

## University of Rochester

### Requirements to Prevent Infectious Disease Transmission from Non-human Primates to University Personnel – updated 6-21-23

#### Introduction:

Zoonotic pathogens are transmissible from animals to humans. Nonhuman primates may carry a variety of zoonotic agents that can be transmitted to humans by direct (e.g. bite or scratch) or indirect exposure to the animals, their carcasses or body fluids. These diseases are viral, bacterial, fungal or parasitic in nature. Examples of primate viruses include filoviruses such as Ebola and Marburg, herpesviruses such as Macacine herpesvirus 1 (also known as Herpesvirus simiae or B-virus), and poxviruses such as monkeypox and Yaba virus. Shigellosis and Salmonellosis are two common bacterial infections affecting the gastrointestinal systems of both humans and nonhuman primates. Giardia, Entamoeba, Trichuris and Strongyloides infections represent four of the more common parasites, again affecting the gastrointestinal system. Ringworm is an example of a fungal disease that nonhuman primates can transmit to humans. It is important to note that in many cases, disease transmission can also occur from humans to nonhuman primates. Examples of such diseases include tuberculosis, measles and influenza.

The likelihood of people contracting any of these diseases from nonhuman primates is very small. Indeed, if the policies established by published recommendations and evaluation of workplace risks are followed, the likelihood of infection with any of these pathogens is extremely low.

Of most concern among nonhuman primate handlers is the potential for transmission of Macacine herpesvirus 1 (“B-virus”) resulting in an acute and often fatal human infection. B-virus infection in humans is recognized as a rapidly ascending encephalomyelitis with a fatality rate of approximately 70%. B-virus occurs naturally only in macaques, but can be present in a few other species of Old World primates if housed with B-virus positive macaques or if experimentally infected with the virus. New World monkeys, such as squirrel and owl monkeys, are not a source of B-virus infection. In macaques, the infection is usually latent. When reactivated, the virus can be shed intermittently in the saliva, ocular and reproductive tract secretions and may be present in thoracic and abdominal viscera and CNS tissues. Although the risk of acquiring a B-virus infection from macaques is very low, supported by the fact that thousands of people have handled macaques with approximately only 50 documented human B-virus cases, the fact remains that human B-virus clinical infection is associated with a high mortality rate.

Transmission of infectious diseases between animals and humans is generally the result of bites and scratches, contact of infectious materials with mucous membranes or broken skin, or poor personal hygiene. Inhalation of aerosols associated with general animal handling tasks represents a significant transmission route for some infectious agents. Even if infected, monkeys are not a significant source of tuberculosis in humans, unless the human is immunocompromised. B-virus transmission from nonhuman primates has been widely recognized to occur primarily by means of bites and scratches and through contact of biological fluids from these animals with broken skin. However, in 1997, a fatal transmission of B-virus to a human was documented to occur via conjunctival exposure. Indirect exposure involves humans contacting surfaces or equipment contaminated with nonhuman primate tissue or fluids.

#### Purpose:

**In recognition that non-human primates may act as reservoirs for significant human pathogens, the following policy has been developed to prevent transmission of infectious disease from non-human primates to University personnel.**

These requirements, based on hazard identification and risk assessment, were developed by Environmental Health & Safety, the Vivarium and the Division of Comparative Medicine in accordance with recommendations from the National Institute of Occupational Safety and Health (NIOSH) and the Centers for Disease Control and Prevention (CDC).

**Scope:**

**These requirements apply to all interactions of University personnel with all non-human primates.**

The job classifications of individuals having interactions with nonhuman primates include veterinarians, animal care technicians, laboratory technicians, post-docs, graduate students, undergraduate students, research associates, principal investigators and any other personnel who may enter an area in which a nonhuman primate is located.

The job tasks include all animal contact situations in both laboratories and the Vivarium. **Animal contact is defined as being within 5 feet of any non-human primate or entering a vivarium room housing nonhuman primates.** Such job tasks may be associated with animal husbandry activities, animal surgery, animal manipulation and cleanup of both environmental surfaces and equipment soiled with animal body fluids.

**Requirements:**

1. No food or drink intended for human consumption is permitted within the vivarium facility and/or research laboratory to which nonhuman primates or primate tissues are taken.
2. All macaques at the University of Rochester shall be regarded as infected with B-virus even if serologically negative for B-virus antibody. Due to the latency of some B-virus infections and inaccuracy of B-virus diagnostic tests, the National Research Council (NRC) recommends that research workers assume that all macaques (even those from specific pathogen free colonies) are infected with B-virus.
3. Refrain from all unnecessary direct physical contact with monkeys. Make sure that animals are properly secured in their chairs before working with them. Do not offer treats directly from hands unless required as part of the research protocol.
4. Only individuals authorized by the Vivarium are permitted to attempt to capture an escaped or loose animal. Vivarium-approved animal handling techniques and equipment shall be used for controlling loose animals. Should an animal escape, exit the room, lock the door to the room and post a sign on the door stating "Loose Monkey - Do Not Enter". Immediately notify the Animal Resource office if normal working hours. Page the on-call Vivarium Supervisor or veterinarian if after-hours.

5. Access to areas where nonhuman primates are either housed or removed to shall be limited to those individuals who are properly trained in nonhuman primate safe work practices and who have a legitimate reason to be present in the room or area.
6. Sharp edges on equipment (e.g. cages, restraint chairs, etc.) that may be contaminated with animal body fluids shall be eliminated. Handling contaminated sharp items shall be conducted with extreme care. Cut-resistant personal protective equipment must be worn when handling sharps except in situations where a loss of manual dexterity may contribute to an injury, i.e. surgery. Fluid-resistant exam gloves shall then be worn as a minimum hand protection.
7. Required personal protective equipment (PPE) shall be worn for all animal contact. PPE is worn to prevent ocular, mucous membrane and broken skin contact with any animal body fluid. PPE shall also be worn to limit the bite/scratch potential presented by animal contact. All activities involving non-human primates must be reviewed by supervisors (Vivarium supervisors, Research Associates, Technical Associates or Principal Investigators) for the purposes of assessing exposure risks. Documentation of these job hazard assessments (JHA) is completed electronically through the on-line University JHA <http://www.safety.rochester.edu/>. The Environmental Health and Safety Industrial Hygiene Unit (xS-3241) provides technical support for PPE selection.
  - a. **Face protection:** A face mask shall be worn for all contact with nonhuman primates. The use of protective eyewear (gasketed safety goggles or gasketed safety glasses) is required for all staff working with Old World primates (e.g. macaques). The use of protective eyewear for activities with New World Primates (e.g. squirrel monkeys) is not required unless the animal has been administered a hazardous material. These situations will be individually assessed by Environmental Health and Safety to determine if eye protection is required.

If facial skin is not intact or is compromised (e.g. eczema) in areas not covered by a mask and eye protection, then face protection in the form of a face shield is required. A face shield may be chosen instead of safety goggles only if the face shield is chin-length and prevents droplet splashes to the head from running down into the eyes and prevents mucous membrane exposure around the edges. Goggles in addition to a face shield will provide superior protection for activities with especially high splash potential. Safety glasses that are tight fitting and have gasketed lenses (Guard Dog Vented Glasses, item# 81641-10 by Cole-Parmer) may be worn in combination with a mask for tasks during which a splash is not likely. Such tasks include nonsurgical procedures on anesthetized monkeys or manipulations with minimal potential for splash performed on chair-restrained macaques (i.e. chamber cleaning). Please note that safety goggles, not safety glasses, must be worn as eye protection while performing a task involving liquids for which a splash is likely and shielding is not possible (i.e. cage or equipment cleaning activities). Safety goggles may be purchased from the Animal Resource Office.

- b. **Hand Protection:** Gloves shall be worn in nonhuman primate rooms and when handling primates or material/equipment that has contacted nonhuman primates. Fluid resistant

exam gloves may be worn if handling an anesthetized nonhuman primate or if having indirect contact with a nonhuman primate. Exam gloves do not offer adequate bite/scratch protection and therefore are not appropriate as the sole means of protection for direct handling of awake animals. The heavier purple nitrile gloves offer a higher level of protection. Double gloving with either exam or nitrile gloves is also an option. Elbow length leather gloves provide an even higher level of protection, and should be worn when direct contact with an unrestrained, conscious animal is necessary. Remember: gloves should be chosen such that they fit well, grip well, and provide the best bite/scratch protection possible without sacrificing the manual dexterity necessary to complete the task safely.

- c. **Protective Clothing:** When working within a primate room or handling animals, a lab coat or gown is required. It is preferable that the clothing protection includes tight fitting cuffs and a neck closure (e.g. polyester Hospitex<sup>®</sup> long-sleeved, cuffed lab coat). Tight cuffs ensure that the garment sleeves do not ride up above the wrist and the neck closure further assures skin coverage when wearing V-neck clothing. If the garment worn has loose fitting sleeves, then additional forearm protection (Tyvek or vinyl sleeves) must be worn. Such fluid resistant arm covers shall also be worn if skin is broken or compromised in any way and if scratch resistant barrier cannot also provide a fluid barrier. Shoe covers protect personnel from tracking feces outside of primate areas. Shoe covers must be worn in all monkey rooms and corridors dedicated to nonhuman primate housing. Long pants and closed toe shoes (e.g. no sandals) must be worn whenever working with monkeys.

Soiled reusable personal protective equipment shall be disinfected according to manufacturer's recommendations after use and may not be taken out of the work area unless it has been cleaned and disinfected. Lab coats used while removing and returning animals to their housing cage may be worn while transporting the animals through the corridors. This assumes that these lab coats are not visibly soiled or contaminated. If a lab coat is soiled while in the animal housing room, it must be removed immediately upon exiting the housing room. The coat should then be turned inside out and taken to the laboratory. A laundering facility is available in the Vivarium. In no event shall gowns or lab coats worn in animal rooms be worn in non-laboratory or vivarium areas other than corridors between labs and housing areas.

8. The Macaque Exposure Protocol shall be followed for any exposure to Old World (macaque) nonhuman primate body fluids including bites, scratches, face splashes and needle sticks. The protocol is posted near all nonhuman primate rooms and is presented during the Primate Safety Orientation provided by the Animal Resource. Any exposure must be reported to the employee's supervisor, the Vivarium and to the Environmental Health and Safety Industrial Hygiene Unit (x5-3241) for follow-up. In addition to providing documentation of an injury for medical purposes, reporting such exposures assists the Animal Resource and Environmental Health and Safety in the recommendation of safe work practices.
9. Each non-human primate handler shall be enrolled in and participate in the Occupational Health Program for non-human primate handlers through University Health Service.
10. Each person having contact with any non-human primate must have training appropriate for the task he/she will be performing.

- a. Vivarium employees receive general and specific training regarding non-human primates from Vivarium personnel
- b. General non-human primate handling training is conducted by experienced research staff or the Animal Resource for the research community. Specific training for the research community shall be conducted in each laboratory for each person having contact with the animal. This training shall be conducted by an individual intimately familiar with the research and with substantial experience in handling the non-human primates. DCM personnel are available to provide additional training in primate restraint and methodology as requested.

Non-human primate training must at least include:

- a discussion of the handling techniques approved by the Vivarium,
  - a discussion of the safe methods of handling any sharp items or edges,
  - a demonstration of the appropriate personal protective equipment for the task,
  - a discussion of approved disinfection of surfaces contaminated by animal body fluids,
  - appropriate response to emergency procedures i.e. an escaped animal or an exposure situation.
- c. Training must also include a discussion of the hazards of B-virus, its symptoms, and treatment, especially emphasizing the immediate care of the wound. Animal handlers shall be advised that persons who are immunosuppressed may be at higher risk for B-virus infection.
  - d. Documentation of training (contents, trainer, attendees and date) must be kept by each investigator.
11. All materials that have come into contact with non-human primate body fluids, tissues or excrement are considered contaminated and potentially pathogenic for humans.
- a. All surfaces potentially contaminated with non-human primate body fluids or excrement shall be disinfected. Accelerated hydrogen peroxides, quaternary ammonias, phenolics or chlorine bleach may be used. Disinfectant recommendations include Rescue, 20% diluted bleach solution, Vesphene II se, and Cavicide.
  - b. All waste from non-human primate animal husbandry and experimental activities shall be disposed of per the institutional and Vivarium requirements. Contaminated bedding and waste from the non-human primate housing rooms is routinely incinerated. Waste generated in laboratories as a result of experimental activities with non-human primates is red bagged for institutional treatment.
  - c. Care must be taken to prevent the spread of animal excrement from the housing rooms. Shoe covers must be removed before exiting the primate facility. Debris must be swept out of the transport path prior to moving transport carts into and out of the housing rooms or moving the housing cages out of the housing rooms.
12. A plumbed eyewash station shall be maintained within 50 feet of every area where non-human primates are housed or worked with.

## References:

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