How to Prevent Vaccination Errors
(and what to do if you make one)

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Immunization Symposium
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Background

- Healthcare professionals and members of the public can contact IAC by writing to admin@immunize.org.
- I answer ~300 such emails each month.
- It appears that more errors are being made (IZ schedule more complex, additional available products, "alternative schedules," more recommended adult vaccines, more places to get vaccinated). In addition, some types of errors that might have gone undetected in the past are now caught by state immunization information systems.

From January 2015 through December 2018, IAC received questions about approximately 1,500 medical errors related to vaccination, including errors in vaccine storage and handling, administration, scheduling, and documentation.

Types of vaccination errors

- **Storage and handling**
- **Administration**
- **Scheduling**
- **Documentation**

“1,900 doses of flu vaccine spoil in hospital’s faulty fridge”
(West Allis, WI; 11/3/04)

“**Kaiser mishandles flu vaccine”** (Fresno, CA; 12/15/04)

“Storage errors cause thousands to be vaccinated again”
(Knoxville, TN; 1/21/05)

“U.S. doctor accused of giving last year’s flu vaccine”
(Bellingham, WA; 11/6/04)

“Frozen vaccine could cost state more than $30,000”
(Arkansas; 11/19/04)

From our IAC email archive…

HELP!

HELP! "We have a local practice that had issues with their refrigerator temperatures being too cold for an extended period. All the vaccines that were given during that time frame are now considered invalid. They have many 2-year-old patients who received 4 doses of DTaP all of which were stored improperly…"

Vaccine storage and handling

- Vaccines are fragile and must be kept at recommended temperatures at all times.
- Vaccines are expensive.
- It is better to **NOT VACCINATE** than to administer a dose of vaccine that has been mishandled.

The results of storage and handling errors

- Your patients may get seriously ill from not being immune from a vaccine-preventable disease.
- You must revaccinate anyone who received a dose of compromised vaccine.
- You will have to explain to parents why their children must repeat vaccine doses.
- Your practice may experience negative publicity.
- You may lose a lot of money.

How to avoid storage & handling problems

- Assign a vaccine manager.
- Store all vaccines appropriately.
- Monitor and record refrigerator and freezer temperatures twice daily and review the results twice a day.
- Use only certified calibrated thermometers that use an active display to provide continuous monitoring information.
- Maintain temperature logs for 3 years.
- Implement a vaccine emergency system.
- Take immediate action for out-of-range temperatures.

Vaccine handling basics

- Open only one vial at a time.
- Store vaccine vials separate from other medications or biologics.
- Do NOT store food/beverages in refrigerator or freezer with vaccines.
- Keep light sensitive vaccines in their box until ready to use.
- Rotate your stocks so vaccines never become outdated.

Prefilling syringes

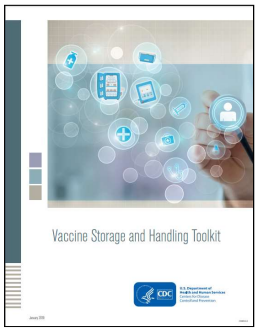
- This practice is strongly discouraged by CDC.
- May result in vaccine administration errors, as well as possible improper temperature control.
- May consider in situations of heavy use of a single vaccine (e.g., annual influenza clinic).
- Consider using manufacturer-supplied prefilled syringes.
- Syringes other than those filled by manufacturer should be discarded at end of clinic day. Also, manufactured pre-filled syringes that have had the caps removed and a needle attached to the syringe should be discarded at the end of the day.

Transporting vaccine

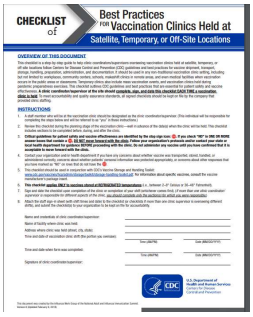
- Vaccines from your supply should not be routinely transported.
- *When necessary*, vaccines should only be transported using a portable vaccine refrigerator or freezer or qualified container and pack-out designed to transport vaccines within the temperature range recommended by the manufacturers. Coolers available at general merchandise stores or coolers used to transport food are NOT ACCEPTABLE.
- Immediately upon arrival at an off-site/satellite facility, vaccines should be stored in an **appropriate storage unit** with a temperature monitoring device, and temperatures should be read and recorded a minimum of 2 times during the workday.

HELP! "When we have flu clinics we put our vaccines in a cooler with ice packs (a few hundred at a time) at the bottom and top but each person keeps the vaccines at their station to give as the pt. comes in. So they could be out several hours if that person does not give one but here and there. I know that can affect the efficiency of the vaccine. Any suggestions?

Vaccine transport resources



www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf
(pages 21–24)



www.izsummitpartners.org/naiis-workgroups/influenza-workgroup/off-site-clinic-resources

Live virus vaccines and some inactivated vaccines (13 total) must be administered promptly after reconstitution…

If not administered within the time limit, these vaccinations need to be repeated!

(If live virus vaccine, there is a 4-week minimum interval.)

HELP! “One the staff mixed the diluent with the MMR vaccine 24 hours before administration, is that ok? Is the vaccine still effective?”

Vaccines with Diluents: How to Use Them

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

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

Vaccine product name	Manufacturer	Lyophilized vaccine (powder)	Liquid diluent (may contain vaccine)	Time allowed between reconstitution and use, as stated in package insert[1]	Diluent storage environment
ActHIB (Hib)	Sanofi Pasteur	Hib	0.4% sodium chloride	24 hrs	Refrigerator
Hiberix (Hib)	GlaxoSmithKline	Hib	0.9% sodium chloride	24 hrs	Refrigerator or room temp
Imovax (RAB$_{HDCV}$)	Sanofi Pasteur	Rabies virus	Sterile water	Immediately[2]	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[2]	Refrigerator
ProQuad (MMRV)	Merck	MMRV	Sterile water	30 min	Refrigerator or room temp
RabAvert (RAB$_{PCEC}$)	GlaxoSmithKline	Rabies virus	Sterile water	Immediately[2]	Refrigerator
Rotarix (RV1)[3]	GlaxoSmithKline	RV1	Sterile water, calcium carbonate, and xanthan	24 hrs	Refrigerator or room temp
Shingrix (RZV)	GlaxoSmithKline	RZV	AS01$_B$ 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.

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. Following reconstitution, Menomune in a multidose vial will require a new needle and syringe for each dose of vaccine to be administered. For Rotarix, see the package insert.[3]

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 (i.e., multi-dose Menomune), 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.

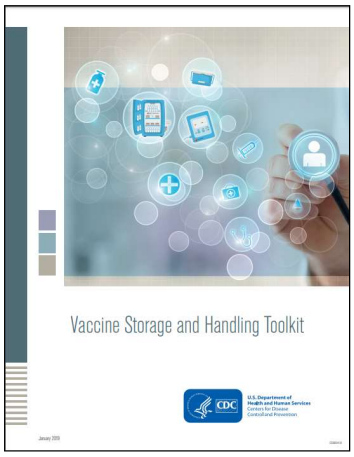
[1] If the reconstituted vaccine is not used within this time period, it must be discarded.
[2] For purposes of this guidance, IAC defines "immediately" as within 30 minutes or less.
[3] Rotarix vaccine is administered by mouth using the applicator that contains the diluent. It is not administered as an injection.
[4] 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.

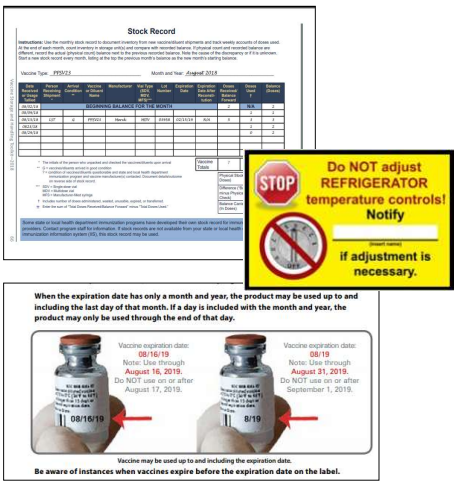
Technical content reviewed by the Centers for Disease Control and Prevention

IMMUNIZATION ACTION COALITION Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org
www.immunize.org/catg.d/p3040.pdf • Item #P3040 (12/17)

Vaccine product name	Manufacturer	Lyophilized vaccine (powder)	Liquid diluent (may contain vaccine)	Time allowed reconstitutio stated in pac
ActHIB (Hib)	Sanofi Pasteur	Hib	0.4% sodium chloride	24 hrs
Hiberix (Hib)	GlaxoSmithKline	Hib	0.9% sodium chloride	24 hrs
Imovax (RAB_{HDCV})	Sanofi Pasteur	Rabies virus	Sterile water	Immediately
M-M-R II (MMR)	Merck	MMR	Sterile water	8 hrs
Menveo (MenACWY)	GlaxoSmithKline	MenA	MenCWY	8 hrs
Pentacel (DTaP-IPV/Hib)	Sanofi Pasteur	Hib	DTaP-IPV	Immediately
ProQuad (MMRV)	Merck	MMRV	Sterile water	30 min
RabAvert (RAB_{PCECV})	GlaxoSmithKline	Rabies virus	Sterile water	Immediately
Rotarix (RV1)‡	GlaxoSmithKline	RV1	Sterile water, calcium carbonate, and xanthan	24 hrs
Shingrix (RZV)	GlaxoSmithKline	RZV	$AS01_B$§ adjuvant suspension	6 hrs

Storage & handling resources





www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf

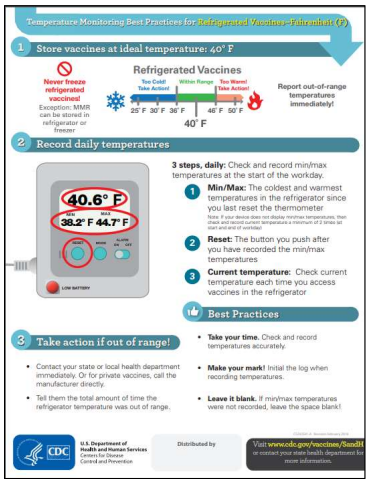
Storage & handling resources

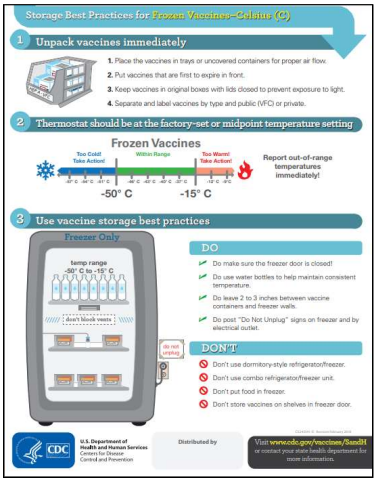
- CDC's "You Call the Shots" web-based course on storage & handling www.cdc.gov/vaccines/ed/youcalltheshots.html
- CDC's "Pink Book" chapter on storage & handling www.cdc.gov/vaccines/pubs/pinkbook/downloads/vac-storage.pdf
- CDC video: *Keys to Storage and Handling Your Vaccine Supply* www2.cdc.gov/vaccines/ed/shvideo
- CDC's Vaccine Label Examples www.cdc.gov/vaccines/hcp/admin/storage/guide/vaccine-storage-labels.pdf

Storage & handling resources

- CDC's *Temperature Monitoring Best Practices for **Refrigerated Vaccines***
- CDC's *Temperature Monitoring Best Practices for **Frozen Vaccines***
- CDC's *Storage Best Practices for **Refrigerated Vaccines***
- CDC's *Storage Best Practices for **Frozen Vaccines***

Each available in Celsius and Fahrenheit
All available at www.cdc.gov/vaccines/hcp/admin/storage/index.html





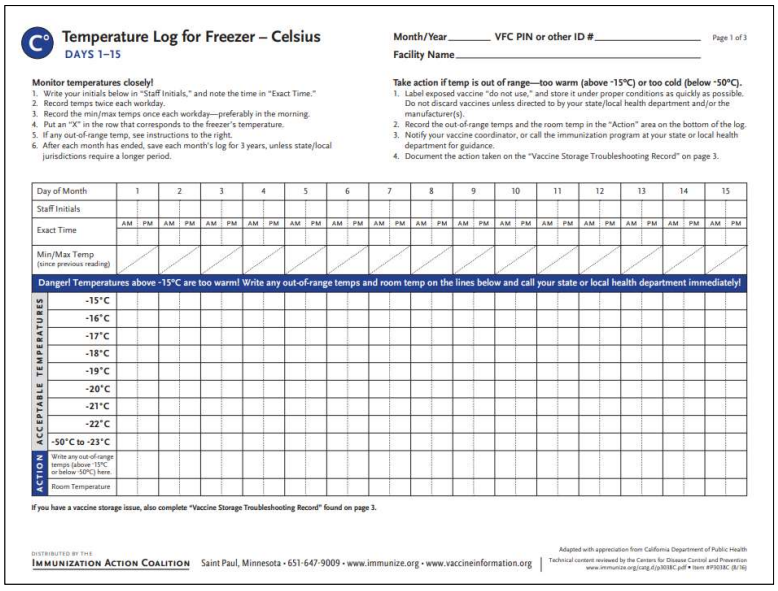
Storage & handling resources

- IAC's "Storage and Handling" print resources www.immunize.org/handouts/vaccine-storage-handling.asp
- IAC's "Clinic Tools: Vaccine Storage and Handling" web page www.immunize.org/clinic/storage-handling.asp

Print resources include:

Storage & handling resources

- *Checklist for Safe Vaccine Storage and Handling* www.immunize.org/catg.d/p3035.pdf
- *Don't Be Guilty of These **Preventable** Errors in Vaccine Storage and Handling!* www.immunize.org/catg.d/p3036.pdf
- *Emergency Response Worksheet* www.immunize.org/catg.d/p3051.pdf
- *Vaccines with Diluents: How to Use Them* www.immunize.org/catg.d/p3040.pdf
- Temperature logs in Celsius and Fahrenheit for refrigerators and freezers
- And more…



Temperature Log for Freezer – Celsius
DAYS 1–15

Month/Year_____ VFC PIN or other ID #_____ Page 1 of 3
Facility Name_____

Monitor temperatures closely!
1. Write your initials below in "Staff Initials," and note the time in "Exact Time."
2. Record temps twice each workday.
3. Record the min/max temps once each workday—preferably in the morning.
4. Put an "X" in the row that corresponds to the freezer's temperature.
5. If any out-of-range temp, see instructions to the right.
6. After each month has ended, save each month's log for 3 years, unless state/local jurisdictions require a longer period.

Take action if temp is out of range—too warm (above -15°C) or too cold (below -50°C).
1. Label exposed vaccine "do not use," and store it under proper conditions as quickly as possible. Do not discard vaccines unless directed to by your state/local health department and/or the manufacturer(s).
2. Record the out-of-range temps and the room temp in the "Action" area on the bottom of the log.
3. Notify your vaccine coordinator, or call the immunization program at your state or local health department for guidance.
4. Document the action taken on the "Vaccine Storage Troubleshooting Record" on page 3.

Day of Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Staff Initials															
Exact Time	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM	AM PM
Min/Max Temp (since previous reading)															
Danger! Temperatures above -15°C are too warm! Write any out-of-range temps and room temp on the lines below and call your state or local health department immediately!															
ACCEPTABLE TEMPERATURES -15°C															
-16°C															
-17°C															
-18°C															
-19°C															
-20°C															
-21°C															
-22°C															
-50°C to -23°C															
ACTION Write any out-of-range temps (above -15°C or below -50°C) here.															
Room Temperature															

If you have a vaccine storage issue, also complete "Vaccine Storage Troubleshooting Record" found on page 3.

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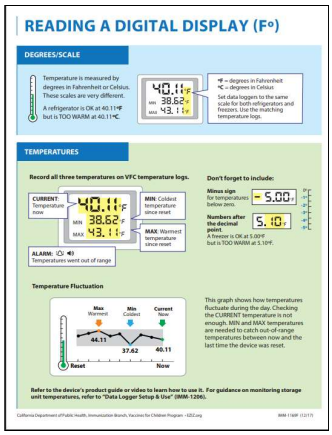
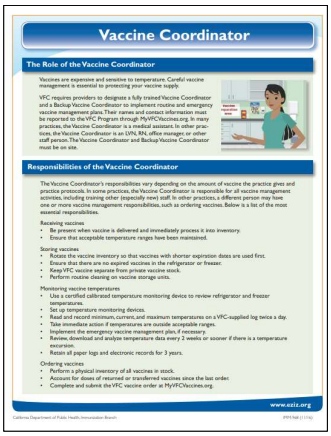
Adapted with appreciation from California Department of Public Health
Technical content reviewed by the Centers for Disease Control and Prevention
www.immunize.org/catg.d/p3038c.pdf • Item #P3038C (8/16)

Storage & handling resources

California's VFC program has many helpful resources at www.eziz.org





Types of vaccination errors

- Storage and handling
- **Administration**
- Scheduling
- Documentation

Administering vaccines correctly

- Ensure staff is adequately trained.
- Provide current immunization education.
- Adhere to OSHA guidelines for employee safety.
- Provide staff with easy-to-use resources and guidelines.

Types of Administration Errors

- Wrong vaccine or diluent
- Wrong dosage
- Expired vaccine
- Incorrect route/site/needle size

A study using the largest medication error reporting database in the U.S. found that administration of the wrong vaccine was commonly reported.

Such errors usually involved vaccines whose generic or trade names looked or sounded alike (Tdap/DTaP, Adacel and Daptacel), or which have similar packaging.

Vaccine (2009)27:3890–6

HELP! "We gave a Tdap inadvertently instead of Kinrix to a 5-year-old."

HELP! "We have a patient who received a PCV-13 in error before her 65th birthday—she was not in one of the high-risk groups." Does she need to have PCV-13 repeated after she turns 65?

HELP! "A 13-month-old child was given a Proquad and Varicella injection instead of a MMR & Varicella. Is there any danger to the child? Need advice ASAP."

HELP! "I have a 4-week-old infant who was accidentally immunized with Hib instead of hep B. Can you tell me about the potential implication for immunizing early with Hib?"

What to do about DTaP and Tdap errors

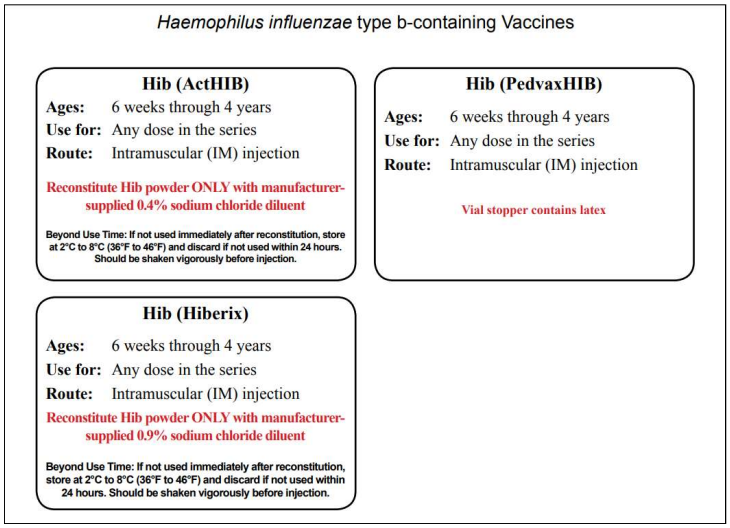
- Tdap given to a child younger than age 7 years as either dose 1, 2, or 3, is not valid. Repeat with DTaP as soon as feasible.
- Tdap given to a child younger than age 7 years as either dose 4 or 5 can be counted as valid for DTaP dose 4 or 5.
- DTaP given to an undervaccinated child 7 through 10 years of age: count this dose as the Tdap dose of the catch-up series. The child should receive an adolescent booster dose of Tdap at 11–12 years of age.
- DTaP given to a person 11 years of age or older: count this dose as the Tdap dose. The person should not receive an additional dose of Tdap.

Is it Tdap, DTaP, or Td?

Check the vial **3 times!**

http://eziz.org/assets/docs/IMM-508.pdf

Label syringes and avoid mix-ups!



Haemophilus influenzae type b-containing Vaccines

Hib (ActHIB)

Ages: 6 weeks through 4 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

Reconstitute Hib powder ONLY with manufacturer-supplied 0.4% sodium chloride diluent

Beyond Use Time: If not used immediately after reconstitution, store at 2°C to 8°C (36°F to 46°F) and discard if not used within 24 hours. Should be shaken vigorously before injection.

Hib (PedvaxHIB)

Ages: 6 weeks through 4 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

Vial stopper contains latex

Hib (Hiberix)

Ages: 6 weeks through 4 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

Reconstitute Hib powder ONLY with manufacturer-supplied 0.9% sodium chloride diluent

Beyond Use Time: If not used immediately after reconstitution, store at 2°C to 8°C (36°F to 46°F) and discard if not used within 24 hours. Should be shaken vigorously before injection.

CDC has free downloadable, informative labels:
www.cdc.gov/vaccines/hcp/admin/storage/guide/vaccine-storage-labels.pdf

Involve the patient or parent in the verification process

"Ask patients or parents to participate in the verification process prior to vaccine administration by reading the VIS and verifying that the patient is within the specific ages for the intended vaccine, and by simultaneously comparing the name of the vaccine on the VIS to the vaccine name stated by the clinician and listed on the vaccine label. Immunization records and/or vaccine logs in which the vaccine name, dose, lot number, and expiration date have been recorded immediately before vaccination can also be verified by the patient or parent as the information on the vaccine label is read aloud by the clinician."

Institute for Safe Medication Practices
https://www.ismp.org/resources/recommendations-practitioners-prevent-vaccine-errors-part-2-analysis-ismp-vaccine-errors?id=104

Giving the wrong vaccine will rarely cause a serious problem, but…

- Additional doses can lead to more vigorous local reactions.
- Patient may be left unprotected against disease.
- Additional cost
- Inconvenience to patient/parent
- May cause loss of faith in provider or complaint to state board.

HELP! "Yesterday my 18-month-old's pediatrician informed me that they made a mistake with her vaccines. They gave her two doses of Prevnar and did not vaccinate for Hib. Will this harm my child? Do I need to get a lawyer and attack this incompetent practice? I am very concerned for my child and the impact it could have on her."

Another potential problem—using the wrong diluent

HELP! "One of the nursing staff used the Merck sterile water diluent to reconstitute the ActHib instead of the 0.4% sodium chloride that comes with it. Does it need to be repeated or will it be considered okay?"

ANSWER

If the wrong diluent is used, the immunization needs to be repeated (except in the case of mixing up the diluent between MMR, MMRV, Varivax, and Zostavax, which are all made by Merck and use the same sterile water diluent).

If an INACTIVATED vaccine is reconstituted with the wrong diluent and is administered, the dose is invalid and should be repeated ASAP.

If a LIVE vaccine is reconstituted with the wrong diluent and is administered, the dose is invalid and if it can't be repeated on the same clinic day, it needs to be repeated no earlier than four weeks after the invalid dose. This spacing is due to the effects of generating a partial immune response that could suppress the live replication of subsequent doses, even of the same live vaccine.

Related error: giving diluent only

The liquid diluents for Menveo (MCV4) and Pentacel (DTaP-IPV/Hib) contain vaccine and need to be combined with the lypophilized vaccine (powder) to provide all the components.

HELP! "We inadvertently gave a child only the DTaP-IPV component of Pentacel not realizing that this component was intended to reconstitute the Hib component. Does this count as a valid dose of DTaP and IPV? Can we mix the unused Hib component with sterile water and give it separately?"

ANSWER

The DTaP-IPV component will count as valid doses of DTaP and IPV vaccines, but take measures to prevent this error in the future. You cannot mix the Hib component with sterile water. ActHib must ONLY be reconstituted with either the DTaP-IPV solution supplied with Pentacel, or with a specific ActHib saline diluent.

HELP! "We mistakenly gave a patient the diluent for Menveo (GSK) meningococcal conjugate vaccine without adding it to the powdered vaccine. What should we do now?"

ANSWER

Menveo's diluent contains the C, W-135, and Y serogroups, and the freeze-dried powder contains serogroup A. Because the patient received only the diluent, he or she is not protected against invasive meningococcal disease caused by *Neisseria meningitidis* serogroup A. Invasive disease with *N. meningitidis* serogroup A is very rare in the U.S., but is more common in some other countries. If the recipient (of the diluent only) is certain not to travel outside the U.S., then the dose does not need to be repeated. Otherwise, the dose should be repeated with either correctly reconstituted Menveo or with a dose of Menactra brand MCV4.

One more caveat: the liquid diluent portion of the Shingrix vaccine does not contain any antigen, but it does include an adjuvant. Because of this, the CDC experts recommend waiting 4 weeks for another dose if the Shingrix diluent is inadvertently administered alone.

Another administration error: giving the wrong dose

HELP! "If an adult patient got a child's dose of hepatitis B vaccine, should he be given an adult dose? If so, how soon?"

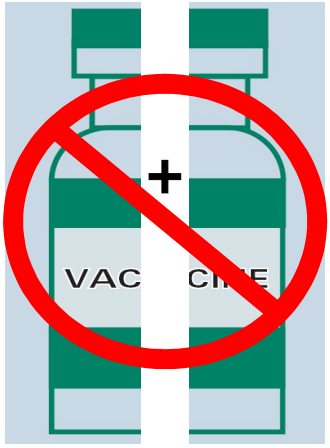
HELP! "We had an incident recently where a 5-year-old presented for 'catch up immunizations,' but was given an adult dose of hep A. We are wondering about side effects or other possible issues."

If you gave LESS than a full age-appropriate dose of any vaccine, the dose is invalid. If the error is discovered while the patient is still in the office, you can give another pediatric dose (i.e., the other "half" dose). If the error is discovered after the person has left the office, then the patient should be revaccinated with a full age-appropriate dose as soon as feasible.

Exceptions are if a patient sneezes after nasal spray vaccine or an infant regurgitates, spits, or vomits during or after receiving oral rotavirus vaccine.

If you give more than an age-appropriate dose of a vaccine, count the dose as valid and notify the patient/parent about the error. Using larger than recommended dosages can be hazardous because of excessive local or systemic concentrations of antigens or other vaccine constituents.

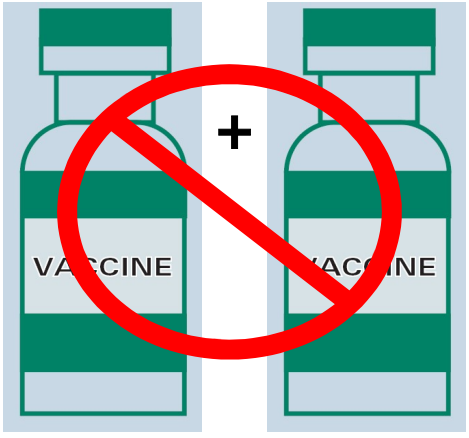
Another dosage error: split or partial doses



- Split or partial (incomplete) doses are NOT valid doses. This includes situations where the patient moves or the syringe fails before the injection is completed.
  - Exceptions to partial doses
    - LAIV if person sneezes
    - Rotavirus if infant regurgitates, spits out, or vomits

CDC

Another administration error: combining vaccines



Different vaccines should NEVER be combined in the same syringe unless FDA-approved for this purpose.

Also, the same vaccine from 2 different vials should never be combined.

Another administration error: using expired vaccine

CDC

HELP! "A physician just called who gave a child a dose of expired vaccine. I am assuming the dose should be re-administered. Please advise."

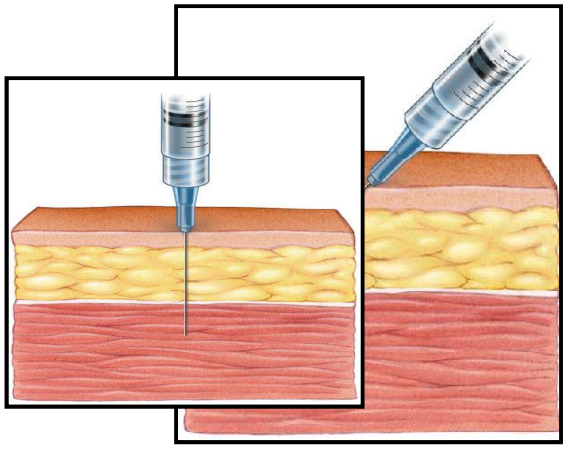
ANSWER

The dose should be repeated. If the expired dose is a live virus vaccine, you should wait at least 4 weeks after the previous (expired) dose was given before repeating it.
If the expired dose is not a live vaccine, the dose should be repeated as soon as possible. An exception to this rule is recombinant zoster vaccine (Shingrix); you should wait 4 weeks to give a repeat dose after the invalid dose.

More on expired doses…

- You *could* perform serologic testing to check for immunity for certain vaccinations: measles, mumps, rubella, hepatitis A, varicella, and tetanus. For non-healthcare personnel, a positive titer for hepatitis B can be accepted, but for HCP, such serology is only valid with evidence of previous vaccination.
- However, commercial serologic testing is not sensitive enough to reliably detect vaccine-induced immunity (with the exception of hepatitis B vaccination at 1–2 months after the final dose), causing false negatives (and revaccination).
- In all cases, revaccination is safe, easier, and probably cheaper than blood work.

Another administration error: incorrect route, site, or needle size



Adapted CDC

What to do if a vaccine is given SC instead of IM

ACIP and/or CDC recommends that if hepatitis B, rabies, HPV, and inactivated influenza vaccines are administered subcutaneously (SC) the doses should NOT be counted as valid and should be repeated. ACIP states that if PCV13, Hib, and/or DTaP are administered by the SC route, providers have the discretion to repeat the doses. There is no minimum interval between the invalid dose and the repeat dose. ACIP and/or CDC recommends that if HepA, MenACWY, IPV, PPSV23, and RZV vaccines are administered SC, the doses *can* count and do not need to be repeated. ACIP/CDC has no recommendation for Tdap, Td, MenB, Typhim VI, or JE-VC.

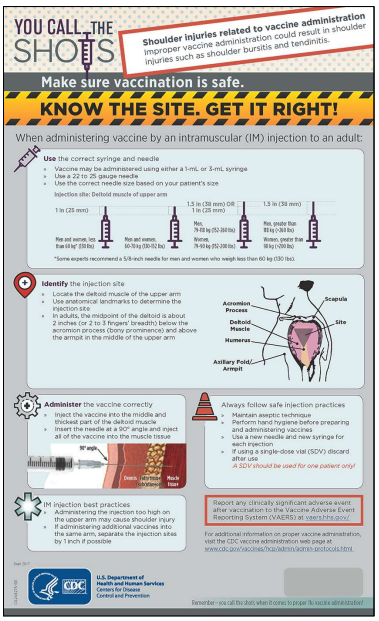
This is the same if a too-short needed is used ('virtual' SC).

What to do if a vaccine is given IM instead of SC

A dose given IM instead of SC can be counted as valid.

Recommended vaccine administration sites

- The deltoid muscle is the preferred site for intramuscular (IM) injection for children age 3 years and older and adults, although the anterolateral thigh can be used as a secondary choice.
- The anterolateral thigh is the site of choice for infants and toddlers under age 3 years; the deltoid is a secondary injection site for IM injections with toddlers if the muscle mass is adequate.



www.cdc.gov/vaccines/hcp/infographics/call-the-shots.html

For deltoid injections, care must be taken to avoid injection too high on the upper arm where injury to the shoulder could result (referred to as Shoulder Injury Related to Vaccine Administration, or SIRVA).

The gluteus muscle is NOT a recommended site for vaccination.

However, a dose given in the gluteus can be considered valid with two exceptions: hepatitis B and rabies vaccines should not be considered valid if administered in any site other than the deltoid or anterolateral thigh.

Vaccine administration resources

- CDC's "Vaccine Administration" web section
  www.cdc.gov/vaccines/hcp/admin/admin-protocols.html
- CDC's "You Call the Shots" web-based course on vaccine administration
  www.cdc.gov/vaccines/ed/courses.html#elearn-vaccadmin
- CDC's "Pink Book" chapter on vaccine administration
  www.cdc.gov/vaccines/pubs/pinkbook/vac-admin.html

Immunization Techniques: Best Practices with Infants, Children, and Adults

Purchase at www.immunize.org/dvd
Watch online at www.youtube.com/watch?v=JEMREaOrfRE

Vaccine administration resources

- IAC's "Administering Vaccines" print resources www.immunize.org/handouts/administering-vaccines.asp
- IAC's "Clinic Tools: Administering Vaccines" web page www.immunize.org/clinic/administering-vaccines.asp

Print resources include:

Vaccine administration resources

- *Administering Vaccines: Dose, Route, Site, and Needle Size* www.immunize.org/catg.d/p3085.pdf
- *Don't Be Guilty of These **Preventable** Errors in Vaccine Administration!* www.immunize.org/catg.d/p3033.pdf
- *Skills Checklist for Vaccine Administration* www.immunize.org/catg.d/p7010.pdf
- *How to Administer Intradermal, Intranasal, and Oral Vaccinations* www.immunize.org/catg.d/p2021.pdf
- *Hepatitis A and Hepatitis B Vaccines: Be Sure Your Patients Get the Correct Dose* www.immunize.org/catg.d/p2081.pdf
- And more…

Vaccine administration resources

http://eziz.org/resources/vaccine-admin-job-aids

Types of vaccination errors

- Storage and handling
- Administration
- **Scheduling**
- Documentation

Scheduling errors: giving doses at too young an age

- Giving the 1st dose of MMR or varicella before age 12 months.
- Giving the 4th dose of DTaP before age 12 months (15 months is preferred).
- Finishing infant's HepB series before age 24 weeks.
- Giving any vaccine (except hepatitis B) before age 6 weeks.
- Giving the 2nd dose of MenACWY before age 16 years.
- Giving the adolescent dose of Tdap before age 11 years.
- Giving the 4th dose of IPV before age 4 years.

HELP! "While registering her for kindergarten, it was brought to my attention by the school RN that my daughter's initial MMR vaccine may not be valid. She received this dose 25 days before her first birthday. I do not want to re-administer a 3rd vaccine if it is not necessary. It is painful and excessive. What, if any, steps can I take to avoid re-vaccinating my daughter?"

Scheduling errors: giving doses without the minimum spacing

- Giving 2nd dose of hepatitis A vaccine less than 6 calendar months after the first dose.
- Giving the hepatitis B vaccine series without at least 4 wks between doses 1 and 2; 8 wks between doses 2 and 3; and 16 wks between doses 1 and 3.
- Giving the 3-dose HPV vaccine series without at least 4 wks between doses 1 and 2; 12 wks between doses 2 and 3; and 24 wks between doses 1 and 3.

HELP! "I am a pediatrician. I have inherited patients from a previous pediatrician and am noting that many of the patients were given the 2nd hepatitis A vaccine a little early, like 1–3 weeks before the 6-month interval that is required. Do I have to vaccinate these patients with a 3rd dose of Hep A?"

CDC's 4-day "grace period"

- Vaccine doses administered up to 4 days before the minimum interval or age can be counted as valid.
- This grace period should not be used when scheduling future vaccination visits, or applied to the 28-day interval between two different live parenteral vaccines not administered at the same visit.
- The grace period cannot be used for rabies vaccine.
- Use of the grace period may conflict with state daycare or school entry vaccination requirements, so check.

- Doses administered 5 or more days before the minimum age should be repeated on or after the patient reaches the minimum age. If the vaccine is a live vaccine, waiting at least 28 days from the invalid dose is recommended.
- ACIP does not require a minimum interval when an inactivated vaccine is given before the minimum age. Once the minimum age is reached, the repeat dose can be given and can be counted.
- HOWEVER, some state immunization registries follow a stricter rule, and, when a dose is given before the minimum age, require that the next dose be given after both the minimum age and interval. So check!

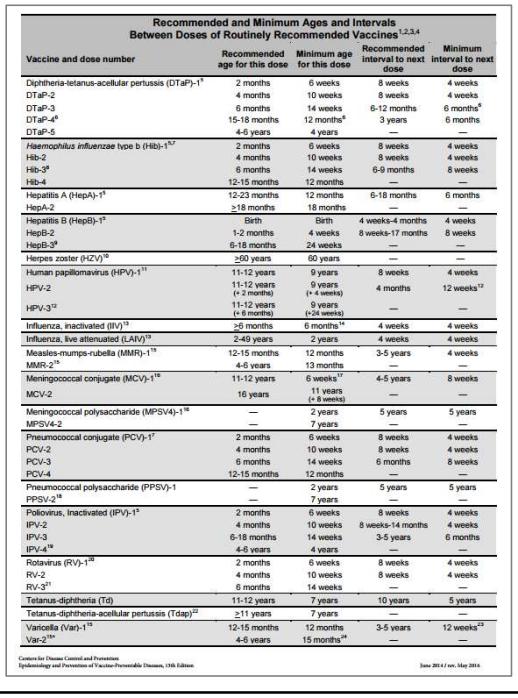
A dose administered 5 or more days earlier than the recommended minimum interval between doses is not valid and must be repeated. The repeat dose should be spaced after the **INVALID** dose by the recommended minimum interval.

A clinician's best friend…

CDC's "Recommended and Minimum Ages and Intervals Between Doses of Routinely Recommended Vaccines"

www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/A/age-interval-table.pdf

Or check with your state immunization registry about when the next dose should be given!



Recommended and Minimum Ages and Intervals Between Doses of Routinely Recommended Vaccines[1,2,3,4]

Vaccine and dose number	Recommended age for this dose	Minimum age for this dose	Recommended interval to next dose	Minimum interval to next dose
Diphtheria-tetanus-acellular pertussis (DTaP)-1[5]	2 months	6 weeks	8 weeks	4 weeks
DTaP-2	4 months	10 weeks	8 weeks	4 weeks
DTaP-3	6 months	14 weeks	6-12 months	6 months[5]
DTaP-4[6]	15-18 months	12 months[6]	3 years	6 months
DTaP-5	4-6 years	4 years	—	—
Haemophilus influenzae type b (Hib)-1[5,7]	2 months	6 weeks	8 weeks	4 weeks
Hib-2	4 months	10 weeks	8 weeks	4 weeks
Hib-3[8]	6 months	14 weeks	6-9 months	8 weeks
Hib-4	12-15 months	12 months	—	—
Hepatitis A (HepA)-1[9]	12-23 months	12 months	6-18 months	6 months
HepA-2	≥18 months	18 months	—	—
Hepatitis B (HepB)-1[9]	Birth	Birth	4 weeks-4 months	4 weeks
HepB-2	1-2 months	4 weeks	8 weeks-17 months	8 weeks
HepB-3[9]	6-18 months	24 weeks	—	—
Herpes zoster (HZV)[10]	≥60 years	60 years	—	—
Human papillomavirus (HPV)-1[11]	11-12 years	9 years	8 weeks	4 weeks
HPV-2	11-12 years (+ 2 months)	9 years (+ 4 weeks)	4 months	12 weeks[12]
HPV-3[12]	11-12 years (+ 6 months)	9 years (+24 weeks)	—	—
Influenza, inactivated (IIV)[13]	≥6 months	6 months[14]	4 weeks	4 weeks
Influenza, live attenuated (LAIV)[13]	2-49 years	2 years	4 weeks	4 weeks
Measles-mumps-rubella (MMR)-1[15]	12-15 months	12 months	3-5 years	4 weeks
MMR-2[15]	4-6 years	13 months	—	—
Meningococcal conjugate (MCV)-1[16]	11-12 years	6 weeks[17]	4-5 years	8 weeks
MCV-2	16 years	11 years (+ 8 weeks)	—	—
Meningococcal polysaccharide (MPSV4)-1[16]	—	2 years	5 years	5 years
MPSV4-2	—	7 years	—	—
Pneumococcal conjugate (PCV)-1[7]	2 months	6 weeks	8 weeks	4 weeks
PCV-2	4 months	10 weeks	8 weeks	4 weeks
PCV-3	6 months	14 weeks	6 months	8 weeks
PCV-4	12-15 months	12 months	—	—
Pneumococcal polysaccharide (PPSV)-1	—	2 years	5 years	5 years
PPSV-2[18]	—	7 years	—	—
Poliovirus, Inactivated (IPV)-1[5]	2 months	6 weeks	8 weeks	4 weeks
IPV-2	4 months	10 weeks	8 weeks-14 months	4 weeks
IPV-3	6-18 months	14 weeks	3-5 years	6 months
IPV-4[19]	4-6 years	4 years	—	—
Rotavirus (RV)-1[20]	2 months	6 weeks	8 weeks	4 weeks
RV-2	4 months	10 weeks	8 weeks	4 weeks
RV-3[21]	6 months	14 weeks	—	—
Tetanus-diphtheria (Td)	11-12 years	7 years	10 years	5 years
Tetanus-diphtheria-acellular pertussis (Tdap)[22]	≥11 years	7 years	—	—
Varicella (Var)-1[23]	12-15 months	12 months	3-5 years	12 weeks[23]
Var-2[23a]	4-6 years	15 months[24]	—	—

Centers for Disease Control and Prevention
Epidemiology and Prevention of Vaccine-Preventable Diseases, 13th Edition

June 2014 / rev. May 2014

Other scheduling errors

- Giving rotavirus vaccine after age 8 months 0 days.
- Giving PPSV every 5 years.
- Giving PPSV and PCV at the same time.
- Not allowing 6 months between the next-to-last and last doses of IPV.
- Using Kinrix/Quadracel other than for the 5th dose of DTaP and the 4th dose of IPV in children age 4–6 years.
- Giving live vaccines not administered at the same visit less than 4 weeks apart.

HELP! "A client received an MMR vaccine at one clinic, and 7 days later received varicella vaccine at another clinic. I assume the varicella is not valid. What about the MMR?"

ANSWER

If two live injectable or nasally administered virus vaccines are administered less than 4 weeks apart and not on the same day, the vaccine given second should be considered invalid and repeated. The repeat dose should be administered at least 4 weeks after the invalid dose. Alternatively, one can perform serologic testing to check for immunity, but this option may not be accurate and may be more costly.

And the classic scheduling error:

Re-starting a vaccine series because of a longer-than-recommended interval

IMPORTANT RULE:

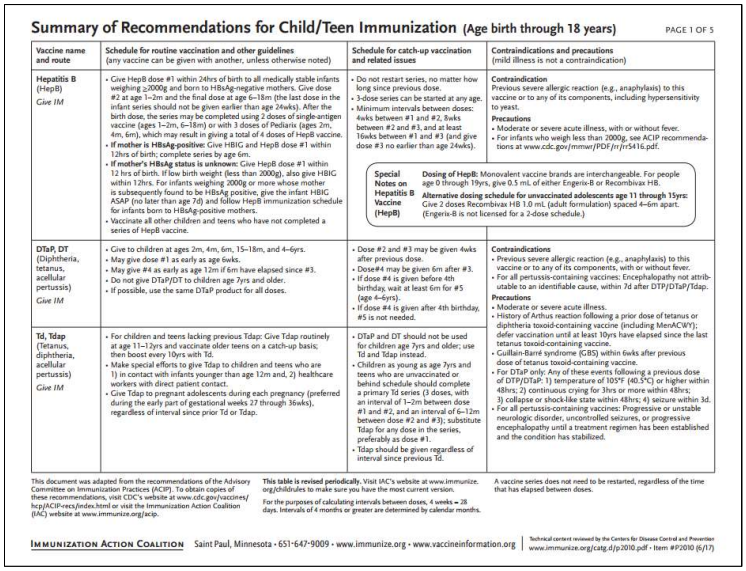
Vaccine doses should not be administered at intervals less than the recommended minimal intervals or earlier than the minimal ages.

But there is no maximum interval!

(except for oral typhoid vaccine in some circumstances)

Vaccine scheduling resources

- IAC's "Vaccine Recommendations" print resources www.immunize.org/handouts/vaccine-recommendations.asp
- IAC's "Clinic Tools: Scheduling Vaccines" web page www.immunize.org/clinic/scheduling-vaccines.asp
- IAC's "Standing Orders" web page www.immunize.org/standing-orders
- IAC's *The Importance of Minimum Ages and Intervals in the Vaccine Schedule* slide set www.immunize.org/catg.d/s8025.pdf



Summary of Recommendations for Child/Teen Immunization (Age birth through 18 years) PAGE 1 OF 5

Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another, unless otherwise noted)	Schedule for catch-up vaccination and related issues	Contraindications and precautions (mild illness is not a contraindication)
Hepatitis B (HepB) *Give IM*	• Give HepB dose #1 within 24hrs of birth to all medically stable infants weighing ≥2000g and born to HBsAg-negative mothers. Give dose #2 at age 1–2m and the final dose at age 6–18m (the last dose in the infant series should not be given earlier than age 24wks). After the birth dose, the series may be completed using 2 doses of single-antigen vaccine (ages 1–2m, 6–18m) or with 3 doses of Pediarix (ages 2m, 4m, 6m), which may result in giving a total of 4 doses of HepB vaccine. • **If mother is HBsAg-positive:** Give HBIG and HepB dose #1 within 12hrs of birth; complete series by age 6m. • **If mother's HBsAg status is unknown:** Give HepB dose #1 within 12 hrs of birth. If low birth weight (less than 2000g), also give HBIG within 12hrs. For infants weighing 2000g or more whose mother is subsequently found to be HBsAg positive, give the infant HBIG ASAP (no later than age 7d) and follow HepB immunization schedule for infants born to HBsAg-positive mothers. • Vaccinate all other children and teens who have not completed a series of HepB vaccine.	• Do not restart series, no matter how long since previous dose. • 3-dose series can be started at any age. • Minimum intervals between doses: 4wks between #1 and #2, 8wks between #2 and #3, and at least 16wks between #1 and #3 (and give dose #3 no earlier than age 24wks). **Special Notes on Hepatitis B Vaccine (HepB)** **Dosing of HepB:** Monovalent vaccine brands are interchangeable. For people age 0 through 19yrs, give 0.5 mL of either Engerix-B or Recombivax HB. **Alternative dosing schedule for unvaccinated adolescents age 11 through 15yrs:** Give 2 doses Recombivax HB 1.0 mL (adult formulation) spaced 4–6m apart. (Engerix-B is not licensed for a 2-dose schedule.)	**Contraindication** Previous severe allergic reaction (e.g., anaphylaxis) to this vaccine or to any of its components, including hypersensitivity to yeast. **Precautions** • Moderate or severe acute illness, with or without fever. • For infants who weigh less than 2000g, see ACIP recommendations at www.cdc.gov/mmwr/PDF/rr/rr5416.pdf.
DTaP, DT (Diphtheria, tetanus, acellular pertussis) *Give IM*	• Give to children at ages 2m, 4m, 6m, 15–18m, and 4–6yrs. • May give dose #1 as early as age 6wks. • May give #4 as early as age 12m if 6m have elapsed since #3. • Do not give DTaP/DT to children age 7yrs and older. • If possible, use the same DTaP product for all doses.	• Dose #2 and #3 may be given 4wks after previous dose. • Dose#4 may be given 6m after #3. • If dose #4 is given before 4th birthday, wait at least 6m for #5 (age 4–6yrs). • If dose #4 is given after 4th birthday, #5 is not needed.	**Contraindications** • Previous severe allergic reaction (e.g., anaphylaxis) to this vaccine or to any of its components, with or without fever. • For all pertussis-containing vaccines: Encephalopathy not attributable to an identifiable cause, within 7d after DTP/DTaP/Tdap. **Precautions** • Moderate or severe acute illness. • History of Arthus reaction following a prior dose of tetanus or diphtheria toxoid-containing vaccine (including MenACWY); defer vaccination until at least 10yrs have elapsed since the last tetanus toxoid-containing vaccine. • Guillain-Barré syndrome (GBS) within 6wks after previous dose of tetanus toxoid-containing vaccine. • For DTaP only: Any of these events following a previous dose of DTP/DTaP: 1) temperature of 105°F (40.5°C) or higher within 48hrs; 2) continuous crying for 3hrs or more within 48hrs; 3) collapse or shock-like state within 48hrs; 4) seizure within 3d. • For all pertussis-containing vaccines: Progressive or unstable neurologic disorder, uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized.
Td, Tdap (Tetanus, diphtheria, acellular pertussis) *Give IM*	• For children and teens lacking previous Tdap: Give Tdap routinely at age 11–12yrs and vaccinate older teens on a catch-up basis; then boost every 10yrs with Td. • Make special efforts to give Tdap to children and teens who are 1) in contact with infants younger than age 12m and, 2) healthcare workers with direct patient contact. • Give Tdap to pregnant adolescents during each pregnancy (preferred during the early part of gestational weeks 27 through 36wks), regardless of interval since prior Td or Tdap.	• DTaP and DT should not be used for children age 7yrs and older; use Td and Tdap instead. • Children as young as age 7yrs and teens who are unvaccinated or behind schedule should complete a primary Td series (3 doses, with an interval of 1–2m between dose #1 and #2, and an interval of 6–12m between dose #2 and #3); substitute Tdap for any dose in the series, preferably as dose #1. • Tdap should be given regardless of interval since previous Td.	

This document was adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP). To obtain copies of these recommendations, visit CDC's website at www.cdc.gov/vaccines/hcp/ACIP-recs/index.html or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip.

This table is revised periodically. Visit IAC's website at www.immunize.org/childrules to make sure you have the most current version.

For the purposes of calculating intervals between doses, 4 weeks = 28 days. Intervals of 4 months or greater are determined by calendar months.

A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses.

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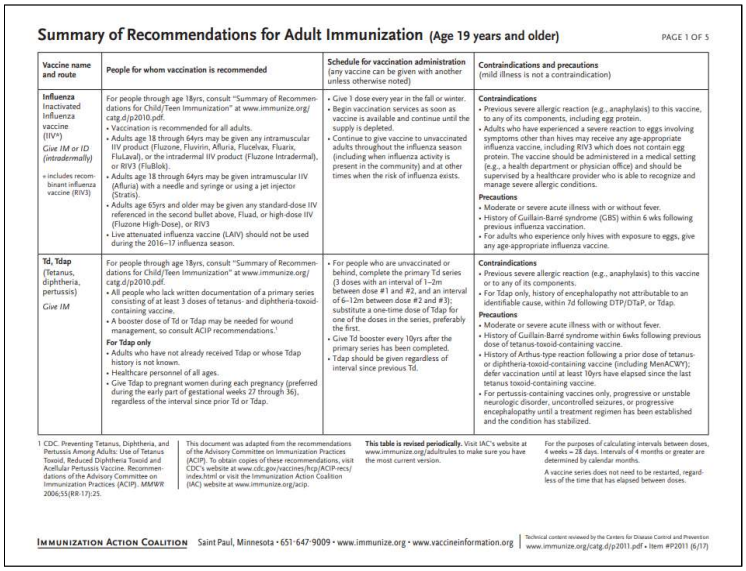
www.immunize.org/catg.d/p2010.pdf



Summary of Recommendations for Adult Immunization (Age 19 years and older)

PAGE 1 OF 5

Vaccine name and route	People for whom vaccination is recommended	Schedule for vaccination administration (any vaccine can be given with another unless otherwise noted)	Contraindications and precautions (mild illness is not a contraindication)
Influenza Inactivated Influenza vaccine (IIV*) *Give IM or ID (intradermally)* * includes recombinant influenza vaccine (RIV3)	For people through age 18yrs, consult "Summary of Recommendations for Child/Teen Immunization" at www.immunize.org/catg.d/p2010.pdf. • Vaccination is recommended for all adults. • Adults age 18 through 64yrs may be given any intramuscular IIV product (Fluzone, Fluvirin, Afluria, Flucelvax, Fluarix, FluLaval), or the intradermal IIV product (Fluzone Intradermal), or RIV3 (FluBlok). • Adults age 18 through 64yrs may be given intramuscular IIV (Afluria) with a needle and syringe or using a jet injector (Stratis). • Adults age 65yrs and older may be given any standard-dose IIV referenced in the second bullet above, Fluad, or high-dose IIV (Fluzone High-Dose), or RIV3 • Live attenuated influenza vaccine (LAIV) should not be used during the 2016–17 influenza season.	• Give 1 dose every year in the fall or winter. • Begin vaccination services as soon as vaccine is available and continue until the supply is depleted. • Continue to give vaccine to unvaccinated adults throughout the influenza season (including when influenza activity is present in the community) and at other times when the risk of influenza exists.	**Contraindications** • Previous severe allergic reaction (e.g., anaphylaxis) to this vaccine, to any of its components, including egg protein. • Adults who have experienced a severe reaction to eggs involving symptoms other than hives may receive any age-appropriate influenza vaccine, including RIV3 which does not contain egg protein. The vaccine should be administered in a medical setting (e.g., a health department or physician office) and should be supervised by a healthcare provider who is able to recognize and manage severe allergic conditions. **Precautions** • Moderate or severe acute illness with or without fever. • History of Guillain-Barré syndrome (GBS) within 6 wks following previous influenza vaccination. • For adults who experience only hives with exposure to eggs, give any age-appropriate influenza vaccine.
Td, Tdap (Tetanus, diphtheria, pertussis) *Give IM*	For people through age 18yrs, consult "Summary of Recommendations for Child/Teen Immunization" at www.immunize.org/catg.d/p2010.pdf. • All people who lack written documentation of a primary series consisting of at least 3 doses of tetanus- and diphtheria-toxoid-containing vaccine. • A booster dose of Td or Tdap may be needed for wound management, so consult ACIP recommendations.[1] **For Tdap only** • Adults who have not already received Tdap or whose Tdap history is not known. • Healthcare personnel of all ages. • Give Tdap to pregnant women during each pregnancy (preferred during the early part of gestational weeks 27 through 36), regardless of the interval since prior Td or Tdap.	• For people who are unvaccinated or behind, complete the primary Td series (3 doses with an interval of 1–2m between dose #1 and #2, and an interval of 6–12m between dose #2 and #3); substitute a one-time dose of Tdap for one of the doses in the series, preferably the first. • Give Td booster every 10yrs after the primary series has been completed. • Tdap should be given regardless of interval since previous Td.	**Contraindications** • Previous severe allergic reaction (e.g., anaphylaxis) to this vaccine or to any of its components. • For Tdap only, history of encephalopathy not attributable to an identifiable cause, within 7d following DTP/DTaP, or Tdap. **Precautions** • Moderate or severe acute illness with or without fever. • History of Guillain-Barré syndrome within 6wks following previous dose of tetanus-toxoid-containing vaccine. • History of Arthus-type reaction following a prior dose of tetanus- or diphtheria-toxoid-containing vaccine (including MenACWY); defer vaccination until at least 10yrs have elapsed since the last tetanus toxoid-containing vaccine. • For pertussis-containing vaccines only, progressive or unstable neurologic disorder, uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized.

1 CDC. Preventing Tetanus, Diphtheria, and Pertussis Among Adults: Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2006;55(RR-17):25.

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This table is revised periodically. Visit IAC's website at www.immunize.org/adultmtx to make sure you have the most current version.

For the purposes of calculating intervals between doses, 4 weeks = 28 days. Intervals of 4 months or greater are determined by calendar months.

A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses.

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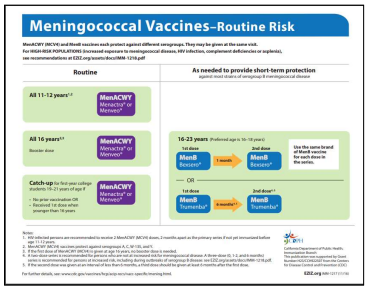
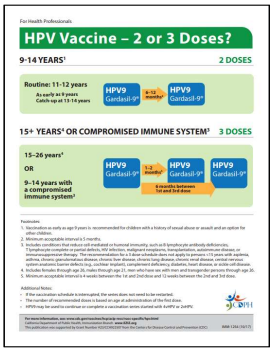
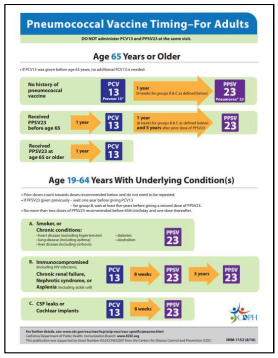
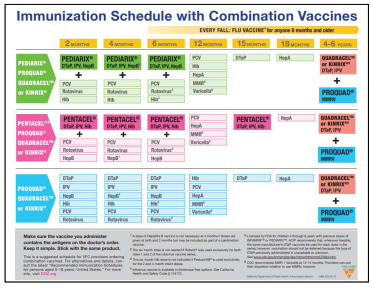








http://eziz.org/administration/schedules-recs

And/or check with your state immunization registry about when the next dose should be given (*before* you give it!)

Types of vaccination errors

- Storage and handling
- Administration
- Scheduling
- **Documentation**

Types of documentation errors

- Not providing a Vaccine Information Statement (VIS) every time a vaccine is given.
- Not using the most current VIS.
- Not knowing if written consent is required.
- Not recording all required information in the patient's chart.
- Forgetting to record a dose or recording a dose not given.

HELP! "My 2-month-old child was recently inoculated at his pediatrician's office. The day following the immunizations my son spiked a high fever, and I was extremely concerned. I called our local hospital and found out that I should have been given a VIS sheet for each of the inoculations that my child received. I did bring this matter up with the pediatrician's office, and I was told by the office manager that she didn't know of any law that mandated they give information sheets out. My question is, to whom do I report this incident? I no longer take my child to their office, but I want them to start doing things right."

A minor side effect becomes a big problem because the parent wasn't given a VIS…

How to ensure you are using the current VIS

- Check CDC's VIS web page
  www.cdc.gov/vaccines/hcp/vis/index.html
- Check IAC's VIS web page
  www.immunize.org/vis
- Subscribe to *IAC Express* and be notified of any new and revised VISs and translations every Wednesday
  www.immunize.org/subscribe

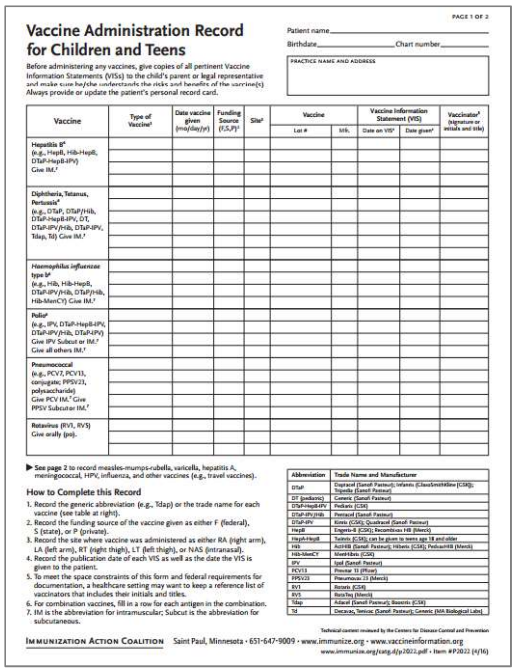
HELP! "For a child, do we have the parent sign each time we give a vaccine in a series, or is it enough to have them sign for the first one?"

ANSWER

There is no federal law requiring written consent to vaccines. VISs cover both benefits and risks associated with vaccinations, and they provide enough information that anyone reading them should be adequately informed. However, some states or institutions have written informed consent laws. Check with your state immunization program and your institution.

Required information to document

- Type of vaccine (e.g., MMR or Hib, NOT brand name) And be careful—DTaP is not the same as Tdap.
- Vaccine manufacturer and lot number
- **FULL** date the vaccination was given
- Name, office address, and title of the healthcare provider administering the vaccine
- VIS edition date
- Date the VIS was given to the patient, parent, or guardian



PAGE 1 OF 2

Vaccine Administration Record for Children and Teens

Patient name_____

Birthdate_____ Chart number_____

PRACTICE NAME AND ADDRESS

Vaccine	Type of Vaccine[1]	Date vaccine given (mo/day/yr)	Funding Source (F,S,P)[2]	Site[3]	Vaccine Lot #	Vaccine Mfr.	Vaccine Information Statement (VIS) Date on VIS[4]	VIS Date given[5]	Vaccinator[6] (signature or initials and title)
Hepatitis B[7] (e.g., HepB, Hib-HepB, DTaP-HepB-IPV) Give IM.[7]									
Diphtheria, Tetanus, Pertussis[8] (e.g., DTaP, DTaP/Hib, DTaP-HepB-IPV, DT, DTaP-IPV/Hib, DTaP-IPV, Tdap, Td) Give IM.[7]									
Haemophilus influenzae type b[9] (e.g., Hib, Hib-HepB, DTaP-IPV/Hib, DTaP/Hib, Hib-MenCY) Give IM.[7]									
Polio[10] (e.g., IPV, DTaP-HepB-IPV, DTaP-IPV/Hib, DTaP-IPV) Give IPV Subcut or IM.[7] Give all others IM.[7]									
Pneumococcal (e.g., PCV7, PCV13, conjugate; PPSV23, polysaccharide) Give PCV IM.[7] Give PPSV Subcut or IM.[7]									
Rotavirus (RV1, RV5) Give orally (po).									

▶ See page 2 to record measles-mumps-rubella, varicella, hepatitis A, meningococcal, HPV, influenza, and other vaccines (e.g., travel vaccines).

How to Complete this Record

1. Record the generic abbreviation (e.g., Tdap) or the trade name for each vaccine (see table at right).
2. Record the funding source of the vaccine given as either F (federal), S (state), or P (private).
3. Record the site where vaccine was administered as either RA (right arm), LA (left arm), RT (right thigh), LT (left thigh), or NAS (intranasal).
4. Record the publication date of each VIS as well as the date the VIS is given to the patient.
5. To meet the space constraints of this form and federal requirements for documentation, a healthcare setting may want to keep a reference list of vaccinators that includes their initials and titles.
6. For combination vaccines, fill in a row for each antigen in the combination.
7. IM is the abbreviation for intramuscular; Subcut is the abbreviation for subcutaneous.

Abbreviation	Trade Name and Manufacturer
DTaP	Daptacel (Sanofi Pasteur); Infanrix (GlaxoSmithKline [GSK]); Tripedia (Sanofi Pasteur)
DT (pediatric)	Generic (Sanofi Pasteur)
DTaP-HepB-IPV	Pediarix (GSK)
DTaP-IPV/Hib	Pentacel (Sanofi Pasteur)
DTaP-IPV	Kinrix (GSK); Quadracel (Sanofi Pasteur)
HepB	Engerix-B (GSK); Recombivax HB (Merck)
HepA-HepB	Twinrix (GSK); can be given to teens age 18 and older
Hib	ActHIB (Sanofi Pasteur); Hiberix (GSK); PedvaxHIB (Merck)
Hib-MenCY	MenHibrix (GSK)
IPV	Ipol (Sanofi Pasteur)
PCV13	Prevnar 13 (Pfizer)
PPSV23	Pneumovax 23 (Merck)
RV1	Rotarix (GSK)
RV5	RotaTeq (Merck)
Tdap	Adacel (Sanofi Pasteur); Boostrix (GSK)
Td	Decavac, Tenivac (Sanofi Pasteur); Generic (NIH Biological Labs)

Technical content reviewed by the Centers for Disease Control and Prevention

IMMUNIZATION ACTION COALITION Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org
www.immunize.org/catg.d/p2022.pdf • Item #P2022 (4/16)

Avoid missing documenting doses or recording doses that weren't actually given

- Document the required information from each vial in the patient's record *before* administration to confirm vaccine selection or preparation of both components of vaccines with diluents.
- Document actual administration of the vaccine *after* it is given.
- Barcode scanning prior to vaccine administration could help catch an error.

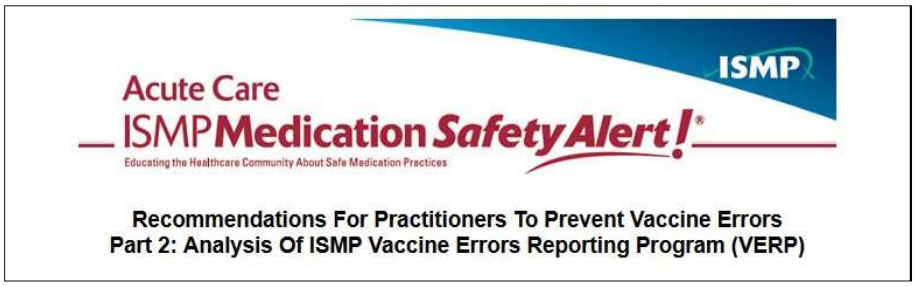
Made a vaccination error?

The Institute for Safe Medication Practices (ISMP) has a website to report vaccine errors—the Vaccine Error Reporting Program (VERP).

VERP was created to allow healthcare professionals and patients to report vaccine errors confidentially. By collecting and quantifying information about these errors, ISMP will be better able to advocate for changes in vaccine names, labeling, or other appropriate modifications that could reduce the likelihood of vaccine errors in the future.

http://verp.ismp.org

In March 2015, VERP published an excellent guide on avoiding vaccine errors:



www.ismp.org/newsletters/acutecare/showarticle.aspx?id=104

Made a vaccination error? (cont.)

CDC recommends that healthcare professionals also report vaccine errors to the Vaccine Adverse Events Reporting System (VAERS). If an adverse event occurs following a vaccine administration error, a report should definitely be sent to VAERS.

Adverse events should be reported to VAERS regardless of whether a healthcare professional thinks it's related to the vaccine or not, as long as it follows administration of a dose of vaccine.

https://vaers.hhs.gov

How to avoid vaccine errors…

Educate yourself

- Read CDC's "Pink Book" cover to cover www.cdc.gov/vaccines/pubs/pinkbook/chapters.html
- Look for answers in the relevant ACIP recommendations www.immunize.org/acip
- Read IAC's "Ask the Experts" Q&As www.immunize.org/askexperts
- Subscribe to *IAC Express* for weekly updates www.immunize.org/subscribe

Educate yourself (cont.)

- "Immunization Techniques" DVD
  www.immunize.org/dvd or
  www.youtube.com/watch?v=WsZ6NEijlfI&t=87s
- IAC's resources related to
  - Storage & handling
    www.immunize.org/handouts/vaccine-storage-handling.asp
  - Vaccine administration
    www.immunize.org/handouts/administering-vaccines.asp
  - Vaccine recommendations, including scheduling
    www.immunize.org/handouts/vaccine-recommendations.asp
  - Documentation
    www.immunize.org/handouts/document-vaccines.asp

Need more help?

- Email CDC's experts: nipinfo@cdc.gov
- Contact your vaccine rep or call the manufacturer
- Call your state immunization program manager. Contact information can be found at www.immunize.org/coordinators.
- Email IAC: admin@immunize.org