**VACCINE ADMINISTRATION AND STORAGE AND HANDLING**

### IMMUNIZATION AND VACCINES (GENERAL)

- **General Best Practice Guidelines for Immunization: Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP)**
  - Guidance about vaccination and vaccines for health care providers.
  - [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html)

- **Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book), 13th Edition: Course Textbook (2015)**
  - Comprehensive information on routinely used vaccines and the diseases they prevent.

- **Vaccine Administration e-Learn**
  - Free, interactive educational program on proper vaccine administration.

- **“You Call the Shots” Online Training Modules**
  - A series of training modules for health care providers on vaccine recommendations with self-tests to assess learning. CE credit available.
  - [www.cdc.gov/vaccines/ed/youcalltheshots.htm](http://www.cdc.gov/vaccines/ed/youcalltheshots.htm)

- **Vaccine Safety**
  - Safety information about specific vaccines and answers to commonly asked questions.
  - [www.cdc.gov/vaccinesafety/hcp/index.html](http://www.cdc.gov/vaccinesafety/hcp/index.html)

- **Vaccine Information Statements (VIS)**
  - Statements required by law to inform patients about the benefits and risks of a vaccine they are receiving.
  - [www.cdc.gov/vaccines/hcp/vis/](http://www.cdc.gov/vaccines/hcp/vis/)

### VACCINE STORAGE AND HANDLING

- **Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book): Storage and Handling Chapter**
  - [www.cdc.gov/vaccines/pubs/pinkbook/vac-storage.html](http://www.cdc.gov/vaccines/pubs/pinkbook/vac-storage.html)

- **Vaccine Storage and Handling Guidelines and Recommendations**
  - Resources on vaccine storage and handling recommendations and guidelines.
  - [www.cdc.gov/vaccines/recs/storage/default.htm](http://www.cdc.gov/vaccines/recs/storage/default.htm)

- **Vaccine Storage and Handling Toolkit**
  - Comprehensive guidance for health care providers on vaccine storage and handling recommendations and best practices.
  - [www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf](http://www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf)

- **“Keys to Storing and Handling Your Vaccine Supply” Training Video**
  - This training outlines vaccine storage and handling best practices, and provides helpful tips for preventing errors and preserving vaccine supply and integrity.
  - [www2.cdc.gov/vaccines/ed/shvideo/](http://www2.cdc.gov/vaccines/ed/shvideo/)

### VACCINE ADMINISTRATION

- **Skills Checklist for Immunization**
  - A self-assessment tool from the Immunization Action Coalition for health care staff who administer vaccines.

- **Epidemiology and Prevention of Vaccine-Preventable Diseases (the Pink Book): Vaccine Administration Chapter**

- **Vaccine Administration Guidelines and Recommendations**
  - CDC resources include information on vaccine dosage, route, and site; vaccines with diluents; sample vaccine records; recommendations for emergency situations; managing vaccine reactions; and vaccine indications.
  - [www.cdc.gov/vaccines/hcp/admin/admin-protocols.html](http://www.cdc.gov/vaccines/hcp/admin/admin-protocols.html)

- **Injection Safety**
  - Information for health care providers about safe injection practices.
  - [www.cdc.gov/injectionsafety/providers.html](http://www.cdc.gov/injectionsafety/providers.html)

- **Using Standing Orders for Administering Vaccines: What You Should Know**
  - The Immunization Action Coalition provides standing orders for ACIP-recommended vaccines and an overview about the use of standing orders for vaccination.
  - [www.immunize.org/standing-orders/](http://www.immunize.org/standing-orders/)
Unpack vaccines immediately

1. Place the vaccines in trays or containers for proper air flow.
2. Put vaccines that are first to expire in front.
3. Keep vaccines in original boxes with lids closed to prevent exposure to light.
4. Separate and label by vaccine type and public (VFC) or private vaccine.

Store vaccines at ideal temperature: 40° F

Never freeze refrigerated vaccines!
Exception: MMR can be stored in refrigerator or freezer

Within Range

Too Cold!
Take Action!

Too Warm!
Take Action!

Report out-of-range temperatures immediately!

Use vaccine storage best practices

DO

✓ Do make sure the refrigerator door is closed!
✓ Do replace crisper bins with water bottles to help maintain consistent temperature.
✓ Do label water bottles “Do Not Drink.”
✓ Do leave 2 to 3 inches between vaccine containers and refrigerator walls.
✓ Do post “Do Not Unplug” signs on refrigerator and near electrical outlet.

DON’T

✗ Don’t use dormitory-style refrigerator.
✗ Don’t use top shelf for vaccine storage.
✗ Don’t put food or beverages in refrigerator.
✗ Don’t put vaccines on door shelves or on floor of refrigerator.
✗ Don’t drink from or remove water bottles.
1. Unpack vaccines immediately

1. Place the vaccines in trays or containers for proper air flow.
2. Put vaccines that are first to expire in front.
3. Keep vaccines in original boxes with lids closed to prevent exposure to light.
4. Separate and label vaccines by type and public (VFC) or private.

2. Thermostat should be at the factory-set or midpoint temperature setting

Report out-of-range temperatures immediately!

3. Use vaccine storage best practices

**DO**

- Do make sure the freezer door is closed!
- Do use water bottles to help maintain consistent temperature.
- Do leave 2 to 3 inches between vaccine containers and freezer walls.
- Do post “Do Not Unplug” signs on freezer and by electrical outlet.

**DON’T**

- Don’t use dormitory-style refrigerator/freezer.
- Don’t use combo refrigerator/freezer unit.
- Don’t put food in freezer.
- Don’t store vaccines on shelves in freezer door.
**Store vaccines at ideal temperature: 40° F**

Never freeze refrigerated vaccines!

Exceptions:
- MMR can be stored in refrigerator or freezer

**Record daily temperatures**

**3 steps, daily:** Check and record min/max temperatures at the start of the workday.

1. **Min/Max:** The coldest and warmest temperatures in the refrigerator since you last reset the thermometer
   - Note: If your device does not display min/max temperatures, then check and record current temperature a minimum of 2 times (at start and end of workday)

2. **Reset:** The button you push after you have recorded the min/max temperatures

3. **Current temperature:** Check current temperature each time you access vaccines in the refrigerator

**Take action if out of range!**

- Contact your state or local health department immediately. Or for private vaccines, call the manufacturer directly.

- Tell them the total amount of time the refrigerator temperature was out of range.

**Report out-of-range temperatures immediately!**

**Best Practices**

- Take your time. Check and record temperatures accurately.

- Make your mark! Initial the log when recording temperatures.

- Leave it blank. If min/max temperatures were not recorded, leave the space blank!

**Contact your state or local health department immediately.**

**Visit** [www.cdc.gov/vaccines/SandH](http://www.cdc.gov/vaccines/SandH) or contact your state health department for more information.
1. Thermostat should be at the factory-set or midpoint temperature setting.

2. Record daily temperatures.

3. Take action if out of range!

- Contact your state or local health department immediately. Or for private vaccines, call the manufacturer directly.
- Tell them the total amount of time the freezer temperature was out of range.

3 steps, daily: Check and record min/max temperatures at the start of the workday.

1. Min/Max: The coldest and warmest temperatures in the refrigerator since you last reset the thermometer.
   Note: If your device does not display min/max temperatures, then check and record current temperature a minimum of 2 times (at start and end of workday).

2. Reset: The button you push after you have recorded the min/max temperatures.

3. Current temperature: Check current temperature each time you access vaccines in the refrigerator.

Best Practices:
- Take your time. Check and record temperatures accurately.
- Make your mark! Initial the log when recording temperatures.
- Leave it blank. If min/max temperatures were not recorded, leave the space blank!

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

<table>
<thead>
<tr>
<th>Vaccine product name</th>
<th>Manufacturer</th>
<th>Lyophilized vaccine (powder)</th>
<th>Liquid diluent (may contain vaccine)</th>
<th>Time allowed between reconstitution and use, as stated in package insert*</th>
<th>Diluent storage environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>ActHIB (Hib)</td>
<td>Sanofi Pasteur</td>
<td>Hib</td>
<td>0.4% sodium chloride</td>
<td>24 hrs</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Hiberix (Hib)</td>
<td>GlaxoSmithKline</td>
<td>Hib</td>
<td>0.9% sodium chloride</td>
<td>24 hrs</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>Imovax (RABHDCV)</td>
<td>Sanofi Pasteur</td>
<td>Rabies virus</td>
<td>Sterile water</td>
<td>Immediately†</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>M-M-R II (MMR)</td>
<td>Merck</td>
<td>MMR</td>
<td>Sterile water</td>
<td>8 hrs</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>Menveo (MenACWY)</td>
<td>GlaxoSmithKline</td>
<td>MenA</td>
<td>MenCwy</td>
<td>8 hrs</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Pentacel (DTaP-IPV/Hib)</td>
<td>Sanofi Pasteur</td>
<td>Hib</td>
<td>DTaP-IPV</td>
<td>Immediately†</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>ProQuad (MMRV)</td>
<td>Merck</td>
<td>MMRV</td>
<td>Sterile water</td>
<td>30 min</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>RabAvert (RABPCECV)</td>
<td>GlaxoSmithKline</td>
<td>Rabies virus</td>
<td>Sterile water</td>
<td>Immediately†</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Rotarix (RV1)‡</td>
<td>GlaxoSmithKline</td>
<td>RV1</td>
<td>Sterile water, calcium carbonate, and xanthan</td>
<td>24 hrs</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>Shingrix (RZV)</td>
<td>GlaxoSmithKline</td>
<td>RZV</td>
<td>AS01l adjuvant suspension</td>
<td>6 hrs</td>
<td>Refrigerator</td>
</tr>
<tr>
<td>Varivax (VAR)</td>
<td>Merck</td>
<td>VAR</td>
<td>Sterile water</td>
<td>30 min</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>YF-VAX (YF)</td>
<td>Sanofi Pasteur</td>
<td>YF</td>
<td>0.9% sodium chloride</td>
<td>60 min</td>
<td>Refrigerator or room temp</td>
</tr>
<tr>
<td>Zostavax (ZVL)</td>
<td>Merck</td>
<td>LZV</td>
<td>Sterile water</td>
<td>30 min</td>
<td>Refrigerator or room temp</td>
</tr>
</tbody>
</table>

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

1. For single-dose vaccine products (exception is Rotarix‡), select a syringe and needle of proper length to be used for both reconstitution and administration of the vaccine. For Rotarix, see the package insert.1

2. Before reconstituting, check labels on both the lyophilized vaccine vial and the diluent to verify that:
   - they are the correct two products to mix together,
   - the diluent is the correct volume, and
   - neither the vaccine nor the diluent has expired.

3. Reconstitute (i.e., mix) vaccine just prior to use by:
   - removing the protective caps and wiping each stopper with an alcohol swab,
   - inserting needle of syringe into diluent vial and withdrawing entire contents, and
   - injecting diluent into lyophilized vaccine vial and rotating or agitating to thoroughly dissolve the lyophilized powder.

4. Check the appearance of the reconstituted vaccine:
   - Reconstituted vaccine may be used if the color and appearance match the description on the package insert.
   - If there is discoloration, extraneous particulate matter, obvious lack of resuspension, or the vaccine cannot be thoroughly mixed, mark the vial as “DO NOT USE,” return it to proper storage conditions, and contact your state or local health department immunization program or the vaccine manufacturer.

5. If reconstituted vaccine is not used immediately or comes in a multidose vial, be sure to:
   - clearly mark the vial with the date and time the vaccine was reconstituted,
   - maintain the product at 2°–8°C (36°–46°F); do not freeze, and
   - use only within the time indicated on chart above.

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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. ASO1l 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.

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**Immunization Action Coalition**
Saint Paul, Minnesota • 651-647-9009 • [www.immunize.org](http://www.immunize.org) • [www.vaccineinformation.org](http://www.vaccineinformation.org)
www.immunize.org/catg.d/p3040.pdf • Item #P3040 (8/18)
Establish Storage and Handling Policies

YES  NO
1. We have designated a primary vaccine coordinator and at least one alternate coordinator to be in charge of vaccine storage and handling at our facility.

YES  NO
2. Both the primary and alternate vaccine coordinator(s) have completely reviewed either CDC’s Vaccine Storage & Handling Toolkit (www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf) or equivalent training materials offered by our state or local health department’s immunization program.

YES  NO
3. We have detailed, up-to-date, written standard operating procedures for general vaccine management, including procedures for routine activities and an emergency vaccine retrieval and storage plan for power outages and other problems. Our procedures are based on CDC’s Vaccine Storage & Handling Toolkit and/or on instruction from our state or local health department’s immunization program.

YES  NO
4. We review these policies with all staff annually and with new staff, including temporary staff, when they are hired.

Log In New Vaccine Shipments

YES  NO
5. We maintain a vaccine inventory log that we use to document the following:

a. Vaccine name and number of doses received

b. Date we received the vaccine

c. Condition of vaccine when we received it

d. Vaccine manufacturer and lot number

e. Vaccine expiration date

Use Proper Storage Equipment

YES  NO
6. We store vaccines in separate, self-contained units that refrigerate or freeze only. If we must use a household-style combination unit, we use it only for storage of our refrigerated vaccines, maintaining frozen vaccines in a separate stand-alone freezer.

YES  NO
7. We store vaccines in units with enough room to maintain the year’s largest inventory without crowding.

YES  NO
8. We never store any vaccines in a dormitory-style unit (a small combination freezer-refrigerator unit with the freezer compartment inside the refrigerator).

YES  NO
9. We use only calibrated temperature monitoring devices (TMD) that have a Certificate of Calibration Testing* (“Report of Calibration”) and are calibrated every 1 to 2 years from the last calibration testing date or according to the manufacturer’s suggested timeline. If storing Vaccines For Children (VFC) vaccine, our TMD is a digital data logger (DDL).

YES  NO
10. We have planned back-up storage unit(s) in the event of a power failure or other unforeseen event.

* Certificate of Calibration Testing (“Report of Calibration”) with calibration measurements traceable to a laboratory with accreditation from the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) signatory body.

Checklist for Safe Vaccine Storage and Handling

Are you doing everything you should to safeguard your vaccine supply?
Review this list to see where you might make improvements in your vaccine management practices. Check each listed item with either [YES] or [NO].

Establish Storage and Handling Policies

1. We have designated a primary vaccine coordinator and at least one alternate coordinator to be in charge of vaccine storage and handling at our facility.

2. Both the primary and alternate vaccine coordinator(s) have completely reviewed either CDC’s Vaccine Storage & Handling Toolkit (www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf) or equivalent training materials offered by our state or local health department’s immunization program.

3. We have detailed, up-to-date, written standard operating procedures for general vaccine management, including procedures for routine activities and an emergency vaccine retrieval and storage plan for power outages and other problems. Our procedures are based on CDC’s Vaccine Storage & Handling Toolkit and/or on instruction from our state or local health department’s immunization program.

4. We review these policies with all staff annually and with new staff, including temporary staff, when they are hired.

Log In New Vaccine Shipments

5. We maintain a vaccine inventory log that we use to document the following:

a. Vaccine name and number of doses received

b. Date we received the vaccine

c. Condition of vaccine when we received it

d. Vaccine manufacturer and lot number

e. Vaccine expiration date

Use Proper Storage Equipment

6. We store vaccines in separate, self-contained units that refrigerate or freeze only. If we must use a household-style combination unit, we use it only for storage of our refrigerated vaccines, maintaining frozen vaccines in a separate stand-alone freezer.

7. We store vaccines in units with enough room to maintain the year’s largest inventory without crowding.

8. We never store any vaccines in a dormitory-style unit (a small combination freezer-refrigerator unit with the freezer compartment inside the refrigerator).

9. We use only calibrated temperature monitoring devices (TMD) that have a Certificate of Calibration Testing* (“Report of Calibration”) and are calibrated every 1 to 2 years from the last calibration testing date or according to the manufacturer’s suggested timeline. If storing Vaccines For Children (VFC) vaccine, our TMD is a digital data logger (DDL).

10. We have planned back-up storage unit(s) in the event of a power failure or other unforeseen event.

* Certificate of Calibration Testing (“Report of Calibration”) with calibration measurements traceable to a laboratory with accreditation from the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) signatory body.

Continued on the next page...
Ensure Optimal Operation of Storage Units

11. We have a “Do Not Unplug” sign (e.g., www.immunize.org/catg.d/p2090.pdf) next to the electrical outlets for the refrigerator and freezer and a “Do Not Stop Power” warning label (e.g., www.immunize.org/catg.d/p2091.pdf) by the circuit breaker for the electrical outlets. Both signs include emergency contact information.

12. We perform regular maintenance on our vaccine storage units to assure optimal functioning. For example, we keep the units clean, dusting the coils and cleaning beneath the units as recommended by the manufacturer.

Maintain Correct Temperatures

13. We always keep at least one accurate (+/- 0.5°C [+/- 1ºF]) calibrated temperature monitoring device (TMD) with the vaccines in the refrigerator and a separate calibrated TMD with the vaccines in the freezer.

14. We use a temperature monitoring device (TMD) that
   a. uses an active display to provide continuous monitoring information.
   b. is digital and has a detachable probe that has been buffered against sudden temperature changes by being immersed in a vial filled with liquid (e.g., glycol, ethanol, glycerin), loose media (e.g., sand, glass beads), or a solid block of material (e.g., aluminum, Teflon®).
   c. includes an alarm for out-of-range temperatures.
   d. has a low-battery indicator.
   e. has a digital data logger that indicates current, minimum, and maximum temperatures.
   f. can measure temperatures within +/- 0.5°C (+/- 1ºF).
   g. has a logging interval (or reading rate) that can be programmed by the user to measure and record temperatures AT LEAST every 30 minutes.

15. We maintain the refrigerator temperature at 2–8°C (36–46ºF), and we aim for 5ºC (41ºF).

16. We maintain the freezer temperature between -50°C and -15°C (-58°F and +5°F).

17. We set the thermostat for the refrigerator and the freezer at the factory-set or midpoint temperatures.

18. We keep extra containers of water in the refrigerator (e.g., in the door and/or on the floor of the unit where the vegetable bins were located) to help maintain cool temperatures. We keep ice packs, ice-filled containers, or frozen water bottles in the freezer to help maintain cold temperatures and to have frozen water bottles available for conditioning in the event of an emergency.

 Maintain Daily Temperature Logs

19. If we are using a TMD (preferably a digital data logger or DDL) that records minimum and maximum temperatures, we check and record these temperatures first thing in the morning during each workday when our practice is open. (See selections for recording at www.immunize.org/clinic/storage-handling.asp.)

20. If we are using a TMD that does not record minimum and maximum temperatures, we check and record the current temperatures of the refrigerator and freezer at least twice each workday. (See selections for recording at www.immunize.org/clinic/storage-handling.asp.)

21. We consistently record temperatures on the log either in Celsius or Fahrenheit. We never mix temperature scales when we record our temperatures.

22. If the temperature log prompts us to insert an “x” by the temperature that’s preprinted on the form, we do not attempt to write in the actual temperature.

23. We follow the directions on the temperature log to call appropriate personnel if the temperature in a storage unit goes out of range.
24. If out-of-range temperatures occur in the unit, we complete the Vaccine Storage Troubleshooting Record (www.immunize.org/catg.d/p3041.pdf) to document actions taken when the problem was discovered and what was done to prevent a recurrence of the problem.

25. Trained staff (other than staff designated to record the temperatures) review the temperature logs weekly.

26. We keep the temperature logs on file for at least 3 years.

Store Vaccines Correctly

27. We post signs (e.g., www.immunize.org/catg.d/p3048.pdf) on the doors of the refrigerator and freezer that indicate which vaccines should be stored in the refrigerator and which in the freezer.

28. We do not store any food or drink in any vaccine storage unit.

29. We store vaccines in the middle of the refrigerator or freezer (away from walls and vents), leaving room for air to circulate around the vaccine. We never store vaccine in the doors.

30. We have removed all vegetable and deli bins from the storage unit, and we do not store vaccines in these empty areas.

31. If we must use a combination refrigerator-freezer unit, we store vaccines only in the refrigerator section of the unit. We do not place vaccines in front of the cold-air outlet that leads from the freezer to the refrigerator (often near the top shelf). In general, we try to avoid storing vaccines on the top shelf, and we place water bottles in this location.

32. We check vaccine expiration dates and rotate our supply of each type of vaccine so that vaccines with the earliest expiration dates are located close to the front of the storage unit, facilitating easy access.

33. We store vaccines in their original packaging with the lids closed in clearly labeled containers.

Take Emergency Action As Needed

34. In the event that vaccines are exposed to improper storage conditions, we take the following steps:

   a. We restore proper storage conditions as quickly as possible. If necessary, we label the vaccine “Do Not Use” and move it to a unit where it can be stored under proper conditions. We do not discard the vaccine before discussing the circumstances with our state/local health department and/or the appropriate vaccine manufacturers.

   b. We follow the Vaccine Storage Troubleshooting Record’s (www.immunize.org/catg.d/p3041.pdf) instructions for taking appropriate action and documenting the event. This includes recording details such as the length of time the vaccine was out of appropriate storage temperatures and the current room temperature, as well as taking an inventory of affected vaccines.

   c. We contact our clinic supervisor or other appropriate clinic staff to report the incident. We contact our state/local health department and/or the appropriate vaccine manufacturers for consultation about whether the exposed vaccine can still be used.

   d. We address the storage unit’s mechanical or electrical problems according to guidance from the unit’s manufacturer or a qualified repair service.

   e. In responding to improper storage conditions, we do not make frequent or large changes in thermostat settings. After changing the setting, we give the unit at least a day to stabilize its temperature.

   f. We do not use exposed vaccines until our state/local health department’s immunization program or the vaccine manufacturer has confirmed that the vaccine is acceptable for use. We review this information with our clinic medical director before returning the vaccine to our supply. If the vaccine is not acceptable for use, we follow our state/local health department instructions for vaccine disposition.

If we answer [YES] to all of the above, we give ourselves a pat on the back! If not, we assign someone to implement needed changes!
Don’t Be Guilty of These **Preventable** Errors in Vaccine Storage and Handling!

Do you see your clinic or practice making any of these frequently reported errors in vaccine storage and handling? Although some of these errors are much more serious than others, none of them should occur. Be sure your healthcare setting is not making any of these **preventable** errors.

**ERROR:** Designating only one person, rather than at least two, to be responsible for storage and handling of vaccines
- Everyone in the office should know the basics of vaccine handling, including what to do when a shipment arrives and what to do in the event of an equipment failure or power outage.
- Train at least one back-up person. The back-up and primary persons should be equally familiar with all aspects of vaccine storage and handling, including knowing how to handle vaccines when they arrive, how to properly record refrigerator and freezer temperatures, what to do when an out-of-range temperature occurs, and how to appropriately respond to an equipment problem or power outage.

**ERROR:** Storing vaccine inappropriately
- Be sure all office staff (especially persons involved in receiving vaccine shipments) understand the importance of properly storing vaccines immediately after they arrive.
- Know which vaccines should be refrigerated and which should be frozen. Storage information is found in the package insert. For quick reference, post IAC’s Vaccine Handling Tips (www.immunize.org/catg.d/p3048.pdf) on the refrigerator and freezer.
- Always store vaccines (and temperature monitoring devices) in the body of the refrigerator – not in the vegetable bins, on the floor, next to the walls, in the door, or near the cold air outlet from the freezer. The temperature in these areas may differ significantly from the temperature in the body of the unit.
- Don’t over-pack the unit. Place the vaccine packages in such a way that air can circulate around the compartment.
- Always store vaccines in their original packaging.

**ERROR:** Using the wrong type of equipment

**STORAGE UNITS**
- CDC recommends storing vaccines in separate, self-contained units that only refrigerate or only freeze. If a combination refrigerator/freezer must be used, only refrigerated vaccines should be stored in the unit, and a separate stand-alone freezer should be used for frozen vaccines.
- Never store vaccines in a “dormitory-style” unit (i.e., a small refrigerator-freezer unit with one exterior door and a freezer compartment inside the refrigerator). These units cannot maintain stable temperatures.

**TEMPERATURE MONITORING DEVICES/DIGITAL DATA LOGGERS**
- Use only temperature monitoring devices (digital data loggers [DDL] preferred and required for VFC vaccine storage) for continuous temperature monitoring and recordings. Set the DDL to measure and record temperatures no less than every 30 minutes. Be sure the DDL has a current and valid Certificate of Calibration Testing (aka Report of Calibration).
- Buffer the DDL’s temperature probe by placing it in glycol, glass beads, sand, ethanol, glycerin, aluminum, or Teflon®. Use of a buffer ensures you are not just measuring air temperature, which is subject to fluctuation when you open the door.

For more detailed information, see the Vaccine Storage and Temperature Monitoring Equipment section of CDC’s Vaccine Storage and Handling Toolkit (www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf).

**ERROR:** Inadvertently leaving the refrigerator or freezer door open or having inadequate seals
- Unfortunately, too much vaccine is lost every year because storage unit doors were left open. Remind staff to **completely** close the door every time they open the refrigerator or freezer.
- Check the seals on the doors on a regular schedule, such as when you’re taking inventory. If there is any indication the door seal may be cracked or not sealing properly, have it replaced. (This is much less costly than replacing a box of pneumococcal conjugate or varicella vaccine!)

**CONTINUED ON THE NEXT PAGE ▶**
ERROR: Storing food and drinks in the vaccine refrigerator
- Frequent opening of the refrigerator door to retrieve food items can adversely affect the internal temperature of the unit and damage vaccines. Store only vaccines in the designated units.

ERROR: Inadvertently cutting the power supply to the storage units
- Be sure everyone in your office, including the janitorial staff, understands that very expensive and fragile vaccines are being stored in the refrigerator and freezer.
- Post a Do Not Unplug sign (www.immunize.org/catg.d/p2090.pdf) next to electrical outlets for the refrigerator and freezer, and a Do Not Stop Power warning label (www.immunize.org/catg.d/p2091.pdf) by the circuit breaker for the electrical outlets.

ERROR: Recording temperatures an insufficient number of times each day
- If using a temperature monitoring device (TMD) (digital data loggers [DDL] preferred and required for VFC vaccine storage) that records min/max temperatures, document min/max and current temperatures once each workday, preferably in the morning. If using a TMD that does not record min/max temperatures, document current temperatures twice, at the beginning and end of each workday.
- Record the temperatures you observed on an appropriate log. IAC has temperature logs (www.immunize.org/handouts/temperature-logs.asp) available in both Fahrenheit and Celsius formats.
- Record temperatures for ALL units being used to store vaccine. Don’t forget to check temperatures for both the refrigerator and freezer.

ERROR: Documenting out-of-range temperatures on vaccine temperature logs but not taking action
- If you find out-of-range temperatures … do something! The viability of your vaccine – and the protection of your patients – is at stake.
- Guidance on what to do may be found on IAC’s temperature logs (www.immunize.org/handouts/temperature-logs.asp) and Vaccine Storage Troubleshooting Record (www.immunize.org/catg.d/p3041.pdf).

ERROR: Have an Emergency Response Plan and trained staff in place before a problem occurs. For help in developing a plan, see the Checklist of Resources for the Emergency Vaccine Retrieval and Storage Plan in CDC’s Vaccine Storage and Handling Toolkit (www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf).

ERROR: Discarding temperature logs too soon
Keep your temperature logs for at least 3 years. Why?
- You can track recurring problems as the storage unit ages.
- If out-of-range temperatures have been documented, you can determine how long and how often this has been occurring.
- This can be a great way to demonstrate why you need a new refrigerator or freezer!

ERROR: Not using vaccine with the soonest expiration date first
When unloading a new shipment of vaccine:
- Move vaccine with the shortest expiration date to the front of the unit, making it easier for staff to access this vaccine first.
- Mark the “older” vaccine to be used first.

ERROR: Dealing inappropriately with expired vaccines
- Carefully monitor your usage to ensure viable vaccines don’t expire! As discussed above, place vaccines with the shortest expiration dates at the front of the unit.
- If you discover expired vaccines, immediately remove them from the unit so that they are not inadvertently administered.

ERROR: Discarding multidose vials prematurely
- Almost all multidose vials of vaccines contain a preservative and can be used until the expiration date on the vial, unless there is actual contamination or the vials are not stored under appropriate conditions. However, multidose vials of reconstituted vaccine (e.g., meningococcal polysaccharide and yellow fever) must be used within a defined period after reconstitution. Refer to the package inserts for information.
- The Joint Commission has clarified that vaccines are an exception to its usual “28-day rule” for use of medications in multidose vials. Providers are directed to follow guidance from CDC and vaccine manufacturers.
Vaccine Label Examples

Staff can easily become confused about vaccines within the storage unit because there are so many brands and formulations available. Labeling the area where vaccines are stored can help staff quickly locate and choose the correct vaccine—perhaps preventing a vaccine administration error. Depending on how vaccines are organized within the storage unit, labels can be placed on containers or bins or directly attached to shelves where vaccines are placed. Other helpful strategies to prevent vaccine administration errors include color-coding labels (e.g., one color for pediatric and another for adult vaccines) and providing additional information such as age indications or other information unique to the vaccine.

In addition, some vaccines must be reconstituted before administration. These vaccines have two components—a lyophilized vaccine and a diluent that must be mixed together. The lyophilized vaccine should only be reconstituted or mixed using the diluent supplied by the manufacturer. Consider posting reminders or labeling vaccines to remind staff to reconstitute certain vaccines prior to administration.

The following labels are examples that may be used to help organize vaccines. Labels are based on recommendations from the Advisory Committee on Immunization Practices (ACIP) and may include indications different from those of the Food and Drug Administration. The Centers for Disease Control and Prevention (CDC) also recommends vaccines be stored in the original packaging to protect the contents from light, to help maintain the recommended temperature range, and to help prevent administration errors.

Note: Some vaccine preparations are being transitioned from vials and prefilled syringes that contain latex (natural rubber) to vials and prefilled syringes that are not made with natural rubber latex. Read the package insert that accompanies the product to check for the presence of natural rubber or latex.
<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Ages</th>
<th>Use for</th>
<th>Route</th>
<th>Tip Cap of Prefilled Syringe Contains Latex</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTap (Daptacel)</td>
<td>6 weeks through 6 years</td>
<td>Any dose in the series</td>
<td>Intramuscular (IM) injection</td>
<td></td>
</tr>
<tr>
<td>DTap-IPV (Kinrix)</td>
<td>4 years through 6 years</td>
<td>DTaP dose #5</td>
<td>IPV dose #4</td>
<td>Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intramuscular (IM) injection</td>
<td>Tip cap of prefilled syringe contains latex</td>
</tr>
<tr>
<td>DTap (Infanrix)</td>
<td>6 weeks through 6 years</td>
<td>Any dose in the series</td>
<td>Intramuscular (IM) injection</td>
<td></td>
</tr>
<tr>
<td>DTap-IPV-HepB (Pediarix)</td>
<td>6 weeks through 6 years</td>
<td>DTaP and IPV: Doses #1, #2, and/or #3</td>
<td>HepB: Any dose in the series</td>
<td>Do NOT use for HepB birth dose</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intramuscular (IM) injection</td>
<td>Tip cap of prefilled syringe contains latex</td>
</tr>
</tbody>
</table>
Diphtheria- and Tetanus-Toxoid- and acellular Pertussis-Containing Vaccines

**DTaP-IPV/Hib (Pentacel)**

**Ages:** 6 weeks through 4 years  
**Use for:** DTaP and IPV: Doses #1, #2, #3, and/or #4  
Hib: Any dose in the series  
**Route:** Intramuscular (IM) injection  
Reconstitute Hib powder ONLY with manufacturer-supplied DTaP-IPV liquid diluent  
Use immediately after reconstitution  
Do NOT administer DTaP-IPV w/o Hib

**DTaP-IPV (Quadracel)**

**Ages:** 4 years through 6 years  
**Use for:** DTaP dose #5  
IPV dose #4 or #5  
**Do NOT use for DTaP doses 1 through 4 OR IPV doses 1 through 3**  
**Route:** Intramuscular (IM) injection
### 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. Shake well prior to administration.

#### 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. Shake well prior to administration.
Hepatitis Vaccines

HepA (Havrix)-Pediatric Formulation
Ages: 12 months through 18 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

Tip cap of prefilled syringe contains latex

HepB (Engerix-B)-Pediatric Formulation
Ages: Birth through 19 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

Tip cap of prefilled syringe contains latex

HepA (Vaqta)-Pediatric Formulation
Ages: 12 months through 18 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

Vial stopper, syringe plunger stopper, and tip cap contain latex

HepB (Recombivax HB)-Pediatric Formulation
Ages: Birth through 19 years
Use for: Any dose in the series
Route: Intramuscular (IM) injection

Vial stopper, syringe plunger stopper, and tip cap contain latex
Hepatitis Vaccines

**HepA (Havrix)-Adult Formulation**
- **Ages:** 19 years and older
- **Use for:** Any dose in the series
- **Route:** Intramuscular (IM) injection

*Tip cap of prefilled syringe contains latex*

**HepA (Vaqta)-Adult Formulation**
- **Ages:** 19 years and older
- **Use for:** Any dose in the series
- **Route:** Intramuscular (IM) injection

*Vial stopper, syringe plunger stopper, and tip cap contain latex*

**HepB (Engerix-B)-Adult Formulation**
- **Ages:** 20 years and older
- **Use for:** Any dose in the series
- **Route:** Intramuscular (IM) injection

*Tip cap of prefilled syringe contains latex*

**HepB (Recombivax HB)-Adult Formulation**
- **Ages:** 20 years and older
- **Use for:** Any dose in the series
- **Alternate Adolescent Schedule for 11- through 15-year olds:** Two 1 mL doses 4 to 6 months apart
- **Route:** Intramuscular (IM) injection

*Vial stopper, syringe plunger stopper, and tip cap contain latex*
### Hepatitis Vaccines

<table>
<thead>
<tr>
<th><strong>HepB (Heplisav-B)</strong></th>
<th><strong>HepA-HepB (Twinrix)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ages:</strong> 18 years and older</td>
<td><strong>Ages:</strong> 18 years and older</td>
</tr>
<tr>
<td><strong>Use for:</strong> Any dose in the series (two 0.5 mL doses 1 month apart)</td>
<td><strong>Contains:</strong> HepA = Pediatric dosage HepB = Adult dosage</td>
</tr>
<tr>
<td><strong>Route:</strong> Intramuscular (IM) injection</td>
<td><strong>Schedule:</strong> 0, 1, and 6 months</td>
</tr>
<tr>
<td></td>
<td><strong>Alternate Schedule:</strong> 0, 7, and 21 to 30 days, followed by booster at 12 months</td>
</tr>
<tr>
<td></td>
<td><strong>Route:</strong> Intramuscular (IM) injection</td>
</tr>
<tr>
<td></td>
<td><strong>Tip cap of prefilled syringe contains latex</strong></td>
</tr>
</tbody>
</table>
Human Papillomavirus Vaccines

**9vHPV (Gardasil 9)**

**Ages:** 9 years through 45 years  
**Recommended ages:** 11 years or 12 years  
**Catch-up ages:** 13 years through 26 years  
**Shared clinical decision-making ages:** 27 through 45 years  
**Route:** Intramuscular (IM) injection
Measles, Mumps, Rubella Vaccine

**MMR (M-M-R II)**

**Ages:** 12 months and older  
**Use for:** Any dose in the series  
**Route:** Subcutaneous (subcut) injection

*Reconstitute MMR powder ONLY with manufacturer-supplied sterile water diluent*

**Beyond Use Time:** If not used immediately after reconstitution, store in vaccine vial in dark place at 2°C to 8°C (36°F to 46°F) and discard if not used within 8 hours.
Meningococcal Vaccines

**MenACWY-D (Menactra)**

**Ages:** 9 months and older

**Use for:** Any dose in the series (and certain high-risk groups)

**Route:** Intramuscular (IM) injection

**MenACWY-CRM (Menveo)**

**Ages:** 2 months and older

**Use for:** Any dose in the series (and certain high-risk groups)

**Route:** Intramuscular (IM) injection

*Reconstitute the MenA lyophilized conjugate component ONLY with manufacturer-supplied MenCWY liquid conjugate component

*Do NOT administer MenCWY w/o MenA

*Beyond Use Time: Should be used immediately after reconstitution, but may be stored between 2°C and 25°C (36°F and 77°F) for up to 8 hours.

*Do not freeze.
Meningococcal Vaccines

**MenB-4C (Bexsero)**

**Ages:** 10 years and older  
**Use for:** Any dose in the series  
**Route:** Intramuscular (IM) injection

_Bexsero and Trumenba are NOT interchangeable_  
_Complete series with same vaccine product_  
_Tip cap of prefilled syringe contains latex_

**MenB-FHbp (Trumenba)**

**Ages:** 10 years and older  
**Use for:** Any dose in the series  
**Route:** Intramuscular (IM) injection

_Bexsero and Trumenba are NOT interchangeable_  
_Complete series with same vaccine product_
<table>
<thead>
<tr>
<th>Pneumococcal Vaccines</th>
<th>Poliovirus Vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PCV13 (Prevnar 13)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Ages:</strong> All children 6 weeks through 5 years</td>
<td></td>
</tr>
<tr>
<td><strong>Certain high-risk groups</strong> 6 years and older who have never received PCV13</td>
<td></td>
</tr>
<tr>
<td><strong>All adults 65 years and older</strong> who have never received PCV13 may receive a dose per shared clinical decision-making</td>
<td></td>
</tr>
<tr>
<td><strong>Route:</strong> Intramuscular (IM) injection</td>
<td></td>
</tr>
<tr>
<td><strong>PPSV23 (Pneumovax 23)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Ages:</strong> Healthy adults 65 years and older</td>
<td></td>
</tr>
<tr>
<td><strong>Certain high-risk groups</strong> 2 years through 64 years</td>
<td></td>
</tr>
<tr>
<td><strong>Route:</strong> Intramuscular (IM) injection OR Subcutaneous (subcut) injection</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>IPV</strong></td>
</tr>
<tr>
<td><strong>Ages:</strong> 6 weeks and older</td>
<td></td>
</tr>
<tr>
<td><strong>Use for:</strong> Any dose in the series</td>
<td></td>
</tr>
<tr>
<td><strong>Route:</strong> Intramuscular (IM) injection OR Subcutaneous (subcut) injection</td>
<td></td>
</tr>
</tbody>
</table>

No more than two doses of PPSV23 recommended before 65th birthday and one dose at 65 years or older
Rotavirus Vaccines

**RV1 (Rotarix)**

**Ages:** 6 weeks through 8 months, 0 days  
Maximum age for 1st dose is 14 weeks, 6 days  
Maximum age for last dose is 8 months, 0 days  

**Route:** Oral (PO)  

Reconstitute RV1 powder ONLY with manufacturer-supplied sterile water/calcium chloride/xanthan diluent

**Beyond Use Time:** If not used immediately after reconstitution, store at 2°C to 8°C (36°F to 46°F) or at controlled room temperature up to 25°C (77°F) and discard if not used within 24 hours.  

Do NOT inject  
Tip cap of prefilled diluent oral applicator contains latex

**RV5 (RotaTeq)**

**Ages:** 6 weeks through 8 months, 0 days  
Maximum age for 1st dose is 14 weeks, 6 days  
Maximum age for last dose is 8 months, 0 days  

**Route:** Oral (PO)  

Do NOT inject
Tetanus- and Diphtheria-Toxoid-Containing Vaccines

**DT (generic)**
- **Ages:** 6 weeks through 6 years
- **Use for:** Primary series and booster doses **ONLY** for children with a contraindication or precaution to pertussis vaccine
- **Route:** Intramuscular (IM) injection

**Td (generic)**
- **Ages:** 7 years and older
- **Use for:** Primary series and booster doses for persons previously vaccinated with Tdap
- **Route:** Intramuscular (IM) injection

**Td (Tenivac)**
- **Ages:** 7 years and older
- **Use for:** Primary series and booster doses for persons previously vaccinated with Tdap
- **Route:** Intramuscular (IM) injection

*Tip cap of prefilled syringe may contain latex*
Tetanus- and Diphtheria-Toxoid- and acellular Pertussis-Containing Vaccines

**Tdap (Adacel)**

**Ages:** 7 years and older  
**Use for:** Routine adolescent dose at 11 to 12 years of age  
Each pregnancy  
Patients not fully vaccinated for pertussis  
**Route:** Intramuscular (IM) injection  
*Tip cap of prefilled syringe may contain latex*

**Tdap (Boostrix)**

**Ages:** 7 years and older  
**Use for:** Routine adolescent dose at 11 to 12 years of age  
Each pregnancy  
Patients not fully vaccinated for pertussis  
**Route:** Intramuscular (IM) injection  
*Tip cap of prefilled syringe contains latex*
Frozen Varicella-Containing Vaccines

**VAR (Varivax)**
- **Ages:** 12 months and older
- **Use for:** Any dose in the series
- **Route:** Subcutaneous (subcut) injection

*Reconstitute VAR powder ONLY with manufacturer-supplied sterile water diluent*

Beyond Use Time: Discard reconstituted vaccine if not used within 30 minutes.

**MMRV (ProQuad)**
- **Ages:** 12 months through 12 years
- **Use for:** Any dose in the series
- **Route:** Subcutaneous (subcut) injection

*Reconstitute MMRV powder ONLY with manufacturer-supplied sterile water diluent*

Beyond Use Time: Discard reconstituted vaccine if not used within 30 minutes.

**ZVL (Zostavax)**
- **Recommended ages:** 60 years and older
- **Use for:** Single dose
- **Route:** Subcutaneous (subcut) injection

*Reconstitute frozen ZVL powder ONLY with manufacturer-supplied sterile water diluent*

Beyond Use Time: Discard reconstituted vaccine if not used within 30 minutes.
RZV (Shingrix)

Ages: 50 years and older

Use for: Immunocompetent adults age 50 years and older
Immunocompetent adults who previously received Zostavax (ZVL)

Route: Intramuscular (IM) injection

Refrigerate both components; do NOT freeze
Reconstitute lyophilized varicella zoster component with manufacturer-supplied adjuvant suspension

Beyond Use Time: Discard reconstituted vaccine if not used within 6 hours.
Reconstituted Vaccines

**DTaP-IPV/HIB (Pentacel)**
- Lyophilized Hib component
- Manufacturer’s DTaP-IPV liquid component
- Pentacel vaccine

**Hib (ActHIB)**
- Lyophilized Hib component
- Manufacturer’s 0.4% sodium chloride diluent

**MMR (M-M-R II)**
- Lyophilized MMR component
- Manufacturer’s sterile water diluent
- M-M-R II vaccine

**Hib (Hiberix)**
- Lyophilized Hib component
- Manufacturer’s 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.

**Should be used immediately after reconstitution**

**Beyond Use Time:** If not used immediately after reconstitution, store in vaccine vial in dark place at 2°C to 8°C (36°F to 46°F) and discard if not used within 8 hours.
Reconstituted Vaccines

**MenACWY-CRM (Menveo)**

- Lyophilized MenA component
- MenCWY liquid component

-Menveo vaccine

**Beyond Use Time:** Should be used immediately after reconstitution, but may be stored at or below 25°C (77°F) and discarded if not used within 8 hours.

**RV1 (Rotarix)**

- Lyophilized RV1 component
- Manufacturer’s sterile water-calcium carbonate-xanthan diluent

-Rotarix vaccine

**Beyond Use Time:** If not used immediately after reconstitution, store at 2°C to 8°C (36°F to 46°F) or at controlled room temperature up to 25°C (77°F) and discard if not used within 24 hours.

Tip cap of prefilled diluent oral applicator contains latex.
Reconstituted Vaccines

**VAR (Varivax)**
- Lyophilized VAR component
- Manufacturer’s sterile water diluent
- Varivax vaccine

Beyond Use Time: Discard reconstituted vaccine if not used within 30 minutes.

**ZVL (Zostavax)**
- Lyophilized ZVL component
- Manufacturer’s sterile water diluent
- Zostavax vaccine

Beyond Use Time: Discard reconstituted vaccine if not used within 30 minutes.

**MMRV (ProQuad)**
- Lyophilized MMRV component
- Manufacturer’s sterile water diluent
- ProQuad vaccine

Beyond Use Time: Discard reconstituted vaccine if not used within 30 minutes.

**RZV (Shingrix)**
- Lyophilized varicella zoster component
- Manufacturer’s adjuvant suspension
- Shingrix vaccine

Refrigerate both components; do NOT freeze
Beyond Use Time: Discard reconstituted vaccine if not used within 6 hours.