	RZV	AS01§ 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.

1 For single-dose vaccine products (exception 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.‡

2 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.

3 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.

4 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.

5 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.

*If the reconstituted vaccine is not used within this time period, it must be discarded.
†For purposes of this guidance, IAC defines "immediately" as within 30 minutes or less.
‡Rotarix vaccine is administered by mouth using the applicator that contains the diluent. It is not administered as an injection.
§$AS01_B$ is composed of 3-O-desacyl-4′-monophosphoryl lipid A (MPL) from Salmonella minnesota and QS-21, a saponin purified from plant extract Quillaja 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.

IMMUNIZATION ACTION COALITION Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org

www.immunize.org/catg.d/p3040.pdf • Item #P3040 (8/18)

[Vaccines with Diluents: How to Use Them (immunize.org)]

BUD and Vaccine in a Multidose Vial

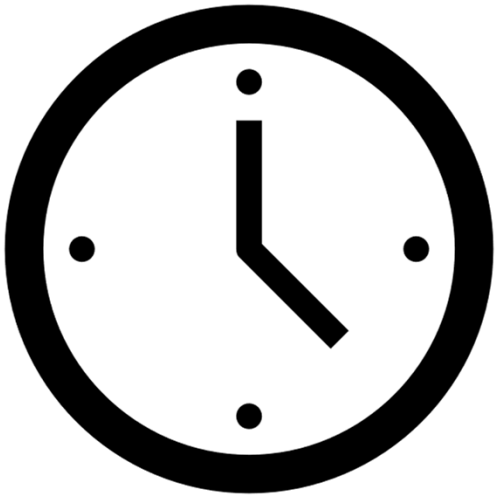
- **Some multidose vials (MDV) have a specified time frame they should be used after the vial is first punctured.**
- **The BUD can vary from hours to days.**
- **Some MDV have a specific maximum number of doses that can be withdrawn or punctures to the vial stopper.**

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

Vaccines Storage and Handling Toolkit | CDC

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?

- Choose the best response:
- You are preparing a vaccine for administration and in the process, you learn:
  - Expiration date = 8/2024
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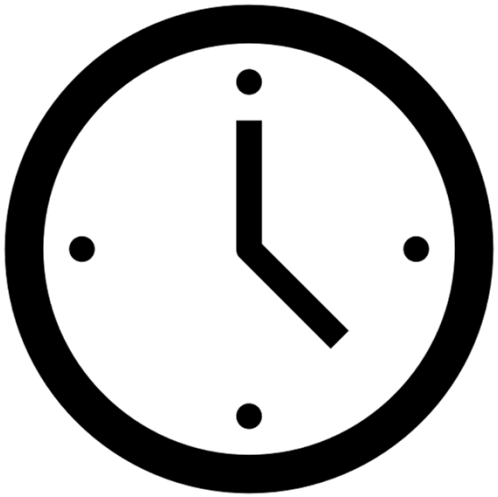


It's 5:00 pm. Can you administer this vaccine?

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.**

Pink book: Vaccine Administration | CDC

Pre-drawing Vaccines

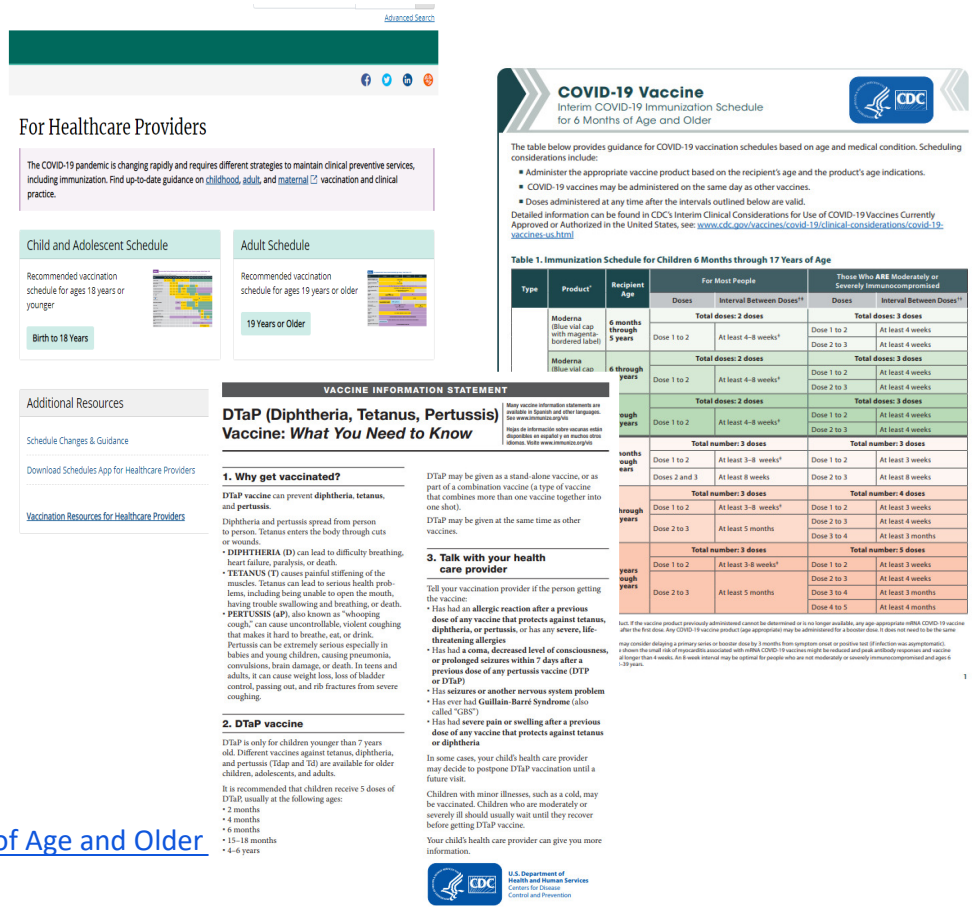
- **Generally not recommended, but if you must**
  - Set up separate administration stations if multiple vaccines are being offered
  - Prepare vaccine at site or event in clean area
  - Draw up 1 multidose vial or 10 doses
  - Once prepared, label each syringe with the vaccine, time, lot number, and preparer's initials
  - Monitor patient flow
  - Additional guidance for reconstituted vaccines
- **Best practice: Use manufacturer-filled syringes for large vaccination**

Vaccines Storage and Handling Toolkit | CDC
Pink book: Vaccine Administration | CDC

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.**



[Reviewing Vaccine Administration History | CDC]

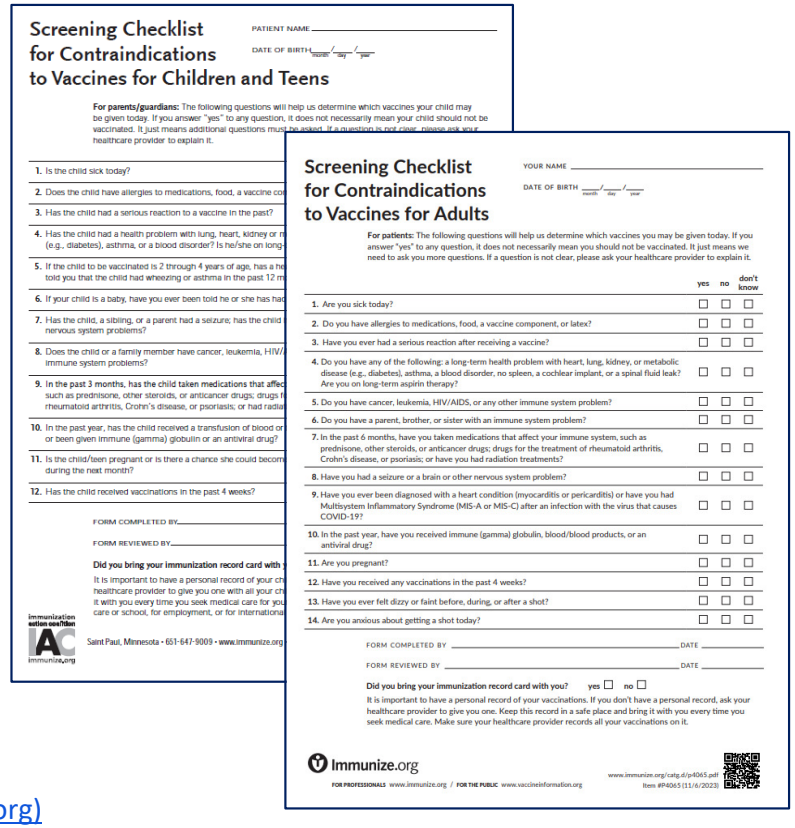
[Assessing Patients for Needed Immunizations | CDC]

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

[Vaccine Information Statements (VISs) | CDC]

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

PATIENT NAME

DATE OF BIRTH month / day / year

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.

1. Is the child sick today?
2. Does the child have allergies to medications, food, a vaccine co
3. Has the child had a serious reaction to a vaccine in the past?
4. Has the child had a health problem with lung, heart, kidney or m (e.g., diabetes), asthma, or a blood disorder? Is he/she on long
5. If the child to be vaccinated is 2 through 4 years of age, has a he told you that the child had wheezing or asthma in the past 12 m
6. If your child is a baby, have you ever been told he or she has had
7. Has the child, a sibling, or a parent had a seizure; has the child nervous system problems?
8. Does the child or a family member have cancer, leukemia, HIV/ immune system problems?
9. In the past 3 months, has the child taken medications that affec such as prednisone, other steroids, or anticancer drugs; drugs f rheumatoid arthritis, Crohn's disease, or psoriasis; or had radia
10. In the past year, has the child received a transfusion of blood or or been given immune (gamma) globulin or an antiviral drug?
11. Is the child/teen pregnant or is there a chance she could becom 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 with

It is important to have a personal record of your ch healthcare provider to give you one with all your ch it with you every time you seek medical care for yo care or school, for employment, or for internationa

Saint Paul, Minnesota • 651-647-9009 • www.immunize.org

Screening Checklist for Contraindications to Vaccines for Adults

YOUR NAME

DATE OF BIRTH month / day / year

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

	yes	no	don't know
1. Are you sick today?	☐	☐	☐
2. Do you have allergies to medications, food, a vaccine component, or latex?	☐	☐	☐
3. Have you ever had a serious reaction after receiving a vaccine?	☐	☐	☐
4. Do you have any of the following: a long-term health problem with heart, lung, kidney, or metabolic disease (e.g., diabetes), asthma, a blood disorder, no spleen, a cochlear implant, or a spinal fluid leak? Are you on long-term aspirin therapy?	☐	☐	☐
5. Do you have cancer, leukemia, HIV/AIDS, or any other immune system problem?	☐	☐	☐
6. Do you have a parent, brother, or sister with an immune system problem?	☐	☐	☐
7. In the past 6 months, have you taken medications that affect your immune system, such as prednisone, other steroids, or anticancer drugs; drugs for the treatment of rheumatoid arthritis, Crohn's disease, or psoriasis; or have you had radiation treatments?	☐	☐	☐
8. Have you had a seizure or a brain or other nervous system problem?	☐	☐	☐
9. Have you ever been diagnosed with a heart condition (myocarditis or pericarditis) or have you had Multisystem Inflammatory Syndrome (MIS-A or MIS-C) after an infection with the virus that causes COVID-19?	☐	☐	☐
10. In the past year, have you received immune (gamma) globulin, blood/blood products, or an antiviral drug?	☐	☐	☐
11. Are you pregnant?	☐	☐	☐
12. Have you received any vaccinations in the past 4 weeks?	☐	☐	☐
13. Have you ever felt dizzy or faint before, during, or after a shot?	☐	☐	☐
14. Are you anxious about getting a shot today?	☐	☐	☐

FORM COMPLETED BY _____ DATE _____

FORM REVIEWED BY _____ DATE _____

Did you bring your immunization record card with you? yes ☐ no ☐

It is important to have a personal record of your vaccinations. If you don't have a personal record, ask your healthcare provider to give you one. Keep this record in a safe place and bring it with you every time you seek medical care. Make sure your healthcare provider records all your vaccinations on it.

Immunize.org

FOR PROFESSIONALS www.immunize.org / FOR THE PUBLIC www.vaccineinformation.org

www.immunize.org/catg.d/p4065.pdf
Item #P4065 (11/6/2023)

[Screening for Vaccine Contraindications and Precautions | CDC]
[Screening Checklists about Vaccine Contraindications and Precautions (immunize.org)]

Infection Control

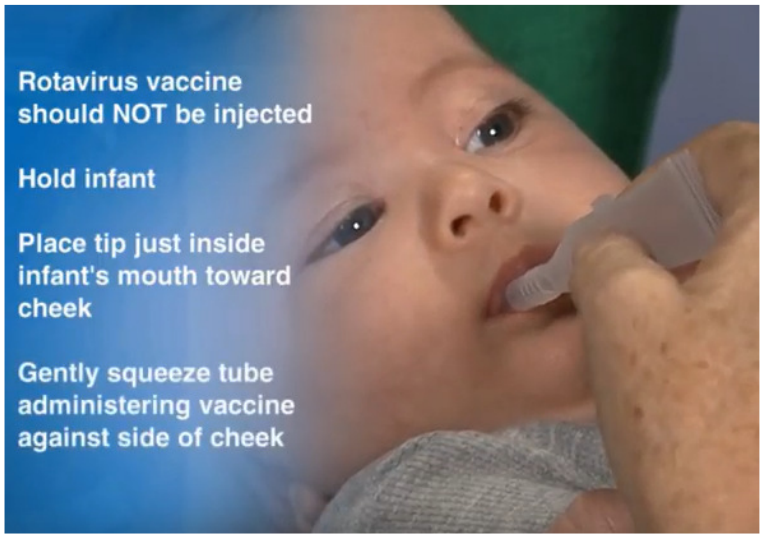
- Gloves are not required when administering vaccines unless healthcare personnel administering the vaccine is likely to come into contact with potentially infectious body fluids or has open lesions on hands:
  - If gloves are worn, they should be changed between patients.
  - Perform hand hygiene between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

Hand Hygiene in Healthcare Settings | CDC
Preparing Vaccines for Administration | CDC

Route and Site

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

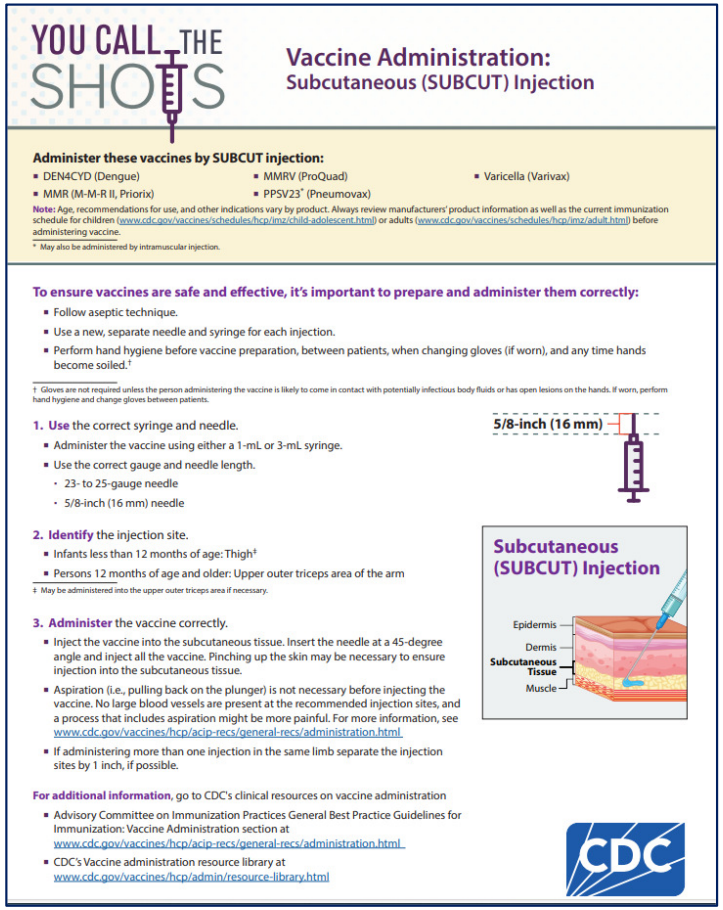
- **Intranasal (NAS):**
  - LAIV4 is the only vaccine administered by the intranasal route.



Pink book: Vaccine Administration | CDC
Vaccine Administration Route and Site | CDC
Videos: Vaccine Administration Resource Library | CDC

Subcutaneous Injection Route

- **Use the correct syringe and needle:**
  - 23- to 25-gauge needle, 5/8-inch
- **Identify the injection site:**
  - Thigh for infants younger than 12 months of age
  - Subcutaneous tissue over the upper outer triceps of arm for children older than 12 months and adults (can be used for infants if necessary)



YOU CALL THE SHOTS

Vaccine Administration:
Subcutaneous (SUBCUT) Injection

Administer these vaccines by SUBCUT injection:

- DEN4CYD (Dengue)
- MMR (M-M-R II, Priorix)
- MMRV (ProQuad)
- PPSV23* (Pneumovax)
- Varicella (Varivax)

Note: Age, recommendations for use, and other indications vary by product. Always review manufacturers' product information as well as the current immunization schedule for children (www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html) or adults (www.cdc.gov/vaccines/schedules/hcp/imz/adult.html) before administering vaccine.

* May also be administered by intramuscular injection.

To ensure vaccines are safe and effective, it's important to prepare and administer them correctly:

- Follow aseptic technique.
- Use a new, separate needle and syringe for each injection.
- Perform hand hygiene before vaccine preparation, between patients, when changing gloves (if worn), and any time hands become soiled.†

† Gloves are not required unless the person administering the vaccine is likely to come in contact with potentially infectious body fluids or has open lesions on the hands. If worn, perform hand hygiene and change gloves between patients.

1. Use the correct syringe and needle.

- Administer the vaccine using either a 1-mL or 3-mL syringe.
- Use the correct gauge and needle length.
  - 23- to 25-gauge needle
  - 5/8-inch (16 mm) needle

5/8-inch (16 mm)

2. Identify the injection site.

- Infants less than 12 months of age: Thigh‡
- Persons 12 months of age and older: Upper outer triceps area of the arm

‡ May be administered into the upper outer triceps area if necessary.

3. Administer the vaccine correctly.

- Inject the vaccine into the subcutaneous tissue. Insert the needle at a 45-degree angle and inject all the vaccine. Pinching up the skin may be necessary to ensure injection into the subcutaneous tissue.
- Aspiration (i.e., pulling back on the plunger) is not necessary before injecting the vaccine. No large blood vessels are present at the recommended injection sites, and a process that includes aspiration might be more painful. For more information, see www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administration.html
- If administering more than one injection in the same limb separate the injection sites by 1 inch, if possible.

Subcutaneous (SUBCUT) Injection

For additional information, go to CDC's clinical resources on vaccine administration

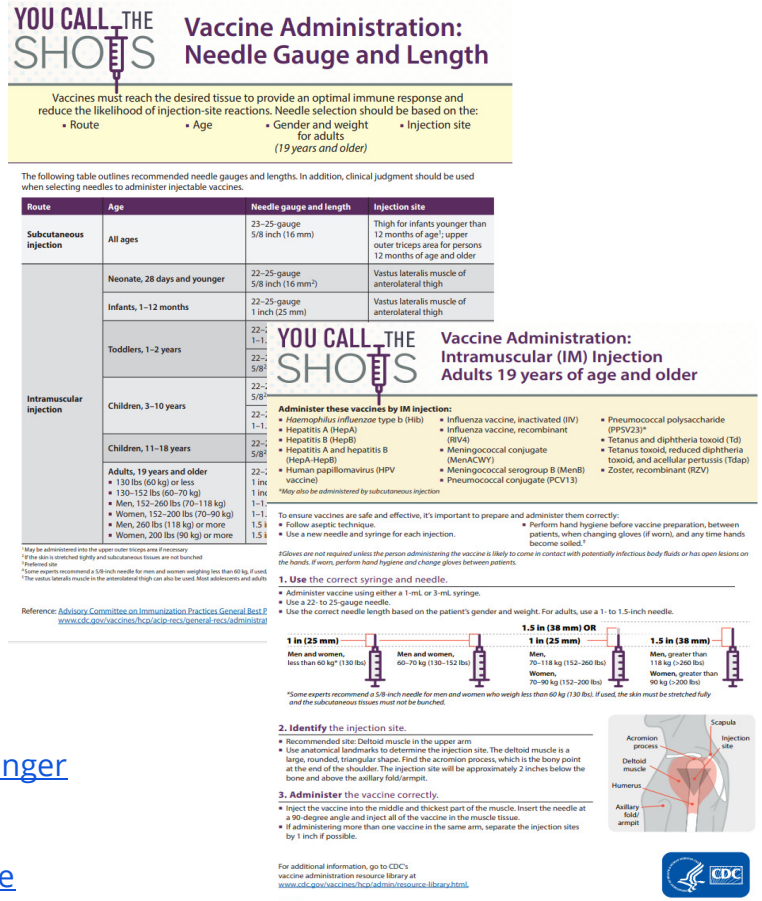
- Advisory Committee on Immunization Practices General Best Practice Guidelines for Immunization: Vaccine Administration section at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administration.html
- CDC's Vaccine administration resource library at www.cdc.gov/vaccines/hcp/admin/resource-library.html

CDC

Pink book: Vaccine Administration | CDC
Vaccine Administration: Needle Gauge and Length
You Call The Shots - Vaccine Administration: Subcutaneous (SUBCUT) Injection (cdc.gov)

Intramuscular (IM) Injection Route

- **Infants and children 2 years of age and younger:**
  - Vastus lateralis muscle in the anterolateral thigh
- **Persons 3 years of age and older:**
  - Deltoid muscle in the upper arm*
- **Use professional judgement when selecting needle length and injection site**



YOU CALL THE SHOTS

Vaccine Administration: Needle Gauge and Length

Vaccines must reach the desired tissue to provide an optimal immune response and reduce the likelihood of injection-site reactions. Needle selection should be based on the:
- Route
- Age
- Gender and weight for adults (19 years and older)
- Injection site

The following table outlines recommended needle gauges and lengths. In addition, clinical judgment should be used when selecting needles to administer injectable vaccines.

Route	Age	Needle gauge and length	Injection site
Subcutaneous injection	All ages	23–25-gauge 5/8 inch (16 mm)	Thigh for infants younger than 12 months of age[1]; upper outer triceps area for persons 12 months of age and older
Intramuscular injection	Neonate, 28 days and younger	22–25-gauge 5/8 inch (16 mm[2])	Vastus lateralis muscle of anterolateral thigh
	Infants, 1–12 months	22–25-gauge 1 inch (25 mm)	Vastus lateralis muscle of anterolateral thigh
	Toddlers, 1–2 years	22–… 1–1…	
		22–… 5/8[3]	
	Children, 3–10 years	22–… 5/8[3]	
		22–… 1–1…	
	Children, 11–18 years	22–… 5/8[3]	
	Adults, 19 years and older ▪ 130 lbs (60 kg) or less ▪ 130–152 lbs (60–70 kg) ▪ Men, 152–260 lbs (70–118 kg) ▪ Women, 152–200 lbs (70–90 kg) ▪ Men, 260 lbs (118 kg) or more ▪ Women, 200 lbs (90 kg) or more	22–… 1 inc… 1 inc… 1–1… 1–1… 1.5 i… 1.5 i…	

[1] May be administered into the upper outer triceps area if necessary
[2] If the skin is stretched tightly and subcutaneous tissues are not bunched
[3] Preferred site
[4] Some experts recommend a 5/8-inch needle for men and women weighing less than 60 kg, if used.
[5] The vastus lateralis muscle in the anterolateral thigh can also be used. Most adolescents and adults

Reference: Advisory Committee on Immunization Practices General Best P… www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administrat…

YOU CALL THE SHOTS

Vaccine Administration: Intramuscular (IM) Injection Adults 19 years of age and older

Administer these vaccines by IM injection:
- *Haemophilus influenzae* type b (Hib)
- Hepatitis A (HepA)
- Hepatitis B (HepB)
- Hepatitis A and hepatitis B (HepA-HepB)
- Human papillomavirus (HPV vaccine)
- Influenza vaccine, inactivated (IIV)
- Influenza vaccine, recombinant (RIV4)
- Meningococcal conjugate (MenACWY)
- Meningococcal serogroup B (MenB)
- Pneumococcal conjugate (PCV13)
- Pneumococcal polysaccharide (PPSV23)*
- Tetanus and diphtheria toxoid (Td)
- Tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap)
- Zoster, recombinant (RZV)

*May also be administered by subcutaneous injection

To ensure vaccines are safe and effective, it's important to prepare and administer them correctly:
- Follow aseptic technique.
- Use a new needle and syringe for each injection.
- Perform hand hygiene before vaccine preparation, between patients, when changing gloves (if worn), and any time hands become soiled.†

†Gloves are not required unless the person administering the vaccine is likely to come in contact with potentially infectious body fluids or has open lesions on the hands. If worn, perform hand hygiene and change gloves between patients.

1. Use the correct syringe and needle.
- Administer vaccine using either a 1-mL or 3-mL syringe.
- Use a 22- to 25-gauge needle.
- Use the correct needle length based on the patient's gender and weight. For adults, use a 1- to 1.5-inch needle.

1 in (25 mm): Men and women, less than 60 kg* (130 lbs)
1 in (25 mm): Men and women, 60–70 kg (130–152 lbs)
1.5 in (38 mm) OR 1 in (25 mm): Men, 70–118 kg (152–260 lbs); Women, 70–90 kg (152–200 lbs)
1.5 in (38 mm): Men, greater than 118 kg (>260 lbs); Women, greater than 90 kg (>200 lbs)

*Some experts recommend a 5/8-inch needle for men and women who weigh less than 60 kg (130 lbs). If used, the skin must be stretched fully and the subcutaneous tissues must not be bunched.

2. Identify the injection site.
- Recommended site: Deltoid muscle in the upper arm
- Use anatomical landmarks to determine the injection site. The deltoid muscle is a large, rounded, triangular shape. Find the acromion process, which is the bony point at the end of the shoulder. The injection site will be approximately 2 inches below the bone and above the axillary fold/armpit.

3. Administer the vaccine correctly.
- Inject the vaccine into the middle and thickest part of the muscle. Insert the needle at a 90-degree angle and inject all of the vaccine in the muscle tissue.
- If administering more than one vaccine in the same arm, separate the injection sites by 1 inch if possible.

Scapula, Injection site, Acromion process, Deltoid muscle, Humerus, Axillary fold/armpit

For additional information, go to CDC's vaccine administration resource library at www.cdc.gov/vaccines/hcp/admin/resource-library.html.

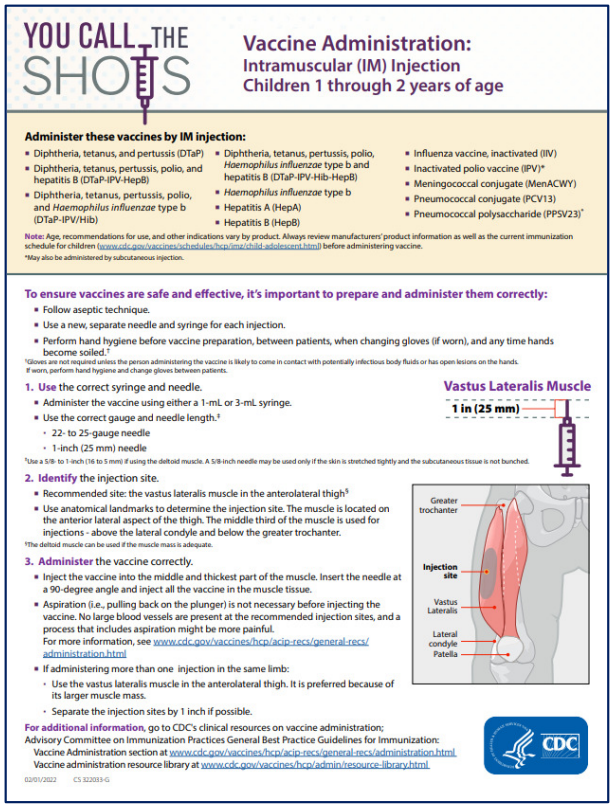
CDC

*The vastus lateralis muscle may also be used.

[Vaccine Administration: Intramuscular (IM) Injection Infants 11 months of age and younger]
[Vaccine Administration: Intramuscular (IM) Injection Children 1 through 2 years of age]
[Vaccine Administration: Intramuscular (IM) Injection Children 3 through 6 years of age]
[Vaccine Administration: Intramuscular (IM) Injection Children 7 through 18 years of age]
[Vaccine Administration: Intramuscular (IM) Injection Adults 19 years of age and older]
[Vaccine Administration: Needle Gauge and Length (cdc.gov)]

Intramuscular Injection Route

- **Use the correct syringe and needle:**
  - Infants and children: 22- to 25-gauge needle, 1-inch
  - 19 years and older: Varies based on weight and gender
- **Identify the injection site:**
  - Infants and children 2 years of age and younger: Vastus lateralis muscle in the anterolateral thigh
  - Persons 3 years of age and older: Deltoid muscle in the upper arm*



YOU CALL THE SHOTS

Vaccine Administration:
Intramuscular (IM) Injection
Children 1 through 2 years of age

Administer these vaccines by IM injection:

- Diphtheria, tetanus, and pertussis (DTaP)
- Diphtheria, tetanus, pertussis, and hepatitis B (DTaP-IPV-HepB)
- Diphtheria, tetanus, pertussis, polio, and *Haemophilus influenzae* type b (DTaP-IPV/Hib)
- Diphtheria, tetanus, pertussis, polio, *Haemophilus influenzae* type b and hepatitis B (DTaP-IPV-Hib-HepB)
- *Haemophilus influenzae* type b
- Hepatitis A (HepA)
- Hepatitis B (HepB)
- Influenza vaccine, inactivated (IIV)
- Inactivated polio vaccine (IPV)*
- Meningococcal conjugate (MenACWY)
- Pneumococcal conjugate (PCV13)
- Pneumococcal polysaccharide (PPSV23)*

Note: Age, recommendations for use, and other indications vary by product. Always review manufacturers' product information as well as the current immunization schedule for children (www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html) before administering vaccine.
*May also be administered by subcutaneous injection.

To ensure vaccines are safe and effective, it's important to prepare and administer them correctly:

- Follow aseptic technique.
- Use a new, separate needle and syringe for each injection.
- Perform hand hygiene before vaccine preparation, between patients, when changing gloves (if worn), and any time hands become soiled.[†]

[†]Gloves are not required unless the person administering the vaccine is likely to come in contact with potentially infectious body fluids or has open lesions on the hands. If worn, perform hand hygiene and change gloves between patients.

1. Use the correct syringe and needle.

- Administer the vaccine using either a 1-mL or 3-mL syringe.
- Use the correct gauge and needle length.[‡]
  - 22- to 25-gauge needle
  - 1-inch (25 mm) needle

[‡]Use a 5/8- to 1-inch (16 to 5 mm) if using the deltoid muscle. A 5/8-inch needle may be used only if the skin is stretched tightly and the subcutaneous tissue is not bunched.

Vastus Lateralis Muscle
1 in (25 mm)

2. Identify the injection site.

- Recommended site: the vastus lateralis muscle in the anterolateral thigh[§]
- Use anatomical landmarks to determine the injection site. The muscle is located on the anterior lateral aspect of the thigh. The middle third of the muscle is used for injections - above the lateral condyle and below the greater trochanter.

[§]The deltoid muscle can be used if the muscle mass is adequate.

Greater trochanter
Injection site
Vastus Lateralis
Lateral condyle
Patella

3. Administer the vaccine correctly.

- Inject the vaccine into the middle and thickest part of the muscle. Insert the needle at a 90-degree angle and inject all the vaccine in the muscle tissue.
- Aspiration (i.e., pulling back on the plunger) is not necessary before injecting the vaccine. No large blood vessels are present at the recommended injection sites, and a process that includes aspiration might be more painful.
  For more information, see www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administration.html
- If administering more than one injection in the same limb:
  - Use the vastus lateralis muscle in the anterolateral thigh. It is preferred because of its larger muscle mass.
  - Separate the injection sites by 1 inch if possible.

For additional information, go to CDC's clinical resources on vaccine administration; Advisory Committee on Immunization Practices General Best Practice Guidelines for Immunization:
Vaccine Administration section at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administration.html
Vaccine administration resource library at www.cdc.gov/vaccines/hcp/admin/resource-library.html

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CDC

Pink book: Vaccine Administration | CDC
Vaccine Administration: Needle Gauge and Length (cdc.gov)
Vaccine Administration Resource Library | CDC

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

ACIP Adverse Reactions Guidelines for Immunization | CDC
Pink book: Vaccine Administration | CDC

Additional Considerations: Simultaneous Administration

Subtitle

Simultaneous Vaccine Administration

- Simultaneous administration or co-administration is defined as administration of two or more vaccines during the same clinical visit.

- Simultaneous administration of most vaccines is safe, effective, and recommended.

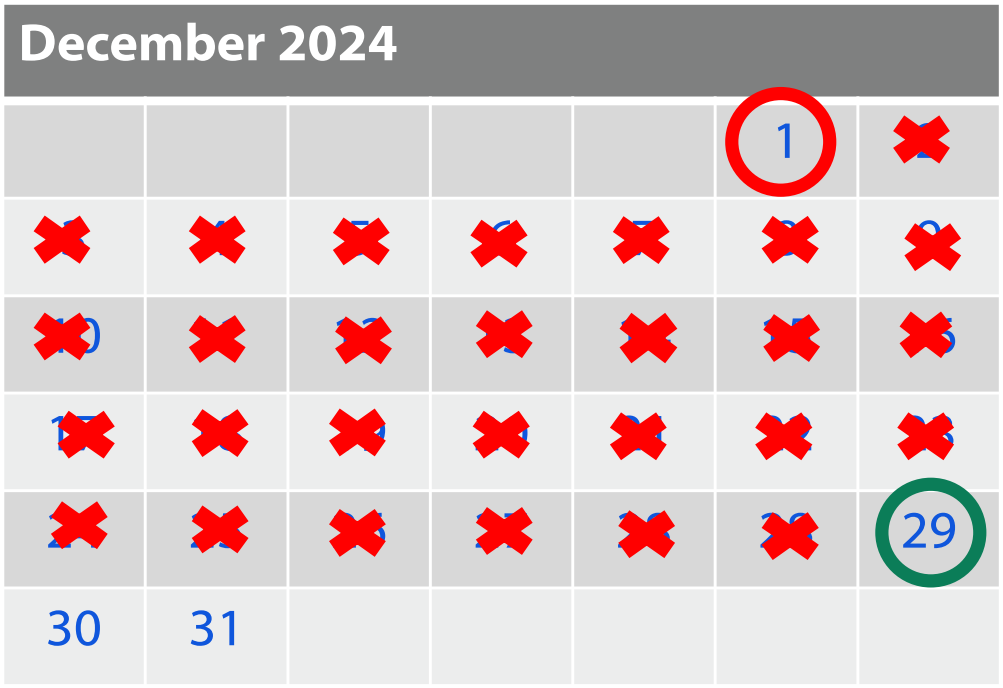
ACIP General Best Practice Guidelines for Immunization | CDC

Clinical Considerations: Live, Attenuated Vaccines

December 2024						
					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	28	29
30	31					

Live, attenuated vaccines may be given on the same day with other live, attenuated vaccines.

Clinical Considerations: Live, Attenuated Vaccines

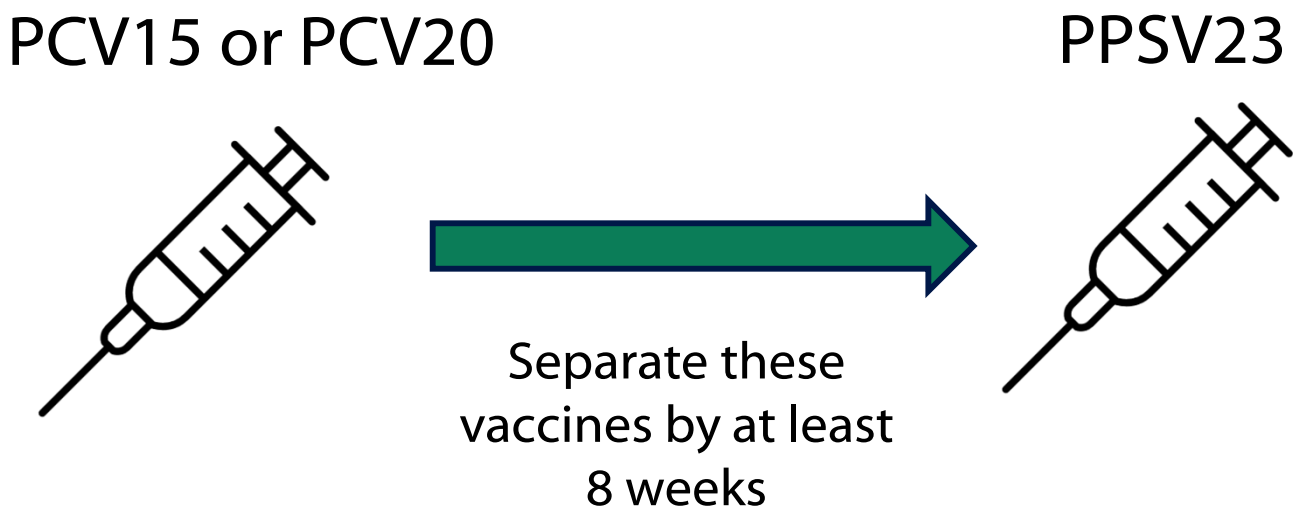


If not given on the same day, separate live, attenuated vaccines by at least 28 days.

ACIP General Best Practice Guidelines for Immunization | CDC

Clinical Considerations: Pneumococcal Vaccines

Do NOT administer PCV and PPSV23 vaccines at the same clinical visit



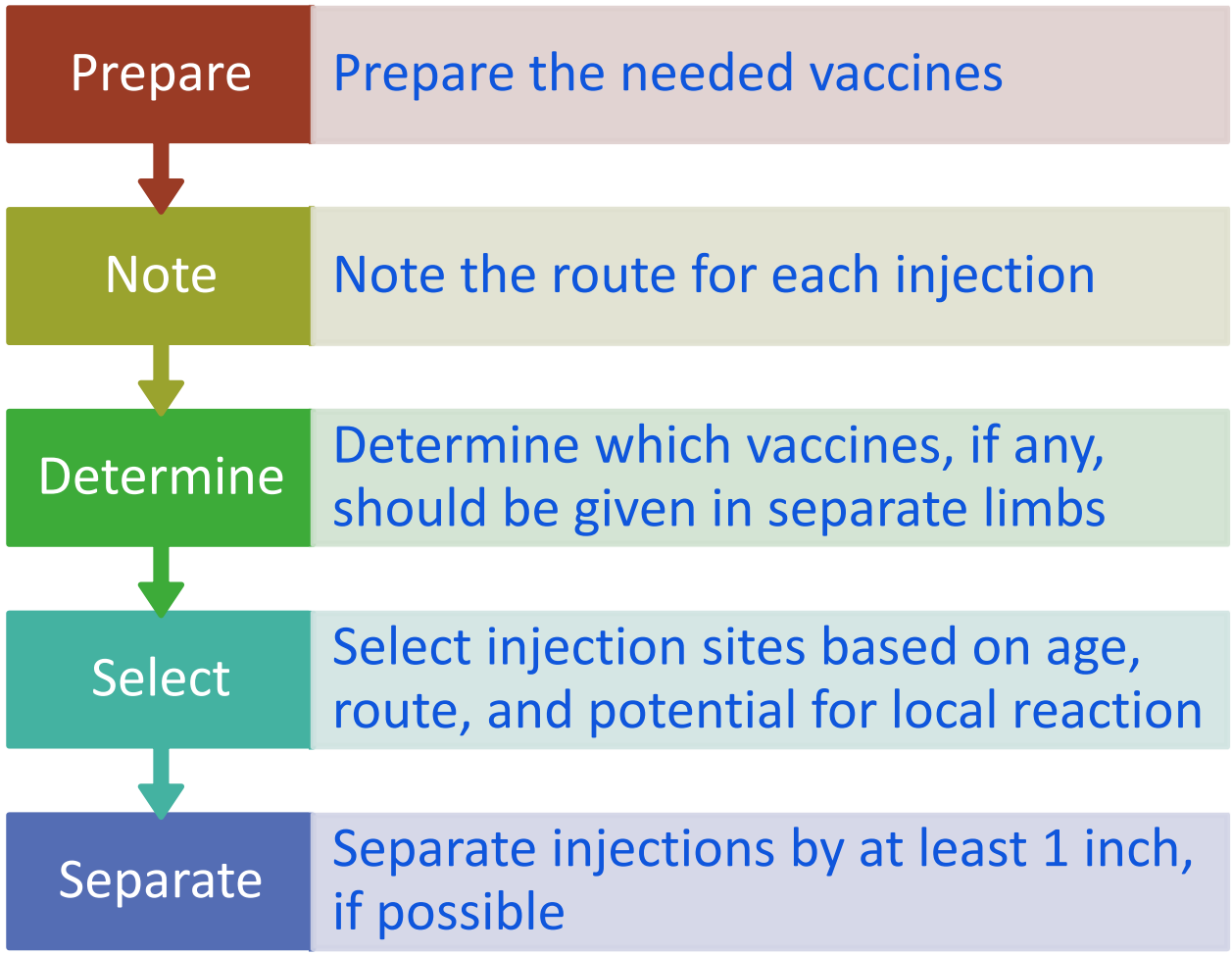
ACIP General Best Practice Guidelines for Immunization | CDC

COVID-19 and Mpox Vaccines

- **There is no required minimum interval between receiving a dose of any COVID-19 vaccine and an orthopoxvirus vaccine, either JYNNEOS or ACAM2000 vaccine (e.g., for mpox prevention), regardless of which vaccine is administered first.**
  - Jynneos is the main vaccine being used in the United States to prevent mpox.
- **Use of JYNNEOS vaccine should be prioritized over ACAM2000 when co-administering a COVID-19 vaccine and an orthopoxvirus vaccine.**
- **People, particularly adolescent or young adult males, who are recommended to receive both vaccines might consider waiting 4 weeks between vaccines.**

Clinical Guidance for COVID-19 Vaccination | CDC

Have an Injection Site Plan



What if an Administration Error Occurs?

What if a Vaccination Error Occurs?

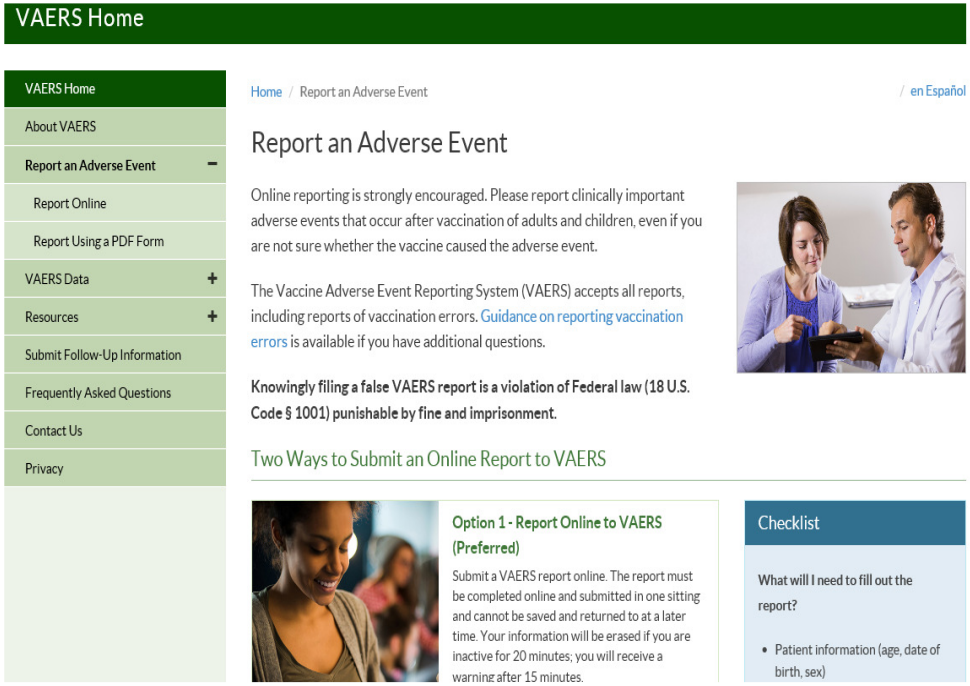
- **Inform the patient/parent of the error**
- **Determine the patient's status**
  - How is the patient doing?
- **Know how to correct the error:**
  - Contact your local health department, vaccine manufacturer, or CDC for guidance.
- **Explain any needed next steps**
  - Does the dose need to be repeated? When?
- **Record the vaccine as it was given on the medical administration record**
- **Determine how the error occurred and put strategies in place to prevent it from happening again.**

Pink book: Vaccine Administration | CDC
CDC INFO | CDC

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 administration errors involving COVID-19 vaccine under an Emergency Use Authorization (EUA)**



VAERS - Report an Adverse Event (hhs.gov)

Preventing Vaccine Administration Errors

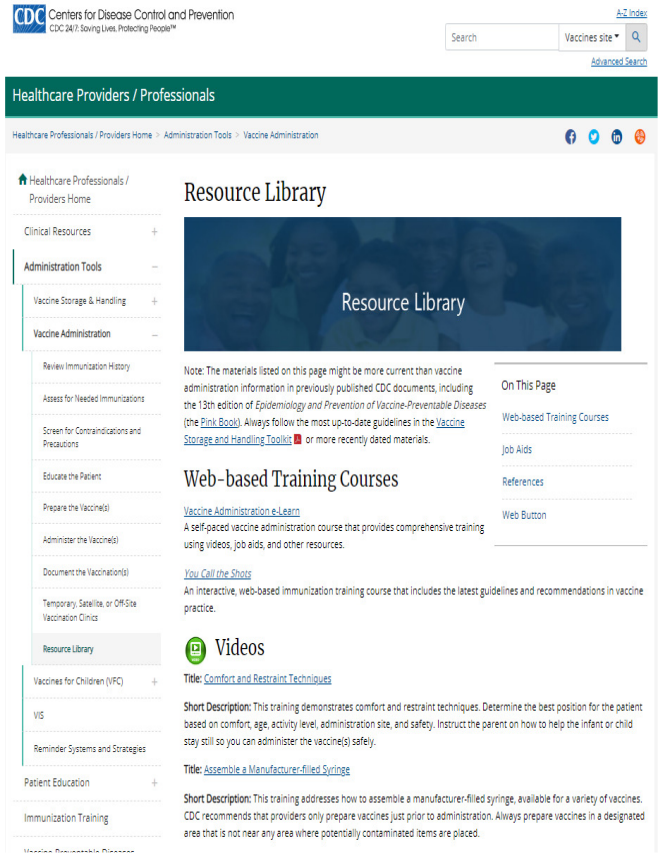
#1. Staff Training

- **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.**

Pink book: Vaccine Administration | CDC

CDC's Vaccine Administration Website

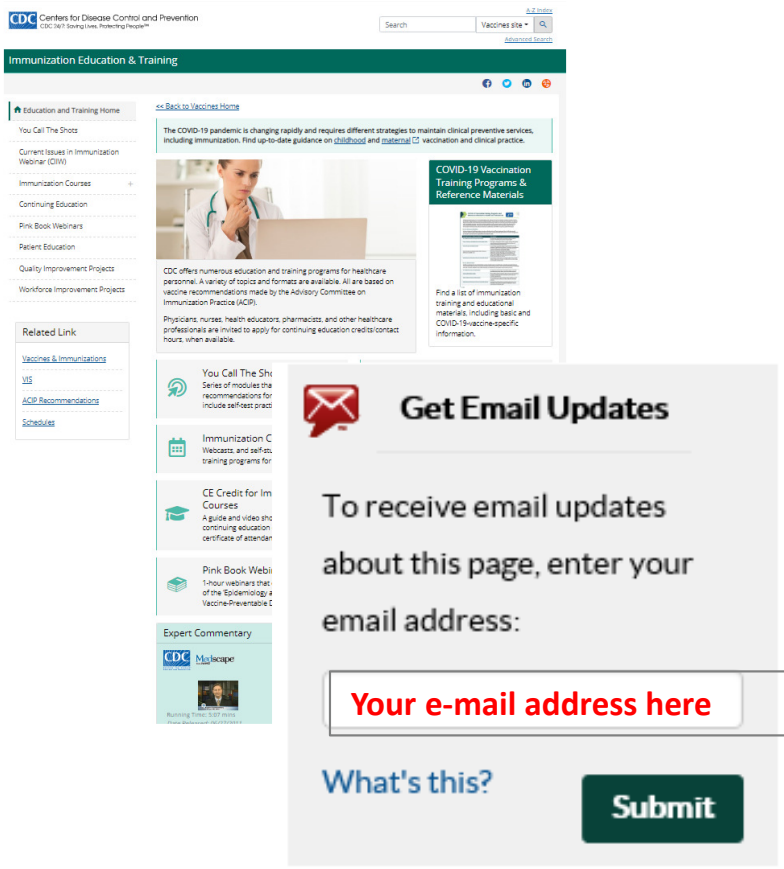
- **Comprehensive source of resources and training materials for healthcare personnel who administer vaccines, including**
  - Self-pace learning modules
  - Demonstration videos
  - Printable job aids
  - References



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

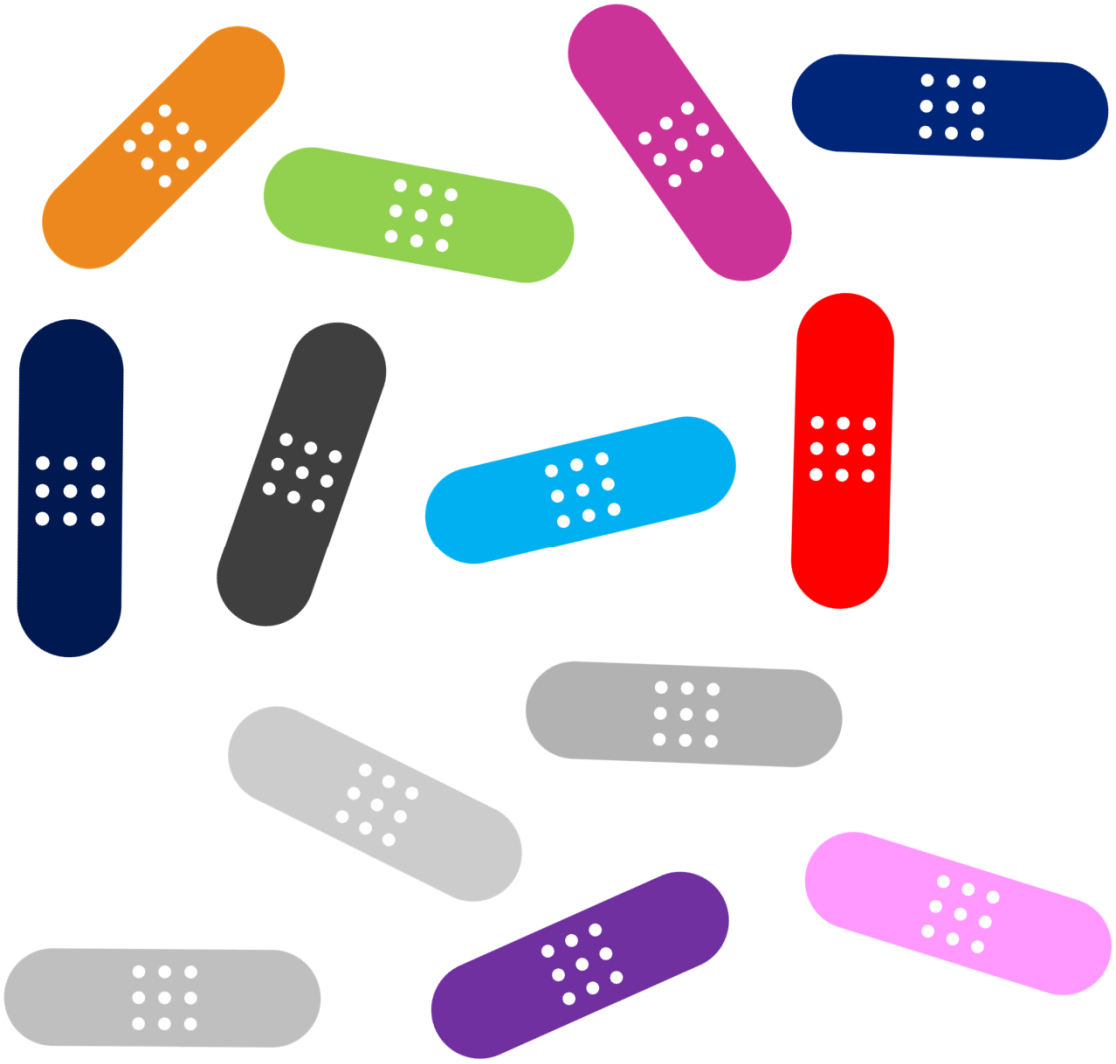
- **Sign up for e-mail updates**



[Vaccine Education and Training for Healthcare Professionals | CDC]

E-mail Your Immunization Questions to Us

- NIPINFO@cdc.gov



Act as if what you do makes a difference. Because it does.

William James

For more information, contact CDC/ATSDR
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov www.atsdr.cdc.gov