

Employee/Personnel First Aid & Postexposure Prophylaxis Instructions for Monkey B Virus and Training



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Employee/Personnel First Aid & Postexposure Prophylaxis Instructions for Monkey B Virus and Training

This document is the current guidelines for managing B virus exposure. These recommendations are reflected in the documents in this packet.

Web Page: [Recommendations for Prevention of and Therapy for Exposure to B Virus](#)



CID Reference.pdf

PDF File:

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First Aid Instructions

For Macaque-Related Injuries Follow These Instructions Step-by-Step



Warning: When assisting an injured person, wear gloves and safety glasses!

A. Macaque bite, scratch, or post-injection needlestick

1. Immediately wash skin thoroughly with a solution containing detergent soap (chlorhexidine or povidone iodine for a minimum of 15 minutes. Scrub and soak the wound (or exposure site) with the surgical scrub brush and solution provided in the labeled bag. After scrubbing, rinse the area well with water.
2. Dry the wound gently with sterile gauze pads.
3. Cover the wound with a Telfa pad and wrap it with gauze. Apply tape.
4. Take the written materials from the Macaque First Aid Kit and go immediately to the BUMC Occupational & Environmental Medicine located at 732 Harrison Avenue, Preston Family Building, F5, tel: (617) 638-8400, Monday – Friday, 7:30 am to 4:00 pm. After hours, go to the Emergency Department located on the Harrison Avenue Campus at 771 Albany Street, Menino Pavilion. For severe injuries call the Security Office at (617) 638-4444. Give the written materials from the Macaque First Aid Box to the medical staff.
5. Call the LASC office at (617) 638-4086 and report what happened and fill out the incident report.

B. Eye, nose, or mouth splash with macaque saliva, urine, feces, blood, or other secretion.

1. For eye splashes use eye wash station to irrigate the eye for 15 minutes. If no eye wash station, use sterile irrigation solution as below.
2. Rinse eye(s), nose, and/or mouth immediately with sterile irrigating solution for 15 minutes.
3. Take the written materials from the Macaque First Aid Kit to give to the clinician.
4. Go immediately to the BUMC Occupational & Environmental Medicine located at 732 Harrison Avenue, Preston Family Building, F5, tel: (617) 638-8400, Monday – Friday, 7:30 am to 4:00 pm. After hours, go to the Emergency Department located on the Harrison Avenue Campus at 771 Albany Street, Menino Pavilion. Give the written materials from the Macaque First Aid Kit to the medical staff.
5. Call the LASC office at (617) 638-4086 and report what happened and fill out the incident report.

Employee Instructions:

MACAQUE MONKEY BITE/SCRATCH POSTEXPOSURE PROCEDURES

An exposure is not limited to a bite or scratch directly from the monkey. An exposure also includes a cut or scrape from primate cages, a needle stick, or saliva contamination of an existing wound or ocular exposure. Exposure can also occur at necropsy (e.g., a cut from a scalpel blade used to perform the monkey necropsy).

If you are exposed, take the following steps:

1. For wounds or scratches, thoroughly scrub or irrigate the wound or exposed area for a minimum of 15 minutes with a disinfectant solution that should be available at a sink in or near the monkey room. **THIS IS THE MOST IMPORTANT STEP! DO NOT DELAY!** Wound cleansing should be started as soon as possible or within two to five minutes after the injury. (It has been shown that a similar virus, the human herpes simplex virus, can enter host cells within five minutes of exposure.)
2. A concentrated soap or detergent such as povidone-iodine (Betadine Scrub), or chlorhexidine (Nolvasan Scrub) is recommended for skin exposures. The B virus is readily killed by most detergent soaps and disinfectants. The mechanical scrubbing or flushing action is reportedly the most effective means of removing the virus.

For ocular exposures, the eye should be copiously flushed at the eye wash station or with an eye solution such as Dacriose or sterile normal saline for a minimum of 15 minutes. Never use any soap or disinfectants in the eyes.

3. After the immediate wound cleansing, contact the supervisor and the veterinarian on duty to report the incident. (The veterinarian will coordinate the collection of blood and virology samples from the involved monkey.) Your supervisor will direct you to go the occupational health clinic during normal working hours for blood and wound virology sample collection. You will bring all sections of this information packet and give it to the treating physician. You should ask for the First Aid section back as it contains follow-up instructions.
4. After normal working hours, BMC holidays and weekends, the emergency department will handle exposures by providing appropriate wound care and collecting a wound virology sample and a blood sample.
5. The clinic or emergency department will repeat 15 more minutes of cleaning as described above. The provider will notify the Microbiology Laboratory (H 406) and tube the specimens to pneumatic tube station #2. The specimens may include viral culture swabs collected from the wound or exposed area after disinfecting as described above. Also a blood sample will be drawn and sent to the Microbiology laboratory. Specimens must be refrigerated or frozen and shipped to the NIH B Virus Resource Laboratory. Viral specimens should be frozen prior to shipment and the serum from the blood sample should be stored in a refrigerator or frozen. Forms are included in this packet and include specific directions on how to obtain and handle specimens.
6. If you are evaluated for your exposure in the Boston Medical Center Emergency Department you must be re-evaluated on the next business day for follow-up at Boston Medical Center Occupational & Environmental Medicine Clinic in the Preston Building (F5),

732 Harrison Avenue. The phone number is (617) 638-8400. Hours are from 7:30 am – 4:00 pm, Monday – Friday.

7. You will also be scheduled to have a follow-up blood sample drawn at the clinic in approximately two to three weeks. The veterinarian will insure that appropriate follow-up samples are obtained from the monkey if indicated.
8. Seek emergency care if you suffer any of the symptoms described on the symptom list on pg 6. Providers must be informed that you work with nonhuman primates. Providers should contact the NIH B virus laboratory for assistance at (404) 651-0808, or emergency page: (404) 358-8168.

Employee Follow-up after Exposure to a Macaque Monkey

You have been potentially exposed to Herpes B Virus from an exposure to a macaque monkey. You must make and keep a follow-up appointment with Occupational & Environmental Medicine (638-8400). You may need daily wound checks and a repeat blood test in 2-3 weeks. It is important that you understand the potential seriousness of this disease, so that you get appropriate medical care and protect the health of others around you.

Precautions

If you have been told that you have had a high risk exposure to a B virus positive monkey, it is recommended that you avoid activities involving the exchange of body fluids, including saliva, for the next four weeks should you become ill with B Virus. Practice safe sex using a barrier. Do not donate blood. Be aware of the signs and symptoms of Herpes B Virus. The following signs or symptoms should be reported immediately to BMC Occupational & Environmental Medicine 617-638-8400 or to an emergency department after sustaining a macaque monkey exposure. Make sure you identify yourself as having had an exposure to a macaque. Emergency number: NIH B virus laboratory 404-651-0808. Emergency Pager #: 404-358-8168, for clinician information.

SIGNS AND SYMPTOMS SUGGESTING POSSIBLE INFECTION WITH B VIRUS

Early manifestations (inconsistently present)

1. Small blister-like eruptions (vesicles) or ulcerations at or near the exposure site
2. Severe pain or itching at the exposure site
3. Inflamed lymph nodes, especially if they occur in the armpit or elbow of the injured arm

Intermediate manifestations (inconsistently present)

1. Fever
2. Numbness or tingling at or near the exposure site, with or without progression toward the center of the body
3. Muscle weakness or paralysis in the exposed extremity
4. Eye redness and inflammation (conjunctivitis)
5. Persistent hiccups

Late manifestations (avoidable with early therapy)

1. Sinusitis
2. Neck stiffness
3. Headache lasting more than 24 hours
4. Nausea and vomiting
5. Double vision, difficulty speaking, difficulty swallowing, dizziness, muscle weakness or partial paralysis on either side, or other symptoms of brain stem dysfunction (cerebellar signs with ataxia, crossed sensory loss, cranial nerve palsies, or drop attacks)
6. Altered mental activity
7. Other signs compatible with an infection of the central nervous system, including urinary retention, respiratory failure, convulsions, hemiplegia (paralysis on one side of the body), other localized neurological signs, progressive ascending paralysis, or coma. (Adapted from Table 1 in Guidelines for the Prevention and Treatment of B-Virus Infections in Exposed Persons by Gary Holmes, et al.)

BMC OEM and Emergency Medicine Clinical Practice Guideline

SIMIAN HERPES B VIRUS EXPOSURE

This guideline is to be used to assist in clinical efficiency, but is not a substitute for clinical judgment

PRIMATE EXPOSURE - POSSIBLE SIMIAN HERPES B VIRUS EXPOSURE

Monday – Friday
Non-Holiday
7:30^{am} – 4:00^{pm}

Herpes B Virus Prophylaxis Recommended

1. Skin exposure or mucosal exposure (with or without injury, i.e. eye) to a high-risk source
2. Inadequately cleaned skin exposure or mucosal exposure
3. Laceration of 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 fluid from monkey oral or genital lesions or with nervous system tissues, or (b) known to contain B virus.
7. A post cleaning culture is positive for B virus

Herpes 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
- 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

Herpes BV Prophylaxis Not Recommended

1. Skin exposure in which the skin remains intact
2. Exposure associated with non-macaque species of nonhuman primates

BPHC Lab reporting regulations applies to B Virus. Report exposures, illnesses, or absenteeism to Occupational Health Officer at (617) 353-6630 or (617) 780-5519 (cell) or OEM. Complete the BPHC Research Laboratory Reporting Form found at: <http://www.bphc.org/bphc/pdfs/LabReportCard.pdf>

1. Wound care – cleanse & irrigate with detergent for 15 minutes; debride only if necessary.
2. Eye flush/irrigation for 15 min.
3. Valacyclovir, 1 g PO q8h for 14 days*
4. Culture – debrided tissue should be placed in viral transport media and sent for B-virus cx; swab wound for viral cx as well.
5. Start Abx – Augmentin or Keflex for bites.
6. Td as indicated (booster if bite and Td > 5 yrs ago)
7. Acute serum collection (aliquot and preserve at -20°C or lower and send to micro lab, complete forms for B virus lab.
8. Provide patient information in first aid packet and schedule OEM follow-up appointment

SIMIAN HERPES B VIRUS (Cercopithecine herpes virus 1)

- Endemic in Macaque Monkeys (rhesus, Pig-tailed, bonnet, cynomolgus)
ALL MACAQUES MUST BE ASSUMED TO BE VIRUS +
- 70% case fatality rate when transmitted to humans
 - Transmitted through open skin and mucocutaneous exposures (bites, scratches, needlesticks, splashes over mucus membranes, open skin)
 - Biomedical lab workers, animal handlers at risk (live monkeys, monkey tissue cultures, body fluid exposures – blood, secretions, excretions)
 - 2days – 5weeks incubation period, but latent presentations occur
 - Disease In Humans: Early-Skin vesicular eruptions, ulcerations; regional nodes; Late – Fever, malaise, diffuse pain, HA, abd pain, n/v, paresthesias, encephalitis, paralysis, death
- Exposures include macaque bites, macaque scratches, or contact with ocular, oral, or genital secretions, nervous system tissue, or material contaminated by macaques.

YES

**REFER TO OCCUPATIONAL
& ENVIRONMENTAL
MEDICINE**

**TO BE INTERVIEWED
IMMEDIATELY**
BMC OEM
732 HARRISON AVE
BOSTON, MA 02118
(617) 638-8400

NO

**Refer to Boston Medical
Center
EMERGENCY
DEPARTMENT
MENINO PAVILION**

(617) 414-7759

**Patients Must Be Evaluated
at
OCCUPATIONAL &
ENVIRONMENTAL
MEDICINE
Next Business Day**

732 Harrison Avenue
Boston, MA 02118
(617) 638-8400

**ANY PATIENT
PRESENTING WITH
SYMPTOMS OF B VIRUS
SHOULD BE ADMITTED
FOR IV GANCICLOVIR
CONSULT ID SERVICE**

EMERGENCY CONSULTATION

If an exposed person exhibits any of these symptoms please contact Julia Hilliard, Ph.D. at the **National B Virus Resource Center** at 404.651.0808

www.gsu.edu/bvirus

*Valacyclovir substitute: Acyclovir, 800 mg PO 5 times per day for 14 days if pregnant

Boston University Accident Report and Analysis

******This form must be completed by supervisor within 24 hours of the accident******

Employee's Name _____ Social Security# _____

Street _____ City _____ State _____ Zip _____

Home Phone _____ Work Phone _____

Date of Birth _____ Sex _____ Date of Hire _____

Department _____ Job Title _____

Days worked _____ Shift Hours _____ Full/Part Time _____

Date of Injury _____ Time of Injury _____

Date Employee Notified You of Accident _____

Location of Injury _____

On Employer's Premises? Yes No Regular occupation when injured? Yes No

Employee's Account of Accident _____

Witnesses _____

Body Part Injured _____

Describe any unsafe act or unsafe condition that may have contributed to the accident. _____

What actions have been taken to prevent recurrence? _____

Has the Office of Environmental Health and Safety been informed? Yes _____ No _____

If lifting injury: What was employee lifting? _____

How much did it weigh? _____

To what height was employee lifting? _____

Supervisor's Comments _____

Supervisor's Signature _____ Date _____

This form along with the state required form (either 118 or 101)* must be filled out by injured employee's supervisor. Once completed, both forms should be forwarded immediately to the Department Administrator/Payroll Coordinator, who will forward them to the Office of Personnel. Attach any additional information that may be useful in processing this claim. The Supervisor must report any unsafe work condition to the Office of Environmental Health and Safety immediately.

* State Forms 118 and 101 can be obtained from the Office of Risk Management.

Employee Training

Infectious Hazards from Nonhuman Primates

	Macaques	Baboons	Guenons	Squirrel Monkeys	Chimpanzees
Viruses	B virus Foamy virus Simian retrovirus (Type D) SV40 SIV Pox viruses Yellow fever Dengue Ebola	Foamy virus Pox viruses Yellow fever Dengue	Foamy virus SIV Pox viruses Yellow fever Dengue	Dengue Yellow fever	Foamy virus SIV Hepatitis B Molluscum contagiosum Hepatitis A Pox viruses Yellow fever Dengue Ebola
Bacteria	<i>Burkholderia pseudomallei</i> <i>Campylobacter</i> spp. <i>Mycobacterium tuberculosis</i> <i>Mycobacterium bovis</i> <i>Mycobacterium leprae</i> (also known in to occur mangabeys) <i>Leptospira</i> spp. <i>Salmonella</i> spp. <i>Shigella</i> spp. <i>Yersinia pseudotuberculosis</i> <i>Yersinia enterocolitica</i>	<i>Campylobacter</i> spp. <i>Leptospira</i> spp. <i>Mycobacterium tuberculosis</i> <i>Mycobacterium bovis</i> <i>Salmonella</i> spp. <i>Shigella</i> spp. <i>Yersinia pseudotuberculosis</i> <i>Yersinia enterocolitica</i>	<i>Campylobacter</i> spp. <i>Leptospira</i> spp. <i>Mycobacterium tuberculosis</i> <i>Mycobacterium bovis</i> <i>Salmonella</i> spp. <i>Shigella</i> spp. <i>Yersinia pseudotuberculosis</i> <i>Yersinia enterocolitica</i>	<i>Campylobacter</i> spp. <i>Leptospira</i> spp. <i>Mycobacterium tuberculosis</i> <i>Mycobacterium bovis</i> <i>Salmonella</i> spp. <i>Shigella</i> spp. <i>Yersinia pseudotuberculosis</i> <i>Yersinia enterocolitica</i>	<i>Burkholderia pseudomallei</i> <i>Campylobacter</i> spp. <i>Mycobacterium tuberculosis</i> <i>Mycobacterium bovis</i> <i>Mycobacterium leprae</i> <i>Leptospira</i> spp. <i>Salmonella</i> spp. <i>Shigella</i> spp. <i>Yersinia pseudotuberculosis</i> <i>Yersinia enterocolitica</i>
Metazoan Parasites	<i>Hymenolepis nana</i> <i>Oesophagostomum</i> spp. <i>Strongyloides</i> spp. <i>Trichuris</i> spp. <i>Enterobius vermicularis</i>	<i>Hymenolepis nana</i> <i>Oesophagostomum</i> spp. <i>Strongyloides</i> spp. <i>Trichuris</i> spp.	<i>Oesophagostomum</i> spp. <i>Strongyloides</i> spp. <i>Trichuris</i> spp.	<i>Hymenolepis nana</i> <i>Trichuris trichuria</i>	<i>Hymenolepis nana</i> <i>Oesophagostomum</i> spp. <i>Strongyloides</i> spp. <i>Trichuris</i> spp. <i>Enterobius vermicularis</i>
Protozoan Parasites	<i>Balantidium coli</i> <i>Cryptosporidium</i> spp. <i>Entamoeba histolytica</i> <i>Giardia intestinalis</i> <i>Plasmodium</i> spp.	<i>Balantidium coli</i> <i>Cryptosporidium</i> spp. <i>Entamoeba histolytica</i> <i>Giardia intestinalis</i> <i>Plasmodium</i> spp.	<i>Balantidium coli</i> <i>Cryptosporidium</i> spp. <i>Entamoeba histolytica</i> <i>Giardia intestinalis</i> <i>Plasmodium</i> spp.	<i>Balantidium coli</i> <i>Cryptosporidium</i> spp. <i>Entamoeba histolytica</i> <i>Giardia intestinalis</i> <i>Plasmodium</i> spp. <i>Trypanosoma cruzi</i>	<i>Balantidium coli</i> <i>Cryptosporidium</i> spp. <i>Entamoeba histolytica</i> <i>Giardia intestinalis</i> <i>Plasmodium</i> spp.

Source: Occupational Health and Safety in the Care and Use of Nonhuman Primates (2003), Institute for Laboratory Animal Research

Macaque Monkeys

Macaques live in many different habitats across the globe, making them the most widely distributed genus of nonhuman primates. Macaques (especially *Macaca mulatta* and *M. fascicularis*) are commonly used in research—most recently in AIDS research. Their coloration includes gray, brown or black fur. They tend to be heavily built and medium to large in stature. Males and females may differ in weight, body size and canine size. (from *Nonhuman Primates in Biomedical Research: Biology and Management* pp 41)

Macaques are native to Asia and Northern Africa, but thousands are housed in research facilities, zoos, wildlife or amusement parks, and are kept as pets in private homes throughout the world.

Pictures of Macaque Monkeys (alphabetical order)



Assamese macaque
(*Macaca assamensis*)



Assamese macaque
(*Macaca assamensis*)



Barbary Macaque
(*Barbary "ape" or Barbary Macaque*)



Barbary Macaque
(*Macaca sylvanus*)



Bonnet Macaque
(*Macaca radiata*)



Bonnet Macaque
(*Macaca radiata*)



Booted or Sulawesi-Booted Macaque
(*Macaca ochreata*)



Celebes "ape", Sulawesi Black "ape", or Sulawesi-Crested Macaque
(*Macaca Nigra*)



**Formosan Rock Macaque
or Taiwan Macaque**
(Macaca cyclopis)



Japanese Snow Macaque
(Macaca Fuscata)



Japanese Macaque
(Macaca Fuscata)



Japanese Macaque
(Macaca Fuscata)



Lion-tailed Macaque
(Macaca silenus)



**Cynomolgus monkey, Crab-
Eating Macaque, Long-
Tailed Macaque, or Java
Macaque**
(Macaca fascicularis)



Pigtailed Macaque
(Macaca nemestrina)



Rhesus Macaque
(Macaca mulatta)



Tibetan Macaque
(Macaca thibetana)



Tonkean Macaque
(Macaca tonkeana)



Tonkean Macaque
(Macaca tonkeana)



Toque Macaque
(Macaca sinica)

Herpes B Virus Prevention

Standard Operating Procedure

Title: Essential Safety Precautions and First Aid Measures for Animal Care and Research Personnel Handling Macaques

Date: Revised 5/28/04 (CSB)

Purpose: This SOP establishes strict requirements for safe handling of macaques and details the immediate post-exposure treatment for personnel who may be exposed to Herpes B virus

Background

Nonhuman primates of all types can harbor diseases that are infectious for personnel handling these animals. Human infection with **B virus** from macaque monkeys is a serious risk due to the high morbidity and mortality of the disease in humans. During the past five years several cases of B virus infection have caused deaths among person exposed to macaques in the United States.

B virus (a.k.a., *Herpesvirus simiae*, *Cercopithecine herpesvirus 1*) is enzootic in rhesus (*Macaca mulatta*), cynomolgus (*M. fascicularis*) and other Asiatic monkeys of the genus *Macaca*. Prolonged or lifelong infection is typical. The detection of infection in macaques is difficult because, as with human oral herpes infection, affected animals are frequently asymptomatic. False negatives are known to occur in the serological monitoring of macaques for infection. **Consequently, all animals not known to have originated from B virus-free sources must be assumed to be carriers.**

Personnel are at risk of contracting infection both through direct contact with infected macaques as well as by indirect contact with an environment contaminated by B virus. Virus may be present in macaque blood, saliva, tears, and genital fluids. Most human cases of B virus have resulted from direct inoculation by macaque bites or scratches or from working with infected macaque tissues. However, any exposure of broken skin or mucous membrane to potentially contaminated secretions or material places the individual at risk of infection. Person to person transmission also has been documented.

Additional background information on B virus may be obtained from the references listed at the end of this document.

Procedure The following requirements apply to the acquisition and handling of macaques:

1. Personnel working with macaques are required to review and sign a copy of this SOP acknowledging that they understand the nature of B virus hazard and that they will rigorously follow the precautions outlined below.
2. All macaque monkeys will be regarded as infected with B virus and are considered capable of transmitting the infection at all times. Consequently, direct handling of macaques must be minimized as much as possible. Macaques will be housed in squeeze-back cages that permit physical restraint to facilitate the administration of ketamine. When possible, macaques will be immobilized with ketamine anesthesia prior to initiation of procedures. Studies necessitating the

handling of macaques without the protection afforded by animal immobilization must be conducted with strict adherence to safety requirements.

3. Extreme care must be taken to avoid accidental self-injury with needles or any other instruments that have been used for procedures on macaques. Post-injection needle re-capping is not permitted when working with macaques. All hypodermic equipment must be discarded in appropriate disposal units immediately after macaque injections are delivered.
4. Surgical instruments that have been used on macaques or macaque tissues must be handled with extreme caution to avoid injury. All items and instruments with any macaque tissue or bodily fluids must be appropriately discarded or decontaminated as soon as possible following use. Safety apparel and precautions apply until disposal or decontamination is complete.
5. Personnel who transfer macaques from one cage to another must wear a long-sleeved garment to prevent scratches and a chin-length wrap around face shield (or surgical mask plus goggles/safety glasses with solid side shields) to prevent exposure of mucous membranes (eyes and mouth) to macaque secretions. Leather gloves must also be worn while manipulating the cage during the animal transfer process. If personnel are working with chemically immobilized animals, latex or vinyl gloves may be worn instead of the leather gloves; eye protection and nose/mouth protection must be maintained.
6. Cages and other equipment used for macaque housing or procedures should be considered contaminated with infectious B virus. This equipment should be designed and maintained to prevent personnel injury from sharp edges or corners and be arranged in the animal housing area to minimize the risk of workers being accidentally grabbed or scratched by the animals.
7. Access to all areas where macaques are maintained or used must be restricted to workers who are properly trained in the methods listed in this SOP. All qualified individuals must also meet our institution's other criteria for nonhuman primate contact (see Occupational Health Program requirements). The essential criteria for nonhuman primate contact include baseline serum banking for retrospective studies of potential zoonotic disease transmission and participation in a program for tuberculosis screening.
8. A person who has received a needlestick, bite, scratch, other injury, or eye/mucous membrane splash that could possibly be contaminated with macaque blood, tissue, or secretions must: within 5 minutes of the injury:
 - a) Wash the injury thoroughly for 15 minutes, by following the attached First Aid Instructions; and then:
 - b) Report to the BMC Occupational and Environmental Medicine Clinic (617)-638-8400 or the Harrison Avenue Campus Emergency Department tel: 617-414-7759 (after hours, holidays, and weekends) promptly after washing affected area for at least 15 minutes! For all severe bites or life threatening injuries report to the Emergency Department.
 - c) Follow-up on the next business day to BMC Occupational & Environmental Medicine and as directed if emergency care was provided by the Emergency Department and if any skin lesions or neurological symptoms (such as itching, pain, or numbness) occur near the site of the wound or if any unusual illness occurs following the injury.

The BMC Occupational & Environmental Medicine will monitor the clinical status of the individuals for up to 12 weeks after an exposure. Symptoms suggestive of B virus infection must be reported immediately to the BMC OEM or to the Albany (Menino Pavilion ED after hours, weekends or

holidays. Postexposure prophylaxis will be offered based on current guidelines. When the possibility of B virus illness is entertained, appropriate diagnostic studies as recommended by current guidelines should be performed and specific antiviral therapy will be instituted if recommended. Medical consultation and serologic testing may be obtained from one or more of the following:

1. NIH B Virus Resource Laboratory
Georgia State University
Julia Hilliard, Ph.D., Laboratory Director
Ph: (404) 651-0808
Emergency: (404) 358-8168
2. NIH B Virus Resource Laboratory
Georgia State University
Martin Wildes, MT (AAB), Laboratory Supervisor
Ph: (404) 651-0792
3. Primary Clinical Consultants
Norman Bernstein, MD
Ph: (540) 374-3277

David Davenport, MD
Ph: (269) 341-6400
4. Center for Disease Control ,
J. Scott Schmid, MD and Colleagues
Ph: (404) 639-0066
9. All potential exposure incidents must also be reported to Veterinarian, LASC Office tel: (617) 638-4086; emergency page (617) 638-5795, id # 4806). Serologic testing must be obtained from the monkey involved unless serologic status is known. Culturing for virus will be considered from specimens collected from lesions, conjunctiva, and buccal mucosa. All injuries will be recorded in the bite/scratch log. The BMC OEM will evaluate all injuries and wounds.

Acknowledgement

I have reviewed the above protocol and am familiar with the serious health hazard posed by B virus in macaque monkeys. Accordingly, I will adhere strictly to the methods of disease prevention described above.

Employee's Signature: _____ Date: _____

Reviewer's Signature: _____ Date: _____

References (available from LASC office upon request)

1. Adams, S. R., E. Muchmore, and J. H. Richardson. 1995. Biosafety. p. 377-420. *In* B. T. Bennett, C. R. Abee, and R. Henrickson, (ed.) *Nonhuman Primates in Biomedical Research*. Academic Press, Inc., Orlando, Florida.
2. Holmes, G. P., L. E. Chapman, J. A. Stewart, *et al.* 1995. Guidelines for the prevention and treatment of B-virus infections in exposed persons. *Clin. Inf. Dis.* 20:421-439.
3. Cohen, JI, Davenport, JA, Deitchman S et al. 2002. Recommendations for Prevention of and Therapy for Exposure to B Virus (Cercopithecine Herpes 1). *Clin. Inf. Dis.* 2002;35 (Nov. 15)

Applicability

1. The SOP for macaque handling and safety must be reviewed and signed by each person who may have exposure to macaques, macaque excretions/secretions, or macaque tissues.
2. A staff member of the BMC OEM will be responsible for reviewing the SOP for macaque handling and safety with LASC and research staff members as described above. The BUMC Employee Health Service staff member will sign as the Reviewer once he/she is satisfied that the recipient is appropriately informed.
3. Actual hand on training with live monkeys is the responsibility of the LASC staff.

Recordkeeping Requirements

1. Two copies of the SOP for macaque handling and safety will be signed and dated by both the recipient of the training and by the BUMC Employee Health staff member.
2. One signed SOP will be retained by the recipient of the training. The other signed document will be filed in BUMC Employee Health records.
3. The Director of LASC will receive written notification from the BMC OEM office when the training requirements have been met for an individual. This notice will be filed with the relevant IACUC Protocol or LASC personnel record. If all other Occupational Health Program criteria are fulfilled, the individual will be permitted to work with macaques.
4. The BMC Occupational & Environmental Medicine will work with the Infectious Disease and Emergency Medicine departments to ensure that appropriate medical center staff members are knowledgeable in the prevention, control, and treatment of Herpes B virus in humans.
5. Records for personnel with ongoing macaque exposure will be updated annually.
6. LASC will inform the BMC Occupational & Environmental Medicine office of the names of all personnel who will be involved in macaque care or use.

First Aid Instructions

For Macaque-Related Injuries Follow These Instructions Step-by-Step



Warning: When assisting an injured person, wear gloves and safety glasses!

A. Macaque bite, scratch, or post-injection needlestick

1. Immediately wash skin thoroughly with a solution containing detergent soap (chlorhexidine or povidone iodine for a minimum of 15 minutes. Scrub and soak the wound (or exposure site) with the surgical scrub brush and solution provided in the labeled bag. After scrubbing, rinse the area well with water. Consider washing with 0.25% hypochlorite solution first.
2. Dry the wound gently with sterile gauze pads.
4. Cover the wound with a Telfa pad and wrap it with gauze. Apply tape.
4. Take the written materials from the Macaque First Aid Kit and go immediately to the BUMC Occupational & Environmental Medicine located at 732 Harrison Avenue, Preston Family Building, F5, tel: (617) 638-8400, Monday – Friday, 7:30 am to 4:00 pm. After hours, go to the Emergency Department located on the Harrison Avenue Campus at 771 Albany Street. For severe injuries call the Security Office at (617) 638-4444. Give the written materials from the Macaque First Aid Box to the medical staff.
5. Call the LASC office at (617) 638-4086 and report what happened and fill out the incident report.

B. Eye, nose, or mouth splash with macaque saliva, urine, feces, blood, or other secretion.

1. For eye splashes use eye wash station to irrigate the eye for 15 minutes. If no eye wash station, use sterile irrigation solution as below.
2. Rinse eye(s), nose, and/or mouth immediately with sterile irrigating solution for 15 minutes.
3. Take the written materials from the Macaque First Aid Kit to give to the clinician.
4. Go immediately to the BUMC Occupational & Environmental Medicine located at 732 Harrison Avenue, Preston Family Building, F5, tel: (617) 638-8400, Monday – Friday, 7:30 am to 4:00 pm. After hours, go to the Emergency Department located on the Harrison Avenue Campus at 771 Albany Street, Menino Pavilion. Give the written materials from the Macaque First Aid Kit to the medical staff.
5. Call the LASC office at (617) 638-4086 and report what happened and fill out the incident report.

Contents of First Aid Kit For Wounds Involving Macaques

1. Cleansing materials

- a. Povidone-iodine or Chlorhexidine scrub concentrate
Sterile surgical scrub brushes
- b. Sterile basin for soaking large wound scrub
- c. Sterile 4 x 4 gauze pads for dressing wound
- d. Telfa pad and tape for dressing wound
- e. Sterile saline solution for irrigation of contaminated eyes, nose, or mouth or eye wash
- f. Paper or cloth tape for dressing of wounds

Additionally, to be included in kit if worksite does not have ready access to a sink with free flowing water.

- a. (2) Sterile saline solution (1L bottle) for irrigation of contaminated eyes, nose mouth.
- b. Dry irrigation bottle
- c. Basin

2. Instructional materials

- a. First Aid Instructions
- b. B-Virus Policy

3. Injury Incident Report Form

NOTE: When macaques are present in the facility, the LASC technologist is responsible for checking the kit contents monthly to keep the components in stock and in date.

Restricted Area



(Attach orange Biohazard Warning Symbol)

Biohazard

**No Entry Unless You have Received and Signed
the Macaque Handling SOP**

Room: CABR Building--W XXX
Species: *M. mulatta* (rhesus macaque)
Hazard: **B virus** (a.k.a., *Herpesvirus simiae*, *Cercopithecine herpesvirus 1*) introduced by bite, scratch, splash, or needlestick involving macaque or material (cage, needle, scalpel blade, etc.) that may be contaminated with macaque tissues

Protective equipment required: for cage changing transport, or removal to transport cage, or dental cleaning, or tracheal tube intubation:

Long-sleeved lab garment to protect **arms**

Gloves to cover **hands**, plus heavy outer gloves for cage handling

Surgical mask and goggles to cover protect eyes, **nose and mouth**

Shoe covers, bonnet and

In case of an emergency, consult instructions in First Aid Kit.

Contact:

Boston Medical Center Occupational & Environmental Medicine at **(617) 638-8400**

Cheryl Barbanel, MD, (617) 353-6630

Dr. Greg Freden, Attending LASC Veterinarian, (617) 638-4086.

BUMC Infectious Disease On-call Physician 617-638-5795 ID # 8902

**BOSTON UNIVERSITY MEDICAL CENTER
B-VIRUS PREVENTION AND EXPOSURE EVALUATIONS**

ROLES AND RESPONSIBILITIES

OCCUPATIONAL & ENVIRONMENTAL MEDICINE (OEM)/EMERGENCY DEPARTMENT (ED) is responsible for:

- a. Patient wound care
- b. Patient sample collection
- c. Patient information and post-exposure follow-up
- d. Sending patient samples to BMC Microbiology Laboratory on DOB H 416 for packaging

ENVIRONMENTAL HEALTH & SAFETY (EHS) is responsible for:

- a. Investigation of the exposure.
- b. Communication of the incident investigation to the primary investigator, and LASC of any possible modification to the study protocol based on the required post exposure follow-up surveillance.
- c. Tracking animal exposure incidents.

LABORATORY ANIMAL SCIENCE CENTER (LASC) is responsible for:

- a. Clinical evaluations of the monkey or monkey tissue.
- b. Animal sample collection packing and transport of samples to B-Virus Laboratory
- c. Define employee exposure groups and train employees on for the B-Virus Protocol

Employees are responsible for:

1. **Prevention** of B virus infection must always be the first goal and can be achieved through the following measures:
 - a. All macaque monkeys and their tissue should be regarded as infected. Viral shedding is intermittent and can occur in the absence of visible lesions.
 - b. Handling of macaques should be minimized and should be done by trained personnel.
 - c. Transfer and squeeze-back cages should be used to move monkeys whenever possible.
 - d. Ketamine may be used to remove monkeys from cages, particularly large or difficult animals.
 - e. Use appropriate personal protective gear. Use protective eyewear: (goggles/glasses with solid side shields and top shield), and a mask or a chin-length wrap around face shield and a mask is recommended to protect the mucous membranes of the worker. Long sleeved and long legged clothing, and gloves are necessary when handling animals or cleaning cages.
 - f. Do not recap needles or sharps!
 - g. Dispose of sharps (scalpel blades, contaminated sharp glass or needles) immediately after use in a designated, conveniently located puncture resistant sharps container.

- h. Surfaces in contact with monkeys or their fluids should be disinfected after use.
- i. Cages/equipment with potential for contamination from monkey fluids should be inspected for sharp edges that may cause injury to workers.
- j. Always practice appropriate hand cleaning techniques.
- k. Routinely report biohazard injuries.

2. First Aid:

If a biohazardous injury occurs, risk of infection can be reduced by immediate first aid.

- a. Immediately go to the first aid station and begin to thoroughly cleanse/scrub/irrigate the wound topical antimicrobial agent (povidone iodine or chlorohexidine) for 15 minutes+. If eyes, mouth, nose or other mucous membranes have been exposed, irrigate the site for 15 minutes+ with sterile saline or rapidly flowing water.
- b. After cleansing the injury, cover the injury with sterile dressing if available and proceed to the Occupational & Environmental Medicine during business hours Monday – Friday 7:30 am to 4:00 pm, except on holidays and weekends. The BMC Emergency Department (ENC) Ph: (617) 638-6240. For serious injuries go directly to the BMC Emergency Department.
- c. As soon as practical, report the injury to your supervisor. If possible, report the identification of the involved animal.

3. Injury Follow-Up:

Know early signs and symptoms suggesting B virus infection and reports soon as possible for physician evaluation if any of the following signs or symptoms occur: Make sure that you inform any treating provider that you have been exposed to B-Virus and bring your information with you, if you are traveling.

- a. Vesicular lesions near injury site
- b. Localized numbness, itching, pain, tingling
- c. Regional lymph node enlargement
- d. Fever
- e. Muscle weakness
- f. Conjunctivitis
- g. Stiff neck, headache, nausea, blurred vision
- h. If initially seen in the Emergency Department report to OEM on the next business day for follow-up. If a baseline blood specimen was sent for B virus serology you must make an appointment to have a follow-up serology drawn 2-3 weeks after the biohazard exposure.

Supervisors or Principal Investigators are responsible for:

1. Prevention

Train employees on the risk of B virus infection, the methods of preventing B virus infection, the need to clean wounds immediately for 15 minutes, and the importance of reporting injuries and/or symptoms to supervisors.

2. First Aid

If present at the time of the injury, assist the injured employee to cleanse the wound. If wound is bleeding, take care not to directly contact employee's blood without using Standard Precautions.

3. Reporting

If possible, identify the animal causing the injury and notify the staff veterinarian to review the animal's health record, examine the animal and collect specimens on the animal for appropriate laboratory tests.

4. Supervisor's completes the Accident Report and Analysis form.

The **BMC Emergency Department Menino Pavilion (Albany Street)** is responsible for:

1. Treating Macaque related biohazard injuries that require suturing or other emergency care.
2. Patient should be referred for follow-up on the next business day at OEM and given written information regarding serious potential symptoms.
3. The attending ED physician should rapidly review the adequacy of the previously administered first aid. Repeat wound/exposure site cleaning and provide prophylaxis if indicated with Tetanus, Augmentin, (wound or bite) and consider B Virus prophylaxis. Drawing a serum sample for the laboratory testing later on if indicated.
4. Instruct the exposed employee to make a follow up appointment with the BMC Occupational & Environmental Medicine (617-638-8400) or contact the Infectious Disease Physician on call for admission to the hospital for symptomatic patients.

MACAQUE MONKEY PROGRAM:

POSSIBLE INFECTIOUS AGENTS AND THEIR CONTROL

AGENT	WORKERS AT RISK	METHOD OF CONTROL	COMMENTS
B Virus	Macaque handlers, cage cleaners and necropsy technicians	See Rules to prevent infection below.	Source: macaque monkeys shedding B virus (similar to shedding of herpes simplex virus by humans); Route: esp. through bite or scratch; infection through intact mouth or eye mucosa is possible;
Tuberculosis	Macaque handlers and others who work in macaque rooms	TB skin test every 6-12 months to detect converters; all new employees should have the two step test as recommended by the CDC;	The monkeys are susceptible to TB. Once introduced by a human, the disease can spread quickly through the colony.
Measles	Macaque handlers and others who work in macaque rooms	If born after 1/1/57, then a booster (MMR) is recommended;	This is just a routine immunization practice.
Hepatitis A	Macaque handlers and others exposed to fecal contamination	Personal protective equipment; good hand washing; offer hepatitis A vaccine;	Hepatitis A vaccine is now a routine immunization for travelers to parts of the world where hepatitis A is endemic.
Hepatitis B	Macaque handlers	Worker training regarding sharps; offer hepatitis B vaccine;	Hepatitis B is now a routine part of childhood immunizations. It is also recommended to health care workers who have exposures to patients' blood.
Tetanus	Macaque handlers	Booster every 10 years or give after tetanus prone wound sustained if more than 5 years;	This is just a routine immunization practice.
Bite wound infection	Macaque handlers	Prevention of bites by using safe handling methods; consider treatment with Augmentin after deep bites;	Also consider debridement of any contused and nonviable tissue in the wound.
Rabies	Macaque handlers	Observe animal after bite; if becomes ill, then consider testing for rabies and beginning immunization of worker;	It is unlikely that these previously quarantined primates would contract rabies.

RULES TO PREVENT B VIRUS INFECTION IN PRIMATE HANDLERS

1. Know the safe methods for handling monkeys and sharps to prevent injuries.
2. Cleanse wounds thoroughly and without delay.
3. Collect specimens from both worker and monkey after an injury and ship promptly to the NIH B Virus Resource Laboratory.
4. Report all injuries and know the symptoms of B virus infection. The evidence from previous human infections suggests that patients survive if they are treated early before advanced symptoms develop.
5. Provide post-exposure prophylaxis if indicated. (see table 5 and 6 for risk assessment and PEP.

Appendix 4 Herpes Virus Simiae (B Virus) Infection – Questions and Answers

Q. What is B-Virus?

- A. Virus is a member of the herpes group of viruses that occurs naturally in Macaque monkeys and possibly in other Old World monkeys. B virus infects $\geq 70\%$ to 100% of surveyed captive adult macaques, but not other nonhuman primates (NHPs). Like humans infected with *Herpesvirus simplex* virus, monkeys infected with B virus have a lifelong infection, with intermittent reactivation and shedding of the virus in saliva, conjunctival fluid, or urogenital secretions. Although virus shedding is more frequent during the mating season (roughly March to June) and when an animal is ill, under stress, or immunosuppressed, there are often no signs of shedding. Macaques should always be regarded as potentially infectious.

Infection with B virus produces very mild disease in the monkey. Most have no obvious evidence of infection. Some monkeys may have vesicles (small blisters) which progress to ulcers in the mouth, on the face, lips, or genitals and/or eye infection. These lesions spontaneously heal after a few days, but the virus resides permanently in the monkey, and may reactivate and cause ulcerative lesions periodically. These relapses are especially likely to occur when the monkey is “stressed” (like cold sores or fever blisters in humans). During these periods, the virus is shed by the monkey to the environment; however, the virus may also be shed by monkeys without visible lesions or symptoms.

Q. How does transmission of the B virus from monkeys to humans occur?

- A. Transmission to humans occurs by exposure to eye, mouth or genital secretions or neurologic tissue from rhesus, cynomolgus or other macaque monkeys. Previously reported human infections usually have been attributed to macaque bites or scratches, injuries from needles used near a macaque’s mucous membranes or central nervous system, or contact with infectious products from the macaques. The first fatal case of B virus infection due to mucosal splash exposure was reported in 1998. Incubation periods may be as short as 2 days, but more commonly they are 2 to 5 weeks. Most documented infections have occurred among biomedical research employees who worked with macaques. Laboratory workers handling only infected central nervous system or primary monkey kidney cell lines have also been exposed and, in at least one instance, infected. One case of person-to-person transmission has been reported.

Q. Who is at risk for infection with B virus?

- A. Those at risk include animal caretakers, laboratory personnel, or anyone who is exposed to monkeys or monkey tissues. Persons who are immunosuppressed because of medication or underlying medical conditions may be at higher risk for infection. The risk of acquiring B virus infections from macaques is probably very low. Thousands of persons who have handled macaques since human infection with B-virus infection was first reported over 50 years ago. There have been approximately 50 known cases of fatal human B virus infection described in the English language literature. About 26 of these cases have been well documented.

Q. Can there be serious complications from B virus infection?

- A. In humans, B virus infections most commonly present as rapidly ascending encephalomyelitis after a prodrome characterized by nonspecific febrile malaise and variably accompanied by herpetic blisters and/or peripheral neurasthenias. Bites to the head and neck are more dangerous

because of their proximity to the central nervous system. A B virus infection occurring after these bites would be less likely than distal bites to present with early warning signs such as extremity paresthesias.

Q. How can I protect myself from infection?

- A. Proper work practices markedly reduce the chances of infection. When working with non-human primates:
1. Exercise caution at all times, remembering these are wild animals. They can and will bite and are capable of transmitting to humans several diseases as well as B virus.
 2. Wear appropriate, protective clothing, and eye and splash protection.
 3. Work together with at least one other person when handling awake primates. Minimize direct handling.
 4. Report any observed facial, lip, or oral lesions in primates to a staff veterinarian.
 5. Report all exposures to macaques to occupational health. Exposure to oral, genital or ocular secretions or neurologic tissues involving a macaque monkey or scratches on cages or equipment that might be contaminated with their secretions must be evaluated at the Occupational and Environmental Medicine clinic after first aid. If the injury occurs after clinic hours first aid should promptly be initiated at the worksite and then go to the Hospital's Emergency Department. The first aid provided at either of these locations should follow the wound care instructions posted in your work area. Immediately clean wound by soaking or scrubbing exposure site with soap or detergent for at least 15 minutes, then rinse well with water.

Rinse eyes and mucus membranes with sterile saline/flowing water.

Q. What are the signs and symptoms of B-virus infection in humans?

- A. B virus related disease is characterized by a variety of signs and symptoms, which generally occur within one month of exposure. These include:

Q. What is the purpose of the serum specimen drawn from all new monkey handlers and placed in frozen storage?

- A. These serum specimens are held in reserve to help in the interpretation a patient's serum antibody levels following an exposure or illness. About half of the human population possesses antibodies to human herpes simplex virus that cross-react to with B virus. By using special techniques, the lab can reduce, but not entirely eliminate the frequency of false positive results.

Clinical manifestations suggesting active infection with B virus.

Early manifestations (inconsistently present)

1. Vesicular eruptions or ulcerations at or near the exposure site
2. Severe pain or itching at the exposure site
3. Regional lymphadenopathy

Intermediate manifestations (inconsistently present)

1. Fever
2. Numbness, paresthesia, or other neurasthenias at or near the exposure site, with or without proximal progression.
3. Muscle weakness or paralysis in the exposed extremity
4. Conjunctivitis
5. Persistent hiccups

Late manifestations (avoidable with early therapy)

1. Sinusitis
2. Neck stiffness
3. Headache lasting > 24 hours
4. Nausea and vomiting
5. Brain-stem findings: diplopia, dysarthria, dysphagia, dizziness, cross hemiparesis, cerebellar signs with ataxia, crossed sensory loss, cranial nerve palsies, or drop attacks
6. Altered mentation

Other signs compatible with CNS impairment or viral encephalitis including urinary retention, respiratory failure, convulsions, twitching, hemiparesis, hemiplegia, other localized neurological signs, progressive ascending paralysis, or coma.

SIGNS AND SYMPTOMS SUGGESTING POSSIBLE INFECTION WITH B VIRUS

To Employees Working with Macaque Monkeys: The following signs or symptoms should be reported immediately, especially if they occur after sustaining a macaque monkey bite or scratch.

Early manifestations (inconsistently present)

1. Small blister-like eruptions (vesicles) or ulcerations at or near the exposure site
2. Severe pain or itching at the exposure site
3. Inflamed lymph nodes, especially if they occur in the armpit or elbow of the injured arm

Intermediate manifestations (inconsistently present)

1. Fever
2. Numbness or tingling at or near the exposure site, with or without progression toward the center of the body
3. Muscle weakness or paralysis in the exposed extremity
4. Eye redness and inflammation (conjunctivitis)
5. Persistent hiccups

Late manifestations (avoidable with early therapy)

1. Sinusitis
2. Neck stiffness
3. Headache lasting more than 24 hours
4. Nausea and vomiting
5. Double vision, difficulty speaking, difficulty swallowing, dizziness, muscle weakness or partial paralysis on either side, or other symptoms of brain stem dysfunction (cerebellar signs with ataxia, crossed sensory loss, cranial nerve palsies, or drop attacks)
6. Altered mental activity
7. Other signs compatible with an infection of the central nervous system, including urinary retention, respiratory failure, convulsions, hemiplegia (paralysis on one side of the body), other localized neurological signs, progressive ascending paralysis, or coma.

(Adapted from Table 1 in Guidelines for the Prevention and Treatment of B-Virus Infections in Exposed Persons by Gary Holmes, et al.)

Employee Instructions:

MACAQUE MONKEY BITE/SCRATCH POSTEXPOSURE PROCEDURES

An exposure is not limited to a bite or scratch directly from the monkey. An exposure also includes a cut or scrape from primate cages, a needle stick, or saliva contamination of an existing wound or ocular exposure. Exposure can also occur at necropsy (e.g., a cut from a scalpel blade used to perform the monkey necropsy).

If you are exposed, take the following steps:

1. For wounds or scratches, thoroughly scrub or irrigate the wound or exposed area for a minimum of 15 minutes with a disinfectant solution that should be available at a sink in or near the monkey room. **THIS IS THE MOST IMPORTANT STEP! DO NOT DELAY!** Wound cleansing should be started as soon as possible or within two to five minutes after the injury. (It has been shown that a similar virus, the human herpes simplex virus, can enter host cells within five minutes of exposure.)
2. A concentrated soap or detergent such as povidone-iodine (Betadine Scrub), or chlorhexidine (Nolvasan Scrub) is recommended for skin exposures. The B virus is readily killed by most detergent soaps and disinfectants. The mechanical scrubbing or flushing action is reportedly the most effective means of removing the virus.

For ocular exposures, the eye should be copiously flushed at the eye wash station or with an eye solution such as Dacriose or sterile normal saline for a minimum of 15 minutes. Never use any soap or disinfectants in the eyes.

3. After the immediate wound cleansing, contact the supervisor and the veterinarian on duty to report the incident. (The veterinarian will coordinate the collection of blood and virology samples from the involved monkey.) Your supervisor will direct you to go the occupational health clinic during normal working hours for blood and wound virology sample collection. You will bring all sections of this information packet and give it to the treating physician. You should ask for the First Aid section back as it contains follow-up instructions.
4. After normal working hours, BMC holidays and weekends, the emergency department will handle exposures by providing appropriate wound care and collecting a wound virology sample and a blood sample.
5. The clinic or emergency department will repeat 15 more minutes of cleaning as described above. The provider will notify the Microbiology Laboratory (H 406) and tube the specimens to pneumatic tube station #2. The specimens may include viral culture swabs collected from the wound or exposed area after disinfecting as described above. Also a blood sample will be drawn and sent to the Microbiology laboratory. Specimens must be refrigerated or frozen and shipped to the NIH B Virus Resource Laboratory. Viral specimens should be frozen prior to shipment and the serum from the blood sample should be stored in a refrigerator or frozen. Forms are included in this packet and include specific directions on how to obtain and handle specimens.

6. If you are evaluated for your exposure in the Boston Medical Center Emergency Department you must be re-evaluated on the next business day for follow-up at Boston Medical Center Occupational & Environmental Medicine Clinic in the Preston Building (F5), 732 Harrison Avenue. The phone number is (617) 638-8400. Hours are from 7:30 am – 4:00 pm, Monday – Friday.
7. You will also be scheduled to have a follow-up blood sample drawn at the clinic in approximately two to three weeks. The veterinarian will insure that appropriate follow-up samples are obtained from the monkey if indicated.
8. Seek emergency care if you suffer any of the symptoms described on the symptom list. Providers must be informed that you work with nonhuman primates. Providers should contact the NIH B virus laboratory for assistance at (404) 651-0808; or emergency page: (404) 358-8168.

QUIZ**WORKING SAFELY WITH NONHUMAN PRIMATES**

- 1) The disease carried by rhesus, cynomolgus, and other macaques that is most feared by humans as a possibly fatal disease is called.
 - a. Tuberculosis (TB)
 - b. Shigellosis (Bacterial Diarrhea)
 - c. Cercopithecine Herpesvirus-1 (B-virus)
 - d. Rubeola (Measles)

- 2) What are the common routes of contact with monkey body fluids that may cause infection of humans with B-virus?
 - a. Scratch by a monkey
 - b. Bite by a monkey
 - c. Splash by a monkey
 - d. All of the above

- 3) Which of the following injury situations, not involving direct contact with a monkey, are potential risks for exposure to B-virus?
 - a. Moving cages
 - b. Washing cages
 - c. Needle stick
 - d. All of the above

- 4) Which of the following diseases are particularly important in the management of a nonhuman primate colony because they can be transmitted to nonhuman primates from infected humans?
 - a. Shigellosis and Chicken Pox
 - b. Measles and Tuberculosis
 - c. Amoebic Dysentery and Measles
 - d. Tuberculosis and Influenza

- 5) It is generally stated that protective clothing is your first line of defense against injury and disease transmission. That being the case, then it is especially important that:
 - a. You disinfect gloves before entering an animal room
 - b. You have protective equipment custom fitted
 - c. You have no gaps between sleeves and gloves
 - d. You must have hearing protection with you at all times

- 6) Who has the primary responsibility for assuring that appropriate training is provided for students and trainees and they have demonstrated competency in performing all activities associated with any nonhuman primates?
 - a. Principal Investigators
 - b. Facility Managers

- c. Facility Veterinarians
 - d. Animal Care-givers
- 7) The primary function of the Animal Exposure Surveillance Program (AESP) is to:
- a. Register you as a user of laboratory animals
 - b. Comply with NIH health policy
 - c. Satisfy your Animal Care and Use Committee
 - d. Protect your health and well-being
- 8) Nonhuman primates are broadly classified as either Old World or New World based on the original homeland of the species. Which of the groups include the species that are potential carriers of Herpes B Virus?
- a. New World
 - b. Old World
 - c. Great Apes
- 9) Which of the following is not classified as Old World monkeys?
- a. Rhesus monkeys
 - b. Squirrel monkeys
 - c. Cynomolgus monkeys
 - d. Pig-tailed monkeys
- 10) In order to protect yourself from injury it is critically important that you be able to recognize the level of arousal and the likelihood of aggressive behavior in nonhuman primates. Which of the following combinations of behaviors represents the highest level of arousal in macaques?
- a. Calling, jumping around, and ear flapping
 - b. Scratching, yawning, and grooming
 - c. Direct stare, sneezing, and raising eyebrows
 - d. Open mouth threat, reaching out, and erect tail
- 11) The risk of you being bitten or scratched is greatest under which of the following circumstances?
- a. Any time your hands are near an occupied cage
 - b. When you are offering treats for good behavior
 - c. Transferring an animal from its home cage to a transport cage
 - d. All of the above
- 12) If you are bitten, scratched, or exposed to body fluids on a cage it is important that you take action within five minutes after the accident. What should you do first?
- a. Call Occupational Medical Service for instructions
 - b. Notify your supervisor and fill out an incident report
 - c. Scrub the injured area for 15 minutes
 - d. Culture the animal that injured you

- 13) If you are bitten, scratched, or exposed to body fluids by a splash in your eye when the Occupational Medical Service (OMS) is closed (evenings, holidays, and weekends) who do you contact before going to the hospital for follow-up?
- a. BUSM Security Office
 - b. Your supervisor
 - c. Your personal health care provider
 - d. BMC Emergency Department, (Menino Pavilion), 771 Albany Street , Tel: (617 414-7759
- 14) Where is the bite/scratch kit located in your work area?



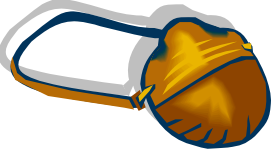



Fill in the blank _____.

Answer Key

- 1) c, 2) d, 3) d, 4) b, 5) c, 6) a, 7) d, 8) b, 9) b, 10) d, 11) d, 12) c, 13) d,
14) The answer is facility specific.

Description of Common Non-Human Primate Procedures at BUMC and Required Eye/Face Personal Protective Equipment		
Procedure	Eye/Face/Mucous Membrane Protection	Alternative, if available
NHP Cage Changing	goggles and surgical mask	safety glasses, face shield and surgical mask
NHP dental cleaning	goggles and surgical mask	n/a
NHP Live Animal Transport or Removal to Transport Cage	goggles and surgical mask	safety glasses, face shield and surgical mask
Anesthetized NHP Animal transport	goggles and surgical mask	safety glasses, face shield and surgical mask
NHP Surgery on Anesthetized Animal using Surgical Microscope	Safety Glasses (prescription if needed) with Surgical Loupes, Surgical Mask for Lead Surgeon, All surgical assistants in room should wear goggles and surgical mask	Lead surgeon currently wearing prescription eyeglasses with side shields and surgical loupes over the glasses with a surgical mask. Alternatively, surgical assistants can wear safety glasses, face shield, and surgical mask
NHP Surgery on Anesthetized Animal using Surgical Loupes	Safety Glasses (prescription if needed) with Surgical Loupes, Surgical Mask for Lead Surgeon, All surgical assistants in room should wear goggles and surgical mask	Lead surgeon currently wearing prescription eyeglasses with side shields and surgical loupes over the glasses with a surgical mask. Alternatively, surgical assistants can wear safety glasses, face shield, and surgical mask
Tracheal Tube Intubation and Extubation during the beginning and end of NHP Surgery	goggles and surgical mask	safety glasses (prescription if needed), face shield and surgical mask
Perfusion of NHP at Termination Surgery	Completed in Fume Hood by Lead Surgeon: Involves slicing of heart ventricles, NHP anesthetized	Completed in Fume Hood by Lead Surgeon: Currently wears prescription eyeglasses and surgical loupes and surgical mask
Magnetic Resonance Imaging of NHP Anesthetized Animal	Anesthetized animals in sealed microisolator cage, safety glasses and surgical mask should be worn	n/a

Personal Protective Equipment For Personnel Working with Non-human Primates

Equipment		For Entry	To handle animals/cages
	Lab coat or surgical gown with <u>long sleeves, Tyvek or jumpsuit</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Tyvek jumpsuit or equivalent
	2 pairs of gloves	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Leather gloves up to elbow or other more sturdy protective glove
	Mask	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 *	<u>Goggles</u> with complete splash protection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Shoe covers	Required Do you want to track monkey feces into your car or home?	
	Bouffant hair cover	Required	

*Alternative face protection in some situations include chin length face shield with top and side seals, safety glasses and a surgical mask, instead of goggles and a surgical mask.

Employee/Personnel: Within 1 Business Day

Illness

- All personnel and laboratory workers are encouraged to report any illness to their supervisor and occupational health directly if they are ill and working with or near agents covered by this BPHC regulation.
- Supervisors should refer any ill worker to the Occupational Health Officer (OHO) or designee for evaluation at Boston Medical Center Occupational & Environmental Medicine located at 732 Harrison Avenue, (F5) or the Emergency Department located at the Menino Pavilion at 771 Albany Street for after hours, weekends and on hospital holidays.
- Supervisors are **required** to report **all** illnesses, significant exposures, and absenteeism to the OHO at (617) 353-6630, (617) 738-4402, or (617) 780-5519 or designee at (617) 414-8262 or (617) 638-8400. The above conditions are reportable to Boston Public Health Commission (BPHC) by OHO or designee.

Significant Exposures

- All laboratory workers must report any exposures to their supervisor and occupational health directly.
- Workers in laboratories working with agents covered by the BPHC regulations **must** be evaluated by the OHO or designee prior to return to work if exposure to agents covered by these guidelines occurs.

Absenteeism

- Worker notifies supervisor of reason for absence from work.
- Supervisor contacts the OHO or designee. If employee is febrile or symptomatic he/she will need to be evaluated by the OHO or designee. The employee must contact the OHO on day 1 of illness and be evaluated, depending on the symptoms, reporting **and also prior to returning to work**.

Occupational Health Officer (OHO) or Designee: Within 1 Business Day

Illness

- OHO or designee will perform an occupational health assessment for any employee who: (1) has been **diagnosed**, (2) is exhibiting **symptoms**, or (3) **may** have been **exposed** to a registered agent as defined in this regulation.
- OHO or designee shall immediately notify the BPHC of the assessment, but not later than **one business day** of the assessment.
- OHO or designee should evaluate the individual based upon clinical findings and epidemiological risk factors, including specific lab work being conducted, and make appropriate recommendations.
- OHO or designee shall report findings of the assessment immediately, but not later than **one business day**.

Significant Exposures

- OHO or designee shall report to the BPHC any diagnosis of any disease caused by a high-risk registered agent pursuant to Section V. Part A of the guidelines, and any violation or breach of any laboratory procedures or any other incident which the IBC, Project Director or OHO should reasonably believe was released beyond the work area must be reported within once business day.
- OHO or designee must evaluate workers in laboratories working with agents covered by the BPHC regulations if an exposure to agents covered in these guidelines occurs.
- OHO or designee must report significant exposures to BPHC within 1 business day.
- Follow-up information must be provided to BPHC as requested.
- OHO or designee must report to BPHC, if a significantly exposed worker develops illness that could be related to an agent used in the laboratory and covered by these guidelines.
- OHO or designee should evaluate the individual based upon clinical findings and epidemiological risk factors, including specific lab work, and make appropriate recommendation.

Absenteeism

- OHO or designee must evaluate any worker in a laboratory using agents covered by these guidelines who is absent from the workplace due to illness for a period of two or more consecutive workdays.
- OHO or designee must contact the ill worker to determine whether illness could be related to an agent covered by these guidelines and used in the laboratory.
- OHO or designee must be reported within 1 business day to the BPHC, if illness may be related to an agent covered by these guidelines.

Occupational Health Officer (OHO) or Designee: Within 3 Business Days

Illness

- If the OHO or designee determines that the illness is caused by an agent that is covered by these guidelines and may be work-related, BPHC must be consulted within 3 business days **before** the worker is allowed to return to work.

Significant Exposures

- OHO or designee must send BPHC documentation that an exposed employee was cleared to return to work within 3 business days of clearance.