PICNet
PROVINCIAL INFECTION CONTROL
NETWORK OF BRITISH COLUMBIA
A program of the Provincial Health Services Authority

Varicella Zoster Virus

Management in Health Care Settings

September, 2019

Contents

Introduction

Varicella is a unique viral illness caused by varicella-zoster virus (VZV). It is a vaccine preventable but non-reportable disease in British Columbia (BC). Varicella often affects health care environments and has significant impacts for both infection prevention and control (IPAC) and occupational health programs. If a significant exposure occurs, follow up and exclusion of patients and health care providers (HCP) is required.

The current BC Centre for Disease Control (BCCDC) Varicella guideline (http://www.bccdc.ca/health-professionals/clinical-resources/communicable-disease-control-manual/communicable-disease-control) was developed for public health purposes. To address the various issues caused by the presence of varicella in health care facilities, the Provincial Infection Control Network was asked to develop recommendations that address the management of the IPAC response to the different presentations of this illness. This document is meant to be used as a companion document for the Communicable Disease Control Manual varicella control guidelines.

Scope

This document gives guidance to the infection prevention and control precautions that are to be applied by all HCP and the management of patients suspected or confirmed to be infected with VZV. It is intended to provide guidance to Infection Prevention and Control (IPAC) and Occupational Health Professionals. These recommendations apply to all individuals carrying on activities in acute or long-term care facilities, including but not limited to employees, physicians, nurses, allied health, contract workers, students, post-graduate medical trainees, researchers, and volunteers. The term "health care provider" (HCP) is used in these recommendations to describe these individuals. These recommendations do not apply to visitors.

When training students or hiring contract workers, the health care setting should inform the responsible school/supplying agency that the school/agency is required to ensure their student/contractors are managed according to this protocol. A health authority is not required to screen volunteers for immunity to VZV, but information about immunity should be collected by the volunteer coordinators. In the case of a significant exposure, volunteers would be included as contacts and would be excluded from the health care setting if their immune status is unknown.

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Background

Varicella is a common childhood infection caused by varicella-zoster virus (VZV), a herpes virus. Following primary infection, the virus becomes latent, and may reactivate later as herpes zoster (shingles). Herpes zoster normally occurs in a limited area that follows a dermatome. In individuals with damaged immune systems, herpes zoster may be widespread (disseminated), causing serious illness. Varicella is highly contagious and spread by the airborne route and by direct contact with the skin lesions or oral secretions. Herpes zoster is spread by direct contact with lesions before they are crusted. Disseminated herpes zoster can also be spread by the airborne route. A susceptible individual exposed to a person with herpes zoster would develop primary varicella, not herpes zoster.

Among susceptible household contacts, attack rates are in the range of 65-87%.[1] Attack rates in other settings are less well documented, but are likely lower. Prior to varicella immunization programs in Canada, varicella developed most commonly in childhood, with 50% of children infected by 5 years of age and 90% by 12 years.[1,2] People from subtropical and tropical regions are less likely to acquire immunity in childhood and therefore are more susceptible as adults.[1]

The incubation period is usually 14-16 days (range 10-21 days) in immune-competent hosts, may be shorter in an immune-compromised host, and can be prolonged as long as 28 days after passive immunization against varicella.[1] Symptoms of varicella in healthy children include a generalized, vesicular, pruritic rash with a mild fever and systemic symptoms.[2] Infected individuals are infectious 1-2 days prior to onset of the rash, and continue to be infectious until the last lesion has crusted. Transmissibility may be prolonged in immune-compromised individuals.[1]

Severe complications can occur including secondary bacterial infection, thrombocytopenia, arthritis, hepatitis, pneumonia, meningitis or encephalitis. People who are at higher risk for severe complications include non-immune pregnant women, premature babies, and anyone with a compromised immune system (eg. leukemia, cystic fibrosis, solid organ transplant).[3,4]

About 5-10% of previously healthy children will develop complications, mainly as skin and soft tissue infections.[1,2]

Epidemiology

The epidemiology of varicella in BC has changed considerably, with a large decrease in varicella incidence since the introduction of the publicly funded varicella vaccine. Prior to routine introduction of varicella vaccine into the childhood immunization schedule, VZV caused up to 47,500 cases of varicella each year in BC. There were 17,000 visits to a physician, 172 hospitalizations and 1-2 deaths annually in BC due to varicella alone. The implementation of the publicly funded program in BC saw a decrease in varicella-related physician visits by 84%, and a 78% decrease in hospitalizations between 1994 and 2012. The greatest reduction was seen in children 0-9 years old, however, there have been evidence of indirect protection through reductions in the incidence of varicella in both infants and those 10 to 39 years of age.[3]

Routine varicella immunization (1 dose) began in 2004 with susceptible children at school entry and grade 6 (birth year cohorts 1993 and 1999). In 2005, routine immunization was provided for infants

at 12 months of age (infants born on or after January 1, 2004). A catch-up for children 18 to 48 months of age began that same year, with an active catch-up for these children in 2006 along with a catch-up for other susceptible children, adolescents, and adults at opportune health encounters (i.e., "universal varicella program").[3]

In 2012, the routine varicella immunization program was changed from 1 dose to 2 doses for children. The routine immunization program for children consists of 1 dose provided at 12 months of age and a second dose provided at school entry (4-6 years of age) with the second dose provided as MMRV. In addition, a second dose of varicella vaccine was provided to eligible grade 6 students (beginning in the 2012-2013 school year).[3]

Health care providers are at risk of exposure to and occupational acquisition of varicella, which may lead to further exposure of and transmission to staff and patients. Management of nosocomial outbreaks of varicella is costly. As early as 1988, estimates of the cost of a VZV outbreak were about US$9,000 - 19,000 and about US$41,000 - 56,000 for annual infection prevention and control costs related to VZV in US acute care hospitals.[5] A 1999 Canadian multicenter study estimated the total medical and societal costs of varicella to be $122.4 million yearly or $353.00 per individual case, 10 percent attributed to hospital-based medical care.[6,7]

Health Care Providers Evidence of Immunity and Vaccination Status

- For HCPs who grew up in a temperate climate, a self-reported history of VZV infection or herpes zoster after 12 months of age is accepted as evidence of immunity only if disease occurred before 2004.[1] This decision is based on studies demonstrating that the majority of HCPs who meet the criteria above have serologic evidence of immunity when tested, with a pooled positive predictive value of self-reported history of 95% (range 89 to 100%).[8,9,10]
- HCPs who give a negative or uncertain history of varicella or herpes zoster should be offered 2 doses of varicella-containing vaccine given at least 4 weeks apart. Decisions regarding obtaining a serology for these HCPs should be made in consultation with an Occupational Health Professional.
- HCPs who were born or grew up in tropical or subtropical climates, regardless of a self-reported history of past VZV infection, should be offered 2 doses of varicella-containing at least 4 weeks apart.[10,11] Decisions regarding obtaining a serology for these HCPs should be made in consultation with an Occupation Health Professional.
- HCPs with a documented history of physician diagnosed VZV infection after 12 months of age or positive serology for VZV are considered immune.
- HCPs with documentation of receipt of 2 doses of varicella-containing vaccine, given a minimum of four weeks apart, on or after their first birthday are considered immune.[11]
- HCPs with documentation of 1 dose of varicella-containing vaccine should receive the second dose (given at least 4 weeks apart from first dose).
- HCPs unable to provide documentation of having received 2 doses of varicella-containing vaccine should be offered 2 doses of varicella-containing at least 4 weeks apart. Serological testing is not useful in these cases. Serologic testing for immunity after immunization is not recommended for the general population. Currently available serologic tests for VZV IgG, although useful to determine natural immunity, are not sensitive enough to determine post-vaccine immunity.[11]

VZV Vaccination of Health Care Providers

VZV vaccine is effective in providing adults with long-term protection from serious VZV disease. HCPs with a negative or uncertain history of VZV infection should be offered vaccination using two doses of varicella-containing vaccine.[11]

When a HCP is pregnant, VZV immunization is contraindicated and should be deferred to the postpartum period.[13]

When a HCP has a medical contraindication to VZV immunization, the Occupational Health professional should assess the risk of varicella infection to the HCP and the risk of onward transmission of infection to their patients.

When a HCP declines immunization, the Health Occupational professional should explore their reasons for declination, and ensure informed refusal occurs including; ensuring the HCP is aware of both the benefits of immunization and risks associated with declination, including risk for transmission to patients and the HCP duty to care.

When considering whether restrictions are necessary for HCPs who cannot or will not be vaccinated, the Occupational Health professional should take into account the level of infection risk to the HCP and their patients, and the effect of redeployment on staffing levels, skill mix and therefore patient safety.

Decisions about restrictions should to be taken in conjunction with the HCP, their manager and the IPAC team at the site, while respecting the HCP's right to medical confidentiality.

Exposure Control and Personal Protective Equipment

Patients with confirmed or suspected localized herpes zoster are cared for under contact precautions, gloves and a gown if direct contact with the patient or environmental surfaces are likely. Patients with confirmed or suspected varicella or disseminated herpes zoster are cared for under airborne/contact precautions. In addition to gloves and gown, a fit-tested, seal checked N95 respirator is required, regardless of immune status. Immune visitors do not require respirators.

Only HCPs with evidence of immunity should be assigned to care for patients with varicella or herpes zoster. If a HCP attends such a patient, regardless of their immunity, the HCP must wear a fit-tested, seal-checked N95 respirator. This is a requirement of WorkSafe BC. Any worker that is at risk of exposure to an airborne infectious agent must be provided with and fit-tested for an N95.
If no immune HCPs are available and patient safety would be compromised by not allowing the susceptible HCP to attend to the patient, the susceptible HCPs must wear a fit-tested, seal-checked N95 respirator and eye protection to enter the patient care area.

Non-immune pregnant HCPs should never be assigned to care for a patient with varicella or herpes zoster.[13]

The patient should be out of the room for essential purposes only. The patient should wear a procedure mask and have skin lesions covered when out of the room.

Infection Prevention and Control and Occupational Health departments are to be notified of any confirmed patient/health care provider VZV case to ensure IPAC precautions are in place and

potentially exposed persons are notified and follow up occurs. If more than one individual on the same unit meet the criteria for a confirmed case, an outbreak may be a possibility.

Roles and Responsibilities For Exposure Follow-up

Infection Prevention and Control (IPAC), Occupational Health and Public Health work together to identify and follow-up with exposed patients, health care providers and other at risk individuals, if identified.

Generally, Infection Prevention and Control follows up with exposed in-patients, Occupational Health follow up with exposed health care providers and Public Health follows up with exposed patients who are now discharged or other exposed, high risk individuals who have been identified (eg. family, visitors).

Management of Health Care Provider Cases and Work Restrictions

Varicella:

- HCPs diagnosed with varicella should be excluded from the workplace until there are no new lesions and all lesions have crusted over.

Localized herpes zoster (localized shingles):

- HCPs diagnosed with localized herpes zoster on a part of the body that can be covered with a bandage and/or clothing should be allowed to work if they are clinically well.
- If they work with high-risk patients, an individual risk assessment should be carried out, to determine the appropriate action.[1]
    - The risk assessment should take into account the level of risk the infected HCP poses to the patients, the effect of redeployment on staffing levels, skill mix and therefore patient safety.
    - Restrictions or reassignment to work in an area without high-risk patients should be taken in conjunction with the HCP, their manager and the IPAC team at the site, while respecting the HCP's right to medical confidentiality.
- HCPs with localized herpes zoster lesions that cannot be covered or who are immunocompromised, should be excluded from the workplace until there are no new lesions and all lesions have crusted over.[1]

Disseminated herpes zoster:

- HCPs with disseminated herpes zoster, should be excluded from the workplace until there are no new lesions and all lesions have crusted over.[1]

Localized herpes zoster is often treated with oral antiviral agents. The decision by a clinician to treat cases of primary varicella infection using antiviral therapy, including the route and duration of treatment, is determined by host factors (e.g., immune-compromised), extent of infection, and the initial response to treatment. In the immunocompetent host, most viral replication has stopped within 72 hours of rash onset. Antivirals should be considered, however, for those at a moderate increased risk of complications, including pregnant women and susceptible people aged older than 12 years. Treatment is recommended within 24-48 hours of rash onset.

Individuals at high risk for complications of varicella disease are:

- those who are immunocompromised due to disease or therapy
- pregnant women
- those with cystic fibrosis
- candidates or recipients of a solid organ transplant or haematopoietic stem cell transplant
- those undergoing hemo or peritoneal dialysis
- those with nephrotic syndromes
- those on chronic salicylate therapy.

Management of Exposed Susceptible HCP

Significant exposure: The following types of contact are considered significant if exposure has occurred during a case's period of communicability:

- Exposure to an active case primary varicella, or a herpes zoster case prior within 24 hours of onset of antiviral treatment (if disseminated or in an immunocompromised host). Antivirals lessen severity of infection and duration of communicability.
- Continuous household contact (living in the same dwelling)
- Being indoors (e.g., classroom, doctor's waiting room) for more than 1 hour
- Sharing the same hospital room for more than 1 hour or having more than 15 minutes of face-to-face contact
- Touching the lesions or articles freshly soiled by discharge from vesicles of a person with active varicella or herpes zoster.
- Contact with dried scabs from varicella or herpes zoster lesions does not constitute exposure. Varicella and disseminated zoster are spread by direct or indirect contact with vesicle fluid, and by the airborne route.
- Surgical masks do not provide complete protection for a susceptible individual exposed to varicella or disseminated herpes zoster. Therefore, a susceptible individual could still have a significant exposure to an infectious patient, even if a mask is worn. Patients are infectious 1 to 2 days before onset of rash.[1,12]

HCPs who have received 2 doses of varicella-containing vaccine should be monitored during post-exposure days 8–21. They can be monitored directly by the occupational health program or infection prevention and control professionals or instructed to report fever, headache, or other constitutional symptoms and any atypical skin lesions immediately. If symptoms occur, the HCP should be immediately removed from patient care areas.

HCPs with documentation of 1 dose of varicella-containing vaccine should receive the second dose within five days after exposure after exposure (provided 4 weeks have elapsed after the first dose). After vaccination, management is the same as that of HCP who have received 2 doses of varicella vaccine.

If a susceptible HCP has a significant exposure to an active case of VZV while wearing a fit-tested, seal-checked N95 respirator and eye protection, the HCP should be monitored during post-exposure days 8–21. They can be monitored directly by an occupational health professional or instructed to report fever, headache, or other constitutional symptoms and any atypical skin lesions immediately. If symptoms occur, the HCP should be immediately removed from patient care areas.

Any HCP whose immune status is unknown and who has a significant exposure while not wearing appropriate PPE should be offered testing for the presence of VZV antibodies. If the HCP's immune status cannot be determined within 8 days of the exposure, the HCP is considered susceptible and should be restricted from work until results are obtained.

Susceptible exposed HCPs are excluded from any work in the health care setting from 8 days after the first exposure until 21 days after the last exposure. If clinical varicella develops during that period, the HCP should remain off work until all lesions are dried and crusted.

Susceptible exposed HCPs that receive VZIG may still develop VZV infection and should be monitored from day 8-28 post exposure. They should be monitored directly by the occupational health professional or instructed to report fever, headache, or other constitutional symptoms and any atypical skin lesions immediately. If symptoms occur, the HCP should be immediately removed from patient care areas.

Varicella vaccine is 90% effective in preventing or modifying severity of varicella if given within five days of exposure. [1] If the exposure does not result in infection, post-exposure vaccination should induce protection against subsequent exposures. The second dose should be given at least 4 weeks later if illness does not develop. Since illness may still occur, the post-exposure vaccinated HCP should remain off work from day 8 after the first exposure until day 21 after the last exposure.

Pregnant HCPs exposed to varicella or herpes zoster should be assessed by an occupational health professional or other appropriate health care professional as to the need for varicella zoster immunoglobulin (VZIG).

Management of Patients in Health Care Settings

Patient are considered contacts if they have been exposed with someone known to have varicella during the period of communicability:

- Continuous household contact (living in the same dwelling)
- Sharing the same hospital room for at least 1 hour
- Face-to-face contact (within 2 metres) for at least 15 minutes
- Direct contact with varicella vesicular fluid to a mucous membrane.

Post-exposure management of patients exposed to a confirmed case of varicella includes:

- Confirmation of diagnosis.
- Notification of Infection Prevention and Control.
- Identification of patients exposed and determination of immunity status for VZV.
- Discharge of all exposed susceptible patients as soon as possible. If discharge is not possible, place susceptible patients on Airborne and Contact Precautions from days 8 through days 21 post exposure. Extend to 28 days, if VZIG is given.
- If patient immune status is unknown, serology should be ordered for VZV IgG. If negative serology, post-exposure immunization can be started within 3 to 5 days of exposure.
- Immunization is contraindicated for susceptible pregnant women or immunocompromised individuals with congenital, acquired immunodeficiency disease, or immunosuppression due to disease or therapy. This includes persons receiving corticosteroid therapy who are taking a high dose systemic steroid (≥ two mg/kg per day or ≥ 20 mg per day) when given for more than two weeks. Prophylaxis with Varicella Zoster Immune Globulin (VZIG) is indicated and is be given within 96 hours of exposure as this may prevent or modify disease in susceptible close contacts. Further details can be found in Appendix 1.

Exposed nonimmune patients should be considered potentially infectious 8 days after first exposure to 21 days after last exposure (28 days if VZIG was given) and be on Airborne and Contact Precautions during that time.

Patients with confirmed or a clinical case of varicella are placed on Airborne and Contact Precautions during the period of communicability (people are contagious from 2 days before the rash until all skin lesions have crusted). They should be cared for in a negative pressure isolation room. If a negative pressure room is not available, use a single room with door closed.

Patients who develop a herpes zoster infection require assessment by a physician. If it is determined that the infection is limited to a single dermatome, the patient should be placed on Contact Precautions until all skin lesions are crusted. A single room is not required. Patients who develop herpes zoster infection in multiple dermatomes are likely more infectious. Infection prevention and control should be consulted regarding the need for Airborne Precautions. Patients who develop disseminated herpes zoster require both Airborne and Contact Precautions until all skin lesions are crusted.

Airborne precautions should be taken for neonates born to mothers with varicella onset < 5 days before delivery. As it is assumed that neonates are susceptible to VZV, these patients would receive VZIG, so precautions should continue until discharged from hospital or 28 days from birth (whichever is earlier).

Pregnant women exposed to a confirmed case of VZV with an uncertain history of VZV or who do not have documentation of receiving two doses of VZV vaccine require evaluation for the need for VZIG on a case-by-case basis. Consultation with an Infectious Disease Specialist is recommended.

If a confirmed case of VZV was not on appropriate precautions while attending a healthcare setting, a review of the patient population that was potentially exposed by Infection Prevention and Control is warranted. Any vulnerable or high-risk patients should be identified as soon as possible and follow up provided to ensure they are offered immunization/VZIG or treatment as appropriate. High-risk patients include persons >65 years, persons with chronic pulmonary or cardiovascular conditions, persons with chronic conditions such as diabetes and other metabolic diseases, cancer, immunodeficiency (including HIV), immunosuppression, renal disease, hemoglobinopathy and anemia.

Case Definition

Individual cases of varicella are not reported to Public Health in BC. Only outbreaks are to be reported to Public Health. An outbreak should be suspected if more than one case of varicella occurs within a patient population that are epidemiologically linked in place and time.

CONFIRMED CASE

Clinical evidence of illness and laboratory confirmation of infection:

- direct antigen detection of varicella-zoster virus (VZV) from an appropriate clinical specimen

OR

- detection of VZV DNA from an appropriate clinical specimen

OR

- seroconversion or a significant rise (i.e. fourfold or greater) by any standard serologic assay in varicella-zoster IgG titre between acute and convalescent sera

OR

- clinical diagnosed illness in a person with an epidemiologic link to a laboratory-confirmed case of varicella or VZV infection

Glossary

Acute care facility: An Acute Care facility is a hospital where lengths of stay average < 30 days, and where a variety of services are provided, including surgery and intensive care

Health care provider (HCPs): person who has direct contact with patients, including both clinical and non-clinical health care providers as defined below:

- *Clinical health care providers* have regular clinical contact with patients and are directly involved in patient care. This includes doctors, dentists, midwives, nurses, health care aids, paramedics, ambulance drivers, occupational therapists, physiotherapists and radiographers. Students and trainees in these disciplines and volunteers who are working with patients are also included.
- *Non-clinical health care providers* are staff in health care settings who may have social contact with patients but are not directly involved in patient care. This group includes receptionists, ward clerks, porters and housekeepers, whether employed directly or through contract.

Long-term care facility: A long-term care facility provides 24-hour professional supervision and care in a protective, supportive environment for people who have complex care needs and can no longer be cared for in their own homes or in an assisted living residence.

Occupational health professional: person who has received formal training and/or a recognized qualification in either occupational medicine or occupational health.

Susceptible to VZV: person at risk of developing VZV infection as having no antibodies to VZV. This is usually because the individual has not had varicella and has not been vaccinated.

Temperate Climate:
The part of the earth's surface lying between the tropic of Cancer and the Arctic Circle in the Northern hemisphere or between the tropic of Capricorn and the Antarctic Circle in the Southern Hemisphere, and characterized by having a climate that is warm in the summer, cold in the winter, and moderate in the spring and fall.

Subtropical and Tropical Climate:

The part of the earth's surface lying between the tropic of Cancer in the Northern hemisphere and the tropic of Capricorn in the Southern hemisphere.
Immunocompromised: person with weakened immunity because of disease, e.g. HIV disease and some cancers, or treatment with immunosuppressant drugs or radiation.

High-risk persons: person who is at high risk of developing complications if infected with VZV. People who are at higher risk for severe complications include pregnant women, infants, unvaccinated and previously unexposed elderly and anyone with a compromised immune system (eg. leukemia, cystic fibrosis, HIV).

Significant exposure: three aspects of the exposure are relevant:

1. *Type of varicella-zoster infection in index case*: varicella, or the following: disseminated herpes zoster, immunocompetent individuals with exposed lesions (e.g. ophthalmic zoster) or immuno-suppressed patients with localized zoster on any part of the body (in whom viral shedding may be greater).

2. *The timing of the exposure in relation to onset of rash in index case*: exposure to a case of varicella or disseminated herpes zoster between 48 hours before onset of rash until cropping has ceased and crusting of all lesions, or day of onset of rash until crusting for those exposed to localised zoster.
3. *Closeness and duration of contact*: The following should be used as a guide to the type of exposure (other than maternal):

    - contact in the same room (e.g. in a 2–4 bed hospital room) for a significant period of time (1 hour or more)
    - face-to-face contact (within two metres), for example while having a conversation for at least 15 minutes
    - direct contact with fluid from vesicles to mucous membrane
    - in the case of large open wards, air-borne transmission at a distance has occasionally been reported.

Appendix 1: Guidance for Prophylaxis with Varicella Zoster Immune Globulin (VZIG)

Alberta Health Services (Public Health Notifiable Disease Management Guidelines)	Center for Disease Control and Prevention
Varicella-zoster Immune globulin (VZIG) may be administered to non-immune individuals who are at high-risk for severe disease. VZIG should be administered as soon as possible after exposure and preferably within 96 hours of exposure for the greatest effectiveness. It may be given up to 10 days after exposure but attenuation of disease is likely to decrease as the length of time between exposure and administration of VZIG increases. VZIG should be considered for: • newborns whose mothers develop varicella within five days prior to delivery up to 48 hours after delivery • immunocompromised individuals with congenital, acquired immunodeficiency disease, or immunosuppression due to disease or therapy. This includes persons receiving corticosteroid therapy who are taking a high dose systemic steroid (≥ two mg/kg per day or ≥ 20 mg per day) when given for more than two weeks. • hospitalized premature infants exposed during the first four weeks of life. If less than 28 weeks gestation, give VZIG regardless of maternal status. • exposed infants of 29 – 37 weeks gestation if the mother was not immune at the time of birth, and • exposed pregnant women who have never had varicella disease, shingles, or varicella vaccine. They are at risk of complications and should be offered VZIG. It should be noted that there is no evidence that VZIG will prevent or alter disease in the fetus.	For people exposed to varicella or herpes zoster who cannot receive varicella vaccine, varicella-zoster immune globulin can prevent varicella from developing or lessen the severity of the disease. Varicella-zoster immune globulin (VZIG) is recommended for people who cannot receive the vaccine and 1) who lack evidence of immunity to varicella, 2) whose exposure is likely to result in infection, and 3) are at high risk for severe varicella. VZIG be administered as soon as possible after exposure and within 10 days. Patient groups recommended by CDC to receive varicella-zoster immune globulin include: • Immunocompromised patients without evidence of immunity. • Newborn infants whose mothers have signs and symptoms of varicella around the time of delivery (i.e., 5 days before to 2 days after). • Hospitalized premature infants born at ≥28 weeks of gestation whose mothers do not have evidence of immunity to varicella. • Hospitalized premature infants born at <28 weeks of gestation or who weigh ≤1,000 g at birth, regardless of their mothers' evidence of immunity to varicella.

Note: VZIG is **not** required for: • persons receiving regular monthly infusions of ≥ 400 mg/kg of intravenous immunoglobulin (IVIg) and • those whose most recent dose of IVIg was within the three weeks before exposure. If a second exposure occurs more than three weeks after the administration of VZIG in a recipient in whom varicella did not develop, another dose of VZIG should be considered. **https://open.alberta.ca/dataset/35d7f99e-a724-44f2-bea3-46c40be11eb9/resource/9b146ef3-e73f-424c-8111-90f82120dd7d/download/guidelines-varicella-chickenpox-2014.pdf**	• Pregnant women without evidence of immunity. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6228a4.htm *Acyclovir Treatment* The American Academy of Pediatrics (AAP) recommends that certain groups at increased risk for moderate to severe varicella be considered for oral acyclovir or valacyclovir treatment. These high risk groups include: • Healthy people older than 12 years of age • People with chronic cutaneous or pulmonary disorders • People receiving long-term salicylate therapy • People receiving short, intermittent, or aerosolized courses of corticosteroids **https://www.cdc.gov/chickenpox/hcp/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fchickenpox%2Fhcp%2Fhealthcare-setting.html#high-risk-people**

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