VARICELLA

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 (i.e. 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

* Not done in Nova Scotia

PROBABLE CASE
Clinical evidence of illness in the absence of laboratory confirmation or epidemiologic link to a laboratory confirmed case.

Causative agent
Human (alpha) herpes virus 3, varicella-zoster virus (VZV).
The virus persists in a latent form in the body and reactivation of the virus years later may result in herpes zoster infection (shingles).

Source
Humans

Incubation
14-16 days; can be as early as 10 days or as late as 21 days
Transmission

• Transmission is person-to-person by direct contact, droplet or airborne spread of vesicle fluid or secretions from the respiratory tract of cases.

• Rarely, transmission can occur from direct contact with fluid in shingles lesions.

• Indirect transmission may occur through articles freshly soiled by discharges from vesicles or respiratory secretions, e.g., linens or towels.

Communicability

• Can be up to 4 days but usually 1-2 days before the onset of rash.

• The highest quantity of VZV DNA in the throat has been found to be on day one of the rash.

• Transmission risk seems to be greatest in the day before onset of the rash.

• In immunocompetent individuals most virus replication has stopped by 72 hours.

• Immunocompromised individuals may be contagious during the period that new lesions are appearing.

Symptoms

• Rash may be maculopapular initially and then change to a generalized, pruritic, vesicular rash which leaves a granular scab. Vesicles commonly occur in successive crops, with several stages of maturity present at the same time. Lesions may appear anywhere on the body and sometimes on mucous membranes.

• There can be a prodromal period or accompanying fever, malaise and upper respiratory infection.

• In adults and immunosuppressed individuals, symptoms may be more severe.

• In milder cases, symptoms may be mild and there may be few vesicles. This may also be evident in breakthrough disease.

Diagnostic testing

• All done through CDHA Laboratory

• Vesicle fluid, swab [viral culture or PCR]

• Vesicle scraping [unfixed] for direct fluorescent antibody [vigorous scraping of the base of the vesicle is needed]

• For more information, see PPHLN Provincial Microbiology User’s Manual
• No serology is available for diagnosis of acute infection. IgG is available for immune status only.

**Treatment**

• Supportive care.

• Antivirals can be used to treat varicella infection, but they are not routinely used in healthy people. Recommended for individuals at high risk of complications if they can be initiated within 24 hours after the appearance of the rash.

**PUBLIC HEALTH MANAGEMENT & RESPONSE**

**Case management**

*Educating the case and family:*

• Discuss treatment, if prescribed.

• If the case is a child or adolescent, ensure that parents/guardians are aware that salicylates, including ASA and aspirin, should NOT be used in the management of varicella symptoms because of the risk of Reye's syndrome, which is a severe illness that can damage the liver and brain. Advise on the use of acetaminophen or ibuprofen for fever and discomfort.

• Discuss how transmission can be limited (airborne, droplet, direct and indirect contact).

• Launder clothing and linens used by infected individual, especially if soiled by respiratory secretions.

*If the case attends a child care or school setting:*

• Children with illness may remain in or return to daycare or school, as long as they are well enough to participate normally in all activities.

• Parents/guardians, particularly parents/guardians of immunosuppressed children, should be notified that varicella is in the class/day care and provided with information on the incubation period and signs and symptoms of varicella.

*If the case resides in an institution:*

Health care facilities should deal with confirmed cases of varicella based on their own guidelines.

Airborne and droplet precautions are recommended for residents with varicella for a minimum of 5 days after the onset of the rash and as long as the rash remains vesicular.
Contact Tracing

• Identify and follow up susceptible non-immune contacts.
• Contact: anyone who shared the same airspace with a case during the infectious period (48 hours before to 5 days after onset of rash.)
• Susceptible contacts should be considered potentially infectious from 8-21 days following exposure. Provide information on the incubation period and signs and symptoms of varicella.

Prophylaxis

• Susceptible contacts of cases can be given varicella vaccine. If administered within three to five days after exposure, it is likely to prevent or reduce the severity of disease.

• Varicella zoster immune globulin (VZIG) is recommended for susceptible individuals (listed below), for whom varicella vaccine is contraindicated. VZIG is not effective once symptoms develop.

CANDIDATES FOR VZIG:

1. Susceptible Contacts

For maximal benefit, varicella zoster immune globulin (VZIG) should be administered as soon as possible after exposure, ideally within 96 hours after first exposure, but can be administered up to 10 days after last exposure. When given more than 96 hours after exposure, its primary purpose may be attenuation rather than prevention of disease. VZIG is recommended for the following susceptible contacts, providing significant exposure* has occurred. These individuals are at high risk of developing complications from varicella infection.

a) Immunocompromised children, adolescents and adults.

b) Newborns of mothers who develop varicella between 5 days before delivery and 48 hours after delivery.

c) Susceptible non-immune pregnant women.

*2. Significant exposure

Persons with varicella are considered contagious from 2 days before onset of the rash to 5 days thereafter or until crusting of lesions. Skin lesions of shingles are infectious only until the eruption has crusted and dried. The following contact situations are considered significant exposures to varicella:

• Continuous household contact (living in the same dwelling).
• Being indoors for more than 1 hour with a case of varicella.
• Sharing the same hospital room for more than one hour with a patient with varicella.
• Face-to-face contact [of more than 15 minutes] of a worker or staff member with an individual with varicella.
• Touching the lesions of a person with active varicella or shingles.

3. Information about VZIG

• This protocol outlines the process to access VZIG:

1. Obtain Medical Officer of Health approval for release of all immunoglobulin. After hours access for the MOH on-call: phone QEII locating at 902-473-2222.

2. Requests that can be submitted within regular business hours through the provincial biodepot:

   Please call 902-481-5800 and ask to speak to the Biodepot Immunization Coordinator or Provincial Biological Coordinator. They will arrange pickup and shipment of the required product from Canadian Blood Services (CBS) following established procedures.

3. Urgent requests after hours to access VZIG product held at CBS [when administration is required before the next business day] for:

   • Delivery to the Public Health Office
     • Please see novascotia.ca/dhw/cdpc/documents/Immunization-Manual.pdf
     • Complete the form titled: Volume expanders/Immune globulin/intravenous/subcutaneous immune globulins order form.
     • Be sure to select STAT as the priority.
     • Fax the form to 1-855-305-6904 [in Halifax area 902-480-5677] and call CBS at 1-855-352-5663 [in Halifax area 902-480-5678].
     • Identify the appropriate Public Health office from the approved list for the delivery.
     • Ensure someone is available to receive the product when delivered.
     • Track the issue/administration of the VZIG on the Immune Globulin Release Tracking Record and enter into ANDS.

• Delivery to Hospital Blood Bank for Administration by Hospital staff.
  • If decided the VZIG is to be administered within the hospital setting, the hospital staff [ER physician usually] will contact the hospital blood bank to request immunoglobulin STAT from CBS.
Significant exposure to case of Varicella

Verify diagnosis of Varicella (ask questions)

Is exposed individual a candidate for VZIG

Determine susceptibility of exposed individual - past history or record of antibody testing

- Not susceptible (immune)
  - No further action

- Susceptible
  - Varicella IgG result.
    - NO
      - Give Varicella Zoster Immune Globulin
    - YES
      - Immune
        - No further action
      - Not immune
        - Varicella IgG result.
          - NO
            - Not immune
              - No further action
          - YES
            - Immune
              - No further action
**Exclusion**

- Children with illness may remain in school or daycare, or should be allowed to return, as long as they are well enough to participate normally in all activities, regardless of the state of the rash.

- In circumstances when an immunocompromised individual is present in the facility, the immunocompromised individual should be excluded (not the case) and referred to their physician. Rationale: other individuals in the facility may be incubating varicella creating further potential exposures. This decision is made on a case-by-case basis.

- Air travel is not recommended until lesions have crusted due to the recirculation of cabin air. If inadvertent exposure occurs during air travel, no follow-up of contacts will take place.

- Swimming in public pools is not recommended until lesions have healed and crusts are no longer present to avoid exposing susceptible individuals.

- Exclude non-immune health care workers from day 8 to day 21 following last exposure.

**Education**

- If a susceptible pregnant woman or a susceptible immunocompromised individual comes in contact with chickenpox, they should contact their health care provider for consideration of VZIG.
<table>
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<tr>
<th></th>
<th>Varicella, wild-type (chicken pox)</th>
<th>Breakthrough disease (vaccine-modified)</th>
<th>Post-varicella vaccine rash</th>
<th>Shingles (Herpes Zoster, HZV)</th>
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<tr>
<td><strong>Comparing</strong></td>
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<td><strong>Distinguishing</strong></td>
<td>Vesicular (fluid-filled) rash.</td>
<td>Maculopapular rash occurring more than 42 days after varicella vaccine.</td>
<td>Varicella-like rash occurring 0 to 42 days after varicella vaccine.</td>
<td>Grouped vesicular eruptions in the distribution of a sensory nerve (dermatome). Thoracic dermatome affected in 50% of cases. Occasionally can become disseminated and lesions can occur outside the primary dermatomes.</td>
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<td><strong>Characteristics</strong></td>
<td>Maculopapules (reddened areas with small, solid bumps), vesicles and scabs in varying stages of evolution.</td>
<td>Usually mild with less than 50 lesions.</td>
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<td><strong>Signs and symptoms</strong></td>
<td>May be mild or severe. Mild prodrome (fever, malaise and upper respiratory tract infection) may precede rash by 1–2 days. Prodrome does not usually occur in children. Generalized, pruritic (itchy), vesicular (fluid-filled) rash typically consisting of 200 – 500 lesions, mild fever and general malaise. Lesions tend to develop on the trunk and face, progress to extremities. Ulcerated lesions may be present on mucous membranes. Much more severe in adolescents and adults.</td>
<td>A mild illness with usually &lt;50 lesions (usually maculopapular rather than vesicular). Systemic symptoms such as fever occur less frequently. Shorter duration.</td>
<td>Localized varicella-like rash at the injection site or some individuals will develop a small number of generalized varicella-like papules or vesicles. Generalized rash is more likely to be vaccine-associated if there is also a local reaction at the injection site.</td>
<td>75% have prodromal neuropathic pain within dermatome which may precede lesions by days to weeks. Grouped vesicular lesions appear in 1 to 3 sensory dermatomes (often unilateral but can be bilateral). Symptoms and lesions tend to resolve in 7–10 days. Is usually benign and not associated with pain in children but tingling may be present. Approximately 30% of elderly will have postherpetic neuralgia.</td>
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<td><strong>Mode of Transmission</strong></td>
<td>Person-to-person by direct contact, droplet or airborne spread of vesicle fluid or secretions of the respiratory tract of cases. Direct contact with vesicle fluid of persons with shingles. Indirectly by touching articles soiled by discharges from vesicles and mucous membranes of cases. Up to 90% of susceptible children exposed to VZV will develop disease.</td>
<td>Person-to-person by direct contact, droplet or airborne spread of vesicle fluid or secretions of the respiratory tract of cases. Contact can be months or years post immunization.</td>
<td>Can occur from 0–42 days after vaccine but usually within 5–26 days.</td>
<td>Direct contact with fluid in vesicle or respiratory droplets can cause varicella (not shingles) in susceptible persons. Respiratory droplet transmission can occur in patients with disseminated shingles and/or who are immunocompromised. The lifetime risk of having at least one episode of herpes zoster is 15–28% occurring predominantly in older adults and rarely, in children.</td>
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### Varicella, wild-type [chicken pox]

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<thead>
<tr>
<th>Incubation Period</th>
<th>10–21 days (commonly 14 to 16 days).</th>
<th>10–21 days (commonly 14 to 16 days).</th>
<th>N/A</th>
<th>VZV remains latent for a few to many years and then reactivates.</th>
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<tr>
<th>Period of Communicability</th>
<th>Usually 1–2 days and up to 4 days before the onset of the rash until all lesions are crusted over (3–5 days). May be longer in immunocompromised persons.</th>
<th>Same as varicella.</th>
<th>N/A</th>
<th>For 7 days after rash appears.</th>
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<tr>
<th>Risk of Transmission</th>
<th>Transmission rates can be high.</th>
<th>Rare but likely increases with number of lesions that develop.</th>
<th>Rarely transmissible.</th>
<th>The fluid in shingles vesicles contains VZV but is much less contagious than varicella.</th>
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<tr>
<th>Occurrence of disease after immunization</th>
<th>See vaccine-modified disease.</th>
<th>Vaccine is 70–90% effective in preventing all varicella disease. Up to 4% per year will develop vaccine-modified disease if exposed to VZV outside a household setting and up to 20% will develop disease if exposed to VZV in a household setting.</th>
<th>Localized or generalized varicella-like rash occurs in 6-10% of people after 1st dose and 1-2% after 2nd dose.</th>
<th>Shingles vaccine efficacy study results range from 51–70% for disease and postherpetic neuralgia depending on age. In studies done so far, duration of protection is 4–7 years. A varicella-like rash can occur at the injection site (0.11 %) Neither wild type nor vaccine strain varicella virus has been identified from any lesions and no cases of disseminated vesicular disease caused by the vaccine virus have been observed.</th>
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</table>

| Recurrence after natural varicella infection | Recovery from primary varicella infection usually results in lifetime immunity. Clinical re-infections have been reported usually in children who were less than one year of age at first infection and/or had a milder first infection. | Vaccine is 70–90% effective in preventing all varicella disease. Up to 4% per year will develop vaccine-modified disease if exposed to VZV outside a household setting and up to 20% will develop disease if exposed to VZV in a household setting. | Localized or generalized varicella-like rash occurs in 6-10% of people after 1st dose and 1-2% after 2nd dose. | The lifetime risk of herpes zoster is 15 to 28%. Approximately 6% of people will experience one or more recurrent episodes. |
No surveillance guidelines (not reportable)

**VZIG Information Sheet**

**General Information Sheet**

**Sample Letter**

REFERENCES


Epidemiology and Prevention of Vaccine-Preventable Diseases 12th edition U.S. Department of Health and Human Services May 2011


*Updated Recommendations for use of the varicella zoster immune globulin (VarIg) for the prevention of varicella in at-risk patients* National Advisory Committee on Immunization [NACI] Advisory Committee Statement April 2015