



Vaccine Storage and Handling and Vaccine Administration

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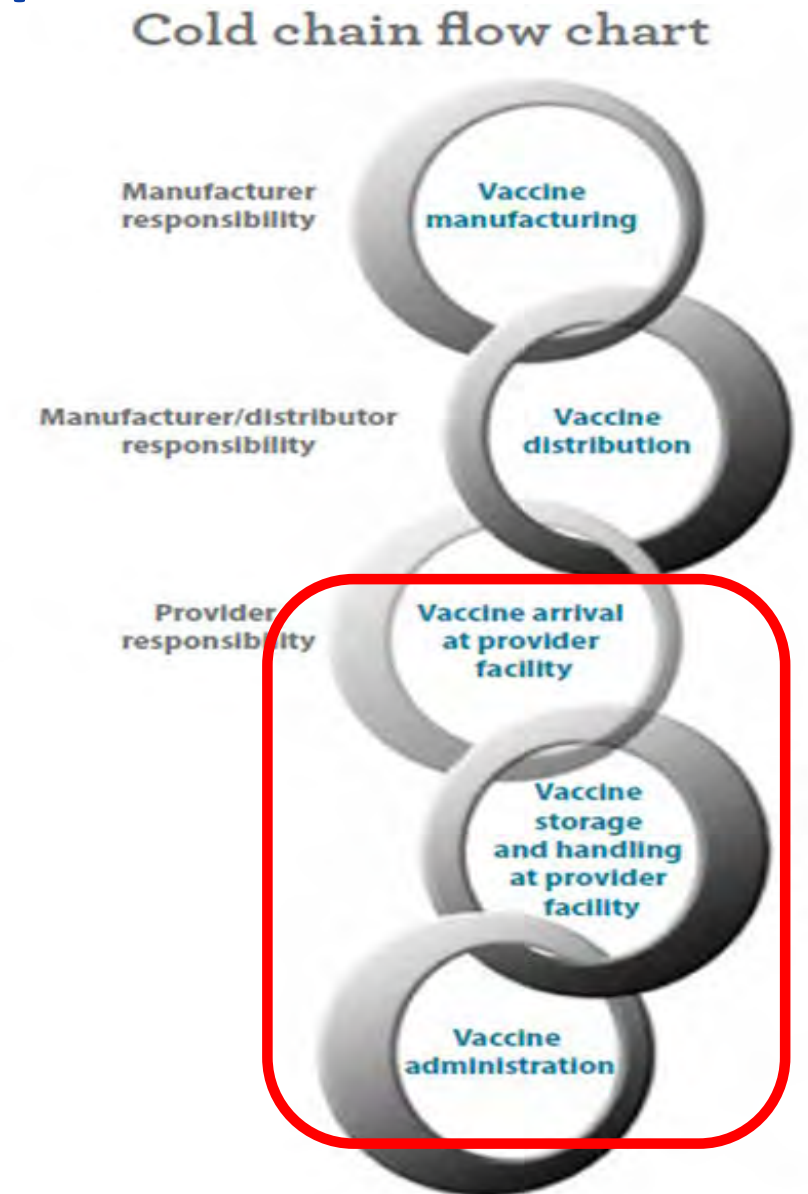
Pink Book Webinar Series

July 11, 2018

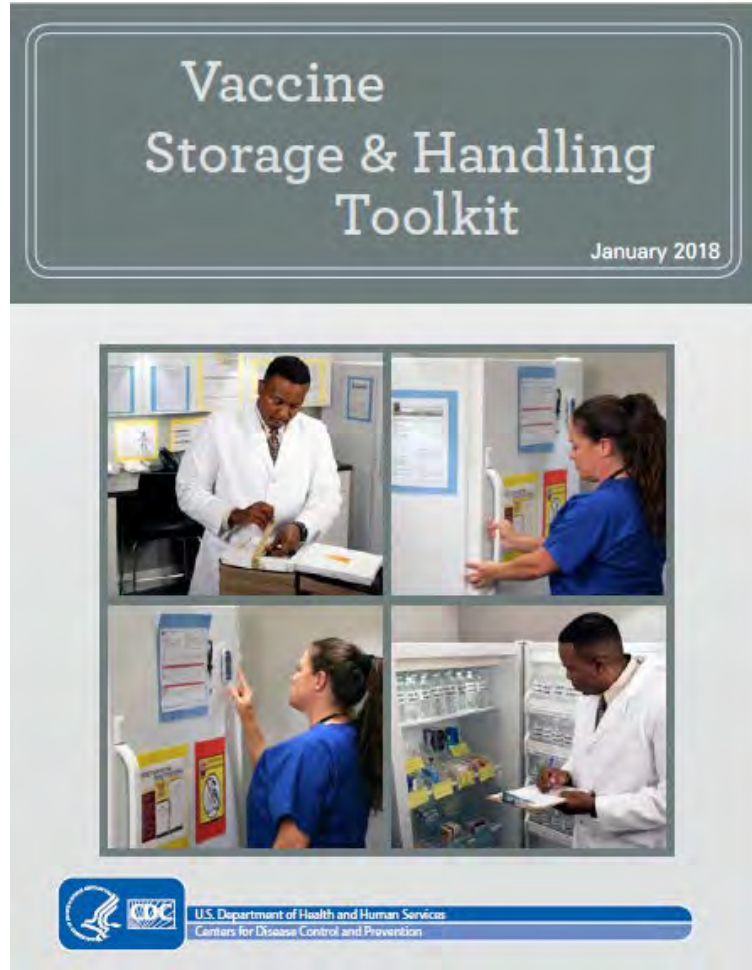
VACCINE STORAGE AND HANDLING

Vaccine Storage and Handling Cold Chain (Temperature-Controlled Supply Chain)

- Vaccines must be stored properly from manufacturer to administration
- Shared responsibility among manufacturers, distributors, public health staff, and health care providers
- An effective cold chain relies on three main elements:
 - Well-trained staff
 - Reliable storage and temperature monitoring equipment
 - Accurate vaccine inventory management



Vaccine Storage and Handling Best Practices



Vaccine Recommendations and Guidelines of the ACIP

ACIP Recs Home

Vaccine-Specific Recommendations

Recs Listed by Date

Comprehensive Recommendations and Guidelines

General Best Practice Guidelines

Introduction

Methods

Timing and Spacing of Immunobiologics

Contraindications and Precautions

Preventing and Managing Adverse Reactions

Vaccine Administration

Storage and Handling of Immunobiologics

Altered Immunocompetence

Special Situations

CDC > ACIP Recs Home > Comprehensive Recommendations and Guidelines

General Best Practice Guidelines for Immunization

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Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP)

Kroger AT, Duchin J, Vázquez M

[Printer friendly version](#) (1.16 MB, 194 pages)

INTRODUCTION

Purpose and topics covered in this report...

METHODS

Method of development of: Timing and Spacing, Contraindications and Precautions, Preventing and Managing Adverse Reactions...

TIMING AND SPACING

Vaccine scheduling, supply of vaccines, interchangeability

CONTRAINDICATIONS

General principles, standard

FDA U.S. FOOD & DRUG ADMINISTRATION

A to Z Index | Follow FDA | En Español

Search FDA

Home | Food | Drugs | Medical Devices | Radiation-Emitting Products | Vaccines, Blood & Biologics | Animal & Veterinary | Cosmetics | Tobacco Products

Vaccines, Blood & Biologics

Home > Vaccines, Blood & Biologics > Vaccines > Approved Products

Approved Products

Resources for You

- Consumers (Biologics)
- Healthcare Providers (Biologics)
- Industry (Biologics)
- About the Center for Biologics Evaluation and Research (CBER)

Vaccines Licensed for Use in the United States

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Product Name	Trade Name
Adenovirus Type 4 and Type 7 Vaccine, Live, Oral	No Trade Name
Anthrax Vaccine Adsorbed	Biothrax
BCG Live	BCG Vaccine
BCG Live	TICE BCG
Cholera Vaccine Live Oral	Vaxchora
Diphtheria & Tetanus Toxoids Adsorbed	No Trade Name
Diphtheria & Tetanus Toxoids & Acellular Pertussis Vaccine Adsorbed	Infanrix
Diphtheria & Tetanus Toxoids & Acellular Pertussis Vaccine Adsorbed	DAPTACEL
Diphtheria & Tetanus Toxoids & Acellular Pertussis Vaccine Adsorbed, Hepatitis B (recombinant) and Inactivated Poliovirus Vaccine Combined	Pediarix
Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed and Inactivated Poliovirus Vaccine	KINRIX

<https://www.cdc.gov/vaccines/hcp/admin/storage/toolkit/index.html>

www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html

www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm093833.htm

Vaccine Storage and Handling Standard Operating Procedures (SOPs)

- Develop, follow, and update plans and SOPs annually:
 - Routine SOPs
 - Emergency SOPs
- Keep SOPs near storage unit(s):
 - Ensure staff knows where to find SOPs and is familiar with their contents
 - Ensure custodial/security staff knows how to notify appropriate staff if there is a problem



Staff Training and Education

- Designate a primary coordinator and at least one alternate (backup) coordinator
- Provide training for all staff that receives deliveries and handles or administers vaccines:
 - New employee orientation
 - Annual refresher training
 - When recommendations are updated
 - When new vaccines are added



Immunization Education & Training

Education and Training Home

[You Call The Shots](#)

Current Issues in Immunization
NetConferences (CINIC)

Immunization Courses +

CE Credit

Pink Book Webinars

Patient Education

Quality Improvement Projects

[Get Email Updates](#)

[CDC > Education and Training Home](#)

You Call The Shots

[f](#) [t](#) [+](#)

Web-based Training Course

Note: You Call the Shots is updated regularly to include the latest guidelines and recommendations in vaccine practice. The latest 2015 modules are below.

Come back every month for the latest training to stay up to date on the immunization practice.

At a Glance

You Call the Shots is an interactive, web-based immunization training course. It consists of a series of modules that discuss vaccine-preventable diseases and explain the latest recommendations for vaccine use. Each module provides learning opportunities, self-test practice questions, reference and resource materials, and an extensive glossary.



Vaccine Ordering and Deliveries

- **Conduct a monthly vaccine and diluent inventory**
 - Avoid overstocking
- **Arrange deliveries when vaccine coordinator or alternate (backup) coordinator is on duty and notify them when delivery arrives**



All staff members who accept vaccine deliveries must be aware of the importance of maintaining the cold chain and the need to immediately notify the vaccine coordinator or alternate (back-up) coordinator upon arrival.

Vaccine Ordering and Deliveries

- Immediately unpack and examine container, contents, and temperature monitors when delivery arrives
- If there are concerns:
 - Label vaccines “Do NOT Use”
 - Store under appropriate conditions, isolated from other vaccines
 - Consult immunization program, distributor, and/or vaccine manufacturer for guidance



Vaccine Storage Equipment

- CDC recommends the following freezers and refrigerators:
 - Purpose-built (stand-alone or combination)
 - Household stand-alone

Store in freezer
Between -50°C and -15°C (-58°F and +5°F)

VAR [†]	
HZV [†]	VAR
MMRV [†]	ZVL
MMRT [‡]	MMRV
	MMR

Store in Refrigerator
Between 2°C and 8°C (36°F and 46°F)

MMR ^{†§}		
HepA	HepB	HepA-HepB
Hib [†]		
9vHPV [†]		
Influenza (LAIV, ^{††} IIV, [†] RIV [†])		
IPV [†]		
Meningococcal (MenACWY-D, MenACWY-CRM, [†] MenB-4C, MenB-FHbp [†])		
Pneumococcal (PCV13 and PPSV23)		
Rotavirus [†] (RV1 and RV5)		
Diphtheria toxoid-, Tetanus toxoid-, and Pertussis (DT, DTaP, DTaP-HepB-IPV, DTaP-IPV, DTaP-IPV/Hib, Tdap, Td)		
RZV [†]		

Vaccine Storage Equipment



- If existing equipment is a household combination refrigerator/freezer, use only the refrigerator compartment for storing vaccines
- Do not store any vaccine in a dormitory-style or bar-style combined refrigerator/freezer unit under any circumstances



Water bottles on top shelf, in door, and on unit floor



Temperature Monitoring Devices (TMD)

- CDC recommends the use of a specific type of TMD known as a digital data logger (DDL) for continuous temperature monitoring and recording
- The DDL should be set to measure and record temperatures no less frequently than every 30 minutes
- The DDL should have a current and valid Certificate of Calibration (also known as a Report of Calibration)

Temperature Monitoring Device



CDC recommends DDLs with the following features:

- Detachable probe that best reflects vaccine temperatures (e.g., a probe buffered with glycol, glass beads, sand, or Teflon®)
- Alarm for out-of-range temperatures
- Low-battery indicator
- Current, minimum, and maximum temperature display
- Recommended uncertainty of $\pm 0.5^{\circ}\text{C}$ ($\pm 1^{\circ}\text{F}$)
- Logging interval (or reading rate) that can be programmed by the user to measure and record temperatures no less frequently than every 30 minutes

Temperature Monitoring

- Post temperature log on each storage unit door or nearby in readily accessible, visible location
- Check and record storage unit minimum and maximum temperatures at the start of each workday
- If your device does not display min/max temperatures, then check and record the current temperature a minimum of 2 times (at the start and end of the workday)
- **Record:**
 - Min/max temperature (current temperature if no min/max temperature)
 - Date
 - Time
 - Name/initials of person checking and recording temperature
 - Any actions taken if a temperature excursion occurred
- **If a reading is missed, leave log entry blank**



Temperature Monitoring

- Review storage unit temperature readings and review continuous DDL software or website information at least 1 time each week
- Keep ongoing file of temperature data, including hard copies and electronic data, for 3 years



Temperature Excursion

- If stored vaccines have been exposed to temperatures outside recommended ranges:
 - Immediately notify the primary or alternate vaccine coordinator
 - Label vaccines “Do NOT Use”
 - Store vaccines in appropriate conditions separate from other vaccines
 - Contact your immunization program, vaccine manufacturer(s), or both for guidance
 - Be prepared to move all vaccines to a different unit if the temperature in the main storage unit has gone out of range

www.immunize.org/catg.d/p3041.pdf

<https://www.cdc.gov/vaccines/hcp/admin/storage/downloads/temperature-excursion-508.pdf>

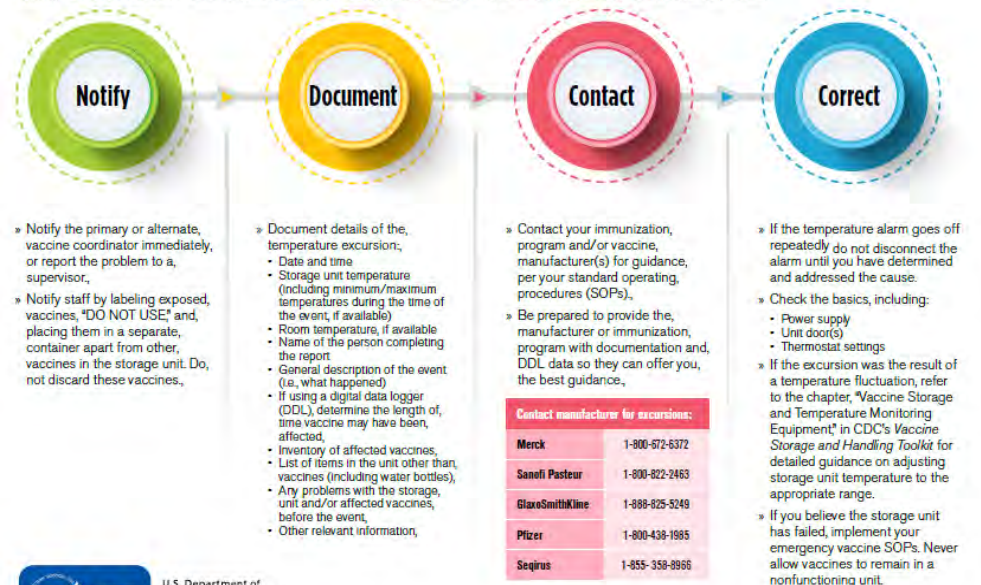
Vaccine Storage Troubleshooting Record (check one) Refrigerator Freezer

Use this form to document any unacceptable vaccine storage event, such as exposure of refrigerated or frozen vaccines to temperatures that are outside the manufacturers' recommended storage ranges.

Date & Time of Event <small>If multiple, related events occurred, see Description of Event below.</small>	Storage Unit Temperature <small>at the time the problem was discovered</small>	Room Temperature <small>at the time the problem was discovered</small>	Person Completing Report	
	<small>When recording temperatures, indicate F (Fahrenheit) or C (Celsius).</small>			
Date:	Temp when discovered:	Temp when discovered:	Name:	
Time:	Minimum temp:	Maximum temp:	Comment (optional):	Title: _____ Date: _____
Description of Event <i>(If multiple, related events occurred, list each date, time, and length of time out of storage.)</i> <ul style="list-style-type: none"> • General description (i.e., what happened?) • Estimated length of time between event and last documented reading of storage temperature in acceptable range (36° to 46°F [2° to 8°C] for refrigerator; -58° to 5°F [-50° to -15°C] for freezer) • Inventory of affected vaccines, including (1) lot #s and (2) whether purchased with public (for example, VFC) or private funds (Use separate sheet if needed, but maintain the inventory with this troubleshooting record) • At the time of the event, what else was in the storage unit? For example, were there water bottles in the refrigerator and/or frozen coolant packs in the freezer? • Prior to this event, have there been any storage problems with this unit and/or with the affected vaccine? • Include any other information you feel might be relevant to understanding the event. 				
Action Taken <i>(Document thoroughly. This information is critical to determining whether the vaccine might still be viable.)</i> <ul style="list-style-type: none"> • When were the affected vaccines placed in proper storage conditions? (Note: Do not discard the vaccine. Store exposed vaccine in proper conditions and label it "do not use" until after you can discuss with your state/local health department and/or the manufacturer[s].) • Who was contacted regarding the incident? (For example, supervisor, state/local health department, manufacturer—list all.) • IMPORTANT: What did you do to prevent a similar problem from occurring in the future? 				
Results <ul style="list-style-type: none"> • What happened to the vaccine? 				

Handling a Temperature Excursion in Your Vaccine Storage Unit

Any temperature reading outside ranges recommended in the manufacturers' package inserts is considered a temperature excursion. Identify temperature excursions quickly and take immediate action to correct them. This can prevent vaccine waste and the potential need to revaccinate patients.



Vaccine and Diluent Placement and Labeling

- Store vaccines away from walls, coils, cooling vents, top shelf, ceiling, door, floor, and back of unit
- Keep vaccines and diluents in original packaging with lids closed
- Arrange in rows of same type of vaccine or diluent 2-3 inches apart
- Store pediatric, adult, look-alike, and sound-alike vaccines on different shelves
- Store refrigerated diluents with corresponding vaccines (these diluents may contain vaccine antigen)
- Use labels with vaccine type and age and gender indications or color coding: <https://www.cdc.gov/vaccines/hcp/admin/storage/index.html>

Vaccine and Diluent Placement and Labeling

- Do not store vaccines in the door or the deli, vegetable, and fruit crisper drawers
- Do not freeze diluents
- Vaccines with Diluents: How to Use Them
www.immunize.org/catg.d/p3040.pdf

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
AethIB (Hib)	Sanofi Pasteur	Hib	0.4% sodium chloride	24 hrs	Refrigerator
Hibicix (Hib)	GlaxoSmithKline	Hib	0.9% sodium chloride	24 hrs	Refrigerator or room temp
Imovax (RAB ₁₀₀₀)	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
Pediaact (DTaP-IPV/Hib)	Sanofi Pasteur	Hib	DTaP-IPV	Immediately‡	Refrigerator
ProQuad (MMRV)	Merck	MMRV	Sterile water	30 min	Refrigerator or room temp
RabAvert (RAB ₁₀₀₀)	GlaxoSmithKline	Rabies virus	Sterile water	Immediately†	Refrigerator
Rotaris (RV1)†	GlaxoSmithKline	RV1	Sterile water, calcium carbonate, and sorbitan	24 hrs	Refrigerator or room temp
Shingrix (RZV)	GlaxoSmithKline	RZV	AS01 [®] adjuvant suspension	6 hours	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 (LZV)	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 (except for Rotaris), select a syringe and needle of proper length to be used for both reconstitution and administration of the vaccine. Following reconstitution, Meruvax in a multidose vial will require a new needle and syringe for each dose of vaccine to be administered. For Rotaris, see the package insert.†
- 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 suspension, 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 cannot be used in a multidose vial (i.e., multi-dose blending), 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.

†The reconstituted vaccine is not used within this time period, it must be discarded.

‡For purposes of this guideline, "DO NOT USE" is within 30 minutes or less.

†Diluent (rotavirus) is administered by mouth using the syringe that contains the diluent. It is not administered as an injection.

‡AS01[®] is composed of 5.0 µmol of monophosphoryl lipid A (MPL) from *Salmonella typhimurium* and QS-21, a saponin.

†The vaccine is a purified live plant extract (Quilja saponin) which, combined in a liposomal formulation. The liposomes are composed of deoxy polyethylene glycol (DPEG) and cholesterol in phospholipid bilayer vesicles containing cholesterol phosphate esters, cholesterol, cholesterol squalene, sodium stearoyl, and water for injection.

Technical content reviewed by the Centers for Disease Control and Prevention.

Preventive Measures

■ DO:

- Plug unit directly into wall
- Plug only one unit into an outlet
- Use a plug guard or safety-lock plug
- Install a temperature alarm
- Label circuit breakers and electrical outlets
- Post warning signs that include emergency contact information



Preventive Measures

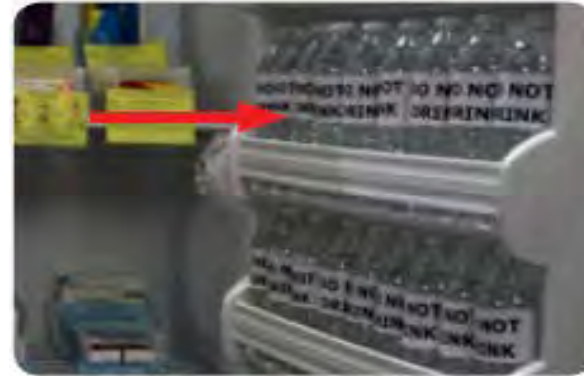
■ DON'T:

- Use power outlets with built-in circuit switches
- Use power outlets that can be activated by a wall switch
- Use multi-outlet power strip



Preventive Measures

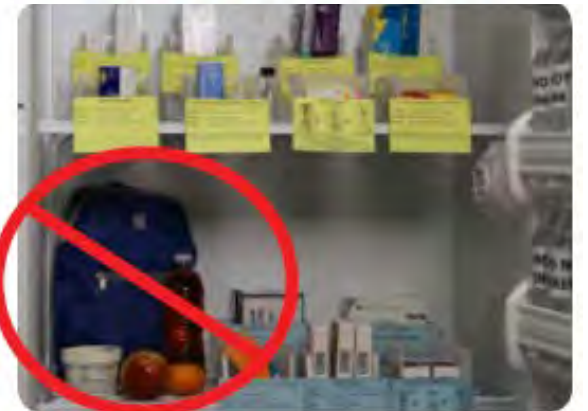
- Use water bottles in refrigerator and freezer to maintain temperature
- If other biologics must be stored in the same unit, store them **BELOW** the vaccines to avoid contamination
- Food and beverages should **NEVER** be stored in the unit with vaccines
- Inspect storage unit(s) daily
- Take immediate corrective action when there is a problem



Water bottles on top shelf, in door, and on unit floor



If other medications/biologics are stored in same unit with vaccines, store on a lower shelf.



Do NOT store food or beverages inside a vaccine refrigerator or freezer.

Vaccine Expiration Dates

- At least 1 time each week and each time vaccines are delivered, check and arrange vaccines and diluents in storage unit according to expiration dates



- **Exceptions:**
 - Reconstitution with a beyond use date or time (BUD)
 - Multidose vial with BUD once opened
 - Manufacturer-shortened expiration date

Vaccine Transport

■ Off-site/satellite facility

- Have vaccines delivered directly to the facility, if possible
- If vaccines must be transported, limit amount to what is needed for that workday (**8 hour maximum** for transport and workday)
- Transport using a portable vaccine refrigerator (if not available, use qualified container and pack out) with a calibrated continuous temperature monitoring device
- Move to an appropriate storage unit and monitor temperatures at least 2 times during the workday (hourly if must be kept in portable storage unit)

www.cdc.gov/vaccines/recs/storage/downloads/emergency-transport.pdf

■ Emergency Transport

Packing Vaccines for Transport during Emergencies

Be ready BEFORE the emergency

Equipment failures, power outages, natural disasters—these and other emergency situations can compromise vaccine storage conditions and damage your vaccine supply. **It's critical to have an up-to-date emergency plan with steps you should take to protect your vaccine.** In any emergency event, activate your emergency plan immediately. Ideally, vaccine should be transported using a portable vaccine refrigerator or qualified pack-out. However, if these options are not available, you can follow the emergency packing procedures for refrigerated vaccines below:

1 Gather the Supplies



Hard-sided coolers or Styrofoam™ vaccine shipping containers

- Coolers should be large enough for your location's typical supply of refrigerated vaccines.
- Can use original shipping boxes from manufacturers if available.
- Do NOT use soft-sided collapsible coolers.



Conditioned frozen water bottles

- Use 16.9 oz. bottles for medium/large coolers or 8 oz. bottles for small coolers (enough for 2 layers inside cooler).
- Do NOT reuse coolant packs from original vaccine shipping container, as they increase risk of freezing vaccines.
- Freeze water bottles (can help regulate the temperature in your freezer).
- Before use, you must condition the frozen water bottles. Put them in a sink filled with several inches of cool or lukewarm water until you see a layer of water forming near the surface of bottle. The bottle is properly conditioned if ice block inside spins freely when rotated in your hand (this normally takes less than 5 minutes).



Insulating material — You will need two of each layer

- **Insulating cushioning material** – Bubble wrap, packing foam, or Styrofoam™ for a layer above and below the vaccines, at least 1 in thick. Make sure it covers the cardboard completely. Do NOT use packing peanuts or other loose material that might shift during transport.
- **Corrugated cardboard** – Two pieces cut to fit interior dimensions of cooler(s) to be placed between insulating cushioning material and conditioned frozen water bottles.



- **Temperature monitoring device** – Digital data logger (DDL) with buffered probe. Accuracy of $\pm 1^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$) with a current and valid certificate of calibration testing. Pre-chill buffered probe for at least 5 hours in refrigerator. Temperature monitoring device currently stored in refrigerator can be used, as long as there is a device to measure temperatures for any remaining vaccines.

Why do you need cardboard, bubble wrap, and conditioned frozen water bottles?

Conditioned frozen water bottles and corrugated cardboard used along with one inch of insulating cushioning material such as bubble wrap keeps refrigerated vaccines at the right temperature and prevents them from freezing. **Reusing vaccine coolant packs from original vaccine shipping containers can freeze and damage refrigerated vaccines.**



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Distributed by

Visit www.cdc.gov/vaccines/SandH
for more information, or your state
health department.

Vaccine Preparation

- Only open a single-dose vial when ready to use
- Once protective cap is removed, vaccine should be used. If not used, discard it at end of workday
- Once a manufacturer-filled syringe is activated (i.e., syringe cap removed or needle attached), vaccine should be used or discarded at end of workday
- Do not predraw vaccine because it increases risk for administration errors, wasted vaccine, and microorganism growth in vaccines
- General-use administration syringes are not for storage
- Consider manufacturer-filled syringes for large immunization events



Vaccine Disposal

- **Contact immunization program and/or vaccine manufacturer(s) for policies regarding disposition of unopened vials, expired vials, unused doses, and potentially compromised vaccine**
- **Open vials, activated manufacturer-filled syringes, predrawn vaccine (by a provider), and broken vials and syringes are not returnable and should be appropriately discarded**
- **Contact your immunization program or state environmental agency to ensure that your vaccine disposal procedures and any related documentation comply with state and federal regulations**

VACCINE ADMINISTRATION

Vaccine Administration

- Key to ensuring vaccination is as safe and effective as possible

- Incorporate:

- Professional standards for medication administration
- Manufacturers' vaccine-specific guidelines
- Evidence-based safe injection practices on CDC's Injection Safety Information for Providers web page

The screenshot shows the 'Injection Safety' page on the CDC website. The page has a dark green header with the title 'Injection Safety'. Below the header is a navigation menu with items: 'Injection Safety', 'CDC's Role', 'CDC Statement', 'Information for Providers' (which is expanded), 'FAQs regarding Safe Practices for Medical Injections', 'Information for Patients', 'Preventing Unsafe Injection Practices', 'Drug Diversion', 'Infection Prevention during Blood Glucose Monitoring and Insulin Administration', and 'Publications'. The main content area is titled 'Information for Providers' and includes social media icons for Facebook, Twitter, and a plus sign. The text discusses recent investigations by state and local health departments and the CDC, identifying improper use of syringes, needles, and medication vials during routine healthcare procedures. It lists several consequences: transmission of bloodborne viruses (including hepatitis C), notification of thousands of patients of possible exposure to bloodborne pathogens, referral of providers to licensing boards for disciplinary action, and malpractice suits filed by patients. The page concludes by stating that these events serve as a reminder of the serious consequences of failure to maintain strict adherence to safe injection practices.

<https://www.cdc.gov/injectionsafety/providers.html>

Staff Training and Education

- **Before administering vaccines, all personnel who administer vaccines should:**
 - Receive competency-based training
 - Have knowledge and skills validated
- **Integrate competency-based training into:**
 - New staff orientation
 - Annual education requirements
- **Ongoing education:**
 - When vaccine administration recommendations are updated
 - When new vaccines are added to the inventory

Skills Checklist for Vaccine Administration

The Skills Checklist is a self-assessment tool for healthcare staff who administer immunizations. To complete it, review the competency areas below and the clinical skills, techniques and procedures outlined for each area. Score yourself in the Self-Assessment column. If you check **Needs to Improve**, you indicate further study, practice, or change is needed. When you check **Meets or Exceeds**, you indicate you believe you are performing at the expected level of competence, or higher.

Supervisors: Use the Skills Checklist to clarify responsibilities and expectations for staff who administer vaccines. When you use it to assist with performance reviews, give staff the opportunity to score themselves in advance. Next, observe their performance as they administer vaccines to several patients, and score in the Supervisor Review columns. If improvement is needed, meet with them to develop a Plan of Action (see bottom of page X) to help them achieve the level of

competence you expect; circle desired actions or write in others.
The DVD "Immunization Techniques: Best Practices with Infants, Children, and Adults" helps ensure that staff administer vaccines correctly. It may be ordered online at www.immunize.org/dvd. Another helpful resource is CDC's Vaccine Administration eLearn course, available at www.cdc.gov/vaccines/hcp/admin/resource-library.html.

COMPETENCY	CLINICAL SKILLS, TECHNIQUES, AND PROCEDURES	Self-Assessment		Supervisor Review		
		NEEDS TO IMPROVE	MEETS OR EXCEEDS	NEEDS TO IMPROVE	MEETS OR EXCEEDS	PLAN OF ACTION
1 Patient/Parent Education	1. Welcomes patient/family and establishes rapport.					
	2. Explains what vaccines will be given and which type(s) of injection(s) will be done.					
	3. Answers questions and accommodates language or literacy barriers and special needs of patient/parents to help make them feel comfortable and informed about the procedure.					
	4. Verifies patient/parents received Vaccine Information Statements (VISs) for indicated vaccines and has had time to read them and ask questions.					
	5. Screens for contraindications (if within employee's scope of work).					
	6. Reviews comfort measures and aftercare instructions with patient/parents, and invites questions.					
2 Medical and Office Protocols	1. Identifies the location of the medical protocols (e.g., immunization protocol, emergency protocol, reference material).					
	2. Identifies the location of epinephrine, its administration technique, and clinical situations where its use would be indicated.					
	3. Maintains up-to-date CPR certification.					
	4. Understands the need to report any needlestick injury and to maintain a sharps injury log.					
	5. Demonstrates knowledge of proper vaccine handling, e.g., maintains vaccine at recommended temperature and protects MMR from light.					

CONTINUED ON THE NEXT PAGE ►

Adapted from California Department of Public Health, Immunization Branch

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

Technical content reviewed by the Centers for Disease Control and Prevention
www.immunize.org/catg.d/p7010.pdf • Item #P7010 (10/17)

Before Administering Vaccines

- Review the immunization history at every health care visit:
 - Accept only written, dated records (except influenza and PPSV23 self-report)
 - Use recommended schedule to determine vaccines needed based on age, medical condition, and risk factors
- Screen for contraindications and precautions prior to administering any vaccine(s)
- Discuss vaccine benefits and risks and vaccine-preventable disease risks using VISs and other reliable resources
- Provide after-care instructions

<http://www.immunize.org/catg.d/p4060.pdf>

<http://www.immunize.org/catg.d/p4065.pdf>

<https://www.cdc.gov/vaccines/parents/tools/tips-factsheet.pdf>

<http://immunize.org/handouts/discussing-vaccines-parents.asp>

Information for Healthcare Professionals about the Screening Checklist for Contraindications (Children and Teens)

Are you interested in knowing why we included a certain question on the screening checklist? If so, read the information below. If you want to find out even more, consult the references listed at the end.

1. Is the child sick today? [all vaccines]

There is no evidence that acute illness reduces vaccine efficacy or increases vaccine adverse events.^{1,2} However, as a precaution with moderate or severe acute illness, all vaccines should be delayed until the illness has improved. Mild illnesses (such as otitis media, upper respiratory infections, and diarrhea) are NOT contraindications to vaccination. Do not withhold vaccination if a person is taking antibiotics.

2. Does the child have allergies to medications, food, a vaccine component, or latex? [all vaccines]

An anaphylactic reaction to latex is a contraindication to vaccines that contain latex as a component or as part of the packaging (e.g., vial stoppers, prefilled syringe plungers, prefilled syringe caps). If a person has anaphylaxis after eating gelatin, do not administer vaccines containing gelatin. A local reaction to a prior vaccine dose or vaccine component, including latex, is not a contraindication to a subsequent dose or vaccine containing that component. For information on vaccine components, see reference 4. People with egg allergy of any severity can receive any recommended influenza vaccine (i.e., any IV or RV) that is otherwise appropriate for the patient's age. For people with a history of severe allergic reaction to egg involving any symptom other than hives (e.g., angioedema, respiratory distress), or adults required epinephrine or another emergency medical intervention, the vaccine should be administered in a medical setting, such as a clinic, health department, or physician office. Vaccine administration should be supervised by a healthcare provider who is able to recognize and manage severe allergic conditions.³

3. Has the child had a serious reaction to a vaccine in the past? [all vaccines]

History of anaphylactic reaction (see question 2) to a previous dose of vaccine or vaccine component is a contraindication for subsequent doses.⁴ History of anaphylaxis within 7 days following DTaP (DTaP is a contraindication for further doses of pertussis-containing vaccine. Precautions to DTaP [see Table] include the following: (a) seizure within 3 days of a dose, (b) pale or limp episode or collapse within 48 hours of a dose, (c) continuous crying for 3 or more hours within 48 hours of a dose, and (d) fever of 102°F (38°C) within 48 hours of a previous dose. There are other adverse events that might have occurred following vaccination that constitute contraindications or precautions to future doses. Under normal circumstances, vaccines are deferred when a precaution is present. However, situations may arise when the benefits outweigh the risk (e.g., during a community pertussis outbreak).

4. Has the child had a health problem with lung, heart, kidney, or metabolic disease (e.g., diabetes), asthma, or a blood disorder? Is he/she on long-term aspirin therapy? [LAIV]

The safety of live, attenuated influenza vaccine (LAIV) in children and teens with lung, heart, kidney, or metabolic disease (e.g., diabetes), or a blood disorder has not been established. These conditions, including asthma in children ages 5 years and older, should be considered precautions for the use of LAIV. Children on long-term aspirin therapy should not be given LAIV; instead, they should be given IV.

5. If the child to be vaccinated is 2 through 4 years of age, has a healthcare provider told you that the child had wheezing or asthma in the past 12 months? [LAIV]

Children ages 2 through 4 years who have had a wheezing episode within the past 12 months should not be given LAIV. Instead, these children should be given IV.

6. If your child is a baby, have you ever been told that he or she has had intussusception? [Rotavirus]

Infants who have a history of intussusception (i.e., the telescoping of one portion of the intestine into another) should not be given rotavirus vaccine.

7. Has the child, a sibling, or a parent had a seizure? Has the child had brain or other nervous system problems? [DTaP, Td, Tdap, IV, LAIV, MMRV]

DTaP and Tdap are contraindicated in children who have a history of anaphylaxis within 7 days following DTaP/DTaP. An unstable progressive neurologic problem is a precaution to the use of DTaP and Tdap. For children with stable neurologic disorders (including seizures) unrelated to vaccination, or for children with a family history of seizures, vaccination is usual (exception: children with a personal or family [i.e., parent or sibling] history of seizures generally should not be vaccinated with MMRV; they should receive separate MMR and VAR vaccines). A history of Guillain-Barré syndrome (GBS) is a consideration with the following: 1) Td/Tdap: GBS has occurred within 6 weeks of a tetanus-containing vaccine and decision is made to continue vaccination.

REFERENCES

1. CDC. General recommendations on immunization. www.cdc.gov/mmwr/pdf/wr0505.pdf.
2. AAP. Red Book: Report of the Committee on Infectious Diseases at www.aapredbook.org.
3. Update on Vaccine Packaging: www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendix2/latex-latex.pdf.
4. Table of Vaccine Components: www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendix/8/ingredients-table-2.pdf.
5. CDC. Prevention and control of seasonal influenza with vaccines: Recommendations of the Advisory Committee on Immunization Practices—United States, 2016–17 influenza season at www.cdc.gov/mmwr/volumes/pdf/65/05/pdf/wr6505a.pdf, page 7–36.

Note: Live attenuated influenza vaccine (LAIV; FluMist), is not recommended by CDC's Advisory Committee on Immunization Practices for use in the U.S. during the 2016–17 influenza season. Because LAIV is still a licensed vaccine that might be available and that some providers might elect to use, for informational purposes, reference is made to previous recommendations for its use.

Note: Live attenuated influenza vaccine (LAIV; FluMist), is not recommended by CDC's Advisory Committee on Immunization Practices for use in the U.S. during the 2016–17 influenza season. Because LAIV is still a licensed vaccine that might be available and that some providers might elect to use, for informational purposes, reference is made to previous recommendations for its use.

8. Does the child or a family member have cancer: leukemia, HIV/AIDS, or any other immune system problem? [LAIV, MMR, MMRV, RV, VAR]

Live virus vaccines (e.g., MMR, MMRV, varicella, rotavirus, and LAIV) are usually contraindicated in immunocompromised children. However, there are exceptions. For example, MMR is recommended for asymptomatic HIV-infected children who do not have evidence of severe immunosuppression. Likewise, varicella vaccine should be considered for HIV-infected children with age-specific CD4⁺ T-lymphocyte percentages at 15% or greater and may be considered for children age 8 years and older with CD4⁺ T-lymphocyte counts of greater than or equal to 200 cells/μL. Varicella and MMR vaccines should not be given to a child or teen with a family history of congenital or hereditary immunodeficiency or first-degree relative (e.g., parent, sibling) unless the immune competence of the potential vaccine recipient has been clinically substantiated or verified by a laboratory. Immunocompromised children should not receive LAIV. Infants who have been diagnosed with severe combined immunodeficiency (SCID) should not be given a live virus vaccine, including rotavirus (RV) vaccine. Other forms of immunosuppression are a precaution, not a contraindication, to rotavirus vaccine. For details, consult ACDP recommendations.^{5,6,7}

9. In the past 3 months, has the child taken medications that affect the immune system such as prednisone, other steroids, or anticancer drugs for the treatment of rheumatoid arthritis, Crohn's disease, or psoriasis; or had radiation treatment? [LAIV, MMR, MMRV, VAR]

Live virus vaccines (e.g., LAIV, MMR, MMRV, VAR) should be postponed until after chemotherapy or long-term high-dose steroid therapy has ended. For details and length of time to postpone, consult the ACDP statement. Some immune modulator and immune modulator drugs (especially the antineoplastic factor agents adalimumab, infliximab, and etanercept) may be immunosuppressive. The use of live vaccines should be avoided in persons taking these drugs. To find specific vaccination schedules for stem cell transplant (bone marrow transplant) patients, see reference 8. LAIV, when recommended, can be given only to healthy non-pregnant people ages 2 through 49 years.

10. In the past year, has the child received a transfusion of blood or blood products, or been given immune (gamma) globulin or an antibody drug? [LAIV, MMR, MMRV, VAR]

Certain live virus vaccines (e.g., LAIV, MMR, MMRV, varicella) may need to be deferred, depending on several variables. Consult the most current ACDP recommendations or the current Red Book for the most current information on intervals between antiviral drugs, immune globulin or blood product administration and live virus vaccines.⁸

11. Is the child/teen pregnant or is there a chance she could become pregnant during the next month? [HPV, IDV, LAIV, MMR, MMRV, VAR]

Live virus vaccines (e.g., MMR, MMRV, varicella, LAIV) are contraindicated one month before and during pregnancy because of the theoretical risk of virus transmission to the fetus.⁹ Sexually active young women who receive a live virus vaccine should be instructed to practice careful contraception for one month following receipt of the vaccine.¹⁰ On theoretical grounds, inactivated poliovirus vaccine should not be given during pregnancy; however, it may be given if risk of exposure is imminent (e.g., travel to endemic areas) and immediate protection is needed. Inactivated influenza vaccine and Tdap are both recommended during pregnancy. HPV vaccine is not recommended during pregnancy.

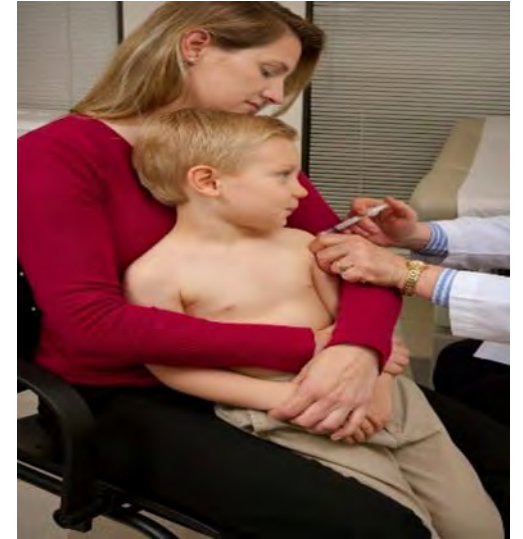
12. Has the child received vaccinations in the past 4 weeks? [LAIV, MMR, MMRV, VAR]

Children who were given either LAIV or an injectable live virus vaccine (e.g., MMR, MMRV, varicella, yellow fever) should wait 28 days before receiving another vaccination of this type. Inactivated vaccines may be given at the same time or at any spacing interval.

6. CDC. Measles, mumps, and rubella—vaccine use and strategies for elimination of measles, mumps, and congenital rubella syndrome and control of mumps. www.cdc.gov/mmwr/pdf/wr0505.pdf, 47 (05-04).
7. CDC. Prevention of varicella. Recommendations of the Advisory Committee on Immunization Practices. www.cdc.gov/mmwr/pdf/wr0505.pdf, 50 (10-04).
8. Rubin LG, Levin M, Ljunggren P, et al. IDSA. Clinical practice guideline for vaccination of the immunocompromised host. www.cdc.gov/mmwr/pdf/wr0505.pdf, Clinical Infectious Diseases 2014;58(2):e44–100.
9. Tomblin M, Greene H, et al. Guidelines for prevention and control of measles, mumps, and congenital rubella syndrome: a global perspective. www.cdc.gov/mmwr/pdf/wr0505.pdf, 15:1143–1202, 2009 at www.cdc.gov/mmwr/pdf/wr0505.pdf.
10. CDC. Notice to readers: Revised ACPD recommendation for avoiding pregnancy after receiving a rubella-containing vaccine. www.cdc.gov/mmwr/pdf/wr0505.pdf, 50 (14-01).

Positioning and Comforting Restraint

- Encourage parent/guardian to hold child
- Sitting rather than lying down
- **Be aware of syncope (fainting):**
 - Have patient seated or lying down 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



Procedural Pain Management Strategies

- **Pharmacological**
 - Topical anesthetics
 - Sweet-tasting solutions
- **Physical**
 - Breastfeeding
 - Positioning – parent holding the infant or young child
 - Sitting upright rather than lying down
 - Tactile stimulation
- **Psychological**
 - Distraction (i.e., games on smart phones)
 - Deep breathing (i.e., young children can blow bubbles)
- **Procedural**
 - Order of injection: administer the vaccine most painful when injected last
 - Rapid injection without aspiration
- **Process intervention**
 - Educating and training staff; implementing a planned approach to address procedural pain management

Procedural Pain Job Aids

Reducing Vaccine Injection Pain in Children A Guide for Health Care Providers

Preparation:

- Review this evidence-based guide
- Provide parent/caregiver with information and tools
- Discuss pain management strategies

Procedure:
Combine strategies to improve pain relief

Practice and Documentation

- Assess pain
- Document pain score
- Assess parent and child satisfaction
- Reflect and plan approach for next vaccine

Document:

- Age of child
- Vaccines given
- Pain-relieving strategies used
- Pain score
- Parent/child satisfaction

see over →

Appendix to Taddio A, Appleton M, Bortoluzzi R, et al. Reducing the pain of childhood vaccination: an evidence-based clinical practice guideline. CMAJ 2010. DOI 10.1503/cmaj.101720. Copyright © 2010 Canadian Medical Association or its licensors.

Reducing Vaccine Injection Pain in Children A Guide for Health Care Providers

Preparation
Consider using the evidence-based strategies described below in order to minimize pain during vaccine injections in infant/children/teens in your practice. Discuss this information with the parent/caregiver and children/teens prior to vaccine injections.

Prepare Parents and Children

- Encourage parents/caregivers and children (when applicable) to prepare for the procedure ahead of time and to use evidence-based strategies to minimize pain and distress in children during vaccine injections.
- Provide parents/caregivers with the HELPinKIDS Information Sheet: A Guide for Parents, Caregivers and Children on How to Reduce Vaccine Injection Pain in Children.

Rapid Injection Without Aspiration

- Perform all intramuscular injections quickly without prior aspiration. Aspiration is not necessary because the sites used for vaccination are devoid of large blood vessels.

Breastfeeding OR Sweetening Agent

- Encourage mothers to breastfeed infants during vaccine injections. Ensure that an adequate latch is established prior to injection.
- Alternatively, infants can be given sugar water.
- Sugar water can be made by mixing 1 packet of sugar with 2 teaspoons of water. Feed some to the infant with a syringe or pacifier right before the injection (within 1-2 minutes).
- Sugar water is indicated for the management of painful procedures only, not for general comfort or as a food supplement.

Topical Anesthetics

- Can be used for children of all ages.
- Available for purchase from a pharmacy without a prescription.
- Must be applied up to 1 hour before injection, either at home or upon arrival to the appointment. Check product instructions.
- Consider providing topical anesthetics in your practice for a minimal fee or no cost to parents/caregivers.
- Two doses may be needed (one for each arm or leg) if 2 or more injections are being given. Specify injection site(s) to parent/caregiver.

Upright Position and Holding

- Infants, children, and teens should not be positioned supine.
- Infants and children should be held by a parent or caregiver in a position that is most comfortable for them and their parent or caregiver (bear hug, on parent/caregiver's lap). Children may lie down after the injection.
- If held by a parent/caregiver, have parent sit on a chair or stand against the examination table to minimize the risk for accidental falls. Keep limbs exposed. Have parent/caregiver secure the child, but advise against undue force as it increases distress.

Multiple Injections

- When multiple vaccines are being administered, always inject the most painful vaccine last.
- There is insufficient evidence for or against simultaneous injections.

Tactile Stimulation Near Injection Site

- Offer to rub/troke the skin near the injection site with moderate intensity prior to and during injection in children aged 4 years and older.

Distraction (Led by Provider, Parent/Caregiver or Child)

- Distraction involves taking the child's attention away from the procedure. It is effective for children of all ages.
- Involve parent/caregiver and children in helping to select the best distraction strategy for the child and involve them in helping with distractions.
- Choose an age-appropriate strategy:
 - Infants:** toys, bubbles, singing, directing the infant's attention to something in the environment that would be of interest to them.
 - Te-toddlers:** toys, bubbles, pop-up books, songs, party blower, kite/wind-up, singing, directing attention to something in the environment, non-procedural talk (storybook, etc.)
 - School-aged children:** toys, stories, videos, books, jigsaw, music, coloring, non-procedural talk (favourite movie, etc.)
 - Adolescents:** games, videos, books, jigsaw, music (iPod, MP3 player), non-procedural talk (favourite video game, etc.)
- Stay focused on the child and interact with the child throughout the procedure.
- Provide verbal and physical reminders for the child to continue to pay attention to the distraction strategy.
- Re-direct the child's attention back to the distraction strategy if their attention wanders to the procedure.
- Use a variety of distractions, and multi-sensory distractions, as necessary.
- Maintain a positive attitude.
- Praise the child for engaging in distraction behaviours.

Deep Breathing

- Prompt children 3 years and older to take slow deep breaths.
- Deep breaths can be facilitated by using bubbles or pinwheel, which also act as distracting techniques.

Simple Suggestion

- DO NOT tell children that "it won't hurt" because evidence shows that this is ineffective. It also promotes distrust. Instead, tell children how potential discomfort will be minimized.

Combine strategies described above to improve pain relief.

Practice and Documentation
Health care providers are encouraged to develop a consistent approach to immunization pain management in their practice. This includes: integrating pain management education, preparing parents/caregivers and children in advance whenever possible, ensuring consistent understanding among team members of the effective strategies, implementation and documentation of strategies used, and children's pain. Providers are encouraged to modify the pain management plan for individual children, as needed, in order to minimize pain and distress.

In collaboration with www.aboutkidshealth.ca

Appendix to Taddio A, Appleton M, Bortoluzzi R, et al. Reducing the pain of childhood vaccination: an evidence-based clinical practice guideline. CMAJ 2010. DOI 10.1503/cmaj.101720. Copyright © 2010 Canadian Medical Association or its licensors.

Infection Control

- **Perform hand hygiene:**
 - Before preparing vaccines
 - Between patients
 - Anytime hands become soiled
- **Gloves are not required when administering vaccines unless the person 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



Vaccine Preparation

- **Inspect vaccine and diluent vials for damage or contamination**
- **Check the expiration dates on the syringe, needle, vaccine, and diluent**
- **Select a separate sterile needle for each injection based on route, patient size, and injection technique**
- **Use only the manufacturer-supplied diluent to reconstitute a vaccine**
- **Agitate the vial to thoroughly mix the vaccine**
 - Inspect the vaccine for discoloration, precipitate, and resuspension
- **Only the number of doses indicated in the manufacturer's package insert should be withdrawn from a vaccine vial. After the maximum number of doses has been withdrawn, the vial should be discarded, even if the expiration date has not been reached**

Vaccine Preparation “Nevers”

- **Never combine vaccines into a single syringe except when specifically approved by the FDA and packaged for that specific purpose**
- **Never transfer vaccine from one syringe to another**
- **Never draw partial doses of vaccine from separate vials to obtain a full dose**

Route and Site

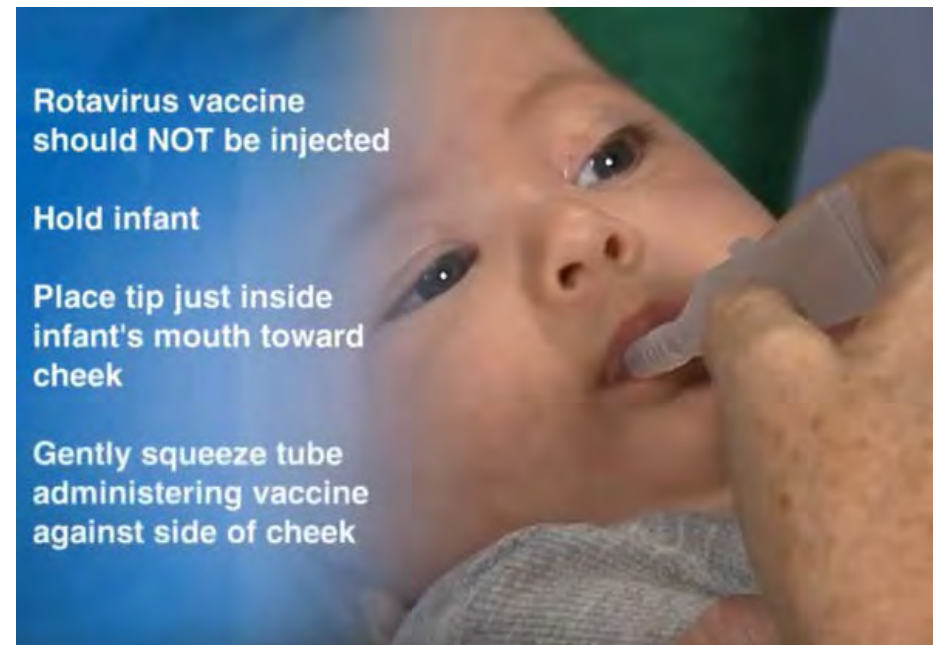
- **Oral (PO):**
 - Administer liquid inside cheek slowly down one side (between cheek and gum) toward the back of infant's mouth

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

<https://www.cdc.gov/vaccines/hcp/admin/resource-library.html>

https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6304a4.htm?s_cid=mm6304a4_w

https://www.cdc.gov/mmwr/volumes/67/wr/mm6722a5.htm?s_cid=mm6722a5_w%20



Subcutaneous Injection (Subcut) Route

■ Site:

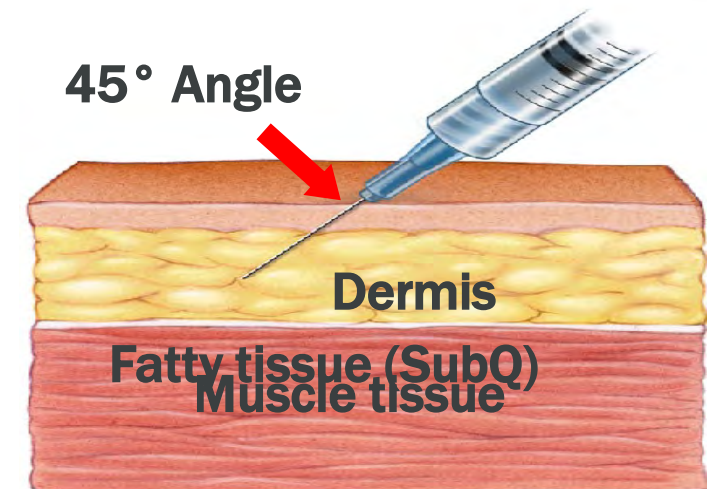
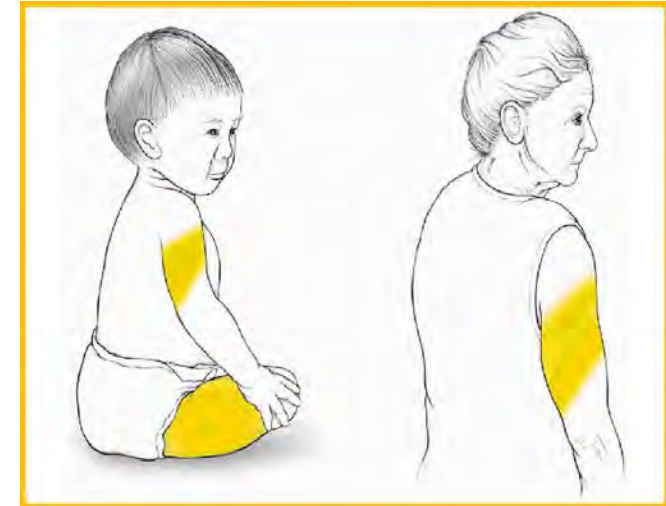
- Thigh for infants younger than 12 months of age
- Upper outer triceps of arm for children older than 12 months and adults (can be used for infants if necessary)

■ Needle gauge and length:

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

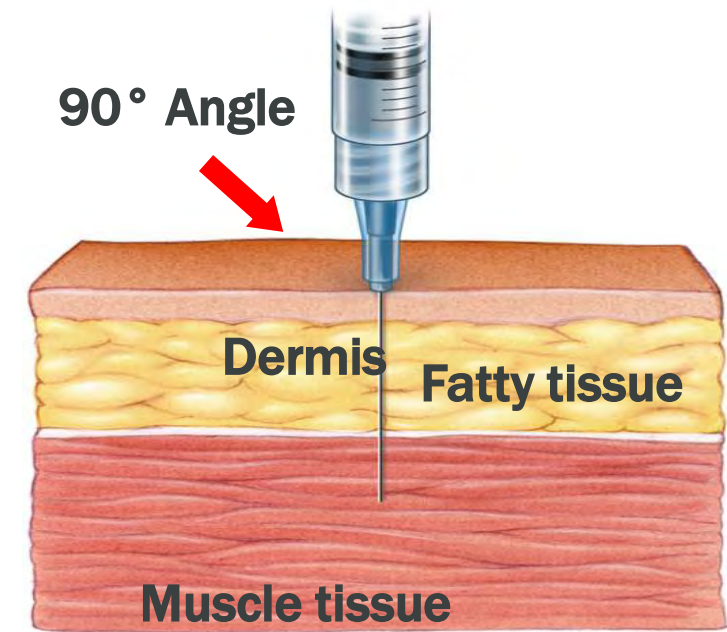
■ Technique:

- 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 (IM) 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

Infants 12 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



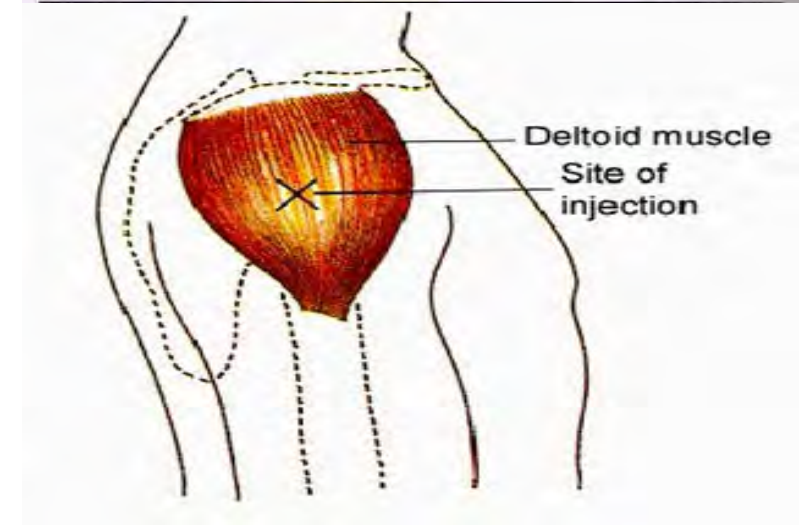
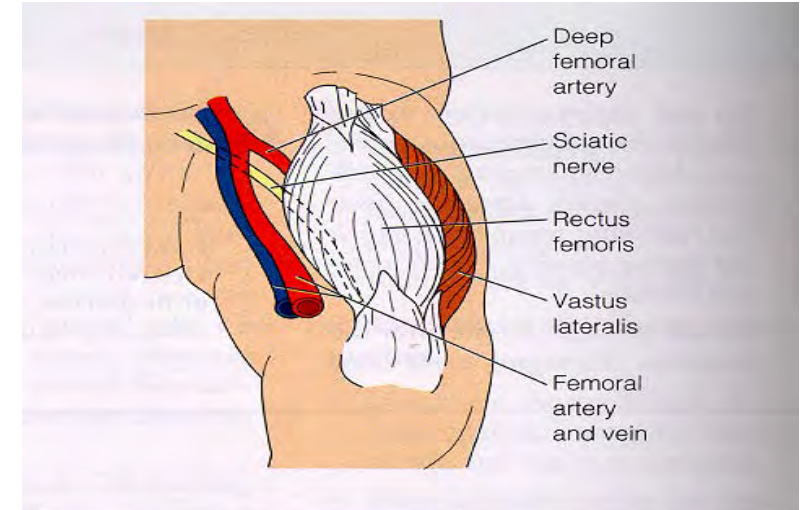
Intramuscular Injection (IM) Route 1 through 2 Years

■ 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:

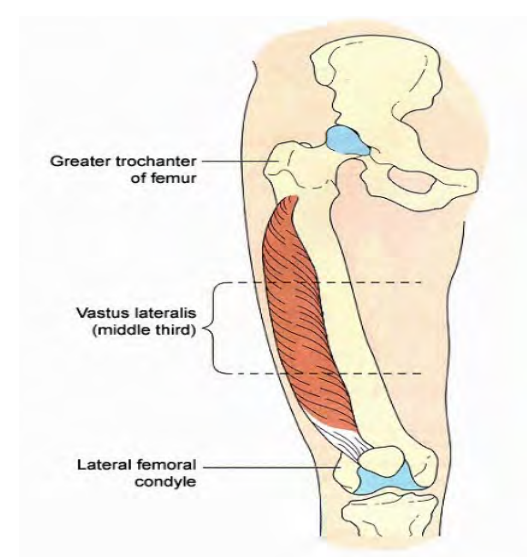
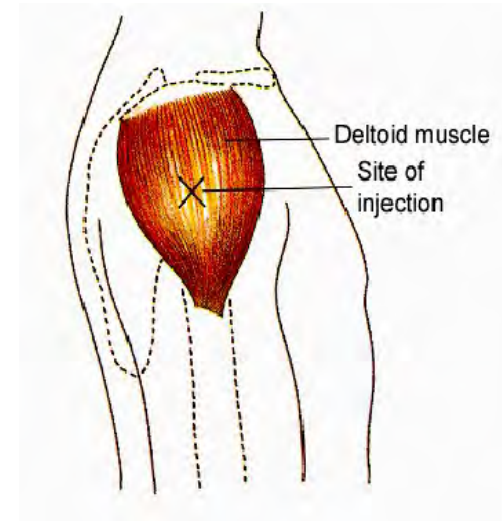
- Deltoid muscle (upper arm) is preferred
- Vastus lateralis muscle (anterolateral thigh) may be used

■ Needle gauge and length:

- 22- to 25-gauge
- 5/8- to 1-inch

■ Most young children in this age range require a 5/8- or 1-inch needle:

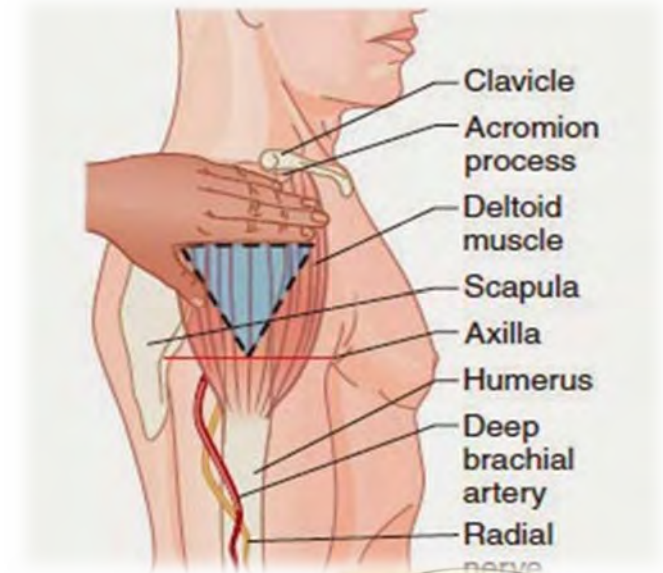
- 5/8-inch needle is adequate only for the deltoid muscle and only if the skin is stretched flat between thumb and forefinger



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: 23- to 25-gauge**
- **Needle length varies with patient size**



Shoulder Injury Related to Vaccine Administration

- **Shoulder injury related to vaccine administration (SIRVA) was added to the Vaccine Injury Compensation Table in March 2017**
- **Shoulder injuries related to vaccine administration are injuries to the musculoskeletal structure of the shoulder, including the ligaments, bursa, and tendons**
 - They are thought to occur as a result of the unintended injection of vaccine antigen and/or trauma from the needle going into and around the underlying bursa of the shoulder
 - Symptoms include shoulder pain and limited mobility after the injection

Shoulder Injury Related to Vaccine Administration and Vaccine Administration Best Practices

- **When administering a vaccine by intramuscular (IM) injection in the deltoid muscle, use:**
 - Proper landmarks and technique to identify the injection site
 - Proper needle length based on the age, patient size, and injection technique

Clinical Resources for Shoulder Injury Related to Vaccine Administration

- CDC vaccine administration web page for information and materials for health care personnel, including:
 - IM demonstration video
 - Job aids and infographics

www.cdc.gov/vaccines/hcp/admin/administer-vaccines.html

YOU CALL THE SHOTS

Shoulder injuries related to vaccine administration
Improper vaccine administration could result in shoulder injuries such as shoulder bursitis and tendinitis.

Make sure vaccination is safe.

KNOW THE SITE. GET IT RIGHT!

When administering vaccine by an intramuscular (IM) injection to an adult:

Use the correct syringe and needle

- Vaccine may be administered using either a 1-mL or 3-mL syringe
- Use a 22 to 25 gauge needle
- Use the correct needle size based on your patient's size

Injection site: Deltoid muscle of upper arm

Weight	Needle Length	Needle Gauge
Men and women, less than 60 kg (130 lbs)	1 in (25 mm)	25 G (0.5 mm)
Men and women, 60-70 kg (130-152 lbs)	1.5 in (38 mm)	23 G (0.7 mm)
Men, 70-110 kg (152-250 lbs) Women, 70-90 kg (152-200 lbs)	1.5 in (38 mm)	22 G (0.7 mm)
Men, greater than 110 kg (>250 lbs) Women, greater than 90 kg (>200 lbs)	1.5 in (38 mm)	21 G (0.8 mm)

*Some experts recommend a 5/8-inch needle for men and women who weigh less than 60 kg (130 lbs).

Identify the injection site

- Locate the deltoid muscle of the upper arm
- Use anatomical landmarks to determine the injection site
- In adults, the midpoint of the deltoid is about 2 inches (or 2 to 3 fingers' breadth) below the acromion process (bony prominence) and above the armpit in the middle of the upper arm

Administer the vaccine correctly

- Inject the vaccine into the middle and thickest part of the deltoid muscle
- Insert the needle at a 90° angle and inject all of the vaccine into the muscle tissue

IM injection best practices

- Administering the injection too high on the upper arm may cause shoulder injury
- If administering additional vaccines into the same arm, separate the injection sites

Always follow safe injection practices

- Maintain aseptic technique
- Perform hand hygiene before preparing and administering vaccines
- Use a new needle and new syringe for each injection
- If using a single-dose vial (SDV) discard after use

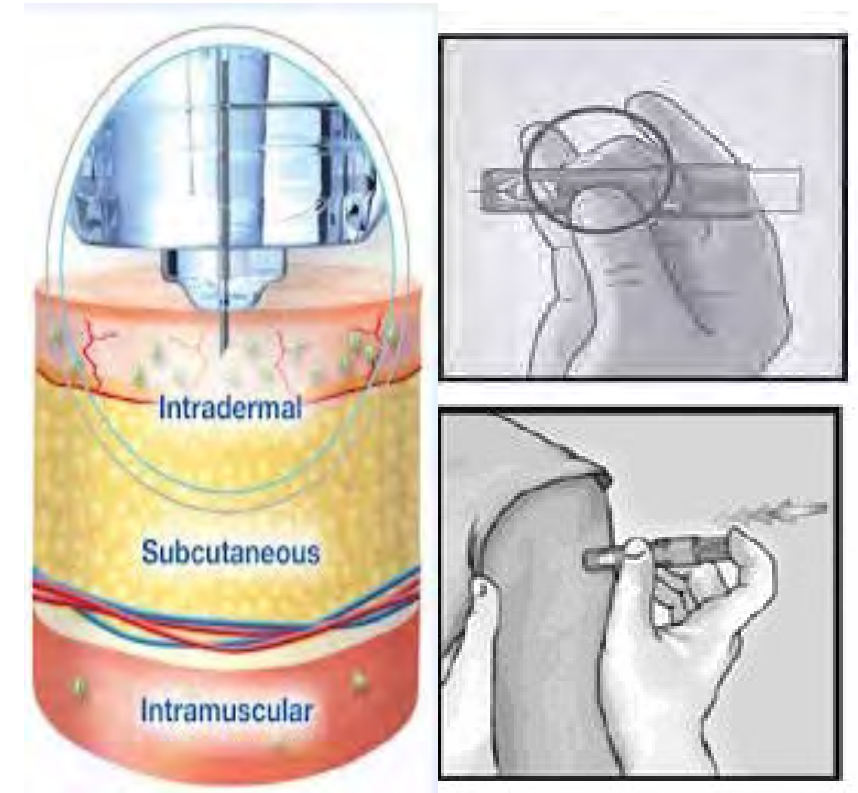
A SDV should be used for one patient only!

Report any clinically significant adverse event after vaccination to the Vaccine Adverse Event Reporting System (VAERS) at vaers.hhs.gov/.

For additional information on proper vaccine administration,

Intradermal Injection (ID) Route

- **Site:**
 - Deltoid region of upper arm
- **Needle gauge and length:**
 - 30-gauge, microneedle
- **Technique:**
 - Hold the syringe between the thumb and the middle finger and using a short, quick motion, insert the needle perpendicular to the skin



Multiple Vaccinations

- **Separate injections by at least 1 inch (or more if possible)**
- **Use a separate limb for most reactive vaccines (e.g., tetanus-toxoid-containing and PCV13), if possible**
- **Use combination vaccines when appropriate to reduce the number of injections**

Documentation

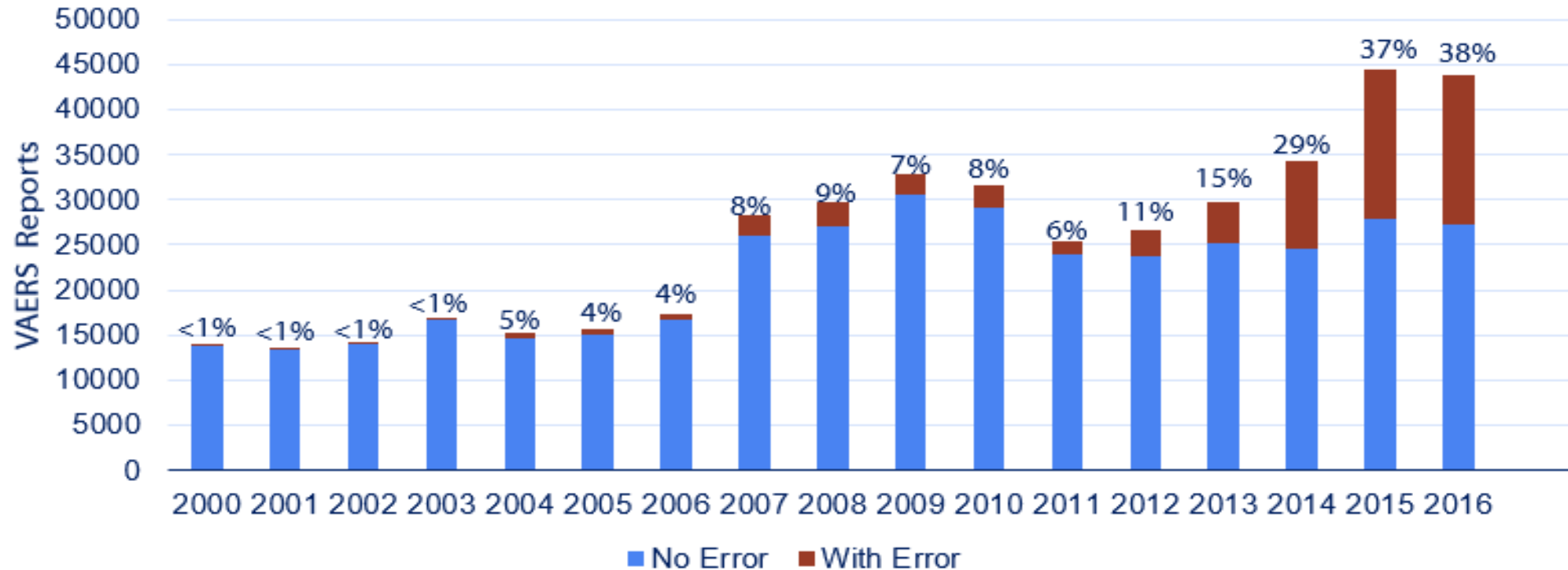
- **Federally required documentation:**
 - Date of administration
 - Vaccine manufacturer
 - Vaccine lot number
 - Name and title of person who administered vaccine and address of clinic or facility where permanent record will reside
 - Vaccine information statement (VIS)
 - Date printed on the VIS
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

- **Best practice documentation:**
 - Vaccine type (ACIP abbreviation)
 - Route
 - Dosage (volume)
 - Site



VACCINE ADMINISTRATION ERRORS

Vaccination error reports¹ number and percentage ² of all VAERS reports³ by year, 2000–2016



¹ 63,759 total vaccination error reports ,primary U.S. VAERS 2000-2016

² Percent of vaccination error reports among all primary U.S. VAERS reports by year

³ 433,116 total primary US reports 2000-2016

Number of VAERS Reports by Error Group, 2000–2016

Vaccination Error Groups ¹	N (% total errors)
Storage and Dispensing	37,782 (57)
Inappropriate Schedule	10,662 (16)
Wrong Vaccine	4,996 (8)
Incorrect Dose	4,772 (7)
Administration Errors	3,382 (5)
General Error	2,634 (4)
Accidental	504 (1)
Product Quality	442 (1)
Equipment	434 (1)
Contraindication	281 (<1)
Product Labeling/Packaging	124 (<1)
Total Errors ²	66,013

¹Vaccination error groups contain multiple MedDRA Codes

²Vaccination error groups are not mutually exclusive; Total Vaccination Error Reports =63,759

Strategies to Prevent Errors

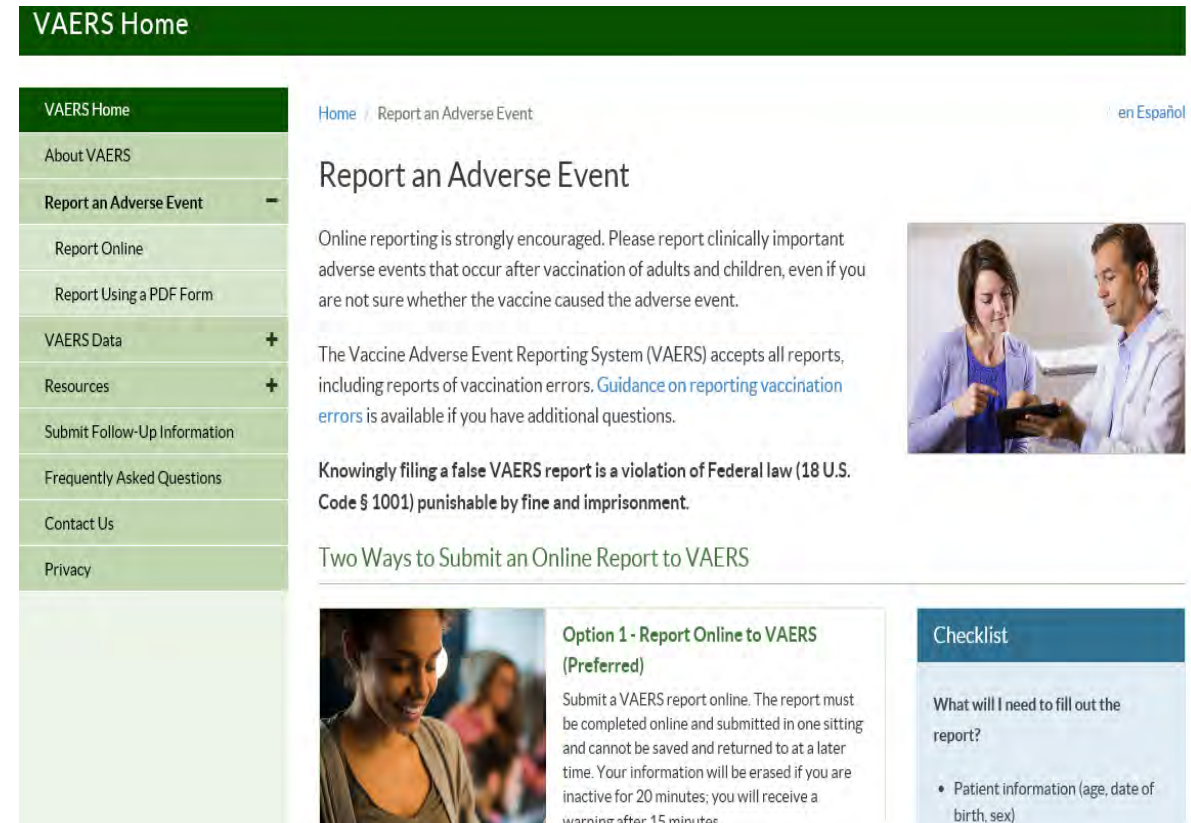
- Establish an environment that values reporting and investigating errors as part of risk management and quality improvement
- Use best practices for storing, handling, preparing, and administering vaccines
- Take immediate action and isolate affected vaccine(s) if there is a temperature excursion
- Promptly remove expired vaccines from the storage unit
- Only administer vaccines you have prepared and triple-checked
- Be familiar with current recommended immunization schedules:
<https://www.cdc.gov/vaccines/acip/index.html>
- Use standing orders when possible: www.immunize.org/standing-orders/

What if a Vaccination Error Occurs?

- Inform the patient/parent of the error
- Determine the status of the patient
- Explain any needed next steps
- Know how to correct the error
 - Contact your local health department, vaccine manufacturer, or nipinfo@cdc.gov for guidance
 - Not all errors require revaccination
- Record the vaccine as it was given on the medical administration record
- Contact the immunization information system for additional information as needed

Reporting Vaccination Errors to VAERS

- VAERS accepts all reports
- VAERS encourages reports of clinically significant adverse health events
- Providers are encouraged to report vaccination errors without health events if they believe the error may pose a safety risk



The screenshot displays the VAERS Home page. At the top, there is a green header with the text "VAERS Home". Below this is a navigation menu with the following items: "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". To the right of the menu, there is a breadcrumb trail: "Home / Report an Adverse Event" and a language selector "en Español". The main heading is "Report an Adverse Event". Below the heading, there is 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." To the right of this text is an image of a female doctor and a male doctor looking at a tablet. Below the paragraph 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." Below this is a warning: "Knowingly filing a false VAERS report is a violation of Federal law (18 U.S. Code § 1001) punishable by fine and imprisonment." Below the warning is the heading "Two Ways to Submit an Online Report to VAERS". Under this heading, there are two columns. The left column is titled "Option 1 - Report Online to VAERS (Preferred)" and includes an image of a woman looking at a tablet. The text below the image says: "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." The right column is titled "Checklist" and includes the heading "What will I need to fill out the report?" and a bullet point: "Patient information (age, date of birth, sex)".