VARICELLA ZOSTER VIRUS (VZV)

Chickenpox/Shingles

Primary infection with varicella-zoster virus (VZV) results in the development of chickenpox. VZV remains latent in the dorsal root ganglia during primary infection.

Reactivation of the virus results in the development of herpes zoster (shingles). A second episode of chickenpox rarely occurs.

Chickenpox (Varicella)

Cause/Epidemiology

Chickenpox is caused by the human herpes virus – varicella zoster virus. It appears worldwide, and infection with the virus is nearly universal. Chickenpox is commonly considered a disease of childhood, with approximately 95% of individuals in industrialized countries having had chickenpox by age 15. Epidemics are most common in late winter and early spring, with children between the ages of 5 and 9 accounting for 50% of all cases.

Clinical Presentation

Prior to the onset of chickenpox rash, patient/resident/client (P/R/C) may experience a mild fever and symptoms of generalized malaise. Occasionally in adults, the fever and generalized symptoms may be severe in nature.

Chickenpox is characterized by a generalized, pruritic (itchy), vesicular rash, typically consisting of 200 – 500 lesions. The rash is itchy and maculopapular for a few hours and subsequently becomes vesicular and leaves scabs. Alternatively, the lesions may be so few in number as to escape detection.

Examples of a typical Chickenpox rash

Note: maculopapular lesions
Chickenpox lesions may occur in successive crops, with several stages of maturity present at the same time. The lesions tend to be more abundant on covered parts of the body, and may appear on the scalp, axilla, mucous membranes/mouth, upper respiratory tract, and on the conjunctivae.

**Potential Complications of Chickenpox**

- bacterial super-infection of skin lesions
- arthritis
- cerebellar ataxia
- meningitis
- streptococcal disease (increasing)
- thrombocytopenia
- hepatitis
- encephalitis
- glomerulonephritis
- pneumonia**

**most common complication in adults**

**Prevention/Treatment Options**

Varicella vaccine is a live-attenuated vaccine, and is licensed for use in Canada in healthy persons >12 months of age, who have not had chickenpox. The development of chickenpox infection in vaccine recipients is milder than that occurring in unimmunized individuals. At times, the disease is so mild in vaccine recipients that it is not easily recognizable, and this may lead to them being potentially infectious to susceptible persons.

Varicella-Zoster immune globulin (VarIg) is indicated for susceptible exposed individuals whose immune systems are either too young, or weak to fight the disease. When VarIg is indicated, it should be given
within 96 hours of exposure to VZV. The administration of VarIg does not always prevent the disease from occurring in susceptible exposed contacts.

Chickenpox infection may be treated with antiviral medications, although these drugs have a limited window of opportunity to affect the infection outcome. Specific host factors, extent of infection and initial response to therapy must be taken into consideration before proceeding with antiviral treatment. Antiviral treatment should be considered for persons >12 years of age; persons with chronic cutaneous or pulmonary disorders; persons receiving long-term salicylate therapy and persons receiving short-term, intermittent, or aerosolized courses of corticosteroids.

**Incubation Period**

The incubation period ranges from 10 – 21 days, with the usual being 14 – 16 days after exposure. This period may be prolonged for up to 28 days if VarIg has been administered.

**Transmission**

Person-to-person transmission occurs primarily by direct contact and airborne spread. Persons are most contagious for 1 to 2 days before and shortly after the onset of rash. Communicability however, can persist until crusting of lesions which typically occurs in 5 days. In an immunocompromised P/R/C, with progressive varicella, contagiousness likely lasts throughout the period of eruption of new lesions.

**Infection Prevention & Control Practices**


**Active Chickenpox** – Implement Airborne and Contact Precautions for P/R/C with active chickenpox disease. Refer to the Management of Communicable Diseases in Personal Care Homes Table, section 8 for specific disease/microorganism information - [http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec08.pdf](http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec08.pdf). Refer to Airborne/Contact Precautions in the Additional Precautions section 5 - [http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec05.pdf#page=13](http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec05.pdf#page=13).

**Susceptible Contact** – Implement Airborne Precautions from 8 days after first contact until 21 days after last contact with rash (28 days if given VarIg) for a P/R/C that is a susceptible contact to chickenpox. Refer to the Management of Communicable Diseases in Personal Care Homes Table, section 8 for specific disease/microorganism information - [http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec08.pdf](http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec08.pdf). Refer to Airborne Precautions in the Additional Precautions section 5 - [http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec05.pdf#page=4](http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec05.pdf#page=4).
Outpatients – Outpatients and day hospital patients should be advised to notify staff if they develop chickenpox and are scheduled to come to a health care facility when their lesions are not yet all crusted and dried. If they develop a chickenpox rash within 48 hours of leaving, notification should also occur.

Visitors – Visitors who are active cases of chickenpox should not enter a health care facility until all lesions have crusted and dried. If there are any questions regarding this issue, Infection Prevention and Control can be consulted to provide assistance.

Health Care Workers – Cases who are health care workers should be advised to immediately notify Occupational Health and/or Infection Prevention and Control and in consultation with them determine when it is appropriate to return to work.

Occupational Health Considerations

Definition of Occupational Exposure – a susceptible healthcare worker who has been in an enclosed airspace, or had face-to-face contact with an infectious person during the period of communicability (2 days before onset of symptoms and until all lesions have dried and crusted). Exposure can also occur through direct or indirect contact of vesicle fluid with oral or nasal membranes of healthcare workers.

Exposed Healthcare Worker

- Determine healthcare workers’ immune status
- Consider immune if:
  - History of varicella or herpes zoster, or
  - Physician/parent diagnosed illness, or
  - Documentation of two doses of varicella vaccine one month apart, or
  - Varicella immune titre
- Exposed susceptible healthcare workers shall contact Occupational Health/designate for clinical management
- Pregnant or susceptible immunocompromised healthcare workers shall be referred for clinical management within 96 hours of exposure
- Exposed susceptible healthcare workers shall be excluded from work from day 8 after first exposure to day 21 after last exposure

Symptomatic/Infected Healthcare Worker

- Physician confirmed diagnosis
- Inform Infection Prevention & Control immediately if suspected or confirmed case of chickenpox
- Healthcare workers shall be referred to Occupational Health/designate for clinical management
- Healthcare workers shall be excluded from work until all lesions are dry and crusted with no new lesions evident

If a post-varicella immunization rash or lesions develop, Occupational Health/designate should assess healthcare workers.
Shingles (Herpes Zoster)

Cause/Epidemiology

Reactivation of varicella zoster virus (VZV) later in life results in the development of herpes zoster infection (shingles). It is not known what precipitates shingles episodes, but they are more common among the elderly, and those who are immunocompromised. Furthermore, the immunocompromised patient/resident/client (P/R/C) is at increased risk of developing severe disease.

Clinical Presentation

Prior to the appearance of shingles rash, the P/R/C may experience headache, photophobia (sensitivity to bright light), and generalized malaise.

The appearance of shingles rash is commonly grouped vesicular lesions, in the distribution of 1 to 3 sensory dermatomes. The rash most commonly appears on the trunk along a thoracic dermatome, and is often accompanied by localized pain, pruritis, and tingling sensation.

Localized zoster is vesicles that appear along a single or associated group of nerve roots. The lesions appear in crops, in an irregular fashion along the nerve root.

Disseminated zoster is vesicles that appear along more than one nerve pathway with lesions appearing outside the primary dermatomes and with visceral complications. Shingles infections can occasionally become disseminated in immunocompromised patients. Adults with cancer - especially of lymphoid tissue, with or without steroid therapy – immunodeficient patients and those on immunosuppressive therapy may have an increased frequency of severe zoster.

Shingles associated rash usually lasts 7 – 10 days, and heals within 2 – 4 weeks

Examples of a typical Shingles rash

Potential Complications of Shingles

- acute neuritis (inflammation of a nerve or group of nerve characterized by pain, loss of reflexes, and atrophy of the affected muscles)
- postherpetic neuralgia (persistent neuropathic pain after the eruption is healed that persists >1 month)
- zoster opthalmicus (sight threatening eye infection)
- CNS infection
- nerve palsy (e.g.: Guillain-Barre Syndrome)
- secondary bacterial infections

**Prevention/Treatment Options**

Herpes Zoster infections may be treated with antiviral medications. The decision to use antiviral therapy, and the duration and route of therapy should be determined by specific host factors, extent of infection and initial response to therapy. To achieve maximum efficacy, antiviral treatment should be initiated early in the course of illness; especially within 24 hours of rash onset.

**Incubation Period**

The incubation period is 10 – 21 days following exposure.

**Transmission**

Non-immune persons, or those who have never had primary varicella zoster (chickenpox), may develop primary infection (chickenpox) from contact with localized zoster (shingles). In immunocompromised patients with localized or disseminated zoster and any patient with disseminated zoster, transmission occurs by airborne spread and from contact with zoster lesions.

**Infection Prevention and Control Practices**


**Disseminated** – Implement Airborne and Contact Precautions for a P/R/C with disseminated shingles. Refer to the Management of Communicable Diseases in Personal Care Homes Table, section 8 for specific disease/microorganism information - [http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec08.pdf](http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec08.pdf). Refer to Airborne/Contact Precautions in the Additional Precautions section 5 - [http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec05.pdf#page=13](http://www.wrha.mb.ca/extranet/ipc/files/manuals/ltc/ManualPCH_Sec05.pdf#page=13).

Non-Extensive Localized in the Normal Host – Follow Routine Practices for a P/R/C with non-extensive localized shingles.

Outpatients – Outpatients and day-surgery patients should be advised to notify staff if they develop herpes zoster and are scheduled to come to a health care facility when their lesions are not yet all crusted and dried.

Visitors – Visitors who are active cases of herpes zoster should not enter a health care facility until all lesions have crusted and dried. If lesions are localized and can be covered, Infection Prevention and Control should be consulted to determine if a visit should occur.

Health Care Workers – Cases who are health care workers should be advised to immediately notify Occupational Health and/or Infection Prevention and Control for the facility/regional program in which they work and in consultation with them determine when it is appropriate to return to work.

Occupational Health Considerations

Definition of Occupational Exposure – a susceptible healthcare worker who has had direct or indirect contact of oral or nasal mucous membranes with the vesicle fluid of an infectious person during the period of communicability (until the lesions are dried and have crusted).

Disseminated Herpes Zoster – a susceptible healthcare worker who has been in an enclosed airspace with an infectious person or had face-to-face contact with an infectious person during period of communicability (until the lesions have dried and have crusted).

Exposed Healthcare Worker

- Determine healthcare workers’ immune status
- Consider immune if
  - Physician/parent diagnosed illness, or
  - Documentation of varicella immune titre, or
  - Two doses of varicella-virus vaccine one month apart
• Exposed, susceptible healthcare workers shall contact Occupational Health for clinical management
• Pregnant or susceptible immunocompromised healthcare workers shall be referred for clinical management within 96 hours of exposure
• Exposed susceptible healthcare workers shall be excluded from work from day 8 after first exposure to day 21 after last exposure

**Symptomatic/Infected Healthcare Worker**

• Physician confirmed diagnosis
• Inform Infection Prevention & Control immediately if suspected or confirmed case of shingles
• Healthcare workers shall be referred to Occupational Health for clinical management
• Healthcare workers shall be excluded from work if unable to cover lesions with occlusive dressing and clothing
• If disseminated zoster, healthcare workers shall be excluded from work until lesions have dried and crusted.
REFERENCES

1. WRHA Acute Care Infection Control Manual (February 2008). *Specific Disease Protocol 4.1 Chickenpox (Varicella)*


6. WRHA Acute Care Infection Control Manual (February 2008). *Specific Disease Protocol 4.2 Shingles (Herpes Zoster)*

