

VARICELLA

Disease Overview

Varicella (chickenpox) and herpes zoster (shingles) are both caused by varicella/herpes zoster virus (VZV). Varicella is the primary infection and is a reportable disease. Herpes zoster is the reactivation of the virus and is not reportable. Varicella is highly contagious; however it is a vaccine preventable disease.

Symptoms

Symptoms of varicella include fever accompanied by generalized, pruritic, maculopapulovesicular rash (a smooth skin rash or redness covered by elevated bumps) typically with 250-500 skin lesions in different stages of development. The lesions progress from maculopapular (few hours), to vesicular and pustular (3-4 days), and finally to crusts leaving granular scabs. The lesions generally appear sequentially in crops for 3-7 days so that there may be varying stages of maturity at the same time. The severity of the disease can range from a mild rash to severe febrile illness with disseminated internal involvement. Serious complications include pneumonia, encephalitis, hemorrhagic complications, and death. Secondary bacterial infection can lead to septicemia or necrotizing fasciitis. Fetal infection from exposure of nonimmune mothers to the virus can lead to congenital varicella syndrome and death.

Breakthrough or modified varicella disease is a varicella infection occurring after an exposure to a wild-type virus and more than 42 days post immunization. This infection is generally milder with individuals developing fewer than 50 skin lesions (commonly atypical, with papules that do not progress to vesicles), experiencing a shorter duration of illness, and having a lower incidence of fever compared to those with natural infection who are unvaccinated.

Reservoir

Humans.

Mode of Transmission

Varicella is spread person to person by direct contact, droplet or airborne spread of vesicle fluid or respiratory tract secretions or from vesicle fluid of a person with herpes zoster. The disease can also be spread indirectly via articles freshly soiled with drainage from vesicles and mucous membranes from infected individuals. Varicella scabs are not infective. Non immune pregnant mothers can pass the virus to their fetuses and newborn children.

Incubation period

The incubation period for varicella is generally 14-16 days but can be as short as 10 days and as long as 21 days. This time period can be prolonged to 28 days after passive immunization against varicella or shortened if immunodeficient.

Period Communicability

The period of communicability for varicella is 1-2 days prior to onset of rash and continues until all lesions are crusted which is usually 5 days after rash onset. Individuals with herpes zoster are infectious while they have vesiculopustular lesions (usually 7-10 days). Susceptible exposed individuals should be considered potentially infectious for 8-21 days after exposure (or 28 days if they received passive immunization).

Risk Factors

Individuals who have not been previously infected or vaccinated are susceptible to varicella. Infants, adolescents, adults, immunocompromised individuals, and pregnant women are at higher risk for development of severe disease and complications. Neonates whose mothers are not immune and individuals with leukemia may develop severe, prolonged, or fatal varicella.

Surveillance Case Definition

Confirmed Case

Clinical evidence of illness and laboratory confirmation of infection:

- Isolation or direct antigen detection of varicella-zoster virus (VZV) from an appropriate clinical specimen.
- OR
- Detection of VZV DNA.
- OR
- Seroconversion or a significant rise (e.g., fourfold, or greater) by any standard serologic assay in varicella-zoster IgG titre between acute and convalescent sera.
- OR
- Positive serologic test for varicella-zoster IgM antibody.
- OR
- Clinical evidence of illness in a person with an epidemiologic link to a laboratory-confirmed case of chickenpox or VZV infection.

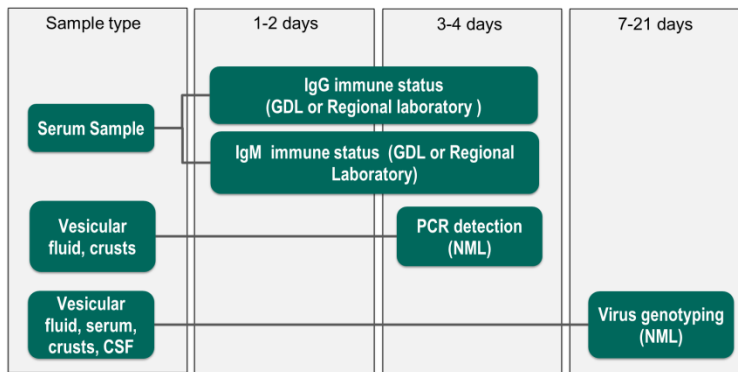
Diagnosis and Laboratory Guidelines

The main diagnostic tests for varicella are serological assays and PCR for viral DNA. The anti-IgM assay can be done up to three months after the initial rash. The serology for IgM and IgG should be collected within 7-10 days of the rash and repeated 2-3 weeks after the first acute sample.

PCR can be performed on vesicular fluid or crusts (scabs). It detects the genetic material of the virus. Viral culture can be done at the Dr. Georges-L.-Dumont University Hospital Centre microbiology laboratory, but it has to be approved by a microbiologist. This technique may take up to a week before yielding a result. In some circumstances, genotyping of the virus may be needed to differentiate the wild type virus and the vaccine virus.

In New Brunswick, serological tests are available in some regional labs and at the GDL microbiological laboratory. PCR and viral culture is only done at the GDL laboratory. The virus genotyping is only done at the National Microbiology Laboratory in Winnipeg.

Figure 1: Timeline for receipt of results for varicella laboratory tests in New Brunswick.



Reporting

Per Policy 2.2 Disease and Event Notification to OCMOH and Disease and Event Reporting section.

- Routine Surveillance (RDSS) for all confirmed cases.

Case Management

Education

- Provide information on disease, symptoms, and length of the communicable period.
- Advise on hand washing, cough etiquette, exposure prevention.

Investigation

Obtain immunization history, investigate source of infection, and contact identification.

Exclusion/Social Distancing

Exclude individual from school/daycare/work until he/she feels well enough to return to school/daycare/work.

If in a healthcare setting, adhere to applicable infection control policies.

Immunization

Varicella disease typically provides life-long immunity; therefore, there is no need to vaccinate individuals who have laboratory confirmed disease.

Treatment

Antiviral therapy is moderately effective.

Contact Management

Education

Educate about:

- signs and symptoms of the disease.
- the incubation period.
- the importance of immunization for susceptible immunocompetent individuals.

Investigation

Promptly evaluate all contacts to determine the requirement for post exposure prophylaxis. Refer to *Canadian Immunization Guide- active vaccines –varicella* for definition of significant exposures.

Recommend that exposed susceptible high risk contacts (those with diseases which compromise the immune system; recently received immune suppressive treatment-including but not limited to certain cancer drugs and radiation therapy; recently taking oral corticosteroid medication for more than two weeks; and pregnancy) should see a physician as soon as possible to review options for post exposure prophylaxis (immunoglobulin therapy or antiviral treatment). Persons taking inhaled corticosteroids (treatment for asthma) or topical corticosteroids are **not** at greater risk and do not necessarily need to see a physician. Individuals exposed to chickenpox who have received a bone marrow transplant should see a physician immediately, regardless of whether or not they have had chickenpox or been vaccinated in the past.

NOTE: A self-reported history and/or a health care provider diagnosis of varicella disease occurring before 2004 are considered a reliable correlate of immunity. If varicella disease occurred on or after 2004, neither a self-reported history nor health care provider diagnosis can be considered a reliable correlate of immunity; a laboratory confirmed diagnosis of varicella/ herpes zoster is necessary for individuals experiencing varicella disease on or after 2004.

Prophylaxis

Chemoprophylaxis:

Antiviral drugs such as acyclovir appear beneficial in preventing or modifying varicella in exposed persons if administered within 7-10 days of exposure for duration of 7 days.

Immunoprophylaxis:

The varicella vaccine is included in the publicly funded childhood immunization program. The vaccine has been shown to be effective in preventing or reducing the severity of chickenpox in people who have been exposed to the virus if it is given within 3 days, and possibly up to 5 days, after exposure. People who have previously had chickenpox or who have already received chickenpox vaccine are usually immune to the disease (unless they have received a bone marrow transplant) and need not be vaccinated.

Varicella vaccine is contraindicated:

- Immunocompromised persons (blood disorders, leukemia, lymphoma, malignant neoplasms affecting the bone marrow or lymphatic systems; HIV infection {single antigen varicella vaccine can be considered}; and immunosuppressive therapy (includes systemic steroids within the previous month). Refer to Canadian Immunization Guide (CIG) - active vaccines –varicella vaccination for immunocompromised persons.
- History of anaphylactic reactions to any component of the vaccine.
- Pregnancy (also, pregnancy should be avoided for 4 weeks following vaccination).
- Acute severe illness.
- History of congenital immune disorders in first-degree relatives unless the immune competence of potential vaccine recipient has been shown.

Passive immunization with varicella –zoster immune globulin can be given to exposed susceptible individuals who cannot receive the vaccine (immunocompromised, neonates whose mothers develop varicella within 5 days prior to or 2 days following delivery, premature infants, and pregnant women). This effectively modifies or prevents the disease if administered as soon as possible following exposure, but may be effective if given up to 10 days post exposure.

Varicella post-exposure management for susceptible * individuals

Post-exposure intervention	Individual		
	Healthy, non-pregnant (12 months of age** and older)	Pregnant	Immunocompromised ****
Vaccinate with varicella vaccine	Yes	No	No
Check VZV IgG	No	Yes	Yes
If VZV IgG negative, administer Varlg ***	Not applicable	Yes	Yes

*Refer to CIG- susceptibility and immunity for definition of susceptible.

**Refer to CIG varicella zoster immune globulin for information regarding newborns of mothers who develop varicella during the 5 days before to 48 hours after delivery.

***If serology results cannot be obtained within 96 hours, Varlg should be administered.

****In case of hematopoietic stem cell transplant (HSCT), administer Varlg regardless of VZV IgG result.

Outbreak Management

Activate the local outbreak plan when an outbreak is declared.