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

Mark S. Freedman, DVM, MPH, Veterinary Medical Officer, CDC/NCIRD
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
Disclosure Statements

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

EpiVac Pink Book Web-on-Demand Series

Mark S Freedman, DVM, MPH, DACVPM
CDR, U.S. Public Health Service
Veterinary Medical Officer, CDC, NCIRD
Disease
Varicella Zoster Virus

- Herpes virus (DNA)
- Primary infection results in varicella (chickenpox)
- Recurrent infection results in herpes zoster (shingles)
- Short survival in environment
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
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
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
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
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
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](https://www.cdc.gov/shingles/about/overview.html)
Vaccine
## Vaccines for the Prevention of Varicella (Chickenpox)

<table>
<thead>
<tr>
<th>Product</th>
<th>ACIP Recommended Age Indications</th>
<th>ACIP Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varivax®</td>
<td>12 months and older</td>
<td>VAR</td>
</tr>
<tr>
<td>ProQuad®</td>
<td>12 months through 12 years</td>
<td>MMRV</td>
</tr>
</tbody>
</table>
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](http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/ucm123793.pdf), accessed 8/12/2018
Child/Adolescent Schedule

- Routine administration

- Medical indications

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Birth</th>
<th>1 mo</th>
<th>2 mos</th>
<th>4 mos</th>
<th>6 mos</th>
<th>9 mos</th>
<th>12 mos</th>
<th>15 mos</th>
<th>18 mos</th>
<th>19-23 mos</th>
<th>2-3 yrs</th>
<th>4-6 yrs</th>
<th>7-10 yrs</th>
<th>11-12 yrs</th>
<th>13-15 yrs</th>
<th>16 yrs</th>
<th>17-18 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varicella (VAR)</td>
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</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19–26 years</th>
<th>27–49 years</th>
<th>50–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varicella (VAR)</td>
<td></td>
<td></td>
<td>2 doses (if born in 1980 or later)</td>
<td>2 doses</td>
</tr>
</tbody>
</table>

- Medical Indications

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Immuno-compromised (excluding HIV infection)</th>
<th>HIV infection CD4 count</th>
<th>Asplenia, complement deficiencies</th>
<th>End-stage renal disease; or on hemodialysis</th>
<th>Heart or lung disease, alcoholism¹</th>
<th>Chronic liver disease</th>
<th>Diabetes</th>
<th>Health care personnel²</th>
<th>Men who have sex with men</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAR</td>
<td></td>
<td></td>
<td>≤200</td>
<td>≥200</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td><strong>NOT RECOMMENDED</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 doses</td>
<td></td>
</tr>
</tbody>
</table>
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
- Prevacummation 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
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)

<table>
<thead>
<tr>
<th>Product (ACIP Abbreviation)</th>
<th>Type</th>
<th>ACIP Age Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zostavax® (ZVL)</td>
<td>Live, attenuated</td>
<td>60 years of age and older*</td>
</tr>
<tr>
<td>Shingrix® (RZV)</td>
<td>Inactivated, adjuvanted</td>
<td>50 years of age and older</td>
</tr>
</tbody>
</table>

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

- Routine administration

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19–26 years</th>
<th>27–49 years</th>
<th>50–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoster recombinant (RZV) (preferred)</td>
<td>or</td>
<td></td>
<td>2 doses</td>
<td>or 1 dose</td>
</tr>
<tr>
<td>Zoster live (ZVL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Medical Indications

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Immuno-compromised (excluding HIV infection)</th>
<th>HIV infection CD4 count</th>
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<th>Diabetes</th>
<th>Health care personnel²</th>
<th>Men who have sex with men</th>
</tr>
</thead>
<tbody>
<tr>
<td>RZV (preferred)</td>
<td>DELAY</td>
<td></td>
<td>&lt;200</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ZVL</td>
<td>NOT RECOMMENDED</td>
<td></td>
<td>≥200</td>
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</tr>
</tbody>
</table>

2 doses at age ≥50 years or 1 dose at age ≥60 years
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**
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

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
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
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
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
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](http://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
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
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**
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
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.
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
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.
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
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
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
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](http://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
Zostavax (ZVL) Adverse Reactions

- Local reactions—34% (pain, erythema)
- No increased risk of fever
- No serious adverse reactions identified
### RZV (Shingrix) Adverse Reactions

<table>
<thead>
<tr>
<th>Reaction Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local reactions</td>
<td>49%</td>
</tr>
<tr>
<td>Local reactions–Grade 3</td>
<td>9.4%</td>
</tr>
<tr>
<td>Systemic reactions (headache, malaise, fatigue)</td>
<td>45–78%</td>
</tr>
<tr>
<td>Systemic reactions (headache, malaise, fatigue)–Grade 3</td>
<td>11%</td>
</tr>
</tbody>
</table>

*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.
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.
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

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 MMWR recommendations: www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mmwr.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/preview/mmwrhtml/rr6707a1.htm

Manufacturer’s vaccine package inserts (PI)
- VAR (Varivax), Merck & Co., Inc.: www.fda.gov/Biot victoryVaccines/Vaccines/ApprovedProducts/ucm205587.htm
- MRV (Provarrix), Merck & Co., Inc.: www.fda.gov/Biot victoryVaccines/Vaccines/ApprovedProducts/ucm398955.htm
- RVV (Shingrix), GlaxoSmithKline Biologicals: www.fda.gov/downloads/biologicals/biologicsvaccines/vaccines/approvedproducts/ucm016015.pdf

Schedule
- 2018 Recommended immunization schedule for persons aged 10 years and younger: www.cdc.gov/vaccines/schedules/hcp/child-adolescent.htm
- 2018 Recommended immunization schedule for adults 19 years and older: www.cdc.gov/vaccines/schedules/hcp/adult.htm

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

Information for health care personnel
- Epidemiology and Prevention of Varicella-Preventable Disease: Varicella chapter: www.cdc.gov/vaccines/yhs/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_zasasp
- MMWR & varicella vaccines or MV vaccine: discussing options with parents: www.cdc.gov/vaccines/pdf/screen/vaccop_factsheet-hcp.html
- You Call the Shots Varicella: www.cdc.gov/vaccines/ed/screenshots/Varicella.html
- You Call the Shots Zoster: www.cdc.gov/vaccines/ed/screenshots/Zoster.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

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

NIPINFO@cdc.gov
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- Comprehensive list of resources for ALL sessions
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Thank You From Atlanta!