CDPH
Chicago Department of Public Health

Clinical Guidelines for Management of Healthcare Personnel Exposed to Varicella

Background

Nosocomial transmission of varicella-zoster virus (VZV) is well recognized. Sources for nosocomial exposures have included patients, healthcare personnel (HCP), and visitors (including the children of personnel) with either varicella or herpes zoster (HZ).[1] In hospitals and other healthcare settings, airborne transmission of VZV from patients with either varicella or HZ has resulted in varicella in HCP and patients who had no direct contact with the index case-patient. VZV exposures among patients and HCP can be disruptive to patient care, time-consuming, and costly even when they do not result in VZV transmission.

All susceptible HCP are at risk for varicella and its complications. Certain persons are at higher risk for severe disease and secondary complications: pregnant women, premature infants born to varicella-susceptible mothers, infants born at less than 28 weeks' gestation or weighing ≤ 1000 gm (regardless of maternal immune status), and immunocompromised persons (including those who are undergoing immunosuppressive therapy, have malignant disease, or are immunodeficient).[2]

Varicella Vaccination Recommendations for HCP

The Advisory Committee of Immunization Practices (ACIP) recommends that healthcare institutions ensure that all HCP have evidence of immunity to varicella to prevent disease and nosocomial spread of VZV. This information should be documented and readily available at the work location.[2]

Evidence of immunity for HCP includes any of the following*:

- Written documentation of vaccination with 2 doses of varicella vaccine, or
- Laboratory evidence of immunity or laboratory confirmation of disease, or
- Diagnosis or verification of a history of varicella or HZ by a healthcare provider†

**Birth before 1980 is not considered evidence of immunity for HCP because of the possibility of nosocomial transmission to high-risk patients.*
†Healthcare providers should refer to CDC's Verifying history of varicella guidance when verifing history of disease in patients.

HCP without evidence of immunity to varicella should receive two doses of varicella vaccine administered 4—8 weeks apart. If >8 weeks elapse after the first dose, the second dose may be administered without restarting the schedule.

In healthcare settings, serologic screening before vaccination of personnel without evidence of immunity is likely to be cost effective. Routine testing for varicella immunity after two doses of vaccine is not recommended.[2]

Recently vaccinated HCP do not require any restriction in their work activities; however, HCP who develop a vaccine-related rash after vaccination should avoid contact with persons without evidence of immunity to varicella who are at risk for severe disease until all lesions are crusted over or, if they develop lesions that do not crust (macules and papules only), until no new lesions appear within a 24-hour period.

Unprotected Exposures in Healthcare Settings

Exposure to VZV is defined as close contact with an infectious person, such as close indoor contact (e.g., in the same room) or face-to-face contact. Experts differ regarding the duration of contact; some suggest 5 minutes, and others up to 1 hour; all agree that it does not include transitory contact.[3]

Post-Exposure Management of HCP

If HCP have an unprotected exposure to VZV, decisions on exclusion and postexposure prophylaxis depend on documentation of immunity and risk of severe disease.[3]

Immune status[§]/risk of severe disease	Postexposure prophylaxis (PEP)	Work exclusion	Symptom monitoring
No evidence of immunity, not at high risk for severe disease	Administer first dose of varicella vaccine as soon as possible.[‡]	Exclude from days 8—21 after the exposure or temporarily reassign to locations remote from patient-care areas.	Educate HCP about symptoms of varicella (fever, headache, skin lesions, and systemic symptoms). All exposed HCP should notify occupational health of any symptoms of illness during the incubation period, from 8 through 21 days after exposure. Exclude from a work facility immediately if symptoms occur, place on sick leave, and provide with antiviral medication.
No evidence of immunity, high risk for severe disease and varicella vaccination is contraindicated (e.g., pregnant HCP)	Administer varicella-zoster immune globulin (VariZIG) as soon as possible and within 10 days of exposure.[4]	Exclude from days 8—21 (extend through day 28 if VariZIG given) after the exposure or temporarily reassign to locations remote from patient-care areas.	
Partial vaccination (1 dose of vaccine)	Administer the second dose within 3—5 days after exposure (provided 4 weeks have elapsed after the first dose).[‡]	For those who do not receive a second dose or who received the second dose >5 days after exposure, exclude from days 8—21 after the exposure or temporarily reassign to locations remote from patient-care areas.	
Evidence of immunity	None	None	

§HCP exposed to VZV with unknown evidence of immunity to varicella may have serologic screening conducted prior to vaccination. Since VZV IgG starts to be detectable within 4 days after rash onset, a postive IgG in an asymptomatic, exposed person is a good indication of prior disease.
‡Vaccination within 3 to 5 days of exposure to rash might modify the disease if infection occurred. Vaccination >5 days post-exposure is still indicated because it induces protection against subsequent exposures if the current exposure did not cause infection.

Note: If the VZV exposure was to localized HZ with covered lesions, no work restrictions are needed if the exposed HCP had previously received at least 1 dose of vaccine or received the first dose within 3--5 days post-exposure. A second dose should be administered at the appropriate interval. If at least 1 dose was not received, restriction from patient contact is recommended.

See Appendix A for a flow chart further describing management of exposures to VZV and postexposure prophylaxis recommendations.

Management of HCP with Illness due to VZV

Herpes Zoster (HZ)

- HCP with localized zoster are not likely to transmit infection to immunocompetent patients if their lesions can be covered. However, some institutions may exclude personnel with shingles from work until their lesions dry and crust.
- Because of the possibility of transmission to and development of severe illness in high-risk patients, HCP with localized zoster should not take care of such patients until all lesions are dry and crusted.

Varicella

- HCP who develop fever, skin lesions, or systemic symptoms suggestive of varicella after unprotected exposures should be excluded from healthcare settings until all lesions are crusted over or, if they develop lesions that do not crust (macules and papules only), until no new lesions appear within a 24-hour period.

Reporting Varicella in Chicago

All cases of primary varicella (chickenpox) must be reported to CDPH within 24 hours through Illinois' National Electronic Disease Surveillance System (I-NEDSS). Cases of shingles do not need to be reported. Healthcare facilities without access to I-NEDSS may report by using the online case report form: https://redcap.link/ChicagoVPDReport or by calling (312) 743-9000, Monday-Friday between 8:30am-4:30pm. After hours, weekends, and holidays, call 311 and ask for the communicable disease physician on-call.

References

1. Josephson A, Gombert M. Airborne transmission of nosocomial varicella from localized zoster. J Infect Dis 1988;158:238-41.
2. Centers for Disease Control and Prevention. Prevention of Varicella: Recommendations of the Advisory Committee on Immunizations Practices (ACIP). MMWR 2007;56(No.RR-4).

3. Centers for Disease Control and Prevention. Immunization of Health-Care Personnel: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep November 25, 2011; 60(No. RR-07); 1-45.
4. Centers for Disease Control and Prevention. Updated Recommendations for Use of VariZIG — United States, 2013. MMWR 2013;62(28);574-576. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6228a4.htm
5. Kimberlin D, Barnett E, Lynfield R, Sawyer M. Varicella-Zoster Virus Infections, Red Book: 2021–2024 Report of the Committee on Infectious Diseases, Committee on Infectious Diseases, American Academy of Pediatrics. 2021.

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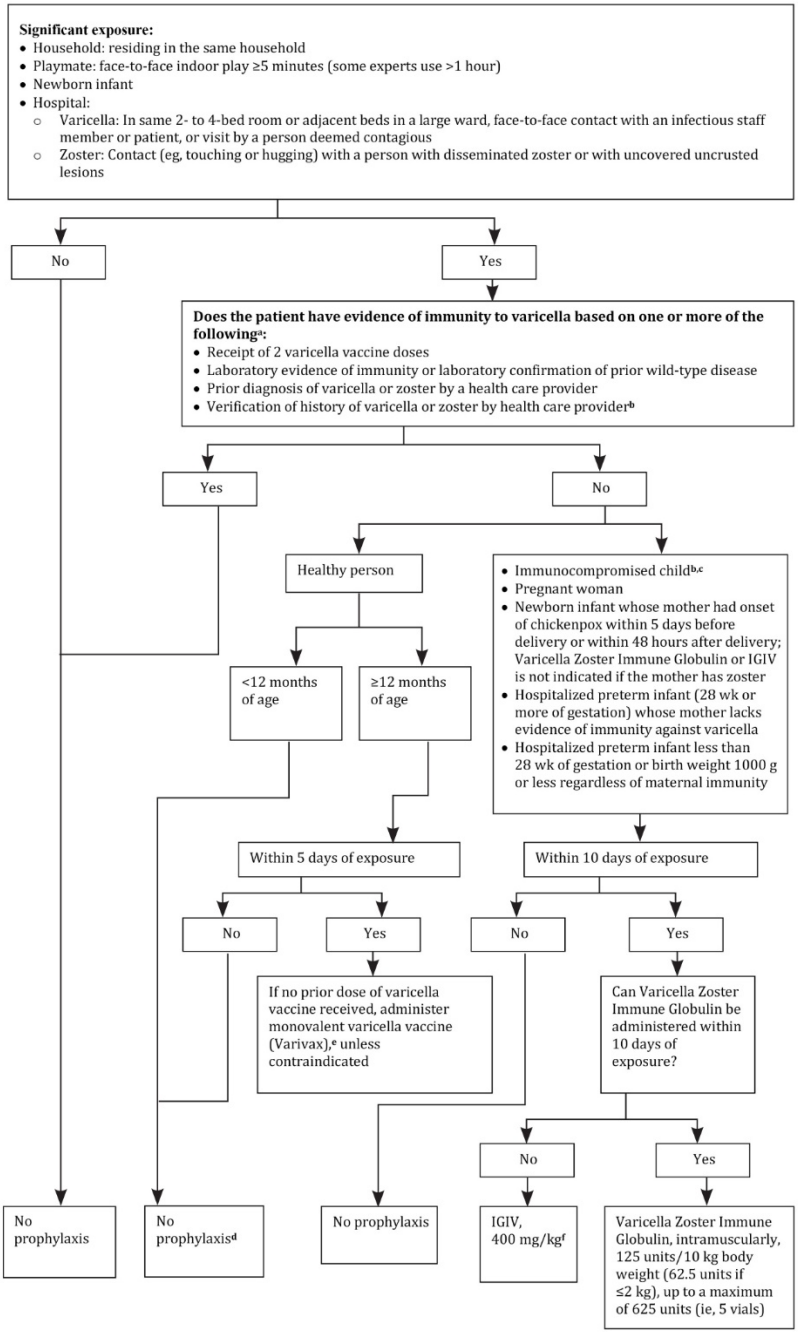
Appendix A: Management of Exposures to Varicella-Zoster[5]

(From 2021-2024 American Academy of Pediatrics Red Book)



IGIV indicates Immune Globulin Intravenous.

[a] People who receive hematopoietic stem cell transplants should be considered nonimmune regardless of previous history of varicella disease or varicella vaccination in themselves or in their donors.

[b] To verify a history of varicella vaccination in an immunocompromised child, health care providers should inquire about an epidemiologic link to another typical varicella case or to a laboratory confirmed case, or

evidence of laboratory confirmation. Immunocompromised children who have neither an epidemiologic link nor laboratory confirmation of varicella should not be considered as having history of disease.

[c] Immunocompromised children include those with congenital or acquired T-lymphocyte immunodeficiency, including leukemia, lymphoma, and other malignant neoplasms affecting the bone marrow or lymphatic system; children receiving immunosuppressive therapy, including ≥2 mg/kg/day of systemic prednisone (or its equivalent) for ≥14 days, and certain biologic response modifiers; all children with human immunodeficiency virus (HIV) infection regardless of CD4+ T-lymphocyte percentage; and all hematopoietic stem cell transplant patients regardless of pretransplant immunity status.

[d] If the exposed person is an adolescent or adult, has chronic illness, or there are other compelling reasons to try to avert varicella, some experts recommend preemptive therapy with oral acyclovir (20 mg/kg per dose administered 4 times per day, with a maximum daily dose of 3200 mg) or oral valacyclovir (if ≥3 months of age; 20 mg/kg per dose administered 3 times per day, with a maximum daily dose of 3000 mg) beginning 7 to 10 days after exposure and continuing for 7 days. If the child is ≥12 months of age, age-appropriate vaccination still is recommended for protection against subsequent exposures, but vaccine should not be administered while antiviral therapy is being administered; if the exposure occurred during an outbreak, 2-dose vaccination is recommended for preschool-aged children younger than 4 years for outbreak control.

[e] If 1 prior dose of varicella vaccine has been received, a second dose should be administered at ≥4 years of age. If the exposure occurred during an outbreak, a second dose is recommended for preschool-aged children younger than 4 years for outbreak control if at least 3 months have passed after the first dose.

[f] If VariZIG and IGIV are not available, some experts recommend preemptive therapy with oral acyclovir (20 mg/kg per dose, administered 4 times per day, with a maximum daily dose of 3200 mg) or oral valacyclovir (if ≥3 months of age; 20 mg/kg per dose, administered 3 times per day, with a maximum daily dose of 3000 mg) beginning 7 to 10 days after exposure and continuing for 7 days.