

Management of Varicella Zoster Virus (VZV) Infections

**Federal Bureau of Prisons
Clinical Practice Guideline**

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<http://www.bop.gov/news/medresources.jsp>

What's New in This Document?

The following changes have been made to the June 2009 version of these guidelines. These and other changes are highlighted in yellow throughout the document.

- A digital Varicella Timeline Calculator (for determining the exposure and infectious periods of an index case and the incubation period of exposed contacts) has been added to the BOP website (<http://www.bop.gov/news/medresources.jsp>).
- For all inmates entering BOP custody, a positive or negative history of varicella and herpes zoster should be ascertained by inmate interview and documented in the electronic medical record.
- Treatment of post-herpetic neuralgia associated with herpes zoster is clarified (see [Treatment of Herpes Zoster/Shingles](#) in *Section 6, Treatment*).
- It is emphasized that inmates with herpes zoster (shingles) should be housed in a single cell if the secretions from the lesions cannot be easily contained (see [Housing Inmates with Varicella or Herpes Zoster](#) in *Section 7, Control Measures*).
- Specific guidance regarding management of employees exposed to varicella has been removed from these Clinical Practice Guidelines and will be provided separately.
- The criteria for “Evidence of Immunity” have been modified (under [Contact Investigations](#) in *Section 7, Control Measures*).
- Information regarding the availability of VariZIG for inmates is provided in [Appendix 5](#).
- A handout with practical advice for inmates with varicella or herpes zoster is now available in [Appendix 6](#).

What Was New in the June 2009 Version of This Document?

The following point was clarified: Inmates with herpes zoster (shingles) should not be transferred until lesions are resolved and the inmate has been medically cleared for movement.

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1. Purpose

The Federal Bureau of Prisons (BOP) Clinical Practice Guidelines for the *Management of Varicella Zoster Virus (VZV) Infections* provide recommendations for the medical management of federal inmates with varicella (chickenpox) and herpes zoster (shingles), as well as for prevention and control measures.

2. Epidemiology of Varicella Zoster Virus

Varicella zoster virus causes two distinct clinical conditions. Primary VZV infection causes **varicella** (chickenpox), a contagious rash illness typically occurring among children. Years after the initial infection, VZV can reactivate to cause **herpes zoster** (shingles), normally presenting as a unilateral, painful, vesicular rash that occurs in adults.

Before the introduction of varicella vaccine in the United States in 1995, almost all persons developed varicella, with 90% of the cases occurring before age 15. Data indicate that 97% of U.S. born persons who were born between 1960 and 1980 are immune. In tropical and subtropical regions, varicella more typically occurs in teenagers and adults; hence, foreign-born inmates are more likely to be susceptible to varicella than U.S. born inmates. With increased vaccination coverage and decreased incidence of wild-type chickenpox, a higher proportion of chickenpox cases will be those that occur after vaccination as “breakthrough disease.”

Beginning at ages 40–50, incidence rates of herpes zoster increase rapidly. Approximately 50% of persons who live to age 85 will experience shingles.

3. Overview of Varicella (Chickenpox)

Natural History

Varicella, or chickenpox, is a highly contagious systemic disease that normally results in lifelong immunity. Persons with a prior history of varicella, who are re-exposed to wild-type VZV, develop an asymptomatic reinfection that boosts VZV antibody titers, but rarely causes a second bout of chickenpox.

Transmission

VZV infection is readily transmitted from person to person as follows:

- **Droplet spread** when a person with chickenpox coughs or sneezes.
- **Direct contact** with upper respiratory secretions or with lesions that have not yet crusted.
- **Airborne spread**, which is more likely in immunocompromised individuals.
- **Congenital** transmission.

Secondary attack rates (rates of transmission from a chicken pox case to those previously uninfected) are extraordinarily high, ranging from 70–90%. Persons can be infected without immediate contact with an infectious person. However, for contact investigation purposes, direct

contact with a chickenpox case of one hour or greater is usually considered significant (see the definition of "[significant exposure](#)" under *Contact Investigations*, in *Section 7*).

Presentation

Chickenpox normally presents with mild constitutional symptoms and the sudden onset of a maculopapular rash that rapidly evolves to a vesicular exanthem. The rash classically spreads in successive crops, resulting in lesions appearing in various stages of evolution, including papules, superficial vesicles ("dew drops"), pustules, and crusted lesions. Lesions are concentrated on the trunk, with fewer lesions on the distal extremities (but not involving the palms of the hands or soles of the feet). See *Table 1* below for guidance on distinguishing between chickenpox and small pox symptoms.

Table 1. Distinguishing Between Varicella and Variola (Small Pox)

An important distinction between varicella and variola is the progression of the rash:

- **With varicella**, different stages of the rash (macules, papules, vesicles, and scabs) are present at **any one** time.
- **With small pox**, **each area of the rash** appears in the same stage simultaneously—evolving from macules to papules to pustules over several days, with each stage lasting 1–2 days. Small pox lesions occur preferentially on the face and distal extremities and, unlike varicella, may be found on the palms of the hands and soles of the feet.

Atypical and subclinical cases of varicella without a rash are rare, but do occur. Most cases of chickenpox are self-limited without serious sequelae, particularly in children. Life-threatening complications such as encephalitis, pneumonia, and hepatitis occur more commonly in newly infected adults and immunocompromised persons.

Pregnancy

Primary infection with VZV during pregnancy may result in viral transmission to the fetus or newborn. Intrauterine transmission of VZV can result in congenital varicella syndrome, neonatal varicella, or herpes zoster during infancy. Congenital varicella syndrome is most commonly associated with primary VZV maternal infection during the first trimester of pregnancy and is characterized by low birth weight, limb deformities, and ocular problems in the newborn. Maternal infection with VZV, which occurs from 5 days before delivery to 2 days after, is associated with severe, potentially fatal, perinatal chickenpox in the newborn infant.

4. Overview of Herpes Zoster (Shingles)

Natural History

Following primary VZV infection, varicella infection persists in a dormant state in the dorsal-root ganglia. Reactivation of VZV infection results in herpes zoster (shingles). Shingles occurs sporadically in otherwise healthy individuals, but more commonly affects the elderly and immunocompromised persons, particularly those with lymphoproliferative cancers, organ transplantations, and infection with human immunodeficiency virus (HIV).

Transmission

Herpes zoster is less contagious than chickenpox; however, VZV can be transmitted by direct contact, droplet, or aerosol exposure to the vesicular lesions of a person with shingles. The infectiousness of herpes zoster is greatly increased for immunocompromised persons and when disseminated disease is present.

→ *In susceptible contacts, transmission of VZV from persons with herpes zoster may result in chickenpox.*

Presentation

Herpes zoster commonly presents as a severe, painful, unilateral dermatomal rash. Malaise, headache, and a severe neuropathic type pain may precede the rash and may be misdiagnosed by the evaluating clinician until the dermatomal rash becomes apparent. The rash is initially papular, then vesicular, and eventually crusts in 10–15 days. Cranial nerve involvement, if present, results in nerve-specific signs.

→ *Eyelid and nose lesions indicate potentially sight-threatening keratitis.*

Severe sequelae are more common with concurrent immunosuppression and may include disseminated dermatologic disease, meningoencephalitis, cerebral angiitis presenting as stroke, visceral disease, and acute retinal necrosis. Once the shingles rash has resolved, post-herpetic neuralgia may persist chronically, particularly in the elderly.

5. Screening and Diagnosis

→ ***Screening of new inmates:*** *For all inmates entering BOP custody, a positive or negative history of varicella and herpes zoster should be ascertained by inmate interview and documented in the electronic medical record.*

Inmates presenting with unilateral dermatomal pain or a vesicular rash should be evaluated for possible VZV infection. See *Table 2* below for diagnostic criteria.

Table 2. Diagnosing VZV Infection

The diagnosis of VZV infection can be made or supported *by any one or more of the following:*

(1) **Physical examination** to identify the symptoms typical of VZV rash:

- **Varicella:** Lesions that are simultaneously in all stages of development—from vesicles on a red base, to umbilicated pustules, to crusted lesions. (See [Table 1](#), for distinguishing between varicella and small pox.)
- **Herpes zoster:** Unilateral, dermatomal distribution of a painful vesicular rash.
→ *Zoster or a history of zoster in an inmate should prompt a recommendation for HIV testing.*

(2) **Patient history** of exposure to varicella or herpes zoster in the past three weeks, in a susceptible contact.

(3) **Laboratory tests** are not routinely required, but can be useful for confirmation of the diagnosis, particularly if the presentation is atypical. (See [Appendix 1, Varicella Virus and Immunity Testing](#), for more detail on available tests and specimen collection procedures.)

• **Varicella virus testing:**

- ▶ *Rapid varicella zoster identification.* Polymerase chain reaction (PCR) testing is widely available from commercial labs, with results available in several hours.
- ▶ *Viral culture* is rarely necessary.

- **Varicella immunity testing (IgG)** is useful in outbreak situations **to determine if a contact is immune to VZV**. See criteria for [evidence of immunity](#) under *Contact Investigations* in [Section 7](#).

6. Treatment

Drug treatment options for VZV infections are outlined in [Appendix 2, Antiviral Therapy for VZV Infections](#).

Treatment of Varicella/Chickenpox

Antiviral treatment of adults with varicella has been shown to decrease the duration and severity of illness. *However, treatment for varicella should be considered only if the inmate is diagnosed within 24 hours of the rash or soon thereafter.*

- **Oral antiviral therapy with acyclovir (800 mg, administered 4 times per day, for 5 days)** may result in fewer skin lesions and fewer constitutional symptoms—if it is initiated at the onset of the rash.
- **Intravenous acyclovir** (and possibly hospitalization) is indicated for immunocompromised persons with chickenpox. Consult with a physician expert regarding inmates who have complicated, primary VZV infections such as varicella pneumonia, varicella during pregnancy, or varicella in an immunocompromised host.

Pruritus should be treated topically (e.g., calamine lotion) and, if necessary, with systemic antihistamines to minimize scratching and the serious secondary bacterial infections that could result. Fingernails should be cut short. As feasible, the inmate should be allowed to shower frequently (several times a day) with soap.

Treatment of Herpes Zoster/Shingles

To be maximally effective, antiviral therapy must be administered within 72 hours of the onset of the rash. The benefits of later treatment have not been studied.

Treatment with acyclovir (800 mg, administered orally every 4 hours, 5 times daily, for 7–10 days) decreases viral shedding, accelerates healing of skin lesions, reduces acute pain, and decreases the risk of post-herpetic neuralgia in some persons.

Note: Famciclovir and valacyclovir, although more simply dosed, offer no major therapeutic advantages over acyclovir; therefore, they should be only selectively considered.

Short-term use of acetaminophen and non-steroidal anti-inflammatory medication can be useful for treatment of acute neuritis. The concurrent administration of a tapering course of prednisone to reduce post-herpetic neuralgia has been demonstrated to decrease zoster pain and decrease time for cutaneous healing. However, steroids should not be prescribed for inmates who have absolute or relative contraindications, e.g., diabetes mellitus. Topical antiviral agents are of no benefit. Patients should be advised to keep the lesions clean to prevent secondary bacterial infections. A nonocclusive, nonadherent, sterile dressing can prevent the irritation caused by contact with clothing. Pain may be severe and should be aggressively managed.

HIV co-infection: Orally administered acyclovir in standard doses is effective in treating herpes zoster in persons with HIV co-infection. Acyclovir therapy should be continued until all lesions have crusted over, due to the risk of relapse in this population. Intravenous acyclovir is recommended for disseminated herpes zoster (rash involving multiple noncontiguous dermatomes). The risk of post-herpetic neuralgia is no greater in persons with HIV infection.

Herpes zoster ophthalmicus: VZV reactivation involving the first branch of the trigeminal nerve often presents with unilateral pain and lesions involving the nose, forehead, or periocular areas. Left untreated, these patients may develop potentially sight-threatening keratitis, and other ocular complications such as episcleritis and iritis.

→ *Diagnosis of herpes zoster ophthalmicus warrants immediate referral to an ophthalmologist.*

Post-herpetic neuralgia: Chronic pain following a bout of herpes zoster can be protracted, incapacitating, and refractory to therapy, particularly in the elderly. **Potentially effective treatments, alone or in certain combinations, include (in order of preference):**

- (1) Tricyclic antidepressants (preferably amitriptyline or nortriptyline).**
- (2) Gabapentin, if tricyclic antidepressants have proven unsuccessful.**
- (3) Addition of short-term opioids, if not relieved by gabapentin or tricyclics alone.**
- (4) Topical capsaicin applied to healed, intact skin (often poorly tolerated because of the burning associated with its application).**
- (5) Short-term use of 5% lidocaine patches. Consult the BOP National Formulary for available formulary items.**

Patient Education

[Appendix 6](#) contains a handout offering practical advice for inmates with varicella or herpes zoster.

7. Control Measures

Housing Inmates with Varicella or Herpes Zoster

All inmates with chickenpox (varicella) or disseminated herpes zoster, and all immunocompromised inmates with herpes zoster: These inmates should be transferred to a community hospital if medically indicated. Otherwise, they should be housed *either* in the institution's airborne infection isolation (AII) room *or* in a single cell with a door that closes; their contact with other inmates should be restricted.

- *All rooms are preferred for immunocompromised inmates who have chickenpox or shingles, or for any inmate with disseminated shingles.* The inmate can return to general population housing or transferred when skin lesions have crusted.
- Anyone entering the cell of an inmate with contagious chickenpox or disseminated herpes zoster should wear masks (NIOSH-certified particulate respirators or surgical masks). They should wear gloves when any direct contact with the inmate is anticipated.

Inmates with herpes zoster (without immunosuppression): These inmates can often be maintained in general population so long as the inmate is cooperative and the lesions can be kept covered. However, transmission of VZV can occur, resulting in secondary cases of chickenpox. If secretions cannot be easily contained, the inmate should be housed in a single cell to prevent transmission to other inmates. Contact precautions, including the use of gloves, should be utilized whenever dressings are changed. Inmates with herpes zoster (shingles) should not be transferred until lesions have crusted over.

Contact Investigations

When a case of varicella infection has been identified in a facility, inmate contacts should be interviewed by a health care provider. Only the inmates with a history of varicella—and either a history of epidemiologic links to other chickenpox cases *or* laboratory documentation of varicella—will be considered to be immune (see [Table 5](#) for information about “*evidence of immunity*”). Contact investigations associated with varicella or herpes zoster are complex. Seek consultation from the **Regional and** Central Offices and the local health department, as necessary.

- ➔ The steps involved in a *contact investigation* are outlined in [Appendix 3a](#), and a detailed checklist is provided in [Appendix 3b](#).

Below is information on the *infectious and incubation periods* for varicella ([Table 3](#)), the definition of “*significant exposure*” ([Table 4](#)), and the criteria for “*evidence of immunity*” ([Table 5](#)).

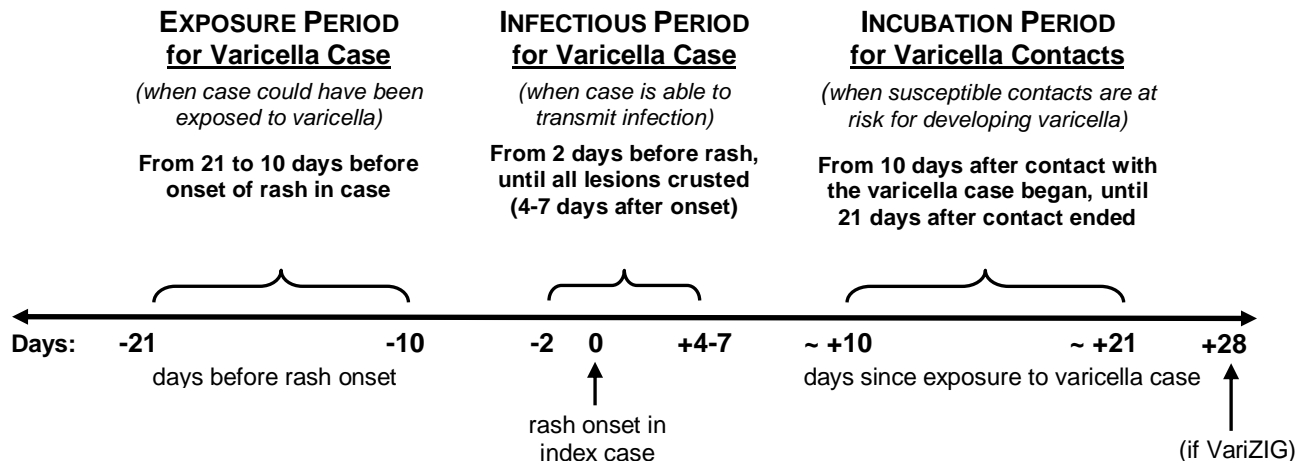
Incubation and Infectious Periods for Varicella Infection

Table 3 below defines the incubation and infectious periods for varicella.

Table 3. Incubation and Infectious Periods for Varicella		
Period	Definition	Range
Incubation Period	Time period from exposure to onset of rash in a susceptible contact	Average incubation period: 14–16 days Possible range: 10–21 days After varicella immune globulin (VariZIG®) is administered, incubation period may be prolonged to 28 days or longer.
Infectious Period	Time period during which the infected person can transmit the infection	Begins: 1–2 days before the onset of the rash Ends: With the crusting of the lesions (usually 4–7 days after the onset of the rash) Immunocompromised persons may be contagious for a somewhat longer period of time.

Varicella Timeline

Below is a timeline of the exposure, infectious, and incubation periods for varicella. A worksheet for calculating these time periods is available on the first page of [Appendix 3b](#). In addition, a digital Varicella Timeline, which calculates these time periods automatically, is available on the BOP website: <http://www.bop.gov/news/medresources.jsp>.



Definition of “Significant Exposure” for Varicella Infection

Table 4 below outlines the specific definition of “significant exposure” that has been developed for contact evaluation. Cases are known to be infectious from 48 hours before onset of rash, until 7 days after onset of rash or until the case is isolated.

Table 4. Definition of “Significant Exposure”	
Exposure to ...	“Significant Exposure”
Chickenpox	<p>At least one hour of one of the following:</p> <ul style="list-style-type: none"> • Contact with nasopharyngeal secretions or lesions • Face-to-face interaction • Sharing indoor airspace* during the case <i>infectious period</i> (i.e., from 2 days before rash onset, until all lesions are crusted or until the index case is isolated)
Uncomplicated shingles	Direct contact with lesions or secretions
Disseminated shingles	<p>One of the following:</p> <ul style="list-style-type: none"> • Contact with lesions or secretions • Sharing indoor airspace*
Disseminated or localized shingles in an immunocompromised person	<p>One of the following:</p> <ul style="list-style-type: none"> • Contact with lesions or secretions • Sharing indoor airspace*
* “Sharing indoor airspace” usually refers to being within three feet, such as in the same 2–4 bed ward, or in adjacent beds in a large ward	

Criteria for “Evidence of Immunity”

Table 5 below lists the **BOP** criteria for “evidence of immunity” to varicella infection.

Table 5. BOP Criteria for “Evidence of Immunity” to Varicella Infection
<p>A contact is considered to be immune if any of the following three conditions are met:</p> <ul style="list-style-type: none"> • History of varicella vaccine (documentation of 2 vaccine doses) • History of chickenpox or shingles, documented by a health care provider * • Laboratory “evidence of immunity” (VZV IgG positive) or confirmation of disease
<p>* When a person reports a history of varicella, verification must be obtained by a health-care provider. To be considered immune, persons who report a history of varicella must also meet one of the following criteria:</p> <ul style="list-style-type: none"> ▶ Report a history of epidemiologic links either to another typical varicella case (e.g., sibling with chickenpox) or to a laboratory-confirmed case ▶ Have evidence of laboratory confirmation at the time of acute disease <p>Persons who do not meet at least one of these two verification criteria do not have a valid history of varicella.</p>

Post-Exposure Prophylaxis

- Please refer to [Appendix 5](#), *Varicella Post-Exposure Prophylaxis*, for more detailed information on varicella vaccine and VariZIG®.

Varicella Vaccine: In 2007, the CDC revised its recommendations to include the use of varicella vaccine as post-exposure prophylaxis for susceptible contacts. Vaccination within 3 days of exposure to rash has been shown to be 90% effective in preventing varicella; vaccination within 5 days of exposure is approximately 70% effective in preventing varicella, and 100% effective in modifying severe disease. Administration of a second dose (4 weeks or more after the initial dose) is recommended for persons who receive a single dose following an exposure.

Varicella vaccine is a live vaccine and should **NOT** be administered to pregnant women or HIV-infected persons with CD4 <200 mg/dL.

- *If clinical status is unknown, screening for HIV infection and pregnancy is necessary prior to vaccine administration.*

The following groups should be considered for post-exposure varicella vaccine:

- For **susceptible** HIV-infected **contacts** with CD4 of 200–1000 mg/dL, post-exposure prophylaxis with varicella vaccine is *definitely indicated*.
- In the context of a varicella outbreak (2 or more related cases), varicella vaccine may be indicated as an outbreak containment measure—even if more than 5 days have passed since exposure.
- As a containment strategy, varicella vaccine prophylaxis should be considered case-by-case, based on the risk of complications.

VariZIG: The CDC recommends that high-risk, susceptible contacts receive post-exposure prophylaxis with varicella immune globulin (VariZIG) within 96 hours (4 days) of exposure. The following categories of contacts should be considered for VariZIG: pregnancy, primary and acquired immunodeficiency (including HIV-infected and CD4 <200mg/dL), neoplastic diseases, and receiving immunosuppressive treatments. **If VariZIG is unavailable, the CDC recommends that IGIV be considered.**

- **See the second page of [Appendix 5](#) for more details.**

Contact Management

Housing of Inmate Contacts

Factors influencing the decisions about housing varicella contacts include the number and location of susceptible contacts, the degree and timing of exposures, security concerns, and housing options.

- For more information, see *Appendix 3b*, [Step 8a](#).

Transferring Inmate Contacts with “Significant Exposure”

- **Susceptible inmate contacts who lack “evidence of immunity”:** In general, these inmates should be placed on “Medical Hold” and may not be transferred until after the 21-day period that followed the end of exposure (28-day period, if VariZIG is administered). If the transfer is urgent, then consider obtaining a VZV IgG to determine if the inmate is immune.
- **Inmate contacts with “evidence of immunity”:** These inmates can be transferred without restrictions.

Staff

Staff should be notified regarding the suspected varicella case. Pregnant and immunocompromised staff who had contact with suspected varicella case should be advised to consult their healthcare provider regarding assessment and treatment.

Visitors

If chickenpox has been identified in the institution, all visitors (particularly women of childbearing age) should be notified about the possible risk of exposure to chickenpox. For example, warnings should be posted in the visiting room. Inmate visitations can continue, although limitations should be considered for susceptible inmate contacts. Restrictions on visitors should be imposed for inmates with varicella.

Definitions

Breakthrough chickenpox is defined as a case of wild-type varicella infection occurring more than 42 days after vaccination.

Chickenpox is the common term for primary varicella infection.

Evidence of immunity is a set of criteria for establishing that an individual has immunity. (See [Table 5.](#))

Herpes zoster, commonly called shingles, is a primarily dermatologic disease caused by the reactivation of latent (dormant) varicella zoster virus.

Incubation period for an infectious disease is the time period between exposure to the disease and the development of symptoms. (See [Table 3.](#))

Index case is the first case of a contagious disease in a group or population that serves to call attention to the presence of the disease.

Infectious period is the time period during which an infected host can transmit infection. (See [Table 3.](#))

Recurrent infection: Although immunity following varicella is considered to be long-lasting, second cases of varicella do occur rarely among immunologically normal persons.

Shingles is the common term for *herpes zoster*.

Significant Exposure is the definition of what constitutes an exposure to varicella in the BOP, for the purposes of the contact investigation. (See [Table 4.](#))

Varicella, commonly called chickenpox, is a highly contagious, systemic disease that usually occurs in childhood and is caused by an acute infection with varicella zoster virus.

Varicella zoster virus (VZV) is a Herpes family virus that causes chickenpox and shingles.

References

American Public Health Association. *Control of Communicable Diseases Manual*. 18th ed. Washington, DC: American Public Health Association; 2004.

Bick J. Case study: infection control of varicella zoster virus (VZV). *IDCR*. October/November 2006. Available at: <http://www.idcronline.com/archives/octnov06/casestudy.html>

Centers for Disease Control and Prevention. A new product (VariZIGTM) for postexposure prophylaxis of varicella available under an investigational new drug application expanded access protocol. *MMWR*. 2006;55(Early Release). Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm55e224a1.htm

Centers for Disease Control and Prevention Web site. Collecting varicella zoster virus (chickenpox & shingles) specimens. Page last modified February 18, 2008. Available at: <http://www.cdc.gov/vaccines/vpd-vac/varicella/surv-collect-virus-spec.htm>. Accessed August 1, 2008.

Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, Lopes AS, Marin M. *Strategies for the Control and Investigation of Varicella Outbreaks, 2008*. Available at: <http://www.cdc.gov/vaccines/vpd-vac/varicella/outbreaks/manual.htm>

Centers for Disease Control and Prevention. Varicella (Chapter 21). In: Atkinson W, Wolfe S, Hamborsky J, eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. 12th ed. Washington DC: Public Health Foundation; 2011. Available at: <http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/varicella.pdf>

Centers for Disease Control and Prevention. Prevention of varicella: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2007;56(RR04):1–40. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5604a1.htm>

Centers for Disease Control and Prevention. Recommended adult immunization schedule — United States. October 2007–September 2008. *MMWR*. 2007;56:Q1–Q4. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5641-immunizationa1.htm>

Centers for Disease Control and Prevention. Prevention of herpes zoster: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2008;57(Early Release):1–30. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr57e0515a1.htm>

Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (HICPAC). Available at: <http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html>

Appendix 1. Varicella Virus and Immunity Testing

Varicella Virus Testing

Laboratory diagnosis is not routinely required, but can be useful to confirm the diagnosis. While it is possible to isolate varicella zoster virus (VZV) in tissue culture, it is rarely necessary for diagnosis. Vesicular fluid is the most frequent source for isolation. Laboratory techniques allow differentiation of wild type and vaccine strains of VZV.

Rapid Varicella Zoster Virus Identification

Rapid virus identification techniques are indicated when initiating antiviral therapy for a case with severe or unusual disease. They may also be useful in identifying the source of an outbreak in a closed population such as a prison. VZV polymerase chain reaction (PCR) is the method of choice for rapid clinical diagnosis. Real-time PCR methods are widely available in commercial reference laboratories and are the most sensitive and specific types of available tests. Results are available within several hours of initiating testing. Because viral proteins persist after cessation of viral replication, PCR tests may be positive when viral cultures are negative.

Specimen Collection

- Vesicular fluid, preferably from a fresh, fluid-filled vesicle, is the specimen of choice. Crusts from lesions are also excellent specimens. Less desirable specimen sources include nasopharyngeal secretions, saliva, blood, urine, bronchial washings, and cerebrospinal fluid because they have a lower yield for positive tests.
- Specimens are best collected by unroofing a vesicle and then rubbing the base of a skin lesion with a polyester swab. Calcium alginate-tipped swabs, wood swabs, and transport swabs containing gel are not acceptable for PCR testing. Enough pressure should be applied to collect epithelial cells without causing bleeding. Collection of infected epithelial cells in the base of the lesion is important because they usually contain a significant amount of virus. Crusts from lesions can be transferred directly into sterile breakage-resistant, snap-cap or screw-top tubes.

→ **See Teaching Video on Collecting Varicella Zoster Virus Specimens:** Centers for Disease Control and Prevention Web site. Collecting varicella zoster virus (chickenpox & shingles) specimens (video). Page last modified February 19, 2008. Available at: <http://www.cdc.gov/vaccines/vpd-vac/varicella/surv-collect-virus-spec.htm>.

(Appendix 1 continued on the next page)

Appendix 1. Varicella Virus and Immunity Testing (*continued*)

Varicella Immunity Testing

The “Evidence of Immunity” guidelines can be used to make an assumption about varicella immunity (see [Step 6](#) in *Appendix 3b, Varicella Contact Investigation Checklist*). However, serologic testing may be useful in the context of a chickenpox outbreak, particularly for those who do not meet the immunity criteria. Serologic evaluation of immunity should always include testing for **anti-varicella antibodies (IgG)**. Testing for IgM antibodies may be useful as an epidemiologic tool to determine if infection with varicella was recent. The antibody titer resulting from vaccination is generally lower than the antibody titer that results from varicella disease. Because of the potential for false negative serologic tests, routine post-vaccination serologic testing is not recommended.

Interpretation of Varicella IgG and IgM Antibody Test Results

IgG Test Result	IgM Test Result	Interpretation
Positive	Positive	Recent infection with varicella-zoster virus and immunity
Positive	Negative	Previous exposure to varicella-zoster virus and immunity
Negative	Negative	Non-immune (does not rule out varicella-zoster virus infection)

Specimen Collection

To collect a blood specimen for varicella immunity testing:

- Perform a venipuncture on the individual.
- Draw blood in a serum-separator vacutainer tube.
- Allow the specimen to clot completely.
- Centrifuge for 15 minutes.
- Submit at least 1 ml of serum in a screw-capped plastic vial to the testing laboratory.
- Serum should be stored at refrigerated temperatures before and during shipment.

Appendix 2. Antiviral Therapy for Varicella Zoster Virus (VZV) Infections

Antiviral Therapy for Varicella Zoster Virus (VZV) Infections*			
Drug	Herpes Zoster (Adults)	Varicella (Adults)	Notes
Acyclovir 200, 400, 800 mgs	800 mg po every four hours (5 times daily) for 7–10 days <i>For immunocompromised patients:</i> 10 mg/kg IV every 8 hours for 7 days	800 mg po 4 times daily for 5 days	<ul style="list-style-type: none"> - ↓ if renal function is impaired. - Can be administered with or without food. - Infuse acyclovir IV over 1 hour. Rapid infusion may cause renal damage. - Closely monitor and hydrate. - In immunocompromised persons, thrombocytopenic purpura/hemolytic uremic syndrome (TTP/HUS) has been reported. - Obese patients should be dosed using ideal body weight (IBW).
Famciclovir (Famvir) 125, 250, 500 mgs	500 mg po, every 8 hours for 7 days		<ul style="list-style-type: none"> - ↓ if renal function is impaired.
Valacyclovir (Valtrex) 500 mgs, 1 gm	1000 mg po, 3 times per day for 7 days		<ul style="list-style-type: none"> - May be taken without regard to meals.

* It is recommended that treatment for varicella begin *within 24 hours* of rash onset. Treatment for herpes zoster should be initiated *within 72 hours* of the onset of the rash. In persons with HIV infection or other potentially immunocompromised conditions, continue antiviral therapy until lesions have crusted. Intravenous acyclovir is required for disseminated disease or serious complications of VZV infection.

Appendix 3a. Varicella Contact Investigation Steps

The steps involved in conducting a varicella contact investigation are listed below. For detail about each step, see [Appendix 3b](#), *Varicella Contact Investigation Checklist*.

1. Identify, isolate, confirm, and characterize the varicella case.
2. Make notifications regarding the potential for a varicella outbreak.
3. Convene contact investigation team.
4. Stop movement of potential inmate contacts pending “evidence of immunity.”
5. Identify and prioritize contacts.
6. Check if contacts have varicella symptoms or “evidence of immunity.”
7. Consider STAT VZV IgG for contacts *without* “evidence of immunity.”
8. Develop containment plan for inmate contacts.
9. Observe for new cases of chickenpox.
10. Summarize outbreak.

Appendix 3b. Varicella Contact Investigation Checklist

A contact investigation should be initiated whenever a single case of varicella or herpes zoster is suspected. The contact investigation steps below may overlap in time. Promptly evaluate close contacts as they are identified.

√	Date	Task
		1. Identify, isolate, confirm, and characterize the varicella case.
		<input type="checkbox"/> varicella (chickenpox) or <input type="checkbox"/> herpes zoster (shingles)
		a. Appropriately isolate (if chickenpox, disseminated shingles, or immunocompromised with shingles) or contain drainage (if uncomplicated shingles) (see Section 7 in guidelines). Begin treatment , if it is indicated (see Section 6 in guidelines).
		b. Consider lab confirmation , particularly if clinical presentation is atypical (Appendix 1).
		c. Determine the exposure and infectious periods for the varicella case, and the incubation period for the varicella contacts. Fill in the blanks below.
c.1. EXPOSURE PERIOD for <i>Varicella Case</i> (time period when VZV exposure could have occurred)		
It can be determined when a varicella case could have been exposed to VZV by using the dates for the incubation period—from 10 to 21 days before the onset of rash. Knowing these dates allows the investigator to determine when (and where) the varicella case could have been exposed to VZV.		
___/___/___ = Date varicella case developed rash		
___/___/___ = Exposure Period for varicella case began (21 days before rash developed)		
___/___/___ = Exposure Period for varicella case ended (10 days before rash developed)		
c.2. INFECTIOUS PERIOD for <i>Varicella Case</i> (time period when case was able to transmit VZV)		
The infectious period is used to identify the group of contacts who were exposed while the case was infectious.		
___/___/___ = Infectious Period for varicella case begins (2 days before rash developed)		
___/___/___ = Infectious Period for varicella case ends (when all lesions are crusted, 4-7 days after rash onset)		
c.3. INCUBATION PERIOD for <i>Varicella Contact</i> (time period from VZV exposure to onset of varicella)		
The incubation period is used to determine when susceptible contacts are at risk for developing varicella.		
___/___/___ = Date exposure began . If contact has been ongoing, then the “date exposure began” is the date that the case infectious period began. Date may vary depending on exposure history.		
___/___/___ = Date exposure ended . The date that exposure to the varicella case ended is often either (1) the end of the case infectious period, or (2) the date that the case was isolated from general population. This date may vary depending on the exposure history of individual contacts.		
___/___/___ = Incubation Period for contact begins (10 days after exposure to varicella case began)		
___/___/___ = Incubation Period for contact ends (21 days after exposure to varicella case ended)		
c.4. Varicella Timeline: Fill in the dates calculated in c.1.–c.3. above.		
See also calculator available at: http://www.bop.gov/news/medresources.jsp		
(Appendix 3b continued on next page)		

Appendix 3b. Varicella Contact Investigation Checklist *(continued)*

√	Date	Task
		2. Make notifications regarding the potential for a varicella outbreak.
		Notify correctional management officials of the need to stop movement of possible contacts. Alert facility clinicians and staff regarding the need to detect and report new cases. Report to public health authorities and BOP regional & central offices per local law and BOP policy.
		3. Convene contact investigation team.
		a. Identify team leader; identify roles and responsibilities of team members. b. Develop plan for managing contact investigation data. c. Develop investigational priorities.
		4. Stop movement of potential inmate contacts pending “evidence of immunity.”
		<ul style="list-style-type: none"> Stop movement of inmates who may have been contacts to the varicella case, pending contact identification and determination of “evidence of immunity” (see <i>Step #6 below</i>). Inmates who were exposed to varicella will require medical clearance prior to transfer. In general, unless the inmate has “evidence of immunity”, varicella contacts should be placed on “Medical Hold” and not be transferred until 21 days after their exposure ended.
		5. Identify and prioritize contacts.
		<p>When identifying contacts, “significant exposure” to varicella is defined as follows:</p> <p>Chickenpox: Exposure is generally defined as at least <i>one hour of contact</i> with nasopharyngeal secretions or lesions, face-to-face interaction, or sharing indoor airspace (usually within 3 feet, e.g., occupying the same 2–4 bed ward, or adjacent beds in a large ward) during the infectious period (2 days before rash onset until all lesions are crusted or until the inmate with varicella was isolated).</p> <p>Shingles: Exposure to <i>uncomplicated shingles</i> is defined as direct contact with lesions. Exposure to <i>disseminated shingles</i>, or exposure to <i>an immunocompromised person with localized or disseminated shingles</i> is defined as: 1) contact with lesions; or 2) sharing indoor airspace (e.g., occupying same 2–4 bed ward or adjacent beds in a large ward).</p> <p>Depending on the circumstances of each facility and the unique characteristics of the varicella case, it may or may not be possible to identify a confined circle of contacts with “significant exposure.” It may be necessary to consider all inmates in a housing unit to be “contacts.”</p>
		a. Obtain inmate traffic history to obtain housing, work, and school locations during infectious period. Tour exposure sites to evaluate transmission potential.
		<input type="checkbox"/> Facility/Housing _____ Date toured: ___/___/___ <input type="checkbox"/> Work _____ Date toured: ___/___/___ <input type="checkbox"/> School _____ Date toured: ___/___/___
		b. Interview index case for close contacts, recent visitors, and activities.
		c. Develop list of contacts with “significant exposure” (Appendix 4).
		d. Identify contacts who are “high risk” (pregnant or immunocompromised).
		Consult Post-Exposure Prophylaxis in Section 7, Control Measures , and Appendix 5 for information on contacts who should be considered for post-exposure vaccination.
		e. Identify inmate contacts who have been transferred to another BOP facility.
		Immediately notify the Clinical Director/HSA of the receiving institutions to facilitate appropriate evaluation and housing of these inmates. Report this information to the Regional MAST IOP Coordinator .
		f. Notify the staff and visitors about the varicella situation.
		Advise pregnant and immunocompromised staff to consult their health care provider regarding assessment and treatment.

(Appendix 3b continued on next page)

Appendix 3b. Varicella Contact Investigation Checklist (*continued*)

√	Date	Task								
		6. Check if contacts have varicella symptoms or “evidence of immunity.”								
		<p>Assess each identified contact for symptoms of chickenpox.</p> <p>Assess each identified contact to determine if they have “evidence of immunity.”</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1) History of varicella vaccine (documentation of 2 vaccine doses) <input type="checkbox"/> 2) History of chickenpox or shingles (documented by health care provider—see <i>Table 5</i> for more about documenting a valid history of varicella) <input type="checkbox"/> 3) Laboratory evidence of immunity (IgG positive) or confirmation of disease <p>If any of conditions 1–3 above are met, then contacts are considered to be immune. No follow-up is needed. Inmates can be housed in general population and can be transferred out. If contacts do not have “evidence of immunity,” then an IgG can be obtained to determine varicella immunity (<i>see Step # 7 below</i>).</p>								
		7. Consider obtaining STAT IgG for contacts <i>without</i> “evidence of immunity.”								
		<p>Depending upon the number of contacts identified, a decision will be made whether or not to obtain VZV IgG tests on those contacts without “evidence of immunity.”</p> <ul style="list-style-type: none"> • IgG Positive: means contact is immune to varicella. No follow-up is required. Inmates can be housed in general population. • IgG Negative: means that the contact is susceptible to varicella and is at risk for developing chickenpox during 10–21 days following exposure (>28 days if VariZIG was administered). 								
		8. Develop containment plan for inmate contacts.								
		<p>The goal of the containment plan is to limit and control a potential varicella outbreak. Susceptible contacts should be considered potentially contagious for the 21 days after their exposure ended (and for 28 days or longer if VariZIG is administered). Susceptible inmate contacts should be placed on Medical Hold and their movement generally should be stopped.</p>								
		a. Develop a housing plan for inmate contacts, considering the following:								
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%; padding: 5px;">High risk, susceptible contacts: pregnant, or immunocompromised and IgG negative)</td> <td style="padding: 5px;">Either house separately or transfer to a facility where they can be housed separately to prevent their exposure to subsequent, secondary varicella cases. They can be cohorted. Another option is to strategically house with inmates who have “evidence of immunity.”</td> </tr> <tr> <td style="padding: 5px;">Closest contacts with significant, sustained exposure (e.g., cell-mates who lack “evidence of immunity”)</td> <td style="padding: 5px;">These contacts should be housed separately from other inmates (or cohorted) and observed closely. These are the inmates who are most likely to develop chickenpox and become “secondary” cases.</td> </tr> <tr> <td style="padding: 5px;">Other contacts with “significant exposure” who lack “evidence of immunity”</td> <td style="padding: 5px;">These contacts should be restricted to their unit, if feasible. Depending on the configuration of the space in the facility, all inmates in the facility may have to be considered contacts. As feasible, contact between known susceptible contacts should be limited. To the extent possible, house susceptible inmates in close proximity to contacts who have “evidence of immunity”.</td> </tr> <tr> <td style="padding: 5px;">Contacts with “evidence of immunity”</td> <td style="padding: 5px;">No housing restrictions.</td> </tr> </table>	High risk, susceptible contacts: pregnant, or immunocompromised and IgG negative)	Either house separately or transfer to a facility where they can be housed separately to prevent their exposure to subsequent, secondary varicella cases. They can be cohorted. Another option is to strategically house with inmates who have “evidence of immunity.”	Closest contacts with significant, sustained exposure (e.g., cell-mates who lack “evidence of immunity”)	These contacts should be housed separately from other inmates (or cohorted) and observed closely. These are the inmates who are most likely to develop chickenpox and become “secondary” cases.	Other contacts with “significant exposure” who lack “evidence of immunity”	These contacts should be restricted to their unit, if feasible. Depending on the configuration of the space in the facility, all inmates in the facility may have to be considered contacts. As feasible, contact between known susceptible contacts should be limited. To the extent possible, house susceptible inmates in close proximity to contacts who have “evidence of immunity”.	Contacts with “evidence of immunity”	No housing restrictions.
High risk, susceptible contacts: pregnant, or immunocompromised and IgG negative)	Either house separately or transfer to a facility where they can be housed separately to prevent their exposure to subsequent, secondary varicella cases. They can be cohorted. Another option is to strategically house with inmates who have “evidence of immunity.”									
Closest contacts with significant, sustained exposure (e.g., cell-mates who lack “evidence of immunity”)	These contacts should be housed separately from other inmates (or cohorted) and observed closely. These are the inmates who are most likely to develop chickenpox and become “secondary” cases.									
Other contacts with “significant exposure” who lack “evidence of immunity”	These contacts should be restricted to their unit, if feasible. Depending on the configuration of the space in the facility, all inmates in the facility may have to be considered contacts. As feasible, contact between known susceptible contacts should be limited. To the extent possible, house susceptible inmates in close proximity to contacts who have “evidence of immunity”.									
Contacts with “evidence of immunity”	No housing restrictions.									
(<i>Appendix 3b continued on next page</i>)										

Appendix 3b. Varicella Contact Investigation Checklist *(continued)*

√	Date	Task
		b. Give consideration to vaccination of inmate contacts.
		<p>Varicella vaccination post-exposure can prevent varicella if it is administered within 5 days of exposure. It also can interrupt transmission during an ongoing outbreak even if administered more than 5 days after the initial exposure. Varicella vaccination should be prioritized for inmate contacts as follows:</p> <ol style="list-style-type: none"> (1) HIV-infected with CD4 200-1000 (<i>definitely indicated</i>) administered within 3-5 days of exposure; (2) In context of a varicella outbreak (2 or more related cases) as an outbreak containment measure; (3) On a case-by-case basis as a containment strategy.
		9. Observe for new cases of chickenpox.
		a. Consider laboratory confirmation for the first three to five cases (see Appendix 1), particularly if presentation is atypical.
		b. The following data should be collected on each case:
		<ul style="list-style-type: none"> • Date of onset of rash • Date all vesicles crusted over (or if lesions did not scab—the date that no new lesions appeared in a 24-hour period) • Date isolated • Known exposure to varicella case (where/when) • Calculation of a Varicella Timeline • Traffic history (housing, work, and school) • Interview for close contacts, visitors, activities • Current medical conditions and medications • Laboratory testing for varicella • Treatment for varicella and varicella complications • Hospitalization
		10. Summarize outbreak.
		<ul style="list-style-type: none"> • # of cases • # treated • # hospitalized • # of contacts • # vaccinated • Factors which contributed to the outbreak • How to prevent future outbreaks • Recommendations for response to future outbreaks

Appendix 5. Varicella Post-Exposure Prophylaxis

Varicella Vaccine Prophylaxis

Indication

Post-exposure prophylaxis with varicella vaccine should be considered for susceptible contacts, since vaccination may prevent varicella or reduce disease severity. The determination to administer varicella vaccine prophylactically should be based on epidemiological and patient-specific factors.

Contraindications

Varicella vaccine is a live vaccine and should **NOT** be administered to pregnant women or HIV-infected persons with CD4 <200 mg/dL.

Note: *Screening for HIV infection and pregnancy is necessary prior to vaccine administration if clinical status is unknown.*

Administration, Dosing, and Timing

- The vaccine should be administered within 3 days and ordinarily no more than 5 days after varicella exposure to be maximally effective. Administration after 5 days exposure may be indicated in an outbreak situation with ongoing exposure.
- Varicella vaccine should be administered in accordance with the manufacturer's instructions after informing the inmate of the vaccine's benefits and risks. The varicella vaccine (VARIVAX®) is administered subcutaneously to adults in a 0.5 mL dose, repeated at the same dose 4 to 8 weeks later.

Note: *Varicella vaccine must be stored in a frost-free freezer with an average temperature of -15°C (5°F) or colder. The vaccine is reconstituted at room temperature with a diluent and must then be administered within 30 minutes.*

Precautions

- Varicella vaccine should not be administered concurrently with **VariZIG** or other immunoglobulins.
- Vaccinated persons may develop a rash that is potentially contagious. They should be monitored closely following vaccination and should be restricted from close contact with others who are pregnant or immunocompromised.
- If vaccinated inmates develop a rash they should be isolated in either in an airborne infection isolation room or in a single room, as if they had wild-type varicella, until the lesions have crusted.
- Any health care providers who have been vaccinated should carefully observe for the occurrence of vaccination-related rash. Health care providers, in whom a vaccine related rash has occurred, should avoid contact with patients who lack "evidence of immunity" and who are at risk for severe disease and complications. Contact should be restricted until all lesions are crusted over or fade away or after no new lesions appear within a 24-hour period.

(Appendix 5 continued on next page)

Appendix 5. Varicella Post-Exposure Prophylaxis (*continued*)

→ *At the time of this publication, the investigational protocol for VariZIG did not permit distribution of VariZIG to inmates. Consult with the Office of the Chief Pharmacist if VariZIG is indicated.*

Varicella Zoster Immunoglobulin (VariZIG®) Prophylaxis

VariZIG is a purified human immune globulin made from plasma containing high levels of anti-varicella antibodies. CDC recommends that VariZIG be administered post-exposure for high risk contacts. VariZIG is currently available in the United States only through an FDA-approved expanded access investigational new drug (IND) protocol. (See the CDC announcement at: www.cdc.gov/mmwr/preview/mmwrhtml/mm55e224a1.htm.)

Indication

VariZIG is recommended for individuals who have been exposed to a case of varicella, *and* who are at high risk for severe disease and complications *and* are IgG negative. These include:

- Immunocompromised patients (primary and acquired immunodeficiency (including HIV with CD4 <200mg/dL), neoplastic diseases and those receiving immunosuppressive treatments)
- Pregnant women. (**Note:** *In pregnant women, VariZIG does not prevent congenital varicella syndrome or neonatal varicella, but limits the potentially severe complications of chickenpox in the mother.*)

Administration, Dosing, and Timing

VariZIG should be administered intramuscularly *within 96 hours* of the exposure. VariZIG is supplied in 125-U vials. The recommended dose is 125 units/10 kg (maximum: 625 units). In situations where administration of VariZIG is not possible within 96 hours, an alternative is immune globulin intravenous (IGIV), dosed at 400 mg/kg and administered once. Consult the Office of the Chief Pharmacist prior to administering IGIV.

In the context of an extended varicella outbreak, where ongoing protection is necessary, VariZIG should be re-administered 3 weeks following the initial dose.

Antiviral Therapy

Any patient who receives VariZIG should be observed closely for signs or symptoms of varicella for 28 days or more after exposure ended, because VariZIG may prolong the incubation period of chickenpox by more than a week. Antiviral therapy should be instituted immediately if signs or symptoms of varicella disease occur.

Interval Between Administration of VariZIG and Varicella Vaccine

Unless varicella vaccine is contraindicated, inmates who receive VariZIG should subsequently receive varicella vaccine. However, varicella vaccine should be delayed until *5 months after* VariZIG administration.

How to Obtain Investigational VariZIG

Providers who identify a patient for whom VariZIG® is indicated should contact FFF enterprises (24-hour telephone, 800-843-7477). Complete a release form which can be obtained at: <http://www.fda.gov/cber/infosheets/mphvzig020806form.pdf>. FAX to: 951-296-2570.

Appendix 6. Patient Education

Inmates with varicella or herpes zoster can be offered the following handout, which offers practical advice.

If you have chickenpox or shingles ...

- ☑ Take medications as prescribed by your health care provider.
- ☑ Don't scratch! Scratching can make the sores harder to heal or lead to scarring. It could also cause the sores to become infected.
- ☑ Take showers. Cool showers every 3 to 4 hours can calm the itching.
- ☑ Apply calamine or a similar lotion to the rash to help relieve the itching.
- ☑ If itching is particularly severe, over-the-counter or prescribed antihistamines may help. Ask your health care provider.
- ☑ Rest! Getting plenty of rest helps you get over any infection.
- ☑ Eat a bland diet if necessary. If chickenpox sores develop in your mouth, switch to a diet of soft, bland foods. Spicy, acidic, or hard, crunchy foods can irritate mouth sores.
- ☑ Treat a fever. Fever can be reduced with acetaminophen (Tylenol).