

## VARICELLA-ZOSTER VIRUS (Chickenpox and Shingles) PROTOCOL

### 1. Introduction

Varicella-Zoster Virus (VZV) is a highly contagious virus. Primary infection with VZV results in chickenpox, also known as Varicella. With chickenpox, VZV disseminates to the nervous system, where it remains dormant.<sup>[4.11]</sup> Reactivation of the virus results in shingles, also known as Herpes Zoster.<sup>[4.5, 4.8]</sup> In other words, VZV causes chickenpox in a susceptible person, then remains dormant in that person and can later cause shingles in the same person. Shingles cannot be passed from one person to another. However, the Varicella-Zoster Virus (VZV) can spread from a person with active shingles to cause chickenpox in a susceptible person.<sup>[4.1, 4.8]</sup>

### 2. Chickenpox (Varicella)

#### 2.1. Cause/Epidemiology

Chickenpox is sometimes called “Varicella”. Chickenpox is caused by the Varicella-Zoster Virus. It appears worldwide, and infection with the virus is nearly universal. Chickenpox is commonly considered a disease of childhood. Epidemics are most common in late winter and early spring, with 50% of all cases in children between the ages of 5 and 9. In most cases, people do not get chickenpox a second time.

#### 2.2. Clinical Presentation

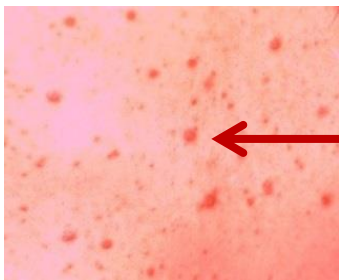
Before the onset of chickenpox rash, symptoms may include a mild fever and malaise.

In children, the rash is often the first sign of disease.

In adults, the fever and malaise may occasionally be severe.

Chickenpox is characterized by a generalized, pruritic (itchy), vesicular (small fluid filled sacs) rash, typically consisting of numerous (200 – 500) lesions. The rash is itchy and maculopapular (macules [small, flat, red areas] and papules [small, red raised lesions]) for a few hours and then becomes vesicular followed by scabbing. However, lesions may be so few that they are not noticed.

#### 2.3. Images of Typical Chickenpox Rashes



First few hours. Note: maculopapular lesions



Note: vesicular lesions



Note: scabbed lesions

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



## 2.4. Potential Complications of Chickenpox

- Bacterial infection of skin lesions
- Arthritis
- Cerebellar ataxia
- Meningitis
- Streptococcal disease (increasing)
- Thrombocytopenia
- Hepatitis
- Encephalitis
- Glomerulonephritis
- Pneumonia (most common complication in adults)

In immune compromised children, progressive severe chickenpox is characterized by continuing eruptions of lesions and a high fever into the second week of the illness. Encephalitis, hepatitis, or pneumonia can develop.

Severe and even fatal chickenpox has been reported in otherwise healthy children who take an intermittent course of corticosteroids for treatment of asthma and other illnesses. Taking corticosteroids during the incubation period increases the risk of severe chickenpox.

Maternal chicken pox infection in the first 20 weeks of pregnancy causes congenital varicella syndrome. This is occasionally associated with abnormalities in the newborn including low birth weight, limb atrophy, skin scarring, localized muscular atrophy, encephalitis, cortical atrophy, chorioretinitis and microcephaly. Maternal chickenpox in the five days before to two days after birth is associated with severe neonatal chickenpox in 17% to 30% of infants, with a high fatality rate. <sup>[4.11]</sup>

## 2.5. Prevention

Chickenpox is a vaccine preventable disease. Chickenpox vaccine is a live-attenuated vaccine. It is licensed for use in Canada in healthy people over 12 months of age, who have not had chickenpox. Its efficacy in children is estimated to be 94.4% after a single dose and 98.3% after a second dose. Occasionally chickenpox can develop in vaccinated people and is correlated to the time since immunization and inversely related to number of doses received. <sup>[4.12]</sup> When it does occur, it is generally milder than in unimmunized people. At times, the disease is so mild in vaccine recipients it is not easily recognizable, and this may lead to transmission to susceptible persons.

Varicella-Zoster immune globulin is recommended for individuals who are at increased risk of severe chickenpox if significant exposure has occurred. These individuals include\*:

- Susceptible pregnant women; <sup>[4.8]</sup>
- Newborn infants of mothers who develop chickenpox from 5 days before until 48 hours after delivery;
- Selected neonates in neonatal or pediatric intensive care settings;
- Susceptible immune compromised people, including susceptible HIV infected persons and hematopoietic stem cell transplantation recipients. <sup>[4.8]</sup>
- For maximal benefit, Varicella-Zoster immune globulin should be administered as soon as possible after exposure, ideally within 96 hours after the first exposure, but it can be administered up to 10 days after last exposure. Varicella-Zoster immune globulin can prevent or decrease severity of chickenpox in those at high risk of severe disease. <sup>[4.8]</sup>



## 2.6. Treatment

Chickenpox is sometimes treated with Antiviral medications.  
Treatment often focuses on relieving symptoms.

## 2.7. Incubation Period

The incubation period ranges from 10 – 21 days, <sup>[4.7]</sup> and is usually 14 – 16 days after exposure. <sup>[4.1]</sup> This period is prolonged for up to 28 days if Varicella-Zoster immune globulin has been administered. <sup>[4.7]</sup>

## 2.8. Transmission

Chickenpox is spread by the airborne route and by direct contact with skin lesions. It can also be spread by indirect contact through items such as those freshly soiled by lesion discharge. Chickenpox can also be transmitted in utero. <sup>[4.11]</sup> People are most contagious for 1 to 2 days before and shortly after the onset of rash. Communicability lasts until lesions crust, which often occurs in 5 days. An immune compromised person can continue to have new lesions after initial lesions crust and is likely to remain contagious while affected. People infected with chickenpox generally become immune to chickenpox, but they are at risk of developing shingles later in life.

## 2.9. Infection Prevention and Control Measures

Active Chickenpox – Implement Airborne and Contact Precautions for a person with active chickenpox disease. Maintain Precautions until all lesions are crusted and dried. Healthcare workers, roommates and caregivers should be immune to chickenpox.

Susceptible High Risk Contacts -Request susceptible high risk contacts be assessed for suitability to receive Varicella-Zoster immune globulin as soon as possible.  
Implement Airborne Precautions for neonates born to mothers with chickenpox onset <5 days before delivery. Prevent exposure of susceptible and immunosuppressed people.

Susceptible Contact – One who has no history of Varicella illness, immunization or being VZV IgG seropositive and exposed to a person with chickenpox or disseminated shingles. Implement Airborne Precautions from 8 days after first contact until 21 days after last contact with rash (28 days if given Varicella-Zoster immune globulin). <sup>[4.7]</sup>  
Healthcare workers, roommates and visitors should be immune to chickenpox. <sup>[4.7]</sup>

Outpatients – Advise outpatients to notify staff if:

- they develop chickenpox and are scheduled to come to a health care facility when their lesions are not all crusted and dried.
- they develop a chickenpox rash within 48 hours of leaving the facility.

Vaccinated people with a rash - Avoid contact with high-risk people for up to 6 weeks after being vaccinated. <sup>[4.3]</sup> High-risk is defined as an immune compromised state, pregnant women who are VZV IgG seronegative, and newborns < 28 days of age.

Visitors with Active Chickenpox shall not enter a health care facility until all lesions have crusted and dried. For exceptional situations, consult site ICP for assistance.

Visitors who are Susceptible Contacts, as described above, should not enter a health care facility. Such visitors must wear a surgical mask if they need to visit during the incubation period (10-21 days, 28 days if given Varicella-Zoster immune globulin). Consult site Infection Control Professional (ICP) for assistance with such visits.

## 2.10. Occupational and Environmental Safety and Health (OESH)

Contact Occupational & Environmental Safety & Health (OESH) for staff assessment &/or concerns.

### 3. Shingles (Herpes Zoster)

#### 3.1. Cause/Epidemiology

Shingles is sometimes called “Herpes Zoster” or “Zoster”. Shingles is the secondary infection due to the reactivation of dormant Varicella-Zoster Virus. The reason shingles occurs is not known. Shingles is more common in the elderly, and those who are immune compromised.

Shingles can be more severe in immune compromised people. Adults with cancer (especially of lymphoid tissue, with or without steroid therapy), immune compromised people, and those on immunosuppressive therapy may have an increased incidence of severe shingles.

#### 3.2. Clinical Presentation <sup>[4.8]</sup>

A shingles rash appears as vesicular lesions, along dermatomes. (See [Appendix A: Dermatome Chart](#) for illustration). The rash is usually painful, itchy or tingly. These symptoms may precede rash by days to weeks. Some people may also have headache, photophobia (sensitivity to bright light) and malaise in the prodromal phase. The rash develops into clusters of vesicles. New vesicles continue to form over three to five days and progressively dry and crust over. They usually heal in two to four weeks. There may be permanent pigmentation changes and scarring on the skin. <sup>[4.8]</sup>

**Localized Zoster:** A shingles rash in one or two adjacent [dermatomes](#). Most often, the rash appears on the trunk along a thoracic dermatome. The rash does not usually cross the body's midline. <sup>[4.8]</sup>

**Disseminated Zoster:** A shingles rash in three or more [dermatomes](#). <sup>[4.8]</sup>

#### 3.3. Image of a Typical Shingles Rash



Note: lesions along dermatome

### 3.4. 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 ophthalmicus (sight threatening eye infection)
- CNS infection
- Nerve palsy (e.g., Guillain-Barre Syndrome)
- Secondary bacterial infections

### 3.5. Prevention/Treatment Options

Herpes zoster infections may be treated with antiviral medications. Pain medicine, wet compresses, lotion or colloidal oatmeal baths may help relieve itching.

### 3.6. Incubation Period

The mechanism of VZV reactivation that results in herpes zoster is unknown.

### 3.7. Transmission

Transmission is via the Contact route for Localized Shingles. Transmission may be via the Airborne or Contact route for Disseminated Shingles. People do not “catch shingles”. A person not immune to chickenpox may develop chickenpox from exposure to shingles.

### 3.8. Period of Communicability

Disseminated Shingles: If immune competent: Until all lesions have crusted and dried. If immune compromised: while affected.

Localized Shingles: Immune compromised person: Until all lesions have crusted and dried AND 24 hours after antiviral therapy started; then per localized zoster in Immune competent person.

Localized Shingles: Immune-competent person: Until all lesions have crusted and dried.

Shingles contact: 8 days after first contact until 21 days after last contact with rash regardless of post-exposure vaccination (28 days if given VZIG).

### 3.9. Infection Prevention and Control Measures

Disseminated Shingles – Implement Airborne and Contact Precautions. Maintain Precautions until all lesions have crusted and dried. <sup>[4.7, 4.6]</sup>

Exposed Susceptible Contact - Implement Airborne Precautions from 8 days after first contact until 21 days after last contact with person with active disease (or 28 days if given Varicella-Zoster immune globulin). <sup>[4.7]</sup>



Localized Shingles in an immune competent person (lesions **CAN BE** covered by clothing or a dressing) – Follow Routine Practices. <sup>[4.13]</sup>

Localized Shingles in an immune competent person (lesions **CANNOT BE** covered by clothing or a dressing) – Implement Contact Precautions. Maintain Precautions until all lesions have crusted and dried. <sup>[4.13]</sup>

Localized Shingles in an immune compromised person – Implement Airborne and Contact Precautions. Maintain Precautions until all lesions have crusted and dried AND 24 hours after antiviral therapy has been started; then as for Localized Shingles in Immune competent host. <sup>[4.7]</sup>

Unassessed Shingles – The symptomatic person wears a procedure or surgical mask until severity of shingles (e.g., localized or disseminated) is determined and placed in an appropriate room.

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

Visitors – Visitors with active shingles lesions should not enter a health care facility until all lesions have crusted and dried. If lesions are localized and can be covered, consult site Infection Control Professional to determine if a visit should occur.

Staff, roommates and visitors should be immune to chickenpox. Non-immune staff should not enter the room if immune caregivers are available. Staff - see 3.10 [Occupational and Environmental Safety and Health \(OESH\) Considerations](#).

If non-immune people must enter the room they wear gloves, a gown and an N95 respirator when Airborne/Contact Precautions in effect.  
Immune people do not need an N95 respirator to enter the room but wear gloves and a gown per Contact Precautions.

### **3.10. Occupational and Environmental Safety and Health (OESH) Considerations**

Contact Occupational and Environmental Safety and Health (OESH) for staff assessment and/or concerns.

#### **Specific Disease Protocol Contacts:**

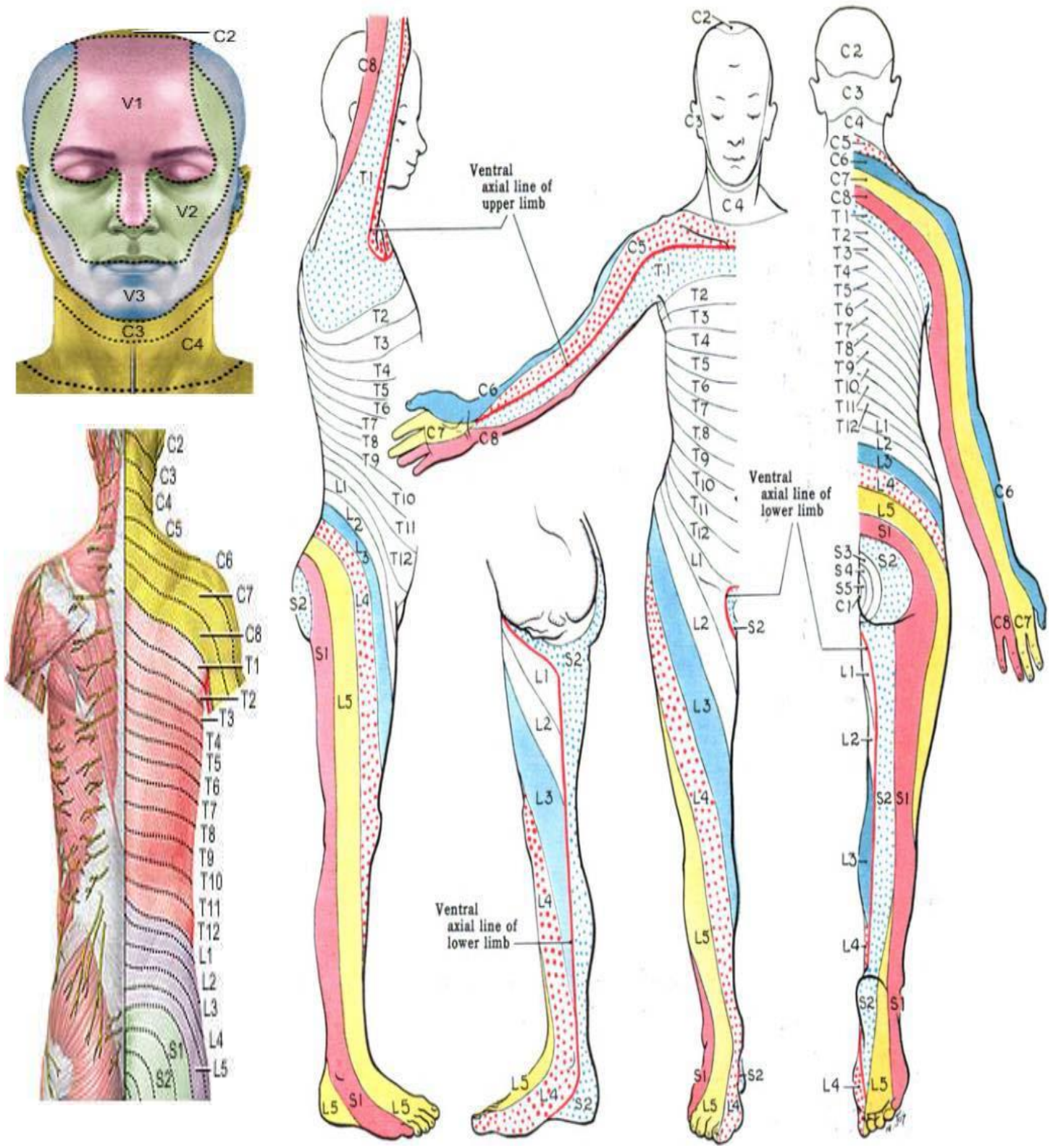
Janice Briggs, RN, BA, MScN, CIC, IP&C Specialist,  
WRHA Infection Prevention & Control Program

Kristy O'Keefe RN BN, Infection Control Professional, Grace Hospital,  
WRHA Infection Prevention & Control Program

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**Appendix A: Dermatome Chart** [4.13]



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