

LARA
LICENSING AND REGULATORY AFFAIRS
CUSTOMER DRIVEN. BUSINESS MINDED.

SHINGLES

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Objectives

- Define the etiology of shingle
 - Etiology of shingles and primary varicella zoster virus (VZV) infections
- Discuss the preventative infection control processes
 - Prevention of shingles and chickenpox

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Objectives

- Describe the management of shingles among the nursing home population.
 - Care and treatment of nursing home residents with shingles.
 - Infection control measures to prevent spread of VZV virus.
 - Efficacy and safety of VZV vaccines.
 - Contraindications of administering VZV vaccine

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Etiology of shingles and primary varicella zoster virus (VZV) infections

- Infection from Varicella Zoster Virus (VZV) causes two distinct clinical conditions
 - Primary Infection or Chicken Pox
 - Reactivation (decades post initial primary infection) or Herpes Zoster
 - A member of the herpes virus family but **not to be confused** with herpes simplex virus I or II (oral or genital herpes)

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Chicken Pox

- Contagious rash illness
 - Primarily in young children
 - Affects up to 98% of adult population
- 1995 Advisory Committee on Immunization Practices (ACIP) recommends varicella vaccine for all children ≥ 12 months without immunity

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Chicken Pox: Varicella Zoster



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Varicella: Complications

- Secondary bacterial infection of skin lesions
- Central nervous system manifestations (meningoencephalitis, cerebellar ataxia)
- Pneumonia (viral or bacterial)
- Hepatitis, hemorrhagic complications, thrombocytopenia, nephritis occur less frequently
- Certain groups at increased risk for complications
 - Adults
 - Immunocompromised persons
 - Pregnant Women
 - Newborns

CDC. Prevention of Varicella. MMWR 2007; 56(No. RR-4); Arvin Clin Microb Rev 19

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Varicella: Transmission

- Transmitted person to person by direct contact, inhalation of aerosols from vesicular fluid of skin lesions of acute varicella or zoster, or aerosolized respiratory tract secretions
- Average incubation period: 14-16 days after exposure to rash (range: 10-21 days)
- Period of contagiousness: 1-2 days before rash onset until all lesions crusted or disappear if maculopapular rash (typically 4-7 days)
- Varicella in unvaccinated persons is highly contagious (61-100% secondary household attack rate)
- Varicella in 1 dose-vaccinated persons half as contagious as unvaccinated cases
 - One study indicated that varicella in 1-dose vaccinees with < 50 lesions was 1/3 as contagious as unvaccinated persons although contagiousness in vaccinees with ≥ 50 lesions was similar to unvaccinated persons

CDC. Prevention of Varicella. MMWR 2007; 56(No. RR-4); Arvin Clin Microb Rev 1996; Seward JAMA. 2004; Vaccines. 5th edition

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Herpes Zoster (Shingles)

- Following initial infection (varicella), VZV establishes permanent latent infection in dorsal root and cranial nerve ganglia
- Years to decades later VZV reactivates and spreads to skin through peripheral nerves causing pain and a unilateral vesicular rash in a dermatomal distribution
- ~1 million cases in the U.S. annually
- Lifetime risk of developing zoster: about 30%

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Shingles: Herpes Zoster

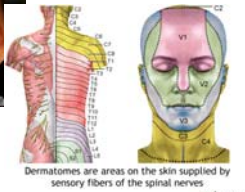
- Reactivation of primary varicella zoster
- Prodrome: headache, photophobia, malaise, fever, abnormal skin sensations and pain
- Triggers – immune competence
- Rash
 - Unilateral not crossing the midline
 - Initially erythematous, maculopapular
 - Vesicles form over several days, then crust over
 - Full resolution in 2-4 weeks
 - Occasionally, rash never develops (zoster sine herpete)
 - Erupts in one to three adjacent dermatomes (thoracic, cervical and ophthalmic)
- Post herpetic neuralgia (PHN)- pain after resolution of the rash

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Shingles: Herpes Zoster



Shingles #ADAM



Dermatomes are areas on the skin supplied by sensory fibers of the spinal nerves

#ADAM

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Prevention of shingles (and chickenpox)

- Vaccination and Isolation Precautions
- Lesions are contagious after the rash erupts and until the lesions crust if possible until dry and crusted
- Zoster lesions contain high concentrations of VZV that can be spread presumably by the airborne route and cause primary varicella in exposed susceptible persons
- Shingles (zoster) is less contagious than varicella

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Isolation Precautions

- Standard Precautions
- Airborne Infection Isolation Precautions (room specifications)
- Contact Precautions

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Isolation Precaution recommendations- Chicken Pox

APPENDIX A ¹			
TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS			
Infection/Condition	Type ^a	Duration ^b	Precautions
Progressive vaccinia	C		
Postvaccinia encephalitis	S		
Herpetic or conjunctivitis	SIC		Use Contact Precautions if there is copious drainage
Iritis or keratitis	S		
Vaccinia associated erythema multiforme (Stevens Johnson Syndrome)	S		Not an infectious condition
Secondary bacterial infection (e.g., S. aureus, group A beta hemolytic streptococcus)	SIC		Follow organism-specific (drug, slough most frequent) recommendations and consider respiratory if drainage
Varicella Zoster	A,C	Until lesions dry and crusted	Susceptible HCWs should not enter room if immune caregivers are available; no recommendation for face protection of immune HCWs; no recommendation for type of protection, i.e. surgical mask or respirator for susceptible HCWs. In immunocompromised host with varicella pneumonia, prolong duration of precautions for duration of illness. Post-exposure prophylaxis: provide post-exposure vaccine (ACAP) but within 120 hours; for susceptible exposed persons for whom vaccine is contraindicated (immunocompromised persons, pregnant women, newborns whose mother's varicella onset is <5days before delivery or within 48 hrs after delivery) provide VZIG, when available, within 60 hours; if unavailable, use IVIG. Use Airborne Precautions for exposed susceptible persons and exclude exposed susceptible healthcare workers beginning 8 days after first exposure until 21 days after last exposure or 28 if received VZIG, regardless of postexposure vaccination. ¹⁰⁴
Varicella (see smallpox)			
Varicella pneumoniae infection (see postherpetic)			
Whitlow's angina (herpes mouth)	S		
Varicella hemorrhagic fever	S, D, C	DI	Single-patient room preferred. Emphasize: 1) use of sharps safety

Isolation Precaution recommendations- Shingles

APPENDIX A ¹			
TYPE AND DURATION OF PRECAUTIONS RECOMMENDED FOR SELECTED INFECTIONS AND CONDITIONS			
Infection/Condition	Type ^a	Duration ^b	Precautions
Type B-HIVAg positive; acute or chronic	S		for duration of hospitalization; for children 3-14 yrs, of age for 2 weeks after onset of symptoms; >14 yrs, of age for 1 week after onset of symptoms
Type C and other unspecified non-A, non-B	S		See specific recommendations for care of patients in hemodialysis centers ¹¹¹
Type D (seen only with hepatitis B)	S		See specific recommendations for care of patients in hemodialysis centers ¹¹¹
Type E	S		Use Contact Precautions for diapered or incontinent individuals for the duration of illness ¹⁰⁴
Type G	S		
Herpesvirus (see enteroviral infection)	S		
Herpes simplex (Herpesvirus hominis)	S		
Encephalitis	S		
Mucocutaneous, disseminated or primary, severe	C		Until lesions dry and crusted
Mucocutaneous, recurrent (skin, oral, genital)	S		
Neonatal	C	Until lesions dry and crusted	Also, for asymptomatic, exposed infants delivered vaginally or by C-section and if mother has active infection and membranes have been ruptured for more than 4 to 6 hrs until infant surface cultures obtained at 24-36 hrs, of age require after 48 hrs incubation ¹¹²⁻¹¹³
Herpes zoster (varicella-zoster) (shingles)	A,C	DI	Susceptible HCWs should not enter room if immune caregivers are available; no recommendation for protection of immune HCWs; no recommendation for type of protection, i.e. surgical mask or respirator; for susceptible HCWs
Disseminated disease in any patient			
Localized disease in immunocompromised patient until disseminated infection ruled out	A,C		

Care and treatment of nursing home residents with shingles.

- Antivirals used in immunocompetent
 - Initiate within 72 hours of rash onset
- Corticosteroids in combination with acyclovir
 - Diminish acute pain
 - Decrease time to achieve cutaneous healing
- Pain control
 - Analgesics, non-steroidal anti-inflammatory, tricyclic antidepressants, opiates, anticonvulsants, and topical anesthetics.
- Wound Care- Clean, dry and covered

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Infection control measures to prevent spread of VZV virus.

- Patient and staff screening for varicella immunity
- Isolation Precautions
 - Standard Precautions
 - Airborne Precautions Susceptible Patients/Personnel
 - Contact Precautions

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Work with occupational health

- Know who is not varicella immune and vaccinate
- Do not assign personnel who are not immune

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Healthcare worker: Work Restrictions CDC

Table 3. Continued

Disease/problem	Work restriction	Duration	Category
Varicella			
Active	Exclude from duty	Until all lesions dry and crust	IA
Postexposure (susceptible personnel)	Exclude from duty	From 10th day after 1st exposure through 21st day (28th day if VZIG given) after last exposure	IA
Zoster			
Localized, in healthy person	Cover lesions; restrict from care of high-risk patients†	Until all lesions dry and crust	II
Generalized or localized in immunosuppressed person	Restrict from patient contact	Until all lesions dry and crust	IB
Postexposure (susceptible personnel)	Restrict from duty	From 10th day after 1st exposure through 21st day (28th day if VZIG given) after last exposure or, if varicella occurs, until all lesions dry and crust	IA
Viral respiratory infections, acute febrile	Consider excluding from the care of high risk patients† or contact with their environment during community outbreak of RSV and influenza	Until acute symptoms resolve	IB

<http://www.cdc.gov/mmwr/preview/mmwrhtml/r6007a1.htm>

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ACIP- recommendations healthcare worker

- [CDC](#)

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Vaccines

- There are 3 licensed vaccines to prevent varicella (Varivax®, Proquad®) and herpes zoster (Zostavax®) in the US:
- Varivax® (licensed 1995)
- Proquad® (licensed 2005)
- Zostavax® (licensed 2006)

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Varicella Vaccination of Healthcare Personnel

- To prevent disease and nosocomial spread of VZV, healthcare institutions should ensure that all HCP have evidence of immunity to varicella
 - Evidence of immunity = (1) laboratory evidence of immunity, (2) history of clinician diagnosed or verified varicella or zoster, (3) Documentation of age-appropriate vaccination
- Pre-vaccination serologic probably cost-effective
- Routine testing for varicella immunity after 2 doses of vaccine not recommended
 - Sensitive tests indicate 94-99% adults develop antibodies after second dose
 - VZV-specific cell-mediated immunity affords protection to vaccinated adults, even in the absence of detectable antibody response.
 - Available commercial assays may not be able to detect vaccine-induced immunity

CDC. Prevention of Varicella. MMWR 2007; 56(No. RR-4)

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Herpes Zoster Vaccine

- Licensed in 2006
- Live, attenuated VZV
- Same strain used in the varicella vaccine, but 14x more potent
- Administered subcutaneously in deltoid region

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ACIP Recommendations for Zoster Vaccine

- In October 2008, the Advisory Committee on Immunization Practices (ACIP) recommended a dose of the herpes zoster vaccine (HZV) for all adults ≥60 years of age unless they have contraindications
- HZV should be offered at the patient's first available clinical encounter

CDC. Prevention of Herpes Zoster. MMWR 2008. 57(RR-5): p. 1-30

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ACIP Recommendations for Zoster Vaccine

- HZV can be administered simultaneously with influenza and pneumococcal vaccines
- HZV is recommended whether or not the patient reports a prior episode of zoster
- It is not necessary to check varicella history or titers before administering HZV
- HZV should be offered to eligible persons including those >80 y.o., frail, or with chronic illnesses

CDC. Prevention of Herpes Zoster. *MMWR* 2008. 57(RR-5): p. 1-30

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Herpes Zoster Vaccine Efficacy

- Decreased zoster incidence by 51%
- Decreased risk of post-herpetic neuralgia in all participants by 67%
- Decreased burden of illness (severity x duration) in all participants by 61%

Oxman *NEMJ* 2005

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Efficacy and safety of VZV vaccines.

- CDC recommends Zoster vaccine for use in people 60 years old and older to prevent shingles. This is a one-time vaccination. There is no maximum age for getting the shingles vaccine.
- Anyone 60 years of age or older should get the shingles vaccine, regardless of whether they recall having had chickenpox or not. Studies show that more than 99% of Americans ages 40 and older have had chickenpox, even if they don't remember getting the disease.
- At this time, CDC does not have a recommendation for routine use of shingles vaccine in persons 50 through 59 years old. However, the vaccine is approved by FDA for people in this age group.
- Even if you have had shingles, you can still receive the shingles vaccine to help prevent future occurrences of the disease. Generally, a person should make sure that the shingles rash has disappeared before getting vaccinated.

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Possible reactions to the vaccine

- No serious problems have been identified with shingles vaccine.
- The vaccine has been tested in about 20,000 people aged 60 years old and older. The most common side effects in people who got the vaccine were **redness, soreness, swelling or itching at the shot site, and headache.**
- It is safe to be around infants and young children, pregnant women, or people with weakened immune systems after you get the shingles vaccine. There is no documentation of a person getting chickenpox from someone who has received the shingles vaccine (which contains varicella zoster virus).
- Some people who get the shingles vaccine will develop a chickenpox-like rash near the place where they were vaccinated. As a precaution, this rash should be covered until it disappears.
- The shingles vaccine does not contain thimerosal (a preservative containing mercury).

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Who should not get the vaccine

- A person who has ever had a life-threatening or severe allergic reaction to gelatin, the antibiotic neomycin, or any other component of shingles vaccine. Tell the doctor of any severe allergies.
- A person who has a weakened immune system because of
 - HIV/AIDS or another disease that affects the immune system,
 - treatment with drugs that affect the immune system, such as steroids,
 - 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

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§483.65 Infection Control F-441

- The facility must establish and maintain an Infection Control Program designed to provide a safe, sanitary and comfortable environment and to help prevent the development and transmission of disease and infection

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§483.65(a) Infection Control Program

- The facility must establish an Infection Control Program under which it –
 - (1) Investigates, controls, and prevents infections in the facility;
 - (2) Decides what procedures, such as isolation, should be applied to an individual resident; and
 - (3) Maintains a record of incidents and corrective actions related to infections.

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§483.65(b) Preventing Spread of Infection

- When the Infection Control Program determines that a resident needs isolation to prevent the spread of infection, the facility must isolate the resident.
- (2) The facility must prohibit employees with a communicable disease or infected skin lesions from direct contact with residents or their food, if direct contact will transmit the disease.
- (3) The facility must require staff to wash their hands after each direct resident contact for which hand washing is indicated by accepted professional practice.

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Vaccination-Residents

- Are informed about the benefits and risks of immunizations; and
- Have the opportunity to receive, unless medically contraindicated or refused or already immunized, the influenza and pneumococcal vaccine; and

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Conclusions

- Focus on areas of prevention
 - Prevention of viral infection through **vaccination**
 - Prevention of transmission through **good infection prevention practices**

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Resources

- Powerpoint: <http://www.cdc.gov/shingles/resources-refs.html>
- Contact Information:
 - Nipinfo@cdc.gov
 - 800.CDC.INFO
- National VZV Laboratory:
 - vzl@cdc.gov
 - <http://www.cdc.gov/shingles/lab-testing/index.html>
- Additional Resources:
 - CDC Chickenpox (Varicella) Website: <http://www.cdc.gov/chickenpox/index.html>
 - CDC Varicella Vaccine Webpage: <http://www.cdc.gov/vaccines/vpd-vac/varicella/>
- CDC Herpes Zoster Disease and Vaccine Webpages:
 - <http://www.cdc.gov/shingles/index.html>
 - <http://www.cdc.gov/vaccines/vpd-vac/shingles/>
- CDC. Prevention of Herpes Zoster. MMWR 2008. 57(RR-5): p. 1-30

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More resources....

- <http://www.cdc.gov/vaccines/vpd-vac/shingles/vacc-need-know.htm#notGet-vaccine>
- <http://www.cdc.gov/Features/Shingles>
- <http://www.cdc.gov/chickenpox>
- Vaccine Information Sheet
<http://www.cdc.gov/vaccines/pubs/vis/downloads/vis-shingles.pdf>
- ACIP <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr57e0515a1.html> 2008
- <http://www.medscape.com/viewarticle/753283>
- Isolation precautions
<http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html>

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Questions



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