



Varicella Exposure Toolkit for Healthcare Settings



Arizona Department of Health Services



This toolkit was developed by Arizona Department of Health Services (ADHS) to assist various healthcare settings prepare for and address a varicella exposure in the state of Arizona. These recommendations were guided by the best available evidence and resources available. This toolkit is only a single piece of an infection prevention and control plan. Healthcare workers should use and incorporate other professional resources to develop a comprehensive infection prevention and control plan.



Arizona Department of Health Services

Office of Infectious Disease Services

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INTRODUCTION

With vaccination widely available, cases of varicella have significantly decreased. While this has led to fewer varicella exposures, they do still occur and should be appropriately handled to further reduce the burden of the disease. This toolkit addresses the management of varicella exposures in healthcare settings.

WHEN TO REPORT

Providers must submit a report to the [Local Health Department](#) within 5 working days after a case or suspect case is diagnosed, treated, or detected ([AAC R9-6-202](#)). Healthcare providers and institutions can report electronically using Arizona's [Medical Electronic Disease Surveillance Intelligence System](#) (MEDSIS) or by submitting a [Communicable Disease Report](#) to the appropriate Local Health Department.

VARICELLA EXPOSURES IN A HEALTHCARE FACILITY

Varicella can be transmitted in healthcare settings, which puts high risk groups such as immunocompromised patients, premature infants and pregnant women in danger of life threatening complications. Healthcare transmissions of varicella have been attributed to delayed diagnosis, reporting and implementation of control measures for varicella.

Once you have a known exposure of varicella in a healthcare facility the following should occur:

- Proper management of active varicella cases in the facility
- Identify possible exposures
- Implement control measures including:
 - o Exposure notification
 - o Management of persons without evidence of immunity (both staff and patients)
- Establish surveillance for additional cases

MANAGEMENT OF PATIENTS WITH ACTIVE VARICELLA

- Follow standard precautions plus airborne precautions (negative air-flow rooms) and contact precautions until lesions are dry and crusted
- If negative air-flow rooms are not available, patients with varicella should be isolated in closed rooms with no contact with persons without evidence of immunity
- Patients with varicella should be cared for by staff with evidence of immunity

[Additional information](#)

➤ What is a possible exposure?

- Direct face-to-face contact with an unmasked active varicella case OR
- Being in a confined space for 15 minutes* or more with an active varicella case

*This recommendation is based on guidance from CDC, The Red Book¹ and previously established practices in the State of Arizona.

These exposures could occur to either healthcare workers or patients in the facility at the time of the exposure.


As individuals who may have been exposed are identified, more information needs to be collected including:

- Immunity status
- High-risk status

Those who have either an unknown or no immunity to varicella will fall into two groups of prophylaxis recommendations.

- High-risk
 - Immunocompromised
 - Pregnant women
 - Infants
- Non-high risk

➤ Exposure Tracking

Identifying and tracking these possible exposures can be aided with the use of an exposure tracking form (click for example ).

➤ Exposure Notifications

These notifications can be completed via phone or mail. Examples of notifications:

- [Exposure notification \(English\)](#)
- [Exposure notification \(Spanish\)](#)

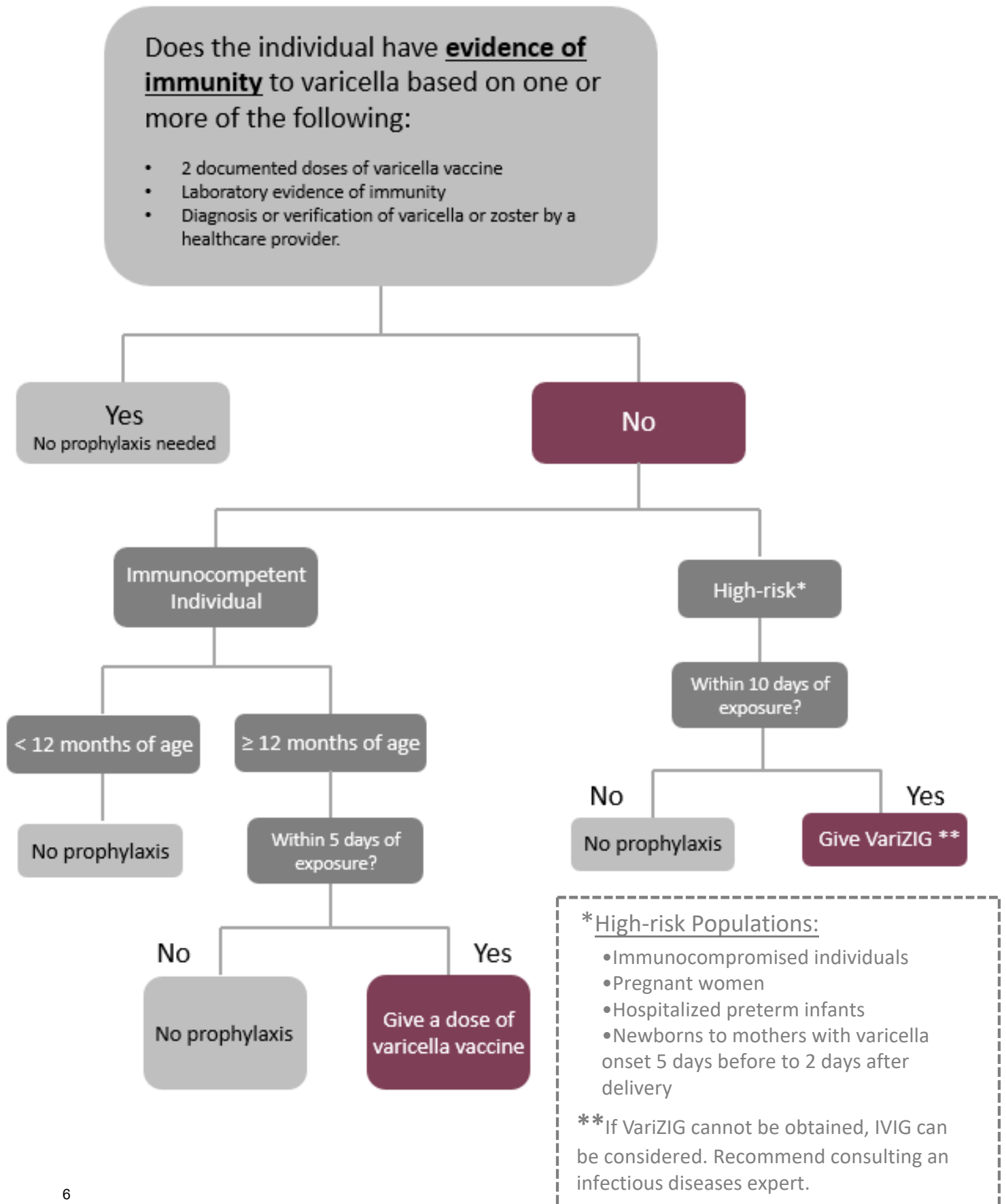
POSTEXPOSURE PROPHYLAXIS

Immunocompetent individuals who are 12 months or older and are without evidence of immunity should receive varicella vaccine within 5 days of exposure. Evidence of immunity is either two documented doses of varicella vaccine, laboratory evidence of immunity, or diagnosis/verification of history of varicella or zoster by a healthcare provider. Postexposure vaccination is recommended within 3 to 5 days but can still be offered greater than 5 days after exposure to protect against varicella in the future.

Certain populations at higher risk of developing complications of varicella should receive varicella zoster immune globulin (VariZIG), instead of varicella vaccine, within 10 days of exposure. These populations include:

- Immunocompromised individuals
- Pregnant women
- Newborn infants whose mothers had onset of varicella (but not zoster) within 5 days before delivery or within 48 hours after delivery
- Hospitalized preterm infants 28 weeks or more of gestation whose mothers lack evidence of immunity against varicella
- Hospitalized preterm infants less than 28 weeks of gestation or birth weight 1000g or less, regardless of maternal immunity

POSTEXPOSURE PROPHYLAXIS FLOWCHART



HEALTHCARE WORKERS

➤ **Vaccine Recommendations for Healthcare Personnel**

The Advisory Committee on Immunization Practices (ACIP), with support from the Hospital Infection Control Practices Advisory Committee (HICPAC), recommends that healthcare institutions ensure that all healthcare personnel have evidence of immunity against varicella. Healthcare personnel without evidence of immunity to varicella should receive 2 doses of varicella vaccine given 4 to 8 weeks apart. Further details are provided in the recommendations, linked below.

[Immunization of Health-Care Personnel](#)

➤ **Testing for Immunity**

Healthcare personnel without evidence of immunity against varicella may get serologic screening before being vaccinated. This is likely to be cost effective since 70% to 90% of adults who do not remember having varicella actually have antibodies in their blood. ACIP or HICPAC do not recommend that healthcare personnel get tested for immunity to varicella after 2 doses of vaccine. Commercial assays are not sensitive enough in all instances to detect antibodies after vaccination.

➤ **Transmission**

It is rare for vaccinated people to spread varicella vaccine virus, especially if they do not have rash. Since the varicella vaccine program started in 1995, only 8 vaccinated people have been documented as spreading vaccine virus to others. All of these vaccinated people had rash after vaccination. As a result, 9 people, including household members and people in long-term care facilities, got infected with varicella.

There has not been any documented transmission of varicella from vaccinated healthcare personnel.

➤ **Work Restrictions**

Healthcare workers with varicella should be excluded from work until lesions have crusted over.

Remember to [report](#) all cases of varicella, including health care workers with varicella, to the [Local Health Department](#).

Recently vaccinated healthcare personnel with no evidence of varicella-like rash do not require any restriction in their work activities. However, healthcare personnel who develop varicella-like rash after getting vaccinated should be excluded from work until lesions have

crusted over. If they develop lesions that do not crust (macules and papules only), they should wait until no new lesions appear within a 24 hour period.

➤ **Management of Healthcare Personnel Exposed to Varicella**

Healthcare personnel (HCP) who have evidence of immunity to varicella:

- Monitor for symptoms during postexposure days 8-21
- Remove from patient care if symptoms occur

HCP who have had 1 dose of varicella vaccine:

- Should receive second dose (if at least 4 weeks have elapsed since first dose)
- Monitor for symptoms during postexposure days 8-21
- Remove from patient care if symptoms occur

Unvaccinated HCP without other evidence of immunity to varicella:

- Should be temporarily furloughed or reassigned away from patient care during postexposure days 8-21
- Should receive postexposure vaccination as soon as possible
- Who are at high risk for complications of varicella and for whom varicella vaccination is contraindicated (e.g., pregnant healthcare personnel), are recommended to receive varicella-zoster immune globulin

[Additional Information](#)

APPENDICES

County Resources:

Contact your [county health department](#) for:

- Evaluation and classification of a possible clinical case
- Guidance for communicable disease reporting
- Specimen submission information
- Subject matter expertise

County	Phone Number
Apache	928-337-4364
Cochise	520-432-9400
Coconino	928-679-7272
Gila	928-402-8811
Graham	928-428-1962
Greenlee	928-865-2601
La Paz	928-669-1100
Maricopa	602-506-6767
Mohave	928-753-0714
Navajo	928-524-4750
Pima	520-724-7770
Pinal	520-866-7325
Santa Cruz	520-375-7900
Yavapai	928-771-3134
Yuma	928-317-4450

If you are unable to reach the local health department, please call the Arizona Department of Health Services at 602-364-3676.

Disease Description

Varicella (chickenpox) is a very contagious disease caused by the varicella-zoster virus (VZV). It causes a blister-like rash, itching, tiredness, and fever. The rash appears first on the stomach, back and face and can spread over the entire body causing between 250 and 500 itchy blisters. Chickenpox can have serious complications, especially in babies, adults, pregnant women, and people with weakened immune systems. The best way to prevent varicella is to be vaccinated with a varicella-containing vaccine.

Symptoms

The classic symptom of varicella is a rash that turns into itchy, fluid-filled blisters that eventually turn into scabs. The rash may first show up on the face, chest, and back then spread to the rest of the body, including inside the mouth, eyelids, or genital area. It usually takes about one week for all the blisters to become scabs.

Other typical symptoms that may begin to appear 1-2 days before rash include:

- fever
- tiredness
- loss of appetite
- headache

Complications from varicella include:

- secondary bacterial skin infections
- pneumonia
- encephalitis
- sepsis
- death

Transmission

Varicella is highly contagious among individuals who have never had the disease or received the vaccine. The virus spreads person to person through direct contact and airborne droplets. A person with varicella is contagious 1-2 days before rash onset until the blisters have scabbed over. It typically takes 10-21 days for a person to develop the illness after being exposed to a person with varicella.

Laboratory Test & Assessing Immunity

Although many varicella cases can be clinically diagnosed and do not require laboratory testing, there are certain scenarios where laboratory testing can be helpful. These include:

- Confirming varicella diagnosis as the cause of an outbreak
- Establishing varicella as the cause of death
- Determining the susceptibility to varicella

The most common types of laboratory testing are:

- PCR
- Serologic tests (IgM and IgG)

Assessing immunity

While a serological assay for IgM can indicate current or recent infection, an IgG serological assay can help assess immunity to varicella.

Varicella IgM → current or recent infections

Varicella IgG → Immunity from past infection or vaccination

For more information, please see the [lab table](#) below

Laboratory tests available for varicella confirmation.

Test	Specimen	Comments
PCR	Vesicular swabs or scrapings; scrapings from maculopapular lesions; scabs from crusted lesions; biopsy tissue	Very sensitive and specific for detecting VZV. Results rapidly available (within 3 hours). Real-time methods (not widely available and require special equipment) have been designed that distinguish vaccine strain from wild-type.
DFA	Vesicle scraping; swab of lesion base (must include cells)	Identifies VZV. More rapid and sensitive than culture. Less sensitive than PCR.
Tissue culture	Vesicular fluid; biopsy specimens from sterile sites (e.g., CSF, joint fluid)	Used to detect the presence of viable VZV. Culture is considerably less sensitive than VZV PCR. Requires up to a week for results.
Tzanck smear	Vesicle scraping; swab of lesion base (must include cells)	Detects multinucleated giant cells with inclusions. Diagnostic of alpha herpes viruses (VZV, herpes simplex viruses). Less sensitive than DFA.
IgM	Acute or convalescent serum specimens for VZV IgM	IgM is inconsistently detected, even among patients with PCR-confirmed disease. Not a reliable method for routine confirmation, especially in vaccinated persons, but a positive result in presence of varicella-like symptoms indicates current/recent VZV infection. However, positive results in the absence of clinical disease would not be considered confirmation of active varicella disease due to limits in specificity.
EIA	Acute and convalescent serum specimens for IgG	Requires special equipment. Specific but may not be sensitive enough to identify vaccine-induced immunity.
LA	Acute and convalescent serum specimens for IgG	Rapid (15 min). No special equipment needed. More sensitive but less specific than EIA. Can produce false-positive results.
IFA	Acute and convalescent serum specimens for IgG	Requires special equipment. Good sensitivity and specificity; however, accurate interpretation requires an experienced operator.
gpELISA	Acute and convalescent serum specimens for IgG	Highly specific and sensitive but not widely or commercially available. Suitable for evaluation of vaccine-induced seroconversion.

Abbreviations: CSF, cerebrospinal fluid; DFA, direct fluorescent antibody; EIA, enzyme immunoassay; gpELISA, glycoprotein-based enzyme-linked immunosorbent assay; IFA, indirect fluorescent antibody; LA, latex agglutination; PCR, polymerase chain reaction; VZV, varicella-zoster virus.

Example Exposure Event Worksheet
Infection Prevention/Occupational Health

Type of exposure:	Dates of exposure:	IC Notified	
Laboratory Evidence:	Suspect:	Confirmed:	
Unit/Location:			
Patient / Source Name:	MR #:	ADM/DC:	
History (Brief story):			
Notification:	Date	By Whom:	
County Health Department			
Occupational Health			
IP, Medical Director			
Dept. Directors			
CNO			
CMO			
QM Director			
Risk Mgmt.			
Other Physicians: See List			
Exposure Summary	How Many	Follow Up completed	Outcome
Employees Exposed (Occ. Health Responsibility)			
Patients Exposed (IP/MCPHD)			
Physicians/ LIP Exposed (IP/ Med Staff Services)			
Other			

Exposure Notification (English)

Chickenpox Exposure Notice

If you or your child were at the _____
(facility name/classroom name) **between** _____ (date/time) **and**
_____ (date/time), you or your child might have been exposed to the
chickenpox (varicella) virus.

Chickenpox is a highly contagious disease, but you may already be protected if you were ever immunized or if you ever had the disease before. Chickenpox was a very common childhood disease until recently, and most adults already had the disease as children.

The CDC recommends 2 doses of Varicella vaccine for healthy people aged 12 months and older, if they do not have evidence of immunity to varicella.

Chickenpox is spread primarily by coughing, sneezing, and direct contact with fluids from the nose, mouth, throat or lesions (the skin rash) of an infected person.

The symptoms of chickenpox are:

- Fever (1-2 days prior to rash)
- Malaise (feeling of being run down, tired, sick)
- Rash (may last 5-10 days)
- Itching

The rash can be seen and felt, and then appears as small fluid-filled blisters (vesicles). The blisters break and then scab over. A person with chickenpox is contagious until all the blisters have dried and crusted. It usually takes about 2 weeks before you start to feel sick after exposure, but may take as long as 21 days.

If you or your child develops these symptoms please contact your health provider immediately. If you need to visit a healthcare facility, please call them ahead of time so you don't expose other patients at the facility. Please keep your child home until fever-free for 24 hours and until all sores are crusted over.

Chickenpox can be more dangerous in a person whose immune system is compromised (such as by HIV infection), or in a pregnant woman near delivery. If you are such a person, even if you don't feel sick, please consult with your health care provider.

Exposure Notification (Spanish)

Aviso Sobre la Varicela

Si Ud. o su hijo(a) estuvo en **(facility/classroom name)** entre el **(date/time)** y el **(date/time)**, es posible que haya sido expuesto al virus de la varicela. La varicela es una enfermedad muy contagiosa. Es posible que ya esté protegido si se vacunó o si ya tuvo la enfermedad. La varicela ha sido hasta recientemente una enfermedad muy común de la niñez, y la mayoría de los adultos de hoy ya la tuvieron.

Los Centros para el Control y la Prevención de Enfermedades (los CDC) recomiendan que todas las personas sanas mayores de 12 meses de edad reciban 2 dosis de la vacuna si no se puede comprobar su inmunidad contra la varicela.

La varicela se transmite cuando una persona infectada estornuda o tose. También se transmite por contacto directo con secreciones de la nariz o boca de personas infectadas, o por contacto con las lesiones (ampollas) de varicela.

Los síntomas incluyen:

- Fiebre que empieza de 1 a 2 días antes del sarpullido
- Malestar general (cansancio, no sentirse bien)
- Erupciones en la piel que duran de 5 a 10 días
- Comezón

En el sarpullido de varicela se ven erupciones o manchas rojas en la piel primero, y luego salen pequeñas ampollas (vesículas) llenas de líquido. Éstas se revientan y forman costras. Una persona con varicela es contagiosa hasta que todas las ampollas se hayan formado costras secas. Por lo general los síntomas empiezan aproximadamente 15 días después de la exposición, pero en algunos casos tardan hasta 21 días en aparecer.

Si Ud. o si hijo tiene estos síntomas, comuníquese con un profesional médico inmediatamente. Si necesitan ir a un centro médico, llámeles de antemano para evitar la exposición de otros pacientes. El niño debe quedarse en casa hasta que pase 24 horas sin fiebre y tenga todas las lesiones completamente secas.

Si Ud. está embarazada o si tiene problemas del sistema inmunológico (por ejemplo el VIH), consulte con su doctor aunque no tenga síntomas, ya que la varicela puede ser más peligrosa en estos casos.

Additional Resources:

CDC:

About Chickenpox

<https://www.cdc.gov/chickenpox/about/index.html>

Prevention of Varicella (The Advisory Committee on Immunization Practices)

<https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5604a1.htm>

Varicella Vaccination

<https://www.cdc.gov/vaccines/vpd/varicella/hcp/recommendations.html>

Preventing Varicella in Health Care Settings

<https://www.cdc.gov/chickenpox/hcp/healthcare-setting.html>

Preventing Varicella-Zoster Virus (VZV) Transmission from Zoster in Healthcare Settings

<https://www.cdc.gov/shingles/hcp/HC-settings.html#patients>

Manual for the Surveillance of Vaccine-Preventable Diseases

<https://www.cdc.gov/vaccines/pubs/surv-manual/chpt17-varicella.html>

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>

¹Kimberlin, D., Brady, M., Jackson, M. and Long, S. (2018). *Red book*. 31st ed. Itasca: American Academy of Pediatrics.