

**UNIVERSITY OF ROCHESTER**  
**UNIVERSITY HEALTH SERVICE, OCCUPATIONAL HEALTH PROGRAM**

**Macaque-Exposure Protocol**  
**Therapy for Exposure to B Virus (*Cercopithecine Herpesvirus 1*)**

**Rationale:**

- Exposure to certain material from macaque monkeys-can result in serious, life-threatening infection in the animal care worker.
- Prompt washing and evaluation can prevent infection
- Visible lesions on the macaque are not necessary for transmission to occur. The ocular (eye), oral or genital secretions of macaques as well as their brain tissue or spinal fluid are potentially infectious. Cell cultures from macaques can be infectious.

**Exposure Criteria:**

**1. Type of fluid from the macaque:**

- Ocular (eye), oral, or genital secretions
- Brain tissue or spinal fluid
- Cell cultures
- **NOT a risk:** peripheral blood (B virus is not considered viremic in macaques- consider if the macaque is very ill)

**2. Type of injury:**

- Bites or scratches from the macaque or the cage
- Punctures or lacerations by an instrument or needle contaminated by macaque secretions (saliva, secretions from mouth, mucous/genital membranes, conjunctiva)
- Splashes in the mouth or eye (mucous membranes) with macaque secretions, including feces and urine

**3. Type of monkey**

**Macaque:**

*Macaca mulatta* - rhesus monkey

*Macaca nemestrina* - pigtailed macaque, “nemestrina”

*Macaca fascicularis* - cynomolgus monkey, crab eating macaque, long-tailed macaque, “cyno”, “fasic”

- **Non-macaque monkeys** (squirrel monkey, marmoset): no risk from B infection, treat as bite/scratch and follow immediate action for cleaning
  - Risk is as for any bite- many bacteria in mouth like a human bite: consider prophylactic /empiric antibiotic therapy especially if moderate to deep wound, difficult to clean wound or wound on the hand. Use same recommends as for a human bite. (Reference: E.J. Goldstein et al, CID 20:1551-2 1995)
  - Call UHS (x5-4955) during business hours
  - After hours can call UHS on call MD for advice (x5-2662 for instructions)or go to the Emergency Department (ED) on weekends or after 5 PM, immediately after or while cleaning the wound.

**INDIVIDUAL EXPOSED- Immediate Action for All Macaque Exposures at the Worksite:**

❖ **Skin:**

- **Soak, irrigate** and gently massage with any detergent soap solution for 15 minutes. Betadine or Chlorohexidine is adequate. Betadine scrub brushes are available in all monkey rooms.

❖ **Eye:**

- **Irrigate** eye with water or sterile saline only for 15 minutes (if wearing contact lenses remove prior to irrigating).

❖ **Mouth:**

- **Rinse** mouth with water and/or 3% hydrogen peroxide rinse for 15 minutes

**Reporting all injuries:**

- ❖ Notify the Division of Comparative Medicine (DCM) at x5-2651 of the incident.
- ❖ UHS at x5-4955 (open weekdays between 8AM-5PM ) Please leave a message after hours for documentation and include your name, date of birth and a phone number where you can be reached during the next business day.

**Evaluation for Treatment: (after washing-immediate action above)**

❖ **Macaques**

- **Risk for B virus in all cases of exposure**-All exposures must be evaluated promptly
- Call UHS (x5-4955) during business hours
- Go to SMH emergency room after hours and on the weekend. **BRING THIS FORM WITH YOU.**

## **UHS/ED Procedure for Macaque Exposures**

- ❖ **Repeat washing** to make sure adequately done
- ❖ Document date, time location, description of injury, type of exposure, name of animal
- ❖ Document significant medical history, allergies, medications, pregnancy status, last Tetanus booster
- ❖ Physical examination: site of injury, neurologic exam
- ❖ Collect serum for baseline- send to serology marked “monkey study hold”
- ❖ Do not recommend culturing the employee’s wound for B virus (may cause deeper entry into the person)
- ❖ **Evaluate for antiviral prophylaxis**
  - The virus is most highly concentrated in the saliva and conjunctival secretions. Therefore, a person suffering a bite (breaking the skin) by a macaque should be considered for prophylaxis unless contraindicated. In addition, a person should be encouraged to take prophylaxis when he/she has had contact with macaque conjunctival secretions or saliva either to a mucous membrane, non-intact skin or an open wound. Table 5 gives further details

## **Medication for Prophylaxis against B virus: Valacyclovir 1 gram po q8h for 14 days**

- Review side effects: GI, headache, abd pain, rash, hematologic, renal failure. Note: pregnancy category B
- Review symptoms of B virus infection: tingling, intense itching, pain or numbness, and vesicular rash at the exposure site. Other flu-like symptoms, headache, and dizziness may develop. Symptoms occur generally within one month of exposure. Instruct the patient to notify the Occupational Health Nurses at x5-4955 if any symptoms occur
- There are no current CDC guidelines regarding the exposed employee’s subsequent contact with others. Recommend that the exposed employee avoid physical contact of the exposed area with others during incubation time (approximately 3-4 weeks or until negative results from the monkey are obtained).
- UHS OH to discuss incident with DCM (x5-2651) for monkey results and follow up. If the culture on the monkey is positive, discuss a longer course of therapy with the patient. If the patient was not prophylaxed, a course of therapy should now be considered.

## **DCM Veterinarian:**

A DCM veterinarian will perform a physical examination on the macaque involved in the exposure incident, as soon as possible after the exposure. A serum sample will be obtained from the macaque for evaluation of an antibody titer to *Herpes simiae*. At least two culture specimens from the monkey’s mucous membranes for virus isolation will be collected. If any lesions are found on the mucous membranes that are consistent with B virus, a culture specimen must be collected from that site. DCM will submit all samples to NIH B Virus Resource Laboratory. Once all Herpes B test results have been obtained, DCM will forward a copy to the UHS OHN office.

**Reference:** General information/recommendations and table 1,4,5,6 :

J.I. Cohen et al, Recommendations for Prevention of and Therapy for Exposure to B Virus **Clinical Infectious Diseases** 2002;35:1191-1203

<http://www.journals.uchicago.edu/CID/journal/issues/v35n10/020880/020880.web.pdf>

**Table 1. Well-documented cases of B virus infection in humans.**

Exposure	No. of cases	Reference(s)
Monkey bite	10	[4–11]
Monkey scratch	2	[4, 12]
Wound contamination with monkey saliva	1	[13]
Tissue culture-bottle cuts <sup>a</sup>	1	[7]
Needlestick injury <sup>b</sup>	2	[4, 14]
Possible aerosol <sup>c</sup>	2	[15, 16]
Cleaned monkey skull	1	[4]
Needle scratch and monkey bite	1	[4]
Cage scratch	2	[10, 17]
Possible reactivation of B virus	1	[18]
Human-to-human contact <sup>d</sup>	1	[10]
Mucosal splash <sup>e</sup>	1	[19]
Unknown	1	[20]
Total	26	

<sup>a</sup> Cultures involved monkey kidney cells.

<sup>b</sup> In one case, a needle had been used to inject the tissues around the eye, and, in the other case, a needle “may have been used previously to inject monkeys” [4, p. 974].

<sup>c</sup> In one case, aerosol may have been generated during autopsies performed on macaques, and, in the other case, the patient presented with respiratory symptoms.

<sup>d</sup> The patient applied cream to her husband’s herpes vesicles and to areas of her own skin that were affected by contact dermatitis.

<sup>e</sup> The patient was splashed in the eye with material, possibly feces, from a macaque.

**Table 4  
B virus.**

Pros

Initiation of acyclovir therapy within 24 h after exposure to B virus prevents death among animals [24]

Initiation of acyclovir therapy within hours of exposure may prevent or modify symptomatic B virus disease

Cons

Infection with B virus is very 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 virus shedding and seroconversion, which may make diagnosis more difficult [25]

**NOTE.** Adapted from [1].

**Table 5. Recommendations for postexposure prophylaxis for persons exposed to B virus.**

## Prophylaxis recommended

Skin exposure<sup>a</sup> (with loss of skin integrity) or mucosal exposure (with or without injury) to a high-risk source (e.g., a macaque that is ill, immunocompromised, or known to be shedding virus or that has lesions compatible with B virus disease)

Inadequately cleaned skin exposure (with loss of skin integrity) or mucosal exposure (with or without injury)

Laceration of the head, neck, or torso

Deep puncture bite

Needlestick associated with tissue or fluid from the nervous system, lesions suspicious for B virus, eyelids, or mucosa

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

A postcleansing culture is positive for B virus

## Prophylaxis considered

Mucosal splash that has been adequately cleaned

Laceration (with loss of skin integrity) that has been adequately cleaned

Needlestick involving blood from an ill or immunocompromised macaque

Puncture or laceration occurring after exposure to (a) objects contaminated with body fluid (other than that from a lesion), or (b) potentially infected cell culture

## Prophylaxis not recommended

Skin exposure in which the skin remains intact

Exposure associated with nonmacaque species of nonhuman primates

<sup>a</sup> Exposures include macaque bites; macaque scratches; or contact with ocular, oral, or genital secretions, nervous system tissue, or material contaminated by macaques (e.g., cages or equipment) (see the Postexposure Prophylaxis section of the text for details).

**Table 6. Summary of recommendations for prophylaxis and treatment of B virus infection.**

Clinical setting	Drug of first choice	Alternative drug
Prophylaxis for exposure to B virus	Valacyclovir, 1 g po q8h for 14 days	Acyclovir, 800 mg po 5 times per day for 14 days
Treatment of B virus disease		
CNS symptoms are absent	Acyclovir, 12.5–15 mg/kg iv q8h <sup>a</sup>	Ganciclovir, 5 mg/kg iv q12h <sup>a</sup>
CNS symptoms are present	Ganciclovir, 5 mg/kg iv q12h <sup>a</sup>	

<sup>a</sup> To be given until symptoms resolve and the results of 2 cultures are negative for B virus; see the Discontinuation of Treatment of B Virus Infection section of the text for additional therapy used after intravenously administered therapy has been completed.



Collection Date and Time:	Collectors Initials:	Patient Number (SMH Med Record #)	Visit Number
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Contact Name: \_\_\_\_\_  
 Department: University Health Service  
 Phone: \_\_\_\_\_

Print Last Name:

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Print First Name:

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**Flowcast Registration Information:**  
 WARD: [AUHS]  
 Plan Code: L590  
 Client Code: [IA127]

Gender: \_\_\_\_\_ Birth Date: \_\_\_\_\_

Ordering Physician: \_\_\_\_\_

\*Lab Staff ONLY\* Apply "Requisition Label":

SEND ADDITIONAL COPIES TO:

Fax To: \_\_\_\_\_

Call To: \_\_\_\_\_

**MICRO MSR**

**SPINS  SPECIAL LAB INSTRUCTIONS**

SPTYP: 1 SST  
 INSTR: SPIN and hold serum in serology frozen storage, please send a copy of the req to serology with the sample  
 ACTON: Serology hold sample frozen pending results of Herp B testing on Monkey Subject  
 STORE: serology frozen aliquot storage

1. When a monkey handler is scratched or bitten by a monkey, a blood draw is done on the monkey and sent out for Herp B virus testing. This takes 2-3 weeks for results.
2. A baseline hold sample is collected from the injured handler and stored pending the results of the monkey sample.
3. If the monkey sample comes back negative for the Herp B virus, the hold sample is discarded.
4. If the monkey sample comes back positive for the Herp B virus, the hold sample is tested for a baseline Simeon B Virus.
5. UHS will contact MSR at 5-7801 when the monkey results are received to authorize discard or add the Simeon B virus testing.

**\*\*\* PLEASE CALL UHS at 275-2662 with ANY questions\*\*\***