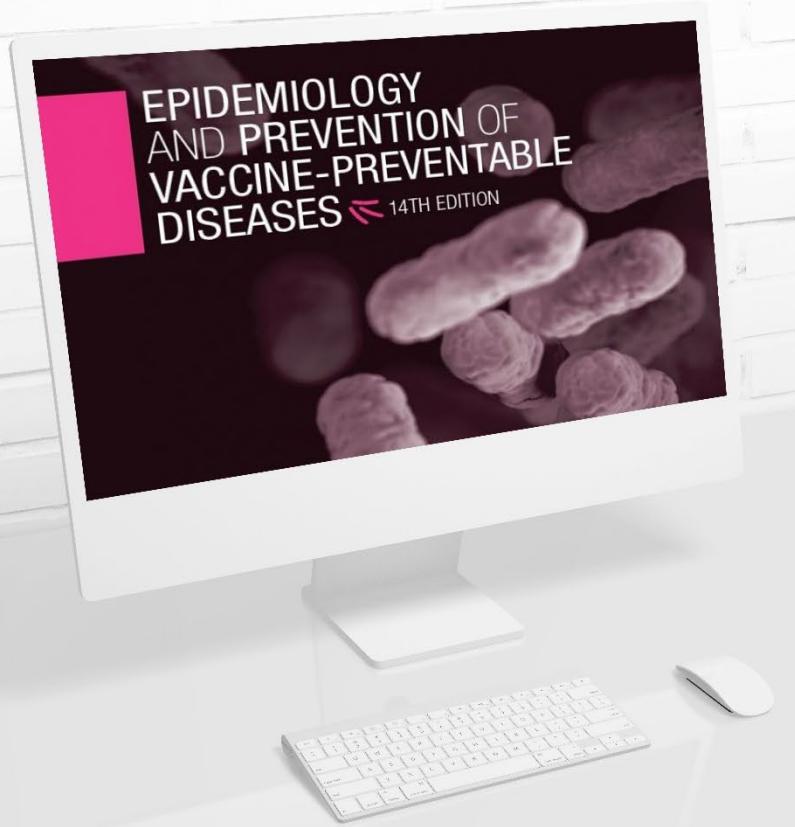
Herpes Zoster Disease and Zoster Vaccine

Pink Book Web-on-Demand Series



Janelle King, MPH, BSN, RN
Nurse Educator
Immunization Services Division

Learning Objectives

- Describe the fundamental principles of the immune response.
- Describe immunization best practices.
- Describe an emerging immunization issue.
- For each vaccine-preventable disease, identify those for whom routine immunization is recommended.
- For each vaccine-preventable disease, describe characteristics of the vaccine used to prevent the disease.
- Locate current immunization resources to increase knowledge of team's role in program implementation for improved team performance.

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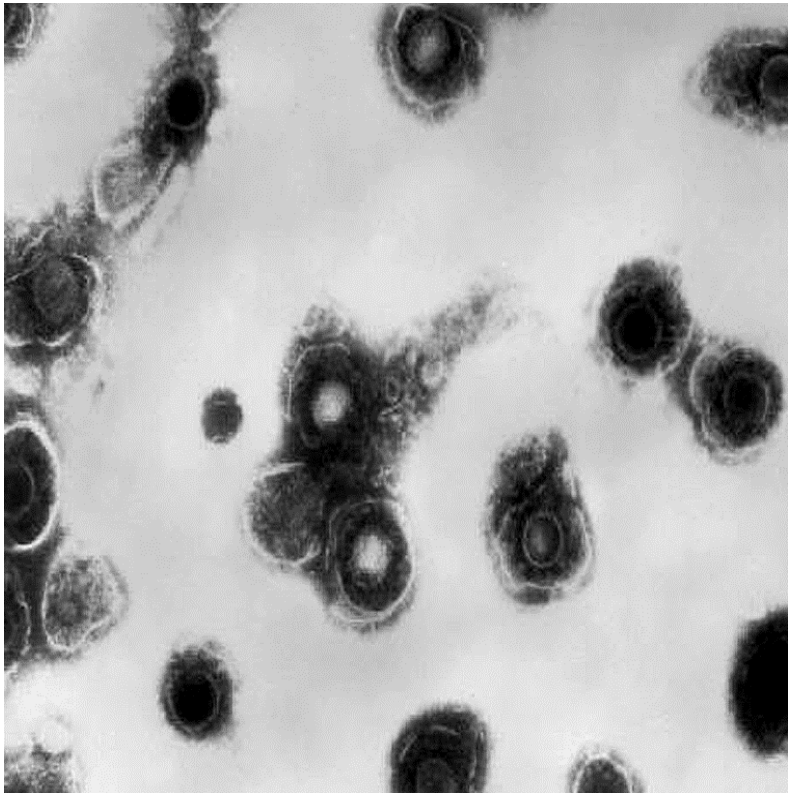
1

Herpes Zoster Disease

Herpes Zoster (HZ, zoster, shingles)

- **Caused by reactivation of varicella-zoster virus (VZV)**
- **VZV primary infection = varicella (chickenpox)**
- **Latent infection reactivates = herpes zoster (shingles)**
  - Eruption along adjacent dermatomes



Chapter 23: Zoster | Pink Book | CDC, Details - Public Health Image Library(PHIL)

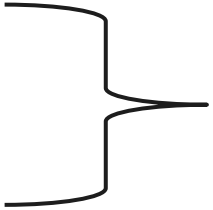
Risk Factors for Development of Herpes Zoster

- Aging (adults older than 50 years of age)

- Immunosuppression

- Intrauterine exposure to VZV

- Varicella at younger than 18 months of age



Pediatric zoster

Chapter 23: Zoster | Pink Book | CDC, Clinical Overview of Shingles (Herpes Zoster) | Shingles (Herpes Zoster) | CDC

Clinical Features of Herpes Zoster

- **Vesicular eruption (rash)**
  - 1–2 adjacent sensory nerve distributions (dermatomes)
  - Most often on trunk or face
  - Usually does not cross the body's midline
  - Heals in 2–4 weeks
- **Painful paresthesia (tingling, burning) can occur 2–4 days before rash onset.**
- **In healthy persons, few systemic symptoms**

Chapter 23: Zoster | Pink Book | CDC, Clinical Features of Shingles (Herpes Zoster) | Shingles (Herpes Zoster) | CDC, Details - Public Health Image Library(PHIL)

Complications of Herpes Zoster (1)

- **Postherpetic neuralgia (PHN)**
  - Most common complication
  - Persistent pain where rash was located that lasts more than 90 days after rash onset
  - Can last for months or years
  - Risk and severity increases with age
  - Can be debilitating and interfere with daily life

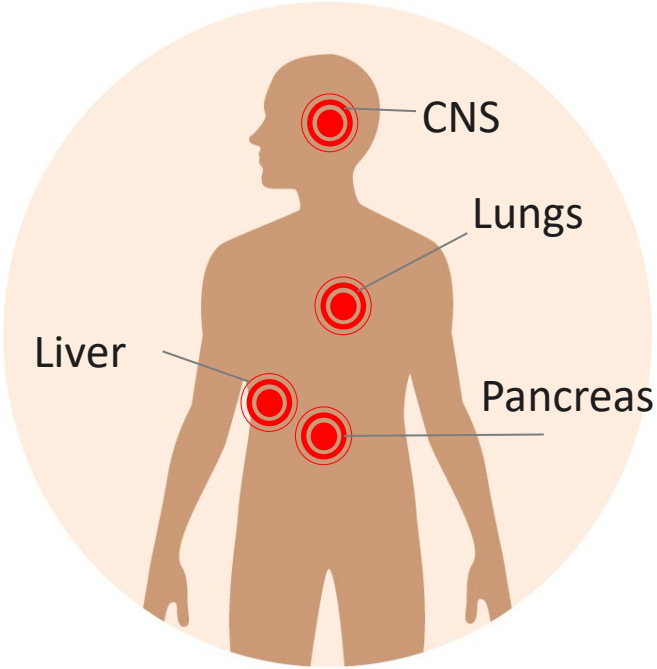
Chapter 23: Zoster | Pink Book | CDC, Clinical Features of Shingles (Herpes Zoster) | Shingles (Herpes Zoster) | CDC

Complications of Herpes Zoster (2)

- **Herpes zoster ophthalmicus (HZO)**
  - Involves ophthalmic division of the trigeminal cranial nerve (V1)
  - Can lead to reduced vision or blindness

Chapter 23: Zoster | Pink Book | CDC, Clinical Features of Shingles (Herpes Zoster) | Shingles (Herpes Zoster) | CDC

Complications of Herpes Zoster (3)



- **Disseminated zoster**
  - Can include generalized skin eruptions that are difficult to distinguish from varicella (chickenpox)
  - Visceral involvement of the central nervous system, lungs, liver, and pancreas can occur
  - Most often occurs in people with immunocompromising conditions

Chapter 23: Zoster | Pink Book | CDC, Clinical Features of Shingles (Herpes Zoster) | Shingles (Herpes Zoster) | CDC

Complications of Herpes Zoster (4)

- **1% to 4% of people with herpes zoster will be hospitalized for complications.**
  - About 30% have an immunocompromising condition.
- **Fewer than 100 people die of herpes zoster complications every year.**
  - Almost all deaths are in older adults or people with immunocompromising conditions.

Shingles Facts and Stats | Shingles (Herpes Zoster) | CDC

VZV Transmission in People with Herpes Zoster

- **People with active herpes zoster lesions can spread VZV.**
  - Transmission of VZV can cause varicella in people who never had chickenpox and those who didn't receive the varicella vaccine
- **Active herpes zoster lesions are infectious through:**
  - Direct contact with vesicular fluid
  - Inhaling virus particles from the blisters until they dry and scab over
- **People with active herpes zoster lesions should:**
  - Cover their lesions.
  - Avoid contact with susceptible people in their household and occupational settings until lesions are dry and scabbed.

Chapter 23: Zoster | Pink Book | CDC, Clinical Overview of Shingles (Herpes Zoster) | Shingles (Herpes Zoster) | CDC
Varicella-Zoster Virus | Infection Control | CDC

Herpes Zoster Burden in the United States

- **Herpes zoster will affect**:
  - 1 in 3 people in their lifetime
  - 50% of people who live to age 85 years
- **Estimated 1 million episodes occur annually**

Chapter 23: Zoster | Pink Book | CDC, Clinical Overview of Shingles (Herpes Zoster) | Shingles (Herpes Zoster) | CDC, Shingles Facts and Stats | Shingles (Herpes Zoster) | CDC

2

Zoster Vaccine

Vaccine for Prevention of Herpes Zoster

Vaccine Product	Indications
Recombinant Zoster Vaccine (RZV, Shingrix)	• Adults ages 50 years and older • Immunocompromised adults ages 19 years and older

- **Indicated for prevention of herpes zoster**
- **Not indicated for prevention of varicella (chickenpox)**

Recommendations of the Advisory Committee on Immunization Practices for Use of Herpes Zoster Vaccines | MMWR
Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022 | MMWR

Recombinant Zoster Vaccine (RZV, Shingrix)

- ✗ No antibiotics
- ✗ No preservatives
- ✓ Recombinant subunit vaccine
- ✓ $AS01_B$ adjuvant

Adjuvants and Vaccines | Vaccine Safety | CDC

Package Insert - SHINGRIX (fda.gov)

RZV Efficacy

Outcomes	Efficacy by Age Group	
	50 to 69 years	70 years and older
Preventing herpes zoster	97%	91%
Preventing postherpetic neuralgia (PHN)	91%	89%

- **In immunocompetent adults 50 years and older, RZV efficacy remained high up to 10 years following vaccination.**

Shingles Vaccination | Shingles (Herpes Zoster) | CDC
Long-term Protection Against Herpes Zoster by the Adjuvanted Recombinant Zoster Vaccine: Interim Efficacy, Immunogenicity, and Safety Results up to 10 Years After Initial Vaccination - PubMed (nih.gov)

Reconstituting RZV

Figure 1. Cleanse both vial stoppers. Using a sterile needle and sterile syringe, withdraw the entire contents of the vial containing the adjuvant suspension component (liquid) by slightly tilting the vial. Vial 1 of 2.

Figure 2. Slowly transfer entire contents of syringe into the lyophilized gE antigen component vial (powder).
Vial 2 of 2.

Figure 3. Gently swirl the vial until powder is completely dissolved. **Do not shake vigorously.**

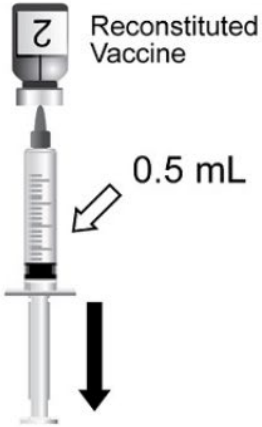


Figure 4. After reconstitution, withdraw 0.5 mL from the vial containing the reconstituted vaccine and administer **intramuscularly.**

Package Insert - SHINGRIX (fda.gov)

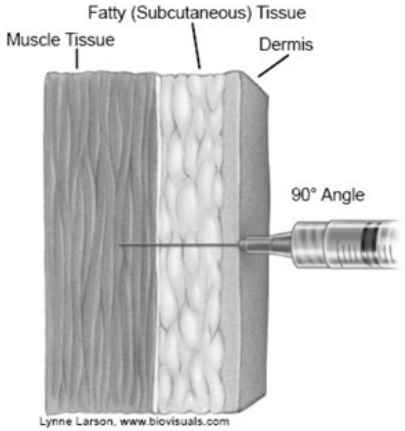
RZV Preparation

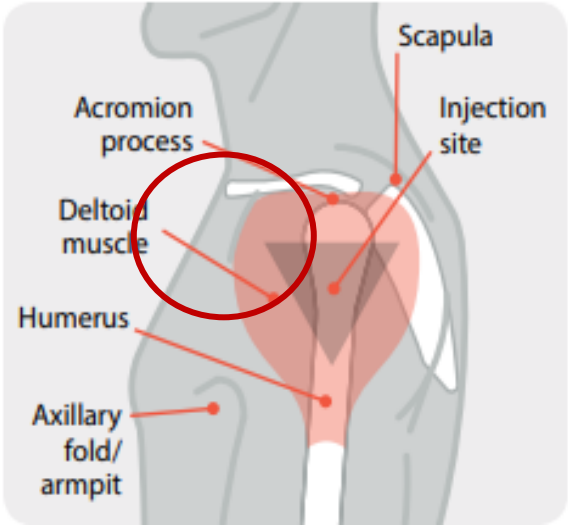
- Administer RZV immediately after reconstitution or store refrigerated between 2° and 8°C (36° and 46°F).
- Use within 6 hours of reconstitution.
- Discard reconstituted vaccine if not used within 6 hours.

Package Insert - SHINGRIX (fda.gov)

RZV Administration

- **Two-dose series administered intramuscularly**
  - Single dose = 0.5 mL after reconstitution





Package Insert - SHINGRIX (fda.gov)

3

Vaccination Schedule and Clinical Considerations

RZV Schedule: Adults 50 Years of Age and Older

Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2025

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
Zoster recombinant (RZV)	2 doses for immunocompromising conditions (See Notes)		2 doses	

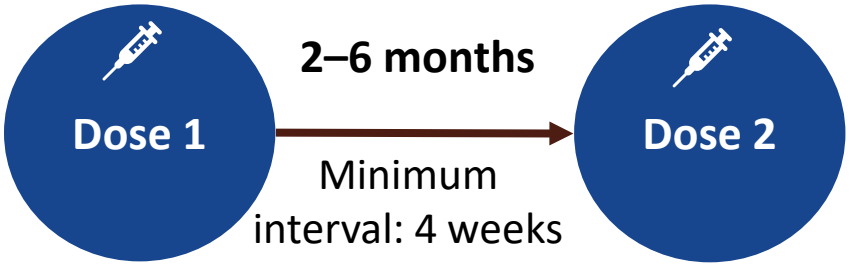
Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of immunity

- **Regardless of:**
  - Previous Herpes Zoster history
  - History of Zoster Vaccine Live (ZVL, Zostavax)*

*Zostavax is no longer available for use in the United States, as of November 18, 2020.

Recommended Adult Immunization Schedule for ages 19 years or older; 2025 U.S.

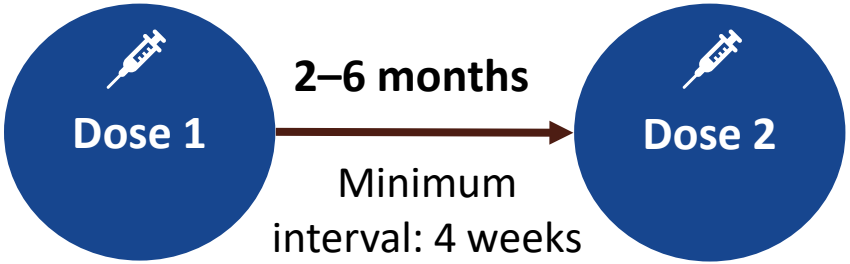
RZV Dosing Schedule in Adults 50 Years of Age and Older (1)



- **If Dose 2 given less than 4 weeks after Dose 1:**
  - Dose 2 is invalid.
  - Repeat Dose 2 at least 4 weeks after the invalid dose.

Adult Immunization Schedule by Age | Vaccines & Immunizations | CDC

RZV Dosing Schedule in Adults 50 Years of Age and Older (2)



- **If more than 6 months have elapsed since Dose 1 of RZV:**
  - Administer Dose 2 as soon as possible.
  - Do not restart the series.
  - There is no maximum interval between Dose 1 and Dose 2.

Adult Immunization Schedule by Age | Vaccines & Immunizations | CDC

RZV Schedule: Adults Ages 19 Through 49 Years with Immunocompromising Conditions

Table 1 Recommended Adult Immunization Schedule by Age Group, United States, 2025

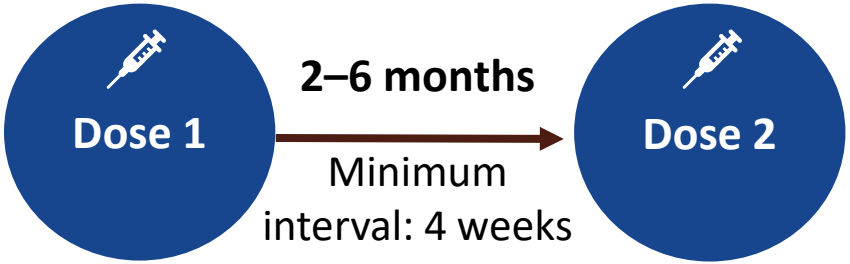
Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
Zoster recombinant (RZV)	2 doses for immunocompromising conditions (See Notes)		2 doses	

Recommended vaccination for adults with an additional risk factor or another indication

Including persons with HIV regardless of CD4 count

Recommended Adult Immunization Schedule for ages 19 years or older; 2025 U.S.
Clinical Considerations for Shingrix Use in Immunocompromised Adults Aged ≥19 Years | Shingles (Herpes Zoster) | CDC

RZV Dosing Schedule: Adults Ages 19 Years and Older with Immunocompromising Conditions



- **For patients who would benefit from completing the series in a shorter period, the second dose can be administered 1–2 months after the first.**

Adult Immunization Schedule by Age | Vaccines & Immunizations | CDC

Clinical Considerations for Shingrix Use in Immunocompromised Adults Aged ≥19 Years | Shingles (Herpes Zoster) | CDC

Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022 | MMWR (cdc.gov)

RZV Timing in Adults Ages 19 Years and Older with Immunocompromising Conditions

- **If vaccination before immunosuppression is not possible, consider timing when the immune response is likely to be most robust.**
- **Factors to consider in assessing the general level of immune competence in a patient include:**
  - Disease severity and duration
  - Clinical stability
  - Complications and comorbidities
  - Any potentially immunosuppressing treatment

Clinical Considerations for Shingrix Use in Immunocompromised Adults Aged ≥19 Years | Shingles (Herpes Zoster) | CDC

Knowledge Check

A 30-year-old patient with no immune suppression has had two previous episodes of shingles. Is RZV recommended for this patient?

A. Yes

B. No

Knowledge Check

A 30-year-old patient with no immune suppression has had two previous episodes of shingles. Is RZV recommended for this patient?

A. Yes

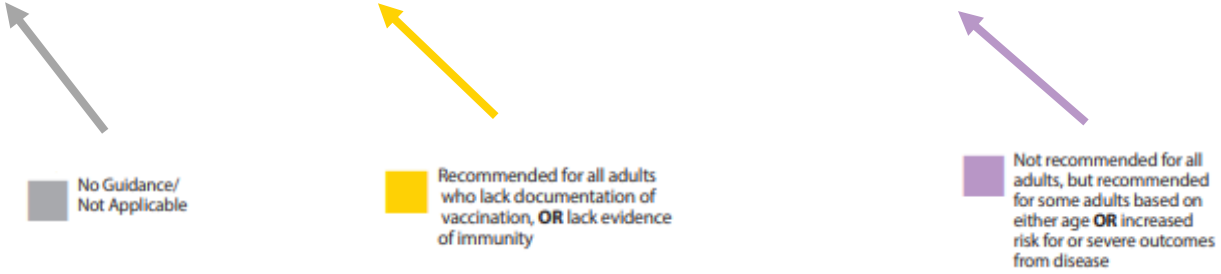
B. No 

RZV Schedule by Medical Condition or Other Indication

Table 2 Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2025

Always use this table in conjunction with Table 1 and the Notes that follow. Medical conditions or indications are often not mutually exclusive. If multiple medical conditions or indications are present, refer to guidance in all relevant columns. See Notes for medical conditions or indications not listed.

VACCINE	Pregnancy	Immunocompromised (excluding HIV infection)	HIV infection CD4 percentage and count		Men who have sex with men	Asplenia, complement deficiency	Heart or lung disease	Kidney failure, End–stage renal disease or on dialysis	Chronic liver disease; alcoholism[a]	Diabetes	Health care Personnel[b]
			<15% or <200mm³	≥15% and ≥200mm³							
RZV		See Notes									



Recommended Adult Immunization Schedule for ages 19 years or older; 2025 U.S.

History of Prior Varicella in Immunocompetent Adults Ages 50 Years and Older

- **Prior to RZV vaccination, *do not* need to:**
  - Obtain medical history of varicella (chickenpox)
  - Conduct laboratory testing for serologic evidence of prior varicella
- **ACIP considers people born in the United States prior to 1980 immune to varicella.**
- ***However,* if serologic evidence of varicella susceptibility becomes available, providers should follow ACIP guidelines for varicella vaccination first.**

Shingles Vaccine Recommendations | Shingles (Herpes Zoster) | CDC

Acceptable Evidence of Varicella Immunity

- Written documentation of age-appropriate vaccination

- Laboratory evidence of immunity
- Laboratory confirmation of disease

- Birth in the US before 1980 **except:**
  - Health care personnel
  - People who are immunocompromised
  - Pregnant women

- Diagnosis or verification of history of varicella or herpes zoster by a health care provider

Chapter 23: Zoster | Pink Book | CDC

Evidence of Varicella Immunity in Immunocompromised Adults Aged 19 Years and Older

- **Includes:**
  - Documentation of two doses of varicella vaccine, or
  - Laboratory evidence of immunity or laboratory confirmation of disease, or
  - Diagnosis or verification of a history of varicella or herpes zoster by a health care provider
- **Important to note:**
  - Commercial assays can be used to assess VZV seroconversion after wild type infection, but sensitivity and specificity can vary.
  - Commercial assays are not sensitive and specific enough to reliably detect varicella vaccine seroconversion.
  - Varicella vaccines contain live virus and are contraindicated for most immunocompromised patients.

Clinical Considerations for Shingrix Use in Immunocompromised Adults Aged ≥19 Years | Shingles (Herpes Zoster) | CDC

Immunocompromised Adults Ages 19 Years and Older with no Evidence of Varicella Immunity

- **Refer to the ACIP varicella vaccine recommendations for further guidance, including post-exposure prophylaxis guidance for immunocompromised adults.**
- **Consider a variety of factors, including a patient's age e.g., birth prior to 1980, recall (e.g., of prior varicella, varicella vaccination, or herpes zoster), documentation, and serology to determine whether to vaccinate with RZV.**
- **There are limited data on the use of RZV in persons without a history of varicella, with or without a history of varicella vaccination.**

Clinical Considerations for Shingrix Use in Immunocompromised Adults Aged ≥19 Years | Shingles (Herpes Zoster) | CDC

RZV Vaccination in Pregnancy

- **There is currently no ACIP recommendation for RZV use in pregnancy.**
- **Providers should consider delaying RZV until after pregnancy.**
- **There is no recommendation for pregnancy testing prior to vaccination.**

Adult Immunization Schedule Notes | Vaccines & Immunizations | CDC
Clinical Considerations for Shingrix Use in Immunocompromised Adults Aged ≥19 Years | Shingles (Herpes Zoster) | CDC

RZV Vaccination: Breastfeeding

- **Recombinant vaccines such as RZV pose no known risk for mothers who are breastfeeding or their infants.**
- **Clinicians may consider vaccination without regard to breastfeeding status if RZV is otherwise indicated.**

Clinical Considerations for Shingrix Use in Immunocompromised Adults Aged ≥19 Years | Shingles (Herpes Zoster) | CDC

RZV in People with a History of Herpes Zoster

- **No specific time to wait before administering RZV to patients who have had herpes zoster.**
  - However, **should not** administer to patients experiencing an acute episode of herpes zoster.

Herpes zoster can recur!

People with a history of herpes zoster who are eligible for vaccination should receive RZV (Shingrix).

Shingles Vaccine Recommendations | Shingles (Herpes Zoster) | CDC

RZV in People Who Previously Received ZVL (Zostavax)

- **As of November 18, 2020, ZVL (Zostavax) is no longer available for use in the United States.**
  - Effectiveness of ZVL wanes substantially over time.
- **Consider the person's age and when they received ZVL to determine when to vaccinate with RZV.**
  - May consider an interval shorter than 5 years between ZVL and RZV depending on the age at which the patient received ZVL.

Shingles Vaccine Recommendations | Shingles (Herpes Zoster) | CDC

Knowledge Check

Your 60-year-old patient reports a previous history of 1 dose of Zostavax. How many doses of Shingrix will this patient need?

A. No doses needed
B. 1 dose needed
C. 2 doses needed

Knowledge Check

Your 60-year-old patient reports a previous history of 1 dose of Zostavax. How many doses of Shingrix will this patient need?

A. No doses needed

B. 1 dose needed

C. 2 doses needed

RZV Coadministration

- **Like other recombinant and adjuvanted vaccines, Shingrix can be coadministered at different anatomic sites with other adult vaccines, including COVID-19 vaccines.**

Shingles Vaccine Recommendations | Shingles (Herpes Zoster) | CDC


ERROR

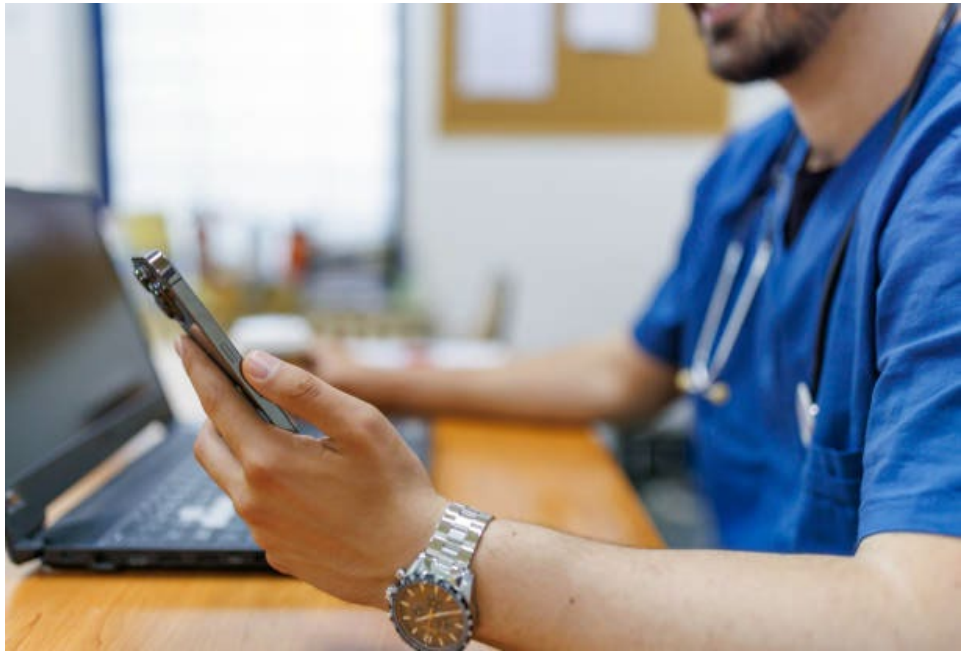
Vaccine Administration Errors (1)

- **If only the RZV diluent (adjuvant) is administered:**
  - Repeat the dose 4 weeks after the diluent-only dose given in error.

Chapter 23: Zoster | Pink Book | CDC
Package Insert - SHINGRIX (fda.gov)

Vaccine Administration Errors (2)

- **If RZV is inadvertently given subcutaneously:**
  - Dose is considered valid
  - Does not need to be repeated



Chapter 23: Zoster | Pink Book | CDC
Package Insert - SHINGRIX (fda.gov)

4

Safety

Contraindications to RZV

- **Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.**

Adult Immunization Schedule Appendix | Vaccines & Immunizations | CDC
Package Insert - SHINGRIX (fda.gov)

Precautions to RZV

- **Moderate or severe acute illness with or without fever**
- **Current episode of herpes zoster**

Adult Immunization Schedule Appendix | Vaccines & Immunizations | CDC
Package Insert - SHINGRIX (fda.gov)

Adverse Reactions After RZV

- **Local reactions are very common.**
  - Pain, redness, swelling
- **Systemic reactions**
  - Fatigue, headache, shivering, fever, nausea
  - Symptoms resolve in 2–3 days.
- **Guillain-Barré syndrome (GBS) has been reported very rarely.**

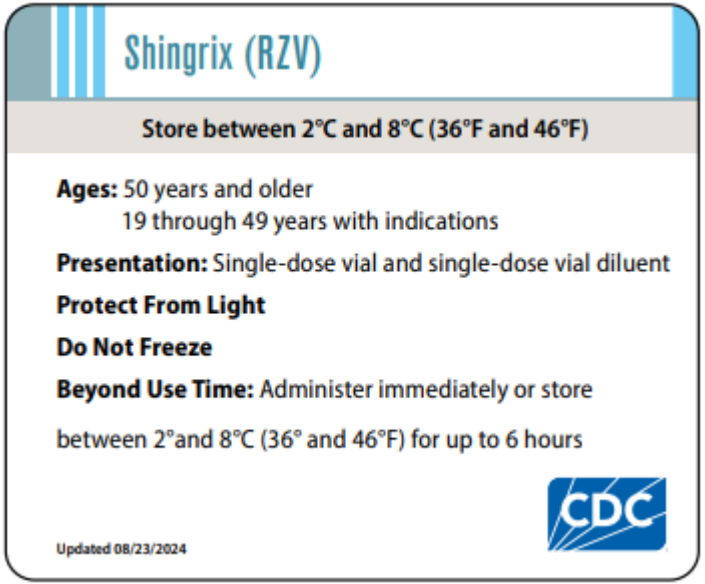
Package Insert - SHINGRIX (fda.gov), Shingles (Herpes Zoster) Vaccine Safety | Vaccine Safety | CDC

5

Storage & Handling

RZV Storage and Handling

- **Store vaccine and diluent refrigerated between 2°C and 8°C (36°F and 46°F).**
- **Protect vials from light.**
- **Do not freeze.**
- **Vaccine should be administered immediately after reconstitution or stored in the refrigerator and used within 6 hours.**



Vaccine Label Examples (cdc.gov)
Package Insert - SHINGRIX

6 Resources

CDC Clinical Resources

- **www.cdc.gov/vaccines/**
  - Advisory Committee on Immunization Practices (ACIP) Vaccine Recommendations and Guidelines
  - Recommended Immunization Schedules
  - Vaccine Storage and Handling Toolkit
  - Vaccine Information Statements

Pink Book Training Materials

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- If you have any questions, contact **CDC TRAIN** at train@cdc.gov or CE Coordinator, Melissa Barnett, at MBarnett2@cdc.gov

https://www.train.org/cdctrain/welcome

Email Us Your Immunization Questions

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Thank You From Atlanta!

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