EpiVac Pink Book Web-on-Demand Series

Varicella and Zoster-2020

Immunization Services Division
National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention
Atlanta, GA

Learning Objectives

- 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.
- Describe an emerging immunization issue.
- Locate current immunization resources to increase knowledge of team's role in program implementation for improved team performance.
- Implement disease detection and prevention health care services (e.g., smoking cessation, weight reduction, diabetes screening, blood pressure screening, immunization services) to prevent health problems and maintain health.

Today's Agenda

EpiVac Pink Book Web-on-Demand Series: Varicella and Zoster-2020

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Continuing Education Information

- CE credit, go to: www.cdc.gov/GetCE
- Search course number: WD4344-090920
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- CE instructions are available on the EpiVac Pink Book Web-on-Demand Series web page
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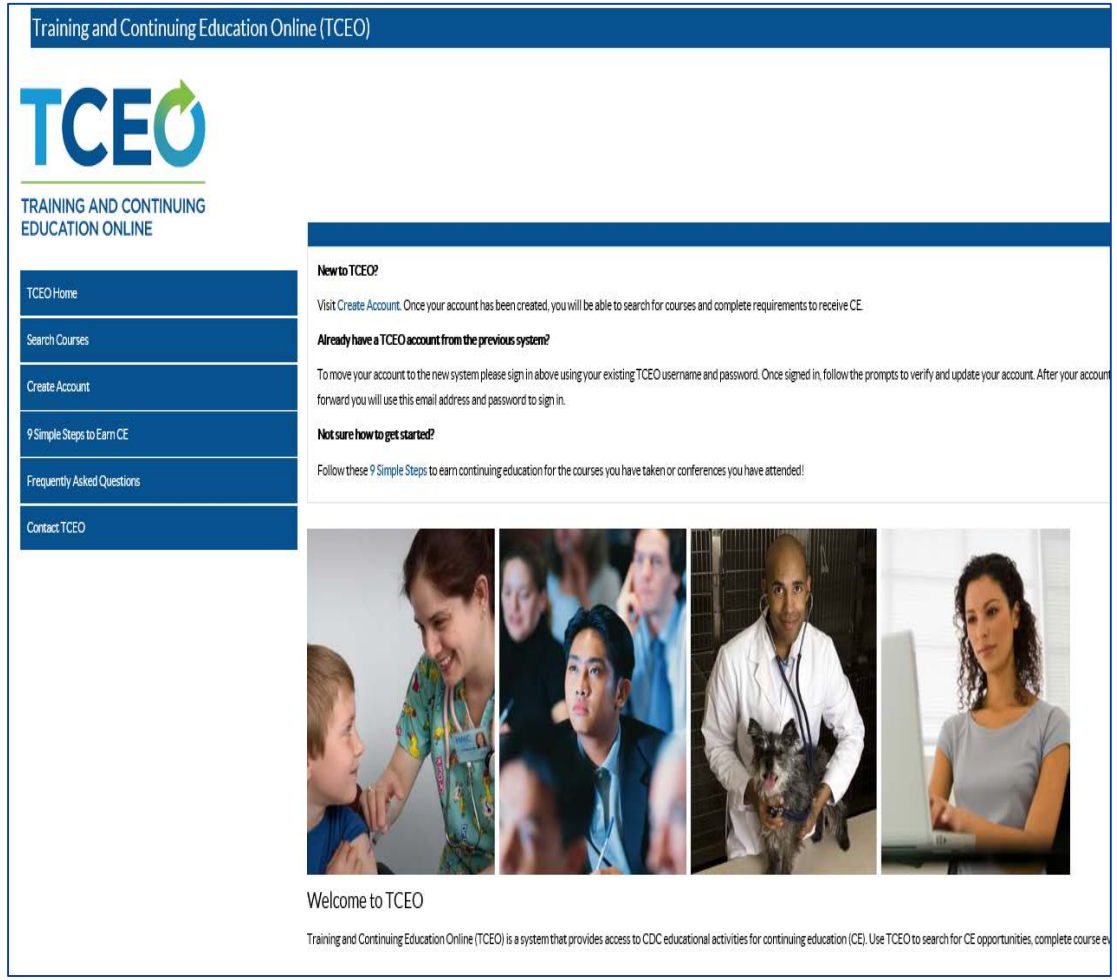

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Varicella (Chickenpox) and Zoster (Shingles) Disease Varicella and Zoster Vaccines

EpiVac Pink Book Web-on-Demand Series

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Disease

Varicella Zoster Virus

- Herpes virus (DNA)
- Primary infection results in varicella (chickenpox)
- Recurrent infection results in herpes zoster (shingles)
- Short survival in environment

MMWR 2007;56(RR-04)

Varicella Pathogenesis

- Respiratory transmission of virus
- Replication in nasopharynx and regional lymph nodes
- Primary viremia 4 to 6 days after infection
- Multiple tissues, including sensory ganglia, infected during viremia

MMWR 2007;56(RR-04)

Varicella (Chickenpox) Clinical Features

- Incubation period 14 to 16 days
- Mild prodrome for 1 to 2 days (adults)
- Rash generally appears first on the head; most concentrated on the trunk
- Successive crops over several days with lesions present in several stages of development

MMWR 2007;56(RR-04)

Varicella Complications

- **Bacterial infection of lesions**
- **Hemorrhagic varicella**
- **CNS manifestations**
- **Pneumonia (primary viral or secondary bacterial)**
- **Congenital varicella**
- **Perinatal varicella**
- **Prevaccine era:**
  - Hospitalization ~3 per 1,000 cases or 1,000/year
  - Death ~ 1 per 60,000 cases or 100/year

MMWR 2007;56(RR-04)

Varicella with a secondary bacterial infection

Increased Risk of Complications of Varicella

- Persons older than 15 years
- Infants younger than 1 year
- Immunocompromised persons
- Newborns of women with rash onset within 5 days before to 48 hours after delivery

MMWR 2007;56(RR-04)

Varicella Epidemiology

Reservoir	Human
Transmission	Person to person – respiratory tract secretions Direct contact with lesions
Temporal Pattern	Peak in late winter and spring (U.S.)
Communicability	1 to 2 days before until lesions have formed crusts May be longer in immunocompromised

MMWR 2007;56(RR-04)

Herpes Zoster (Shingles)

- **Reactivation of varicella zoster virus**
- **Associated with:**
  - Aging
  - Immunosuppression
  - Intrauterine exposure
  - Varicella disease younger than 18 months of age

MMWR 2008;57(RR-5)

Complications of Herpes Zoster

- Dissemination with generalized skin eruptions and involvement of the central nervous system, lungs, liver, and pancreas
- Postherpetic neuralgia (PHN)
- Ophthalmic zoster

MMWR 2008;57(RR-5)

Zoster involving the ophthalmic division of the trigeminal nerve

Herpes Zoster

- Approximately 1 million episodes occur annually in the United States
- Lifetime risk of zoster estimated to be 32%
- 50% of persons living until age 85 will develop zoster

CDC Shingles (Herpes Zoster) Overview https://www.cdc.gov/shingles/about/overview.html

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Vaccine

Vaccines for the Prevention of Varicella (Chickenpox)

Product	ACIP Recommended Age Indications	ACIP Abbreviation
Varivax®	12 months and older	VAR
ProQuad®	12 months through 12 years	MMRV

Varicella-Containing Vaccines: Varivax® (Var) and ProQuad® (MMRV)

- **Storage:**
  - Lyophilized vaccine: In the freezer between -50°C and -15°C (-58°F and +5°F)
  - Diluent: At room temperature (68°F to 77°F, 20°C to 25°C) or in the refrigerator (36°F to 46°F, 2°C to 8°C)
- **Preparation: Reconstitute the vaccine with the diluent supplied by the manufacturer just before administering**
- **Administration: Subcut injection**
  - Site: Fatty tissue of the anterolateral thigh or upper outer triceps of the arm
  - Needle length and gauge: 5/8-inch, 23- to 25-gauge needle

ProQuad package insert www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm123793.pdf, accessed 8/12/2018
Varivax package insert www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM142812.pdf, accessed 8/12/2018

Child/Adolescent Schedule

- Routine administration

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2–3 yrs	4–6 yrs	7–10 yrs	11–12 yrs	13–15 yrs	16 yrs	17–18 yrs
Varicella (VAR)							◄— 1st dose —►					2nd dose					

- Medical indications

VACCINE	INDICATION										
	Pregnancy	Immunocom-promised status (excluding HIV infection)	HIV Infection CD4+ count[1]		Kidney failure, end-stage renal disease, or on hemodialysis	Heart disease or chronic lung disease	CSF leaks or cochlear implants	Asplenia or persistent complement component deficiencies	Chronic liver disease	Diabetes
			<15% and total CD4 cell count of <200/mm3	≥15% and total CD4 cell count of ≥200/mm3						
Varicella										

Var Recommendations for Children and Adolescents (Birth through 18 Years)

- **First dose at 12–15 months of age**
  - Minimum age is 12 months
  - Doses given before 12 months of age are not counted as valid

- **Second dose at 4–6 years of age**
  - May be administered before age 4 years (observe 3-month minimum interval)
  - People who received 2 doses of VAR vaccine as children according to the U.S. vaccination schedule are considered protected for life

Varicella Vaccination and Children

- **Routine recommendations:**
  - Dose 1 at 12–15 months of age
  - Dose 2 at 4–6 years of age
- **Minimum interval between doses is 3 months for children younger than 13 years of age**

Adult Schedule

- Routine administration

Vaccine	19–26 years	27–49 years	50–64 years	≥65 years
Varicella (VAR)	2 doses (if born in 1980 or later)		2 doses	

- Medical Indications

Vaccine	Pregnancy	Immuno-compromised (excluding HIV infection)	HIV infection CD4 count		Asplenia, complement deficiencies	End-stage renal disease; or on hemodialysis	Heart or lung disease, alcoholism[1]	Chronic liver disease	Diabetes	Health care personnel[2]	Men who have sex with men
			<200	≥200							
VAR	NOT RECOMMENDED			2 doses							

ACIP Immunization Recommendations: Adults

- Adults born in 1980 or later without acceptable evidence of immunity to varicella should receive 2 doses of VAR
- A routine second dose of VAR vaccine at least 28 days after the first dose is recommended for adults
- Adults born before 1980 are generally presumed immune to varicella

Varicella Vaccination and Adolescents and Adults

- **All persons 13 years of age and older without evidence of varicella immunity**
  - 2 doses separated by at least 4 weeks
- **Do not repeat first dose because of extended interval between doses**
- **Second dose recommended for persons of any age who have only received 1 dose**

Varicella Vaccination and Health Care Personnel

- Vaccination is recommended for all susceptible health care personnel
- Prevaccination serologic screening probably cost-effective
- Postvaccination testing not necessary or recommended
- Give 2 doses, 4 weeks apart to susceptible persons

Varicella Vaccine and Immunocompromised Persons

- **Single-antigen varicella vaccine may be administered to persons with isolated humoral immunodeficiency**

- **Consider varicella vaccination for:**
  - HIV-infected children with CD4 count of 15% or higher
  - HIV-infected older children and adults with CD4 count of 200 or higher

What Do You Think?

- **An 18-month-old child received their first dose of VAR at 13 months of age. A second dose was administered at a different clinic at 15 months of age. Does this child need another dose of VAR?**

- Yes
- No

Vaccines for Prevention of Zoster (Shingles)

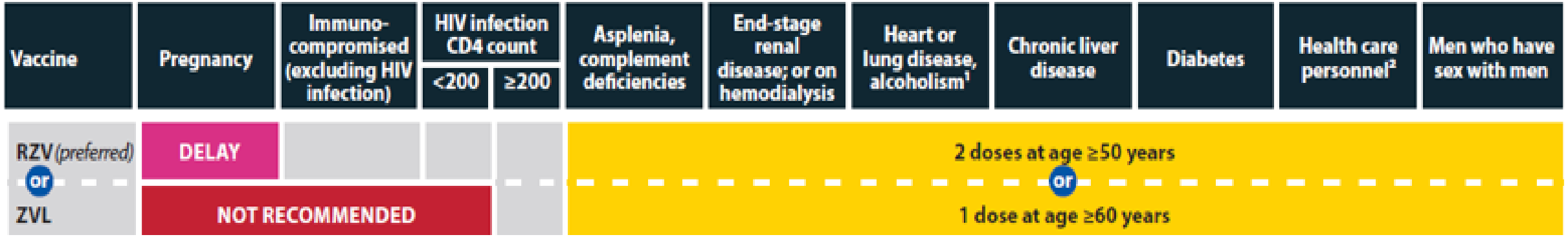
Product (ACIP Abbreviation)	Type	ACIP Age Recommendations
Zostavax® (ZVL)	Live, attenuated	60 years of age and older*
Shingrix® (RZV)	Inactivated, adjuvanted	50 years of age and older

*Zostavax is FDA-approved for persons 50 years of and older

Adult Schedule

- Routine administration

- Medical Indications



Zoster Vaccine: Shingrix (RZV)

- **Storage: Store vaccine AND diluent in the refrigerator between 2°C and 8°C (36°F and 46°F)**
- **Preparation: Reconstitute the vaccine with the diluent (adjuvant) supplied by the manufacturer just before administering**
  - If not used immediately, the reconstituted vaccine may be stored in the refrigerator and use it within 6 hours of reconstitution
  - If not used,
- **Schedule: 2 doses, 2 to 6 months apart**
- **Route: IM Injection**
  - Site: Deltoid or the thigh may be used if necessary
  - Needle gauge and length: 23- to 25-gauge needle, length varies by age/weight
- **RZV may be administered during the same clinical encounter as other vaccines**

MMWR 2018;67(3):103–108

Zoster Vaccine: Zostavax (ZVL)

- **Storage:**
  - Lyophilized vaccine: In the freezer between -50°C and -15°C (-58°F and +5°F)
  - Diluent: At room temperature (68°F to 77°F, 20°C to 25°C) or in the refrigerator (36°F to 46°F, 2°C to 8°C)
- **Preparation: Reconstitute the vaccine with the diluent supplied by the manufacturer just before administering**
- **Schedule: 1 dose**
- **Administration: Subcut injection**
  - Site: Fatty tissue of the upper outer triceps of the arm
  - Needle length and gauge: 5/8-inch, 23- to 25-gauge needle

Zostavax package insert www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm132831.pdf, accessed 8/12/2018

ACIP Zoster Immunization Recommendations

- **Administer 2 doses of Shingrix to immunocompetent persons 50 years of age and older**
  - Regardless of previous history of:
    - Vaccination with varicella-containing vaccines–Varivax or Zostavax
    - Zoster disease
- **Shingrix is preferred to Zostavax for persons 60 years and older**
  - Separate varicella-containing vaccines and Shingrix by at least 8 weeks

MMWR 2018;67(3):103–108

Zoster Vaccination:
Patients Who Do Not Report A Prior Episode of Varicella

- **When vaccinating adults 50 years of age and older, there is no need to:**
  - Screen for a history of varicella (chickenpox) infection OR
  - Conduct laboratory testing for serologic evidence of prior varicella infection
- **More than 99% of adults age 50 years and older worldwide have been exposed to varicella zoster virus**
- **ACIP considers people born in the United States prior to 1980 immune to varicella**

MMWR 2018;67(3):103–108

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Clinical Considerations

Varicella Vaccine
Immunogenicity and Efficacy

- **In a pre-licensure clinical trial, 2 doses of vaccine were:**
  - 98% effective at preventing any form of varicella
  - 100% effective against severe varicella

- **In post-licensure studies, 2 doses of vaccine were:**
  - 88% to 98% effective at preventing all varicella

CDC Chickenpox About the Vaccine for Health Care Professionals www.cdc.gov/vaccines/vpd/varicella/hcp/about-vaccine.html, accessed 8/13/2018

Acceptable Evidence of Varicella Immunity

- Written documentation of age-appropriate vaccination
- Laboratory evidence of immunity or laboratory confirmation of varicella disease
- U.S.-born before 1980*
- Health care provider diagnosis or verification of varicella disease
- History of herpes zoster based on health care provider diagnosis

*Birth year immunity criterion does not apply to health care personnel or pregnant women

MMWR 2007;56(RR-4):16-17

Varicella and MMRV Vaccine Contraindications

- Severe allergic reaction to a vaccine component or following a prior dose
- Pregnancy or planned pregnancy within 4 weeks*
- Immunosuppression
- Family history of altered immunocompetence

*ACIP off-label recommendation

MMWR 2007;56(RR-04)

General Best Practice Guidelines for Immunization: Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP) Contraindications and Precautions section www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html, accessed 08/12/2018

Varicella and MMRV Vaccine Precautions

- **Moderate or severe acute illness with or without fever**
- **Recent blood product**
  - Varicella or MMRV vaccines should not be administered for 3–11 months after receipt of antibody-containing blood products
- **Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination**
  - Avoid use of these antiviral drugs for 14 days after vaccination)
- **Use of aspirin or aspirin-containing products**

MMWR 2007;56(RR-04)\
General Best Practice Guidelines for Immunization: Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP) Contraindications and Precautions section www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html, accessed 08/12/2018

Varicella-Containing Vaccines Precautions

- MMRV only: personal or family (i.e., sibling or parent) history of seizures of any etiology

- These children generally should be vaccinated with separate MMR and varicella vaccines

MMWR 2007;56(RR-04)

Varicella Adverse Reactions

- **Local reactions (pain, erythema)**
  - Varicella:
    - 19% (children)
    - 24% (adolescents and adults)
  - Rash: 3%–4%
  - May be maculopapular rather than vesicular
  - Average 5 lesions
- **Systemic reactions not common**

MMWR 2007;56(RR-04)

Adverse Reactions

MMRV and MMR + VAR

- Fever is more common in the 5–12 days after vaccination with MMRV (22%) than with MMR + VAR (15%)
- Data from CDC Vaccine Safety Datalink sites indicate the rate of febrile seizures following MMRV (9 per 10,000 vaccinated) was approximately 2 times higher than among those receiving MMR + VAR at the same visit (4 per 10,000 vaccinated)
- Merck post-licensure surveillance has identified a similar trend

MMWR 2007;56(RR-04)

MMRV Vaccine

- For the first dose of measles, mumps, rubella, and varicella vaccines at age 12–47 months, either MMR vaccine and varicella vaccine or MMRV vaccine may be used

- Providers who are considering administering MMRV vaccine should discuss the benefits and risks of both vaccination options with the parents or caregivers

MMWR 2010;59(RR-3)

MMRV Vaccine

- **Administer MMRV:**
  - For the second dose of measles, mumps, rubella, and varicella vaccines at age 15 months through 12 years
  - For the first dose at age 48 months or older

MMWR 2010;59(RR-3)

MMRV Vaccine

- Unless the parent or caregiver expresses a preference for MMRV vaccine, CDC recommends that separate MMR vaccine and varicella vaccine should be administered for the first dose for children 12–47 months of age

MMWR 2010;59(RR-3)

Live Zoster Vaccine (ZVL) Efficacy

- **Vaccine recipients 60 to 80 years of age had 51% fewer episodes of zoster**
  - Efficacy declines with increasing age
  - Significantly reduces the risk of postherpetic neuralgia
  - Reduces the risk of zoster 69.8% in persons 50 through 59 years of age

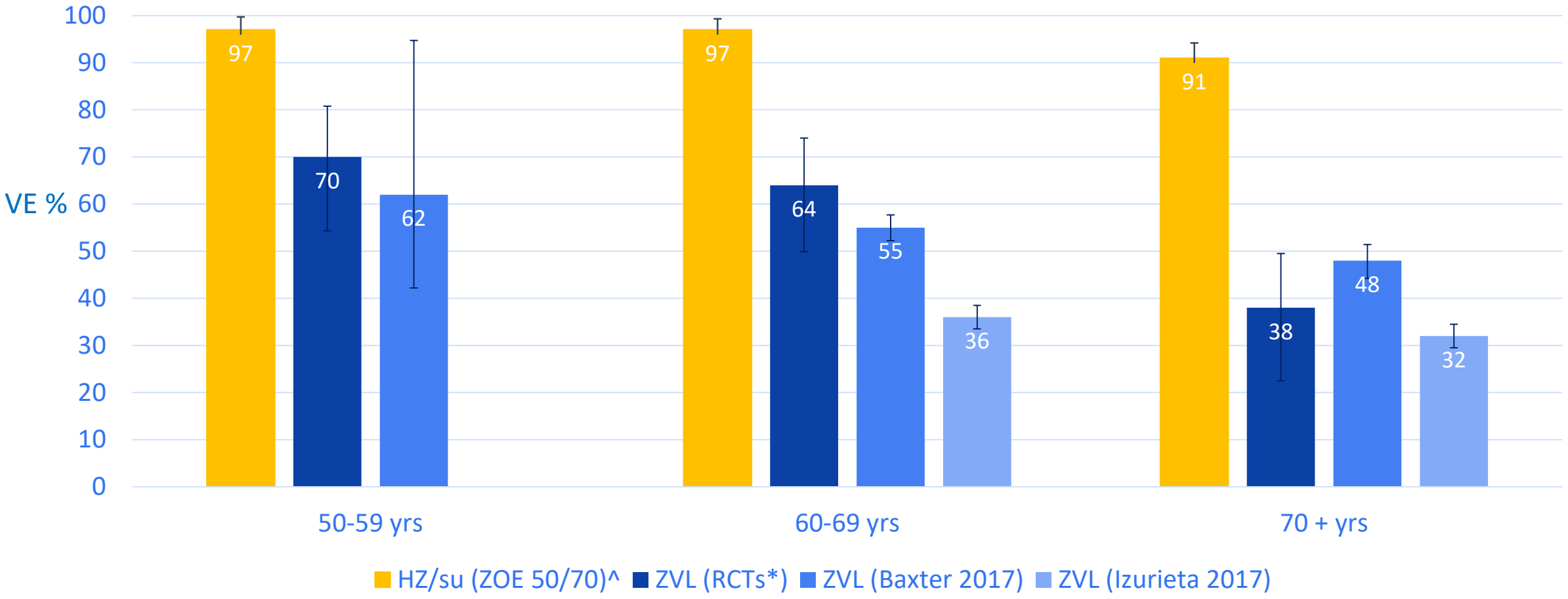
CDC Zostavax Information for Healthcare Professionals www.cdc.gov/vaccines/vpd/shingles/hcp/zostavax/about-vaccine.html

Shingrix (RZV) Vaccine Efficacy

- **Efficacy for the prevention of zoster:**
  - 96.6% in adults age 50 to 59 years
  - 97.4% in adults age 60 to 69 years
  - 91.3% in adults age 70 years and older
- **The efficacy for the prevention of postherpetic neuralgia (PHN) was:**
  - 91.2% in adults age 50 years and older
  - 88.8% in adults age 70 years and older

CDC Shingrix Information for Healthcare Professionals https://www.cdc.gov/vaccines/vpd/shingles/hcp/shingrix/about-vaccine.html, accessed 8/12/2018

Vaccine Efficacy and Effectiveness against HZ for HZ/su and ZVL, by Age Group, During the First 4‡ Years Following Vaccination



‡ Median follow-up may be less than 3 yrs: Schmader 2012= 1.3 yrs

^ZOE 50/70= 50-59 and 60-69yr: Lal 2015, 70+yrs: Cunningham 2016

*RCTs= 50-59 yrs: Schmader 2012, 60-69 and 70+ yrs: Oxman 2005,

Zoster Vaccine and Serology

- **If tested and varicella-negative:**
  - Administer 2 doses of single-antigen varicella vaccine (Varivax) separated by at least 4 weeks
  - Followed by 2 doses of RZV, separated by 2–6 months
    - Separate the 2nd (last) dose of varicella and 1st dose of RZV by at least 8 weeks

MMWR 2008;57(RR-5)

RZV Contraindications and Precautions

- **History of severe allergic reaction, such as anaphylaxis, to any component of a vaccine or after a previous dose of Shingrix**
- **Moderate to severe illness, including an acute episode of herpes zoster**
  - Shingrix is not a treatment for herpes zoster or postherpetic neuralgia (PHN)
- **Shingrix has not been studied in pregnant women or women who are breastfeeding. Providers should consider delaying Shingrix vaccination for these women**

CDC Shingrix Recommendations www.cdc.gov/vaccines/vpd/shingles/hcp/shingrix/recommendations.html, accessed 8/12/2018

RZV and Immunosuppressive Therapy

- **Administer RZV to persons:**
  - Taking low-dose immunosuppressive therapy (e.g., <20 mg/day of prednisone or equivalent or using inhaled or topical steroids)
  - Anticipating immunosuppression
  - Who have recovered from an immunocompromising illness

- **ACIP has not yet made recommendations regarding use RZV in these patients**
  - Persons on moderate to high doses of immunosuppressive therapy were excluded from RZV efficacy studies

MMWR 2018;67(3):103–108

Zostavax (ZVL) Contraindications

- **History of a life-threatening or severe allergic reaction to gelatin, the antibiotic neomycin, or any other component of ZVL**
- **A weakened immune system because of:**
  - HIV/AIDS or another disease that affects the immune system
  - Treatment with drugs that affect the immune system
  - Cancer treatment such as radiation or chemotherapy
  - Cancer affecting the bone marrow or lymphatic system, such as leukemia or lymphoma
- **Women who are or might be pregnant**
  - Women should not become pregnant until at least 4 weeks* after getting ZVL

*ACIP off-label recommendation

MMWR 2008;57(RR-5)

Zostavax (ZVL) Vaccine Precautions

- **Moderate or severe acute illness**
- **Current treatment with an antiviral drug active against herpes viruses**
  - Discontinue at least 24 hours before administration of zoster vaccine
  - Should not be taken for at least 14 days after vaccination
- **Recent receipt of a blood product is NOT a precaution**

MMWR 2008;57(RR-5)

Zostavax (ZVL) Adverse Reactions

- Local reactions–34% (pain, erythema)
- No increased risk of fever
- No serious adverse reactions identified

MMWR 2008;57(RR-5)

RZV (Shingrix) Adverse Reactions

Local reactions	49%
Local reactions–Grade 3	9.4%
Systemic reactions (headache, malaise, fatigue) Systemic reactions (headache, malaise, fatigue)–Grade 3	45–78% 11%

MMWR 2018;67(3):103–108

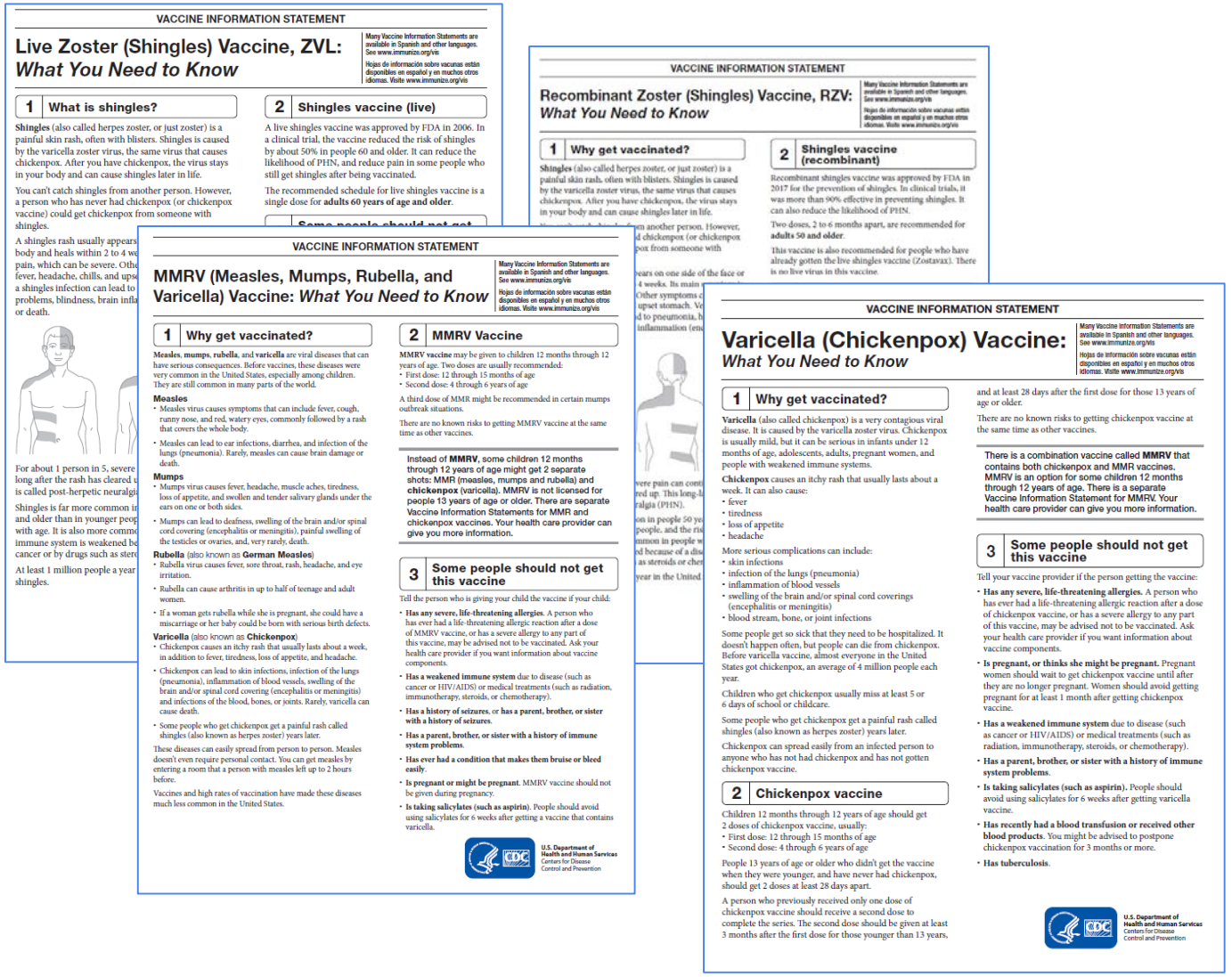
Adverse Reactions after Shingrix

- **Educate patients regarding:**
  - Potential adverse reactions, including injection site and systemic reactions
  - **The need for a second dose–even if s/he has an adverse reaction**

- **Offer comfort measures and strategies**

CDC unpublished photo. Used with the permission of the patient.

Vaccine Information Statements



- **There is a VIS for:**
  - ZVL (Zostavax)
  - RZV (Shingrix)
  - Var (Varicella)
  - MMRV (ProQuad)
- **Give the parent or patient the appropriate VIS for the product that will be administered**

Vaccine Information Statements https://www.cdc.gov/vaccines/hcp/vis/vis-statements/shingles.html, accessed 8/12/2018

Real-Life Shingrix Administration Errors

- Notes from the Field: Vaccine Administration Errors Involving Recombinant Zoster Vaccine
- 13 (8%) of the 155 reports to VAERS regarding Shingrix documented a vaccine administration error

Morbidity and Mortality Weekly Report

Notes from the Field

Vaccine Administration Errors Involving Recombinant Zoster Vaccine — United States, 2017–2018

Tom T. Shimabukuro, MD[1]; Elaine R. Miller, MPH[1]; Raymond A. Strikas, MD[2]; Beth F. Hibbs, MPH[1]; Kathleen Dooling, MD[3]; Ravi Goud, MD[4]; Maria V. Cano, MD[1]

Two vaccines for the prevention of herpes zoster (shingles) are licensed for use in the United States and recommended by the Advisory Committee on Immunization Practices (ACIP). Zoster vaccine live (ZVL; Zostavax, Merck), licensed in 2006,* is a live attenuated virus vaccine administered as a single subcutaneous (SQ) dose. Although the Food and Drug Administration (FDA) approved ZVL for adults aged ≥50 years, ACIP recommends ZVL for immunocompetent adults aged ≥60 years (*1*). Recombinant zoster vaccine (RZV; Shingrix, GlaxoSmithKline), licensed October 2017,† is also approved by the FDA for adults

also described vaccination of a person aged 48 years (inappropriate age), and two described patients receiving the vaccine information statement for ZVL instead of RZV and not being instructed to return for the second RZV dose. The remaining four reports included 1) administration of RZV instead of the intended varicella (Varivax) vaccine to a person of unreported age, 2) administration of RZV after incorrect frozen storage, 3) administration of RZV to a person aged 39 years, and 4) administration of only the adjuvant component without reconstitution with the vaccine antigen. Vaccine administration errors occurred in a pharmacy (nine reports), a health care provider's office (two), and unknown sites (two). CDC also received 13 public inquiries concerning RZV administration errors or questions asked to avoid errors. Topics included SQ administration (five), reconstitution (five), incorrect interval or schedule (two), and administration of previously frozen vaccine (one).

MMWR 2018;67:20

Shingrix Vaccine Administration Errors

- **Vaccine administration errors reported to VAERS include:**
  - **Wrong route**: Subcut route rather than the IM
  - **Wrong age**: Administered to persons less than 50 years of age
  - **Wrong vaccine**: Shingrix instead of varicella (Varivax) vaccine
  - **Improper storage**: Administered after frozen storage
  - **Wrong preparation**: Administered the adjuvanted diluent only
  - **Wrong schedule**: Interval violations between doses of Shingrix or a previous dose of varicella-containing vaccine
- **Other errors we have heard about:**
  - Staff unaware of the need for a second dose
  - Staff thinks Zostavax can count toward completing the 2-dose Shingrix series

Varicella and Zoster Vaccine Resources and References

- Resources and references are available on the webinar web page

Varicella and Zoster Vaccines Resources and References

2018 Pink Book Webinar Series

ACIP recommendations

- Current ACIP varicella vaccine recommendations www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/varicella.html
- Current ACIP MMRV recommendations www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mmrv.html
- Current ACIP zoster vaccine recommendations www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/shingles.html
- ACIP Update on the use of herpes zoster vaccine www.cdc.gov/mmwr/volumes/67/wr/mm6703a5.html

Manufacturer's vaccine package inserts (PI)

- VAR (Varivax), Merck & Co., Inc. www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm200582.htm
- MMRV (ProQuad), Merck & Co., Inc. www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm094051.htm
- RZV (Shingrix), GlaxoSmithKline, Biologicals www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm581605.pdf
- ZVL (Zostavax) Merck & Co., Inc. www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm132831.pdf

Schedule

- 2018 Recommended immunization schedule for persons aged 18 years and younger www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html
- 2018 Recommended immunization schedule for adults 19 years and older www.cdc.gov/vaccines/schedules/hcp/adult.html

Disease

- Chickenpox disease webpage www.cdc.gov/chickenpox/about/
- Information you need to know www.vaccineinformation.org/chickenpox/
- Shingles (Herpes Zoster) www.cdc.gov/shingles/hcp/index.html

Information for health care personnel

- *Epidemiology and Prevention of Vaccine-Preventable Diseases*: Varicella chapter www.cdc.gov/vaccines/pubs/pinkbook/chapters.html
- Ask the Experts: varicella questions www.immunize.org/askexperts/experts_var.asp
- Ask the Experts: zoster questions www.immunize.org/askexperts/experts_zos.asp
- CDC Zoster Fact Sheet www.cdc.gov/shingles/downloads/shingles-factsheet-hcp.pdf
- MMR & varicella vaccines or MMRV vaccine: discussing options with parents www.cdc.gov/vaccines/vpd/mmr/hcp/vacopt-factsheet-hcp.html
- *You Call the Shots*: Varicella www.cdc.gov/vaccines/ed/youcalltheshots.html
- *You Call the Shots*: Zoster www.cdc.gov/vaccines/ed/youcalltheshots.html
- You call the Shots: Zoster job aid www.cdc.gov/vaccines/hcp/infographics/you-call-the-shots-intramuscular-shingrix-vaccination.html
- Varicella information www.immunize.org/varicella/
- Zoster information www.immunize.org/zoster/

What Do You Think?

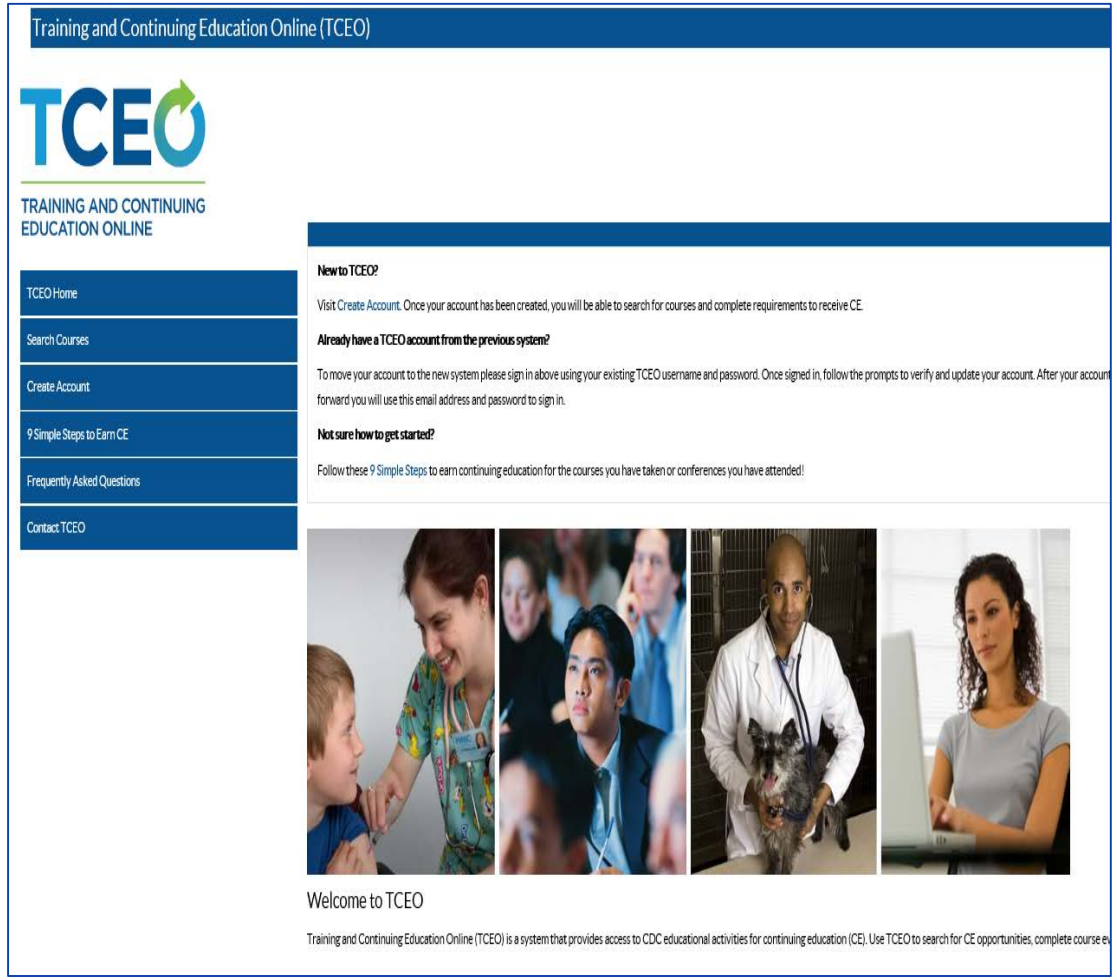
- **A nursing student had VAR titers done before she started school. Her titers came back negative. She has 2 documented doses of VAR after 1 year of age, separated by more than 4 weeks. How many doses of VAR should we administer?**

  - One
  - Two
  - None

Frequently Asked Questions

Continuing Education Information

- CE credit, go to: www.cdc.gov/GetCE
- Search course number: WD4344-090920
- CE credit expires: July 1, 2022
- CE instructions are available on the EpiVac Pink Book Web-on-Demand Series web page
- Questions and additional help with the online CE system, e-mail CE@cdc.gov



E-mail Your Immunization Questions to Us

NIPINFO@cdc.gov

Write “Web-on-Demand–VAR/ZOS” in the subject line

EpiVac Pink Book Web-on-Demand Resources

- **Comprehensive list of resources for ALL sessions**
- **Located on the web page for this web-on-demand session at www.cdc.gov/vaccines/ed/webinar-epv/index.html**
- **Additional materials located on this webpage include:**
  - Varicella/Zoster slide set
  - Web-on-demand questions and answers
  - Transcript of this session
  - Continuing education instructions

COURSE RESOURCES

Epidemiology and Prevention of Vaccine-Preventable Diseases

- Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book) Supplement: www.cdc.gov/vaccines/pubs/pinkbook/supplement.html

Overall Resources

- Current childhood and adult immunization schedules: www.cdc.gov/vaccines/schedules/index.html
- CDC Vaccine Schedules App for Health Care Providers: www.cdc.gov/vaccines/schedules/hcp/schedule-app.html
- Advisory Committee on Immunization Practices (ACIP) recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.html
- CDC General Best Practice Guidelines for Immunization: www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- CDC Continuing Education Information: www.cdc.gov/vaccines/ed/ce-credit-how-to.html
- Health Care Personnel Vaccination Recommendations: www.immunize.org/catg.d/p2017.pdf
- Pink Book Webinar Series: www.cdc.gov/vaccines/ed/webinar-epv/index.html
- Vaccines Licensed for Use in the United States Package Inserts: www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm093833.htm
- You Call the Shots: www.cdc.gov/vaccines/ed/youcalltheshots.html

Course Intro and Objectives

- What is the Advisory Committee on Immunization Practices (ACIP)?: www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-acip-color-office.pdf
- CDC Immunization Resources for You and Your Patients: www.cdc.gov/vaccines/hcp/admin/downloads/Resource-Booklet.pdf
- Parents' Guide to Childhood Immunizations: www.cdc.gov/vaccines/parents/tools/parents-guide/index.html
- Order Information for Free CDC Immunization Materials for Providers and Patients: www.cdc.gov/pubs/CDCInfoOnDemand.aspx

Principles of Vaccination

- Immune System Research: www.niaid.nih.gov/research/immune-system-research
- What is the Immune System?: www.vaccines.gov/basics/work/prevention
- Understanding How Vaccines Work: www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-understand-color-office.pdf
- Vaccines Work: www.vaccines.gov/basics/work/index.html
- Vaccine Basics: How Vaccines Work: www.vaccineinformation.org/how-vaccines-work/
- The History of Vaccines: How Vaccines Work: www.historyofvaccines.org/content/how-vaccines-work

General Best Practice Guidelines

- Ask the Experts-Scheduling Vaccines FAQs: www.immunize.org/askexperts/scheduling-vaccines.asp
- Ask the Experts-Combination Vaccines FAQs: www.immunize.org/askexperts/experts_combo.asp
- Ask the Experts-Precautions and Contraindications FAQs: www.immunize.org/askexperts/precautions-contraindications.asp
- Foreign Language Vaccine-Preventable Disease Terms: www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/foreign-products-tables.pdf
- Guide to Contraindications and Precautions to Commonly Used Vaccines: www.immunize.org/catg.d/p3072a.pdf
- Guidelines for Vaccinating Pregnant Women: www.cdc.gov/vaccines/pregnancy/hcp/guidelines.html
- IDSA 2013 Clinical Practice Guideline for Vaccination of the Immunocompromised Host: www.idsociety.org/Guidelines/Patient_Care/IDSA_Practice_Guidelines/Vaccination_of_the_Immunocompromised_Host/
- Interval Between Antibody-Containing Products and Measles- and Varicella-Containing Vaccines: www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/a/mmr_ig.pdf

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Centers for Disease Control and Prevention

Thank You From Atlanta!