

Herpes B Virus Exposure Protocol

(This protocol has been revised based on new recommendations published in Clinical Infectious Diseases 2002; 35:1191-1203 which supercedes recommendations published in Clinical Infectious Diseases 1995; 20:421-439)

Purpose:

To provide appropriate first aid, risk assessment, and treatment for staff members who have been exposed to Herpes B virus.

Scope/Risk:

Herpes B Virus is enzootic among monkeys of the genus macaca (macaque). Monkeys of this genus infected with Herpes B virus show minimal morbidity from the virus. Infected macaque monkey saliva, blood, and other body fluids can be infectious to humans. Humans who become infected with Herpes B virus often develop encephalitis with a mortality rate that is approximately 80%.

Infection in humans is rare and occurs as a result of exposure to macaque monkeys and secretions and tissue from macaque monkeys. The incubation period in humans ranges from 2 days to 5 weeks after exposure. Symptoms range from local rash to systemic viral symptoms and CNS symptoms (see section on post exposure counseling for listing of early, intermediate, and late signs and symptoms).

Humans have become infected after exposure to infectious tissues and body fluids including ocular, oral, genital, CNS, and CSF tissues and fluids. Cell cultures from macaque kidneys are also potentially infectious. Exposure to peripheral blood from macaque monkeys has not been reported to cause infection in humans. However, exposures involving blood from macaque monkeys will be considered in the risk assessment for evaluation and treatment for this policy.

Routes of infection include bites, scratches, exposure to tissue culture media, tissue obtained from autopsy, needlestick injuries, scratches from contact with cages, mucous membrane splashes. There has been one reported human to human transmission.

Certain types of exposures pose a greater risk of infection. Deep puncture wounds that are difficult to clean, inadequately cleaned wounds, wounds on the face, eye, neck, and thorax. Exposures to the head and thorax can lead to quicker progression of CNS symptoms.

Definition of occupational exposure: All staff who handle macaque monkey tissue, cell cultures and blood are at risk of exposure to Herpes B virus. Exposure can occur through monkey bites, percutaneous injury, non-intact skin and mucous membrane contact.

Prevention of Exposure:

All monkey tissue cultures, blood, saliva, and other body fluids should be considered infectious. The most critical period for prevention of Herpes B virus infection is the first few minutes after exposure. Education of staff at initial orientation regarding the risk of B-virus infection is done by Biosafety officer.

Post Exposure Evaluation:

1. Staff should immediately decontaminate even before coming to OHS:
 - Wash intact skin with soap and water for several minutes
 - Open wounds should be soaked and scrubbed with bleach (1:10 dilution) or Betadine for 15 minutes.
 - Eyes or mucous membrane exposure – flush eyes at eye wash station for at least 15 minutes.

Thorough cleansing of the wound within minutes of exposure decreases the risk that viral contamination will progress to infection. Although detergents, bleach, and betadine can inactivate the virus, the mechanical action of scrubbing or irrigating the wound for at least 15 minutes to wash away virus is probably the most important aspect of the cleansing procedure.

2. Staff should report to OHS during regular business hours of Mon – Fri from 8:30AM to 4:30PM. For off hours, holidays and weekends, the STIK beeper should be paged following the established STIK beeper process.
3. OHS Management of B Virus Exposure – Initial evaluation:
 - Exposed Staff:
 1. Assess the adequacy of wound cleaning done prior to evaluation and perform wound assessment.
 2. Wound cleaning procedure above should be repeated in OHS. This should be done regardless of the staff's report of cleaning the wound to ensure adequate time and procedure for wound cleansing has taken place.
 - Mucous Membrane exposure: flush eyes or mucous membranes at eyewash station or sterile saline solution for 15 minutes.
 - Skin exposure: wash skin thoroughly with a solution containing detergent soap (povidone iodine, chlorhexidine) for 15 minutes. Consider washing skin with bleach 1:10 dilution followed by detergent solution for 15 minutes.

3. Determine date, time, location, description of the injury, description of exposure and source material.
 4. Physical exam with focus on neurological symptoms.
 5. Evaluate general health and date of last Td Booster.
 6. Determine need for PEP (see below) and antibiotics to prevent wound infection.
- Non Human Primate Source Risk Assessment:
 1. Veterinarian where animal, tissue, or body fluid originated should be contacted for risk assessment of source monkey. Lab PI will have contact information regarding source tissue.
4. Wound culture and serology testing:
 - Consider obtaining baseline serologic testing and viral cultures of bite wounds and/or exposed mucosa.
 - Serology Testing:
 1. Blood sample should be drawn in a red top tube (must be 5-7 cc tube).
 2. Properly label tube with staff information (name, ID, collection date)
 3. Complete National B Virus Resource Center lab form.
 4. Store in refrigerator prior to transport to Lab control for shipping. *Samples may be stored in our refrigerator over night and over the weekend prior to spinning and processing should an exposure occur after hours.*
 - Virology Swab Testing:
 1. Culture wound and/or mucous membrane exposed areas only after wound/mucous membranes cleaned following above process.
 2. Swab each wound/mucous membrane site with a separate sterile cotton swab (must be plastic or wooden handle. Available in kit with viral transport media tube).
 3. Place swab in vial of sterile viral transport media (plastic tube with red cap, kits in store room). ***Viral transport media kits available from General Stores. Kit contains sterile swab and plastic culture tube containing transport media.***
 4. Sample must be stored at ≤ 60 degrees C until shipping. *Samples may be stored in our freezer over night and over the weekend prior to processing should an exposure occur after hours.*
 5. Complete National B Virus Resource Center lab form.

- **Instructions on “Sample Collection & Handling” from the NIH B Virus Resource Lab can be found at end of protocol. Lab control has been given copy of “Sample collection and handling” instructions for the National B Virus Resource Lab.**

5. Post Exposure Prophylaxis:

- If post-exposure prophylaxis is indicated treatment should begin within hours of exposure. Antiviral treatment should be Valacyclovir 500mg 2 tabs p.o. TID X 14 days.
- If a pregnant woman were exposed, consult with OB/GYN physician. PEP if given should be Acyclovir 800mg 5X a day for 14 days.
- Prophylaxis Recommended:
 1. Skin exposure* (with loss of skin integrity) or mucosal exposure (with or without injury) to a high risk source (macaque that is ill, immunocompromised, or known to be shedding virus or that has lesions compatible with B virus disease)
 2. Inadequately cleaned skin exposure (with loss of skin integrity) or mucosal exposure (with or without injury).
 3. Laceration of the head, neck, or torso
 4. Deep puncture bite
 5. Needlestick associated with tissue or fluid from the nervous system, lesions suspicious for B virus, eyelids, or mucosa.
 6. Puncture or laceration after exposure to objects (a) contaminated either with fluid from monkey oral or genital lesions or with nervous system tissues, or (b) known to contain B virus.
 7. A post cleansing culture is positive for B virus.
- Prophylaxis considered:
 1. Mucosal splash that has been adequately cleaned
 2. Laceration (with loss of skin integrity) that has been adequately cleaned.
 3. Needlestick involving blood from an ill or immunocompromised macaque.
 4. Puncture or laceration occurring after exposure to (a) objects contaminated with body fluid (other than from a lesion), or (b) potentially infected cell culture.
- Prophylaxis Not Recommended:
 1. Skin exposure in which the skin remains intact.
 2. Exposure associated with nonmacaque species of nonhuman primates.

- Review Pros and Cons of antiviral treatment with exposed employee:
 1. Pros:
 - The initiation of valacyclovir therapy within 24 hours after exposure to B virus prevents death among animals.
 - The initiation of valacyclovir therapy within hours of exposure may prevent or modify symptomatic B virus disease.
 2. Cons:
 - Infection with B virus is quite rare relative to the number of possible exposures
 - There are no controlled studies that document the ability of immediate empirical therapy to prevent infection or symptomatic B virus infection in humans.
 - Acyclovir therapy can suppress viral shedding and seroconversion, which may make diagnosis more difficult.

6. Post Exposure Counseling:

- Include the following information in post-exposure counseling with exposed employees:
 1. Inform employee of incubation period which may be as short as 2 days and as long as 5 weeks.
 2. Discuss risk of infection of exposure incident.
 3. Review pros and cons of antiviral treatment
 4. Review side effects of antiviral medications
- Review signs and symptoms of B virus infection:
 1. Early Symptoms (inconsistently present)
 - Vesicular eruptions or ulceration at or near the exposure site
 - Severe pain or itching at the exposure site
 - Regional lymphadenopathy
 2. Intermediate Manifestations (Inconsistently present)
 - Fever
 - Numbness, paresthesia, or other neuresthesias at or near the exposure site and with or without proximal progression.
 - Muscle weakness or paralysis in the exposed extremity
 - Conjunctivitis
 - Persistent hiccups
 3. Late Manifestations (avoidable with early therapy)

- Sinusitis
- Neck stiffness
- Headache lasting greater than 24 hours
- Brain stem findings: diplopia, dysarthria, dysphagia, dizziness, gross-hemiparesis, cerebellar signs with ataxia, crossed sensory loss, cranial nerve palsies, drop attacks.
- Altered mentation
- Other signs compatible with CNS impairment or viral encephalitis including urinary retention, respiratory failure, convulsion, twitching, hemiparesis, hemiplegia, other localized neurological signs, progressive ascending paralysis, or coma.

7. Post Exposure Follow Up:

- Exposed staff will be followed closely in OHS on a weekly basis for at least 2 months post exposure. Review signs and symptoms of infection, monitor wound, monitor compliance with PEP and side effects.
- Follow grid below for follow up blood work schedule.
- Staff member will be advised to follow up with OHS immediately if any signs and symptoms suggestive of B-virus infection develop.
- Treatment with antiviral therapy and referral to ID specialist may be necessary and will be arranged on a case by case basis. Development of signs and symptoms of B Virus infection warrants prompt referral to ID specialist.

	Baseline	2 Weeks	4 weeks	3 months
No PEP	Culture and serology per policy		Repeat Serology testing	
PEP	Culture and serology per policy; CBC, diff, BUN, Creatinine, lytes	CBC, Diff, BUN, Creatinine, lytes	Repeat serology testing. If initial culture wound culture positive, perform cultures from conjunctivae, oropharynx, and any unhealed skin lesions.	Repeat Serology testing

References:

CDC (Centers for Disease Control and Prevention). 1987. Guidelines for the Prevention of Herpesvirus simiae (B Virus) Infection in Monkey Handlers. Morbidity and Mortality Weekly Report (MMWR) 36 (41): 680-682, 687-689; October 23, 1987.

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