

WORKING SAFELY WITH NONHUMAN PRIMATES

Training Package

- 1) Video (English version) - Spanish and Captioned versions are available from OACU
- 2) Quiz with answer key - Each trainee is expected to complete the quiz. The trainer should review and discuss any missed answers with the trainee

***The following items should be copied and given to each trainee, OR should be readily accessible in a prominent location in the facility and pointed out to the trainee during orientation:**

- 3) Manual Chapter 3044-2 - Protection of Personnel Who Work with Nonhuman Primates
- 4) Additional Training Requirements with attachments and memo from Dr. Gottesman (included within the MC 3044-2)
- 5) What is B-virus Fact Sheet?
- 6) Manual Chapter 1340 - NIH Occupational Safety and Health Management

***The following items are provided as resource material for trainers:**

- 7) Script (text) from the video
- 8) Current AESP Description: includes section on Injuries Involving NHPs
- 9) MMWR 47:1073-1076, 1998, Fatal *Cercopithecine herpesvirus 1* (B virus) Infection Following a Mucocutaneous Exposure and Interim Recommendations for Worker Protection.

***The Training Registration form provides *minimum* info that must be gathered for each student as they take the training. This form can be used as is, or altered in format (but not content) to suit your needs.**

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 that 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) NIH Security Office
 - b) NIH Emergency Clinic
 - c) Your personal health care provider
 - d) OMS care provider through the NIH Page Operator
- 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.

NIH POLICY MANUAL

3044-2 - PROTECTION OF NIH PERSONNEL WHO WORK WITH NONHUMAN PRIMATES

Issuing Office: OD/OIR 496-4920

Release Date: 02/09/93

1. **Explanation of Material Transmitted:** This chapter outlines the policy for protection of National Institutes of Health (NIH) personnel who work with or around nonhuman primates. Requirements are established for training, supervision, use of personal protective equipment, medical surveillance, accident reporting, and wound care.
2. **Filing Instructions:**
 - Remove:** NONE
 - Insert:** NIH Manual Chapter 3044-2 dated: 02/09/93
3. **Distribution:** NIH Manual Mailing Keys F-401 and F-405

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A. Purpose:

Established under this chapter is the NIH policy for protection of NIH personnel who work with or around nonhuman primates. The policy describes the requirements for training, supervision, compliance, personal protective equipment, medical surveillance, accident reporting, and wound care. The intent of this policy is to minimize the overall number of injuries, specifically bites and scratches, sustained by NIH employees, special volunteers, and visitors who work with nonhuman primates or enter nonhuman primate rooms. Contractors engaging in activities with nonhuman primates must have a program in place with policies and procedures equivalent to the program described

herein. Project Officers for such contracts shall ensure that all contracts contain the equivalent components.

B. Policy and Procedures:

Training. Each individual regularly entering a nonhuman primate room shall have received introductory training prior to entry. Transient visitors will be supervised by someone with appropriate training. Those individuals having hands-on interaction with nonhuman primates must also have additional training in approaching and handling nonhuman primates. Certification by the first line supervisor that a basic level of performance has been achieved is required. The Training Coordinator, Office of Animal Care and Use (OACU/OD), is responsible for the development and management of the program for training intramural personnel to work safely and humanely with nonhuman primates.

Supervision and Compliance. All NIH employees, including special volunteers, guest workers, visitors, and contract personnel shall comply with procedures set forth in this policy statement. Immediate supervisors are responsible for ensuring that their employees follow established policy. Corrective action shall be taken by the immediate supervisor for failure to comply with the provisions of this policy.

Continued failure to comply with requirements set forth in this policy shall be reported to the Scientific Director and/or Institute Director and may result in suspension of the privilege to use nonhuman primates in research protocols or other disciplinary action. The Institutional Official for Animal Welfare Assurance (i.e., Deputy Director for Intramural Research) shall be informed of such infractions and disciplinary actions taken.

Personal Protective Equipment. All individuals entering a nonhuman primate room must wear appropriate personal protective clothing and equipment which meets or exceeds the guidance established by the NIH Animal Research Advisory Committee (ARAC) (Appendix 1). Guidance on the selection and use of personal protective equipment for selected protocols will be provided upon request, by the Occupational Safety and Health Branch, Division of Safety (OSHB, DS). The NIH Institutional Biosafety Committee (NIH IBC) shall advise on appropriate protective measures, as needed, at the request of the Division of Safety. Individuals participating in protocols involving infectious disease agents must meet or exceed practices and procedures recommended in the CDC/NIH publication entitled Biosafety in Microbiological and Biomedical Laboratories and any additional stipulations placed on the protocol by the NIH IBC. Copies of THE CDC/NIH publication may be obtained by calling 496-2346. All support personnel, who have not been appropriately trained, (e.g. building engineers, pest controllers, safety and health personnel, etc.) entering nonhuman primate rooms must be accompanied by a responsible facility staff member who is knowledgeable in the behavior and handling of nonhuman primates.

Medical Surveillance. All persons having direct contact with nonhuman primates in the course of conducting research and all persons providing care must participate in the NIH Animal Exposure Surveillance Program (AESP). Transient visitors, who are

required to enter a room housing nonhuman primates but do not have direct contact with the animals, are not required to participate in the AESP but are to wear single-use dust/mist masks in addition to other required protective clothing. All contractor employees having direct contact with nonhuman primates must participate in an AESP that is equivalent to that of the NIH and which shall be provided by their employer.

Accident Reporting. All accidents and injuries involving animals, animal wastes, or potentially contaminated equipment must be reported promptly to the first-line supervisor. An individual who sustains any injury must report to the Occupational Medical Service (OMS) as soon as possible. The Division of Safety will regularly review accident/injury reports and make accident information available to the Training Coordinator, OACU, who will ensure that training will address identified problem areas.

Wound Care. Each nonhuman primate facility manager or ICD veterinarian, as applicable, is responsible for maintaining an adequately stocked wound care kit. The kit includes materials for culturing a wound, inflicted by a nonhuman primate, for Herpesvirus simiae also known as Monkey B virus. The wound care kit must be located in an easily accessible area, and instructions for culturing wounds, first aid, and reporting to OMS must be prominently displayed. The facility manager or veterinarian, as applicable, is responsible for informing all research and animal care staff of the location of the wound care kit. The procedures to be followed in the event of a nonhuman primate bite or scratch are described in the NIH Animal Exposure Surveillance Program (AESP).

C. Additional Information:

For further information on this manual chapter, contact the NIH Office of Animal Care and Use (496-5424).

D. Additional Copies:

Copies of this manual chapter may be obtained by completing Form NIH 414-5 and submitting it to the P&RB, DSS, ORS, in Bldg 31, Room B4BN08.

Appendix 1 - Minimum Requirements for Protective Clothing in Nonhuman Primate Rooms

Appendix 2 - Protective Clothing Requirements for Personnel in Nonhuman Primate Facilities

NIH MANUAL 3044-2 APPENDIX 1
DATE: 2/9/93
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**PROTECTION OF NIH PERSONNEL WHO WORK
WITH NONHUMAN PRIMATES
Minimum Requirements for Protective Clothing in
Nonhuman Primate Rooms**

Although research using animals entails some real and unavoidable risks, the goal of protective programs is to enable animal based research to go on in a safe and productive environment. Our goal is to provide a set of principles that can be applied to a variety of animal facilities. Two principles are at the base for all protective measures: accident avoidance based on understanding the physical risks entailed, as exemplified by avoiding bites, and scratches; and good personal hygiene based on knowledge of when contamination is most likely to occur, methods of avoidance, and decontamination, as exemplified by proper use of barrier methods and good hand washing practices.

For a protective program to be effective, workers must believe that the recommendations that are in place increase their safety significantly. The most important preventive strategy is education. Vigilance in animal handling, specific training of scientists and handlers in techniques for safe interaction with animals, proper use of protective clothing and equipment, and hand washing should be stressed. Any preventive measures that are put in place must be accompanied by an educational process that instructs all animal workers in the methods and rationale for each preventive measure. Protocols for emergency diagnosis and treatment of injury, especially possible B virus infection should be worked out ahead of time and all personnel instructed in their use. Workers who are knowledgeable about the risks and the protection offered by each device, article of clothing, and procedure should enthusiastically cooperate with the protection program.

All animal handlers, scientists, technicians and caretakers must be enrolled in the Animal Exposure Surveillance Program. This program classifies employees according to the species of animals to which they are exposed and provides appropriate surveillance and prophylaxis to these employees. Employees immunosuppressed by virtue of disease or treatment should be advised of their increased risks and should limit their exposure to animals.

NIH MANUAL 3044-2 APPENDIX 1
DATE: 2/9/93
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Page 2

**PROTECTION OF NIH PERSONNEL WHO WORK
WITH NONHUMAN PRIMATES
Minimum Requirements for Protective Clothing in
Nonhuman Primate Rooms**

These requirements are not meant to cover all of the specific instances that might be encountered, or to limit the requirements of any facility, but to provide a framework of minimum standards for implementing a program tailored to the local conditions. Specific recommendations for a safe environment must be formulated to account for local conditions, and these may vary from one laboratory to the next even within a single facility. Exceptions to any of these requirements may be requested of the ICD ACUC. However, in these instances individuals must demonstrate adequate training and proficiency in appropriate techniques and the Division of Safety must concur with the exceptions. The NIH Institutional Biosafety Committee (IBC) will serve as the final review body, as needed. Specific minimum requirements for handling nonhuman primates have been extracted from the ACUC guidance document and are presented in Appendix 2.

PROTECTION OF NIH PERSONNEL WHO WORK
 WITH NONHUMAN PRIMATES

Protective Clothing Requirements for Personnel in Nonhuman Primate Facilities

ACTIVITY	REQUIREMENTS
View animals in the primate room. No contact with the animals or the cages	Mucous membrane protection as appropriate*, street clothes covering, handwashing should be performed upon leaving the area and after any of the following activities.
Contact with a restraint device holding an awake animal	Mucous membrane protection as appropriate*, street clothes covering and light gloves
Transfer alert monkey using a stand-off method such as pole/collar technique or transfer cage	Mucous membrane protection as appropriate*, street clothes covering and light gloves.
Handling (e.g. hand catching or restraining) of an alert monkey.	Mucous membrane protection appropriate for high risk situations, street clothes covering and arm length bite protection gloves.
Physical contact with an anesthetized monkey.	Mucous membrane protection as appropriate*, street clothes covering and light gloves.
Cleaning cages.	Mucous membrane protection appropriate for high risk situations, dedicated clothing, dedicated shoes, and light gloves; dust-mist masks, if approved by OSHB, DS.
Physical contact with restrained alert monkey	Mucous membrane protection as appropriate*, street clothes covering and light gloves.
Physical contact with infant monkeys	Mucous membrane protection as appropriate*, street clothes covering and light gloves. As infants mature, heavier gloves may be required.
Perform portions of experiments in a laboratory that do not involve physical contact with monkey or body fluids.	Protection appropriate for non-animal aspects of research.
Handling awake New World Species	Mucous membrane protection as appropriate*, street clothes covering, protective gloves appropriate for the species and size of animal being handled. Larger species such as Cebus should be handled with the arm length bite protection gloves, while very small species such as marmosets may be handled with lighter weight protection. * Mucous membrane protection should be appropriate to the potential for splash hazard. The level of mucous membrane protection should be detailed in facility standard operating procedures (SOP's). SOP's are subject to review and approval by the ICD ACUC with the concurrence of the Division of Safety with consult by the IBC as necessary. The degree of risk involved in entering an animal holding room or working with awake animals varies with the design of the facility, the species involved and the nature of the task being performed. Examples of high risk situations include any procedures which may aerosolize NHP wastes or body fluids, e.g., hosing down animal rooms, dental work or tracheal intubation, especially of macaques. Lower risks are associated with fully restrained animals, anesthetized animals (However, Ketamine increases salivation which is a major source of potential B virus contamination from macaques.), and increased distance from animals. In very low risk situations, e.g., entering hallways through which animals in restraint devices may briefly pass, mucous membrane protection may not be required. The future definition and availability of SPF animals may alter these requirements.

Additional Responsibilities and Training Requirements for Working With Nonhuman Primates

Letter from Michael M. Gottesman, M.D. - Deputy Director for Intramural Research

1. Students and Trainees are defined, for the purpose of this policy, as those individuals who do not have documented training and experience in handling and working with nonhuman primates. In such cases, the Principal Investigator must assure that required training has been provided and that the student or trainee has demonstrated competency in performing all activities or procedures undertaken with any nonhuman primate. Minors (individuals under 18 years of age) may not work or be present for procedures or research activities involving awake nonhuman primates. Minors under 16 years of age may not enter a room containing a nonhuman primate.
2. Principal Investigators are responsible for the following:
 - specifying, in writing, each procedure and activity in which the student/trainee may participate involving an awake nonhuman primate
 - developing a training plan for the student/trainee including the length of time or number of procedures the student/trainee must perform under directly observed supervision by the Principal Investigator or qualified member of the staff designated by the Principal Investigator.
 - obtaining review of and concurrence with the training plan, for each student/trainee, from the ICD Veterinarian and the Occupational Safety and Health Branch (OSHB), DS, ORS (Note: the format for development of the training plan can be obtained from the OSHB)
 - instructing the student/trainee in the proper performance of any technique, procedure and/or manipulation of an awake nonhuman primate
 - documenting the student/trainee's progress
 - documenting the student/trainee's competency in the performance of any technique, procedure or manipulation involving an awake nonhuman primate prior to allowing the student/trainee to perform these activities in an independent manner
 - providing and documenting refresher training for any returning student/trainee (e.g., summer students)
3. Principal Investigators must provide all documentation and records, pertinent to a student/trainee's training and competency to perform work with awake nonhuman primates, upon request of the ICD ACUC and/or Division of Safety personnel.
4. Principal Investigators are responsible for insuring a student/trainee's compliance with all other provisions of NIH Manual Chapter 3044-2, Protection of NIH Personnel Who Work with Nonhuman Primates and any other special requirements or procedures specific to the facility within which they are working.

Michael M. Gottesman, MD
Deputy Director for Intramural Research

April 4, 1997

The National Institutes of Health Additional Responsibilities and Training Requirements for Working with Nonhuman Primate

Students/Trainees who will be working with nonhuman primates should:

- participate in the NIH, OMS Animal Exposure Surveillance Program (AESP)
- receive a copy of MI 1340: NIH Occupational Safety And Health Management
- receive a copy of MI 3044-2: Protection Of NIH Personnel Who Work With Nonhuman Primates
- receive a copy of: Additional Responsibilities and Training Requirements for Working with Nonhuman Primates
- complete the training course: Safety with Nonhuman Primates, a program developed by the OACU and administered at the ICD level
- demonstrate the location of bite/scratch kits in their working area and how to use them .
- receive training on the procedures they will be performing.*

Principal Investigators/Supervisors should provide an opportunity for discussion of the above documents and ensure that students/trainee understand the material content.

Written SOP's must be developed for each procedure involving an awake NHP. The SOP should include but not be limited to the following:

- step by step instructions on performing the procedure
- number of people necessary to perform the procedure
- equipment/supplies needed
- proper sharps techniques
- required personal protective equipment
- proper waste disposal
- name of person to consult when questions arise
- person to call in case of an emergency

* See the sample form for training documentation developed by OSHB.

Required Training: OSHB suggested format

April 1997

Working with Awake Nonhuman Primates
Required Training Documentation

Name: _____ Trainer: _____ Date of Initiation: _____
(Trainee) (P.I. or P.I. Designee)

Procedure: _____ Risk Type: Bite _____ Scratch _____ Splash _____ Percutaneous _____
Specify the length of time or number of procedures the student/trainee must perform under the direct supervision of the Principal Investigator or a qualified member of the investigative staff designated by the P.I. _____
(Length of time/# of procedures)

Training Progress*:

Date _____ Duration _____ Trainer _____ Comments _____ P.I./Supervisor's Approval _____

*Length of time and number of training sessions to document proficiency will vary depending upon the type and complexity of the procedure.

Proficiency Certification:

I _____, hereby certify that _____ has demonstrated proficiency in the above
(P.I./supervisor's signature) (date) (Trainee)
named procedure on an awake NHP.

Note: This training record is to be maintained by the P.I./supervisor, and provided upon request to the IC ACUC or NIH Div. of Safety personnel.

Cercopithecine Herpesvirus-1 (B-Virus) Infection

Q. What is B-Virus?

A. Cercopithecine Herpesvirus-1, also known as B-Virus, is a member of the herpes group of viruses that occurs naturally in Macaque monkeys and possible in other Old World monkeys. 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. 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 contaminated monkey saliva, secretions, or tissues. The most likely routes of transmission are bites and scratches or splashes. There has been a report of person to person transmission.

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 immune-suppressed 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 have handled macaques since human infection with B-Virus infection was first reported over 50 years ago, yet only about 22 cases of human infection have been described.

Q. Can there be serious complications from B-Virus infection?

B. Of the 22 reported cases, 20 infected individuals developed encephalitis and 15 of these patients died as a result of their infection.

Q. How can I protect myself from infection?

- A. Proper work practices markedly reduce the chances of infection. When working with nonhuman 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.
 3. Work together with at least one other person when handling nonhuman primates. Minimize direct handling.

4. Report any observed facial, lip or oral lesions in the nonhuman primates to a veterinarian.
5. For bite or scratch injuries involving a macaque monkey, or scratches with cages or equipment that might be contaminated with their secretions, begin first aid immediately and report as soon as possible to the Occupational Medical Service (OMS), Building 10/6C306. If the injury occurs during non-OMS clinic hours (7:30pm to 7:30am, weekends, or federal holidays) first aid should be initiated at the work site and the on-call OMS physician contacted for further instructions via the NIH Page Operator (496-1211). The first aid provided should follow the wound care instructions posted in your work area.

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:
1. vesicular (small blister) skin lesions at or near the site of injury.
 2. localized neurological symptoms such as pain, numbness or itching near the wound site.
 3. flu-like aches and pains
 4. fever and chills
 5. headaches lasting more than 24 hours
 6. fatigue
 7. muscular incoordination
 8. shortness of breath.

If such symptoms occur following an injury involving a macaque or equipment contaminated with their secretions or tissues, immediately call the Occupational Medical Service at 496-4411.

NIH POLICY MANUAL

1340 - NIH OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT

Issuing Office: ORS/DS 496-2346

Release Date: 11/29/96

1. **Explanation of Material Transmitted:** This chapter is being revised to reflect organizational changes in the Office of Research Services, Division of Safety.
2. **Filing Instructions:**
 - Remove:** NIH Manual 1340, dated 09/28/90
 - Insert:** NIH Manual Chapter 1340 dated 11/29/96
3. **Distribution:** NIH Manual Mailing Keys F-401, and F-402

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A. Purpose:

This chapter outlines the scope, objectives, and responsibilities of employees for the National Institutes of Health (NIH), Occupational Safety and Health Management Program. It represents the NIH commitment to actively promote a comprehensive and effective Occupational Safety and Health Program and provides the foundation for the development and maintenance of the various program components.

B. Policy:

The objective of the Program is to assign responsibility to support the development, implementation, maintenance, and improvement of a comprehensive Occupational Safety and Health Program that reflects the NIH policy to:

Provide the highest practical degree of safety and health for employees in all activities of the NIH;

Minimize losses in property damage and human resources due to accident, injury, or illness; and

Comply with Public Law 91-596 (The Occupational Safety and Health Act of 1970), Executive Order 12196, and other regulations, standards, and guidelines governing the occupational safety and health of HHS employees.

C. Scope:

The objectives and responsibilities set forth in this manual are applicable to all NIH employees and are directed toward providing a comprehensive and effective Occupational Safety and Health Program. Institute, Center, and Division (ICD) Directors and Supervisors will actively support the Occupational Safety and Health Programs within their respective areas of responsibility and comply with the specified directives and responsibilities. NIH employees will comply with applicable regulations and guidelines, perform their duties in the safest possible manner, and report hazards, accidents, injuries, and illnesses to the appropriate NIH authorities.

D. References:

1. Executive Order 12196 of February 26, 1980, Occupational Safety and Health Programs for Federal Employees
2. Public Law 91-596, Williams-Steiger Occupational Safety and Health Act of 1970, Federal Agency Safety Programs and Responsibilities
3. Title 10 CFR Part 21, Reporting of Defects and Noncompliance; Section 21.21, Notification of failure to comply or existence of a defect and Section 21.61, Failure to notify; Nuclear Regulatory Commission
4. Title 29 CFR Subpart G, Part 1910.96, Ionizing Radiation; Occupational Safety and Health Administration, Department of Labor
5. Title 29 Code of Federal Regulations (CFR) Part 1960, Basic Program Element for Federal Employee Occupational Safety and Health Programs and Related Matters; Occupational Safety and Health Administration, Department of Labor
6. HHS Safety Management Manual
7. The National Institutes of Health Radiation Safety Guide. U.S. Department of Health, Education, and Welfare; Public Health Service; National Institutes of Health. Prepared by the Radiation Safety Branch, Division of Safety, July 1988

E. Responsibilities:

The Office of Research Services (ORS), through the Division of Safety (DS), has overall responsibility for Occupational Safety and Health at NIH.

The promotion of safety and health policies, practices, and procedures is the responsibility of each member of the NIH Community. Employees are expected to

perform their work in a safe manner and to ensure that they do not place themselves, co-workers, visitors, or support services personnel at risk of injury or illness due to unsafe or unhealthful conditions, actions or infractions. When operating a government or public vehicle, employees are expected to wear seatbelts and obey traffic regulations. When representing the NIH on official business, employees should ensure that their contributions exhibit health and safety concerns.

1. Director, NIH:
 - a. Through the ORS, DS, provides executive leadership in the development, promulgation and implementation of occupational safety and health policies, standards, and procedures applicable to the NIH.
 - b. Supports a staff necessary to effectively administer a comprehensive occupational safety and health program for NIH.
2. NIH Safety Committees: (See Appendices 1-3 for charters for the 1) Occupational Safety and Health Committee, 2) Biosafety Committee, and 3) Radiation Safety Committee, at the National Institutes of Health, approved by the Director, NIH, on December 2, 1983.)
 - a. Assist the Director, NIH, and the Division of Safety in providing oversight required for compliance with applicable safety and health laws and regulations.
 - b. Assist with the organization and administration of the NIH Occupational Safety and Health Program.
 - c. Provide technical advice, assistance, and management-level support; recommend and set policies regarding occupational health and safety as authorized by the NIH Director.
 - d. Provide a means by which employees can use their knowledge of workplace operations to assist management in the improvement of policies, conditions, and practices.
3. Office of Research Services, Division of Safety:
 - a. Serves as the operational component in developing and implementing NIH-wide safety and health programs through surveillance, consultation, training, and education.
 - b. Provides administrative management for the comprehensive Occupational Safety and Health Program in compliance with NIH policy and applicable federal, state, and local regulations.
 - c. Prepares and coordinates the NIH position on proposed legislation and regulations pertaining to safety and industrial hygiene, engineering,

fire safety, environmental hazards control, occupational safety and health, education, training, promotion, etc. that are applicable to the NIH.

d. Monitors, investigates, prepares reports and maintains records of NIH work-related injuries and illnesses. Develops and implements methods to prevent these work-related losses. Conduct and/or assists in the conduct of investigations of hazardous conditions.

e. Performs workplace reviews as are considered appropriate to evaluate compliance with occupational safety and health policies and procedures.

f. Provides technical assistance to NIH employees at all levels of responsibility on matters pertaining to the Occupational Safety and Health Program. Assesses the need for and develops training programs to promote occupational safety and health.

4. Supervisors: (all levels throughout NIH)

a. Ensure and promote safety in the work area under their jurisdiction.

b. Comply with and enforce all applicable occupational safety and health standards, rules, regulations and orders by competent authority pertaining to the activities under their jurisdiction.

c. Ensure that their employees are instructed and/or trained in safe practices and methods of job performance as such pertain to their assignment. Ensure that all visitors and support services personnel are appropriately informed about the existence of hazards present and special precautions required to prevent adverse exposure to these hazards. Acquire the knowledge and information needed to recognize and control hazardous conditions in the workplace. Select and employ standard operating procedures that reduce the potential for injury or illness to the lowest practicable level.

d. Ensure that employees performing official duties and who become ill or are injured on the job have access to appropriate first aid and/or medical attention.

e. Investigate and report each accident and/or injury in accordance with established procedures. Initiate, to the limit of their authority and capability, such actions necessary to correct unsafe or unhealthful working conditions determined to exist and promptly advise appropriate management when such conditions require corrective actions beyond their jurisdiction.

f. Review work practices to ensure compliance with such standards,

codes, regulations, rules, and orders identified by occupational safety and health personnel as being applicable to the work area concerned.

g. Obtain assistance from the appropriate occupational safety and health personnel on the interpretation and application of specific standards, codes, regulations, or rules.

h. Ensure that employees under their supervision are aware of their responsibilities and follow the appropriate procedures for conducting their work safely.

5. Employees:

a. Comply with all occupational safety and health standards, rules, regulations, orders, and safe operating procedures applicable to the NIH.

b. Promptly advise the supervisor regarding all work related accidents resulting in personal injury, illness, and/or property damage.

c. Promptly report to the supervisor or appropriate occupational safety and health personnel or committee any unsafe or unhealthful conditions in the work environment.

F. Reporting Occupational Safety and Health Concerns:

1. Employees can report what appears to be a legitimate concern for their occupational safety and health without any form of reprisal.
2. Employees may request an inspection of their workplace by giving notice of alleged unsafe or unhealthful conditions directly to the Occupational Safety and Health Branch, Division of Safety.
3. NIH employees should report any unsafe or unhealthful condition to their Supervisor and/or the Division of Safety. Reports involving physical, chemical, or biological hazards should be reported to the Occupational Safety and Health Branch. Reports involving radiation hazards should be reported to the Radiation Safety Branch (see the NIH Telephone Directory for information). Employees will be notified by the supervisor or Division of Safety personnel of the actions taken in response to their report of unsafe or unhealthful conditions.
4. All reports of job-related accidents, personal injury, or illnesses are initiated through the Occupational Medical Service (OMS), Division of Safety, when the injured party presents to the OMS. The OMS will ensure that appropriate accident report forms are completed, filed, and appropriately distributed.
5. Employees may appeal decisions relative to alleged unsafe and unhealthful conditions to the Health and Human Services (HHS) designated Safety and Health Official or applicable agencies outside the HHS (Department of Labor,

Nuclear Regulatory Commission, Occupational Safety and Health Administration).

G. Additional Information:

For further information on this manual chapter, contact the Technical Assistance Section, Occupational Safety and Health Branch, Division of Safety, Office of Research Services on 496-2346.

H. Records Retention and Disposal:

For this chapter, records are retained and disposed of under the authority of NIH Manual [1743](#) "Keeping and Destroying Records," Appendix 1, "NIH Records Control Schedule," Items 1300 B and 2300-792.

Appendix 1. Charter for NIH Occupational Safety and Health Committee :

The NIH Occupational Safety and Health Committee provides recommendations for Safety policy to the Safety and Health Council for approval by the Director, NIH, or designee, in matters pertaining to occupational health, accident control and fire prevention and serves as an advisory body to the Division of Safety, ORS. Committee functions include those designated in the NIH Guidelines for the Laboratory Use of Chemical Carcinogens.

Duties of the Committee:

1. Recommends policies regarding occupational health, accident control, and fire prevention to the Safety and Health Council.
2. Provides technical advice, assistance, and management-level support to the Director, Division of Safety, in matters regarding occupational health, accident control, and fire prevention.
3. Identifies substantive biomedical research areas and institutional support programs where occupational health, safety, and fire hazards may exist.
4. Encourages the development of and maintains liaison with the Safety and Health Committees of the ICDs.
5. Monitors and reviews, as the Committee deems appropriate: reports of inspections; safety and health training programs; plans for controlling and abating hazards; medical surveillance initiatives; reports of occupationally-acquired illnesses and injuries; responses to reports of hazardous conditions; safety and health program deficiencies; and complaints regarding the safety and health programs.
6. Performs committee responsibilities specified in the NIH Guidelines for the Laboratory Use of Chemical Carcinogens.
7. Establishes working groups and appoints ad hoc members to the Committee, as

the Committee deems it necessary, to effectively carry out its duties.

Membership and Organization of the Committee: The Committee is composed of ten members appointed by the Director, NIH, or designee. Members are nominated by the ICD Directors. All members should be recognized as persons of good judgement and should represent the diversity of occupational areas which reflect the employee make-up and accident experience of the NIH. The discipline of chemistry, toxicology, and medicine must be represented on the Committee. Five members are selected from current chairpersons of established ICD Safety and Health Committees. The Chief, Occupational Safety and Health Branch, DS, ORS, serves as Executive Secretary. The Chief, Emergency Management Branch, DS, ORS, and the Medical Director, Occupational Medical Service, DS, ORS, serve as permanent, non-voting, resource members of the Committee. The Director, NIH, or designee, selects the chairperson from among the Committee membership. The chairperson serves a two-year term. The members serve overlapping terms of three years duration. The chairperson and members may be reappointed for additional terms.

Appendix 2. Charter for NIH Biosafety Committee :

The NIH Biosafety Committee provides recommendations for safety policy to the Safety and Health Council for approval by the Director, NIH, or designee, in matters pertaining to the control of hazards associated with the intramural use of microbiological agents and their vectors and serves as an advisory body to the Occupational Safety and Health Branch, DS, ORS. Committee functions include those designated for the Institutional Biosafety Committee in the NIH Guidelines for Research Involving Recombinant DNA Molecules.

Duties of the Committee:

1. Recommends policies regarding biosafety to the Safety and Health Council.
2. Provides technical advice, assistance, and management-level support to the Occupational Safety and Health Branch, DS, ORS, and to the NIH Biosafety Officer in matters regarding biosafety.
3. Identifies substantive biomedical research areas where biohazards may exist.
4. Recommends procedures for approving operations involving microbiological agents and their vectors that require maximum containment for biosafety and for such agents which, in the judgement of the Committee, may constitute unique or serious hazards.
5. Performs function of an Institutional Biosafety Committee as specified in the NIH Guidelines for Research Involving Recombinant DNA Molecules.
6. Reviews accidents resulting in personnel exposures to hazardous microorganisms or widespread area contamination and reports of non-

compliance with established national and NIH policies regarding the safe conduct of research involving hazardous microorganisms.

7. Establishes working groups and appoints ad hoc members to the Committee, as the Committee deems it necessary, to effectively carry out its duties.

Membership and Organization of the Committee: The Committee is composed of ten members appointed by the Director, NIH, or designee. Six members are nominated by the Board of Scientific Directors from among the intramural research community; five being scientists representing a diversity of disciplines relevant to biomedical research, infectious diseases, and recombinant DNA technology and one being a non-doctoral employee from a biomedical research laboratory. The NIH Biosafety Officer is a member and serves as the Executive Secretary. Two members are selected from the general public who are not affiliated with the NIH apart from their membership on the Committee. One member who is nominated by the Director, Division of Engineering Services, shall have expertise pertaining to design, operational capability, and maintenance of NIH research facilities. The Director, NIH, or designee selects the chairperson from among the Committee membership. The chairperson serves a two-year term. The members serve overlapping terms of three years duration. The chairperson and members may be reappointed for additional terms.

Appendix 3. Charter for NIH Radiation Safety Committee :

The Radiation Safety Committee oversees the NIH Radiation Safety Program to ensure the safe use of radioactive materials and source of radiation throughout NIH and those NIH-occupied buildings included within the NIH Radiation Safety Program and provides recommendations for radiation safety policy to the Safety and Health Council for approval by the Director, NIH, or designee. The Radioactive Drug Research Committee is a subcommittee of the NIH Radiation Safety Committee.

Duties of the Committee:

1. Ensures the safe use of all radioactive materials and sources of radiation throughout NIH and those NIH-occupied buildings included within the NIH Radiation Safety Program, for the Director, NIH.
2. Assigns to the NIH Radiation Safety Officer responsibility for implementing the Radiation Safety Program and enforcing applicable Federal regulations and NIH radiation safety policies and procedures to ensure the radiation safety of persons and protection of the environment.
3. Provide technical advice, assistance, and management-level support to the Radiation Safety Officer in implementing the Radiation Safety and the NIH program for maintaining radiation exposures to employees, patients, and research subjects as low as reasonably achievable (ALARA).
4. Reviews the Radiation Safety Program at least annually to determine that all

activities involving radioactive materials and sources of radiation are being conducted safely in accordance with applicable Federal regulations and NIH radiation safety policies.

5. Reviews the qualifications of licensed physicians and grants approval for the use of radioactive materials in human subjects.
6. Performs functions of the Radioactive Drug Research Committee in accordance with applicable regulations of the Food and Drug Administration, PHS, DHHS.
7. Reviews all requests to use radioactive materials in human subjects and protocols for such use and grants approval for specific uses.
8. The Chairperson of the Radiation Safety Committee acts for the Director, NIH in all matters relating to federal or state radioactive material or radiation source licensing.
9. Recommends new radiation safety policies to the Safety and Health Council for approval by the Director, NIH, or designee.
10. Establishes working groups and appoints ad hoc members to the Committee, as the Committee deems necessary.

Membership and Organization of the Committee: The Committee is comprised of ten members - the NIH Radiation Safety Officer and nine members appointed by the Director, NIH, or designee. Membership shall include representation of the various types of users of radioactive materials and radiation sources at NIH, a representative of the nursing staff, and representative of NIH management. At least four of the appointed members shall be physicians with training and experience in the use of radioactive materials and radiation sources, and should include the disciplines of hematology, radiology, pathology, and internal medicine. These four members will be selected from candidates nominated by the Medical Board. The other three members will be selected from candidates nominated by the Board of Scientific Directors, and should include a radiation physicist with training and experience in the use of radioactive materials and radiation sources in biomedical research.

The chairperson is named by the Director, NIH, or designee, from among the Committee membership and shall serve a two-year term. The members serve three-year terms and shall have staggered appointments so as to provide for some continuity of membership. The chairperson and members may be reappointed for additional terms. The Radiation Safety Officer shall serve as the Executive Secretary of the Committee and shall maintain the official Committee files. A quorum consisting of five Committee members shall be required before any official action may be taken by the Committee.

**Working Safely with Nonhuman Primates
Script (English version)**

Graphic Open Montage

Music

Narrator on camera

You are about to see and hear some very important information; information that could prevent injury and possibly save your life.

The purpose of this training... is to explain some safety procedures when working in a nonhuman primate facility.

The National Institutes of Health requires that you get this information in order to prevent injuries.

Bite and scratch injuries are largely preventable. Wearing proper protective gear can guard against most of these incidents. But as important is learning about nonhuman primate behavior and paying attention whenever you're in an animal room.

It can't be stressed enough. Most bite and scratch incidents are due to carelessness.

As I mentioned, some of these injuries could be lethal.

The most dangerous disease transmitted from nonhuman primates is commonly known as *Herpes B virus* or *Herpes virus simiae*.

Herpes B virus is transmitted by several nonhuman primate species that we classify as macaques, such as rhesus and cynomologous.

Herpes B is a mild disease in macaques, often without symptoms.

But, it can cause fatal encephalitis in humans. Since 1987, several people have died of *Herpes B* encephalitis. Most of the cases have been due to bites, scratches and possible splashes from the animals or injuries from contaminated equipment.

What's frightening is that for some cases, the route of exposure has not been identified.

Tuberculosis, salmonellosis, shigellosis, amoebic dysentery, Ebola virus and other diseases can be transmitted from monkeys to humans.

Humans can also transmit diseases such as tuberculosis and measles to nonhuman primates. These diseases can delay or jeopardize research projects.

Needle sticks, bites, scratches or splashes from animals or injuries from sharp edges of cages or equipment can expose you to disease. The most important precaution is to treat all macaques as if they were *Herpes B* positive.

Using appropriate protective clothing and equipment is your first line of defense against injury.

These items are essential parts of your protection any time you're in nonhuman primate rooms: a gown or coveralls, facemask, head cover and shoe covers. Nitrile or latex gloves should be worn, use double gloves for high risk procedures when your hands might be close to an occupied cage.

Make sure there are no gaps between the gloves and sleeves.

You should add a plastic face shield or goggles to your protective clothing whenever there's the possibility of splashing of body fluids or aerosols.

Never wear protective clothing outside the animal facility.

Taking off and disposing of the protective gear is part of biohazard containment. Remove the face shield or goggles. Next the mask and head cover, and then your shoe covers. Protective garments and gloves are the last items to come off. Remove them so that they are inside out.

Be sure to put these items in the proper containers for laundry or disposal.

Frequent hand washing is important to protect yourself from potential hazards.

Place all sharp objects like syringes and scalpel blades into a sharps container. Never recap needles!

At NIH, it is the Principal Investigators' responsibility to assure that the required training has been provided for students and trainees and that they have demonstrated competency in performing all activities associated with any nonhuman primates.

All NIH employees, visitors, and contract personnel must comply with training procedures. Immediate supervisors are responsible for ensuring that their employees do so.

Employee @ OMS

Another way that NIH strives to protect the health of individuals is through the Animal Exposure Surveillance Program. It is managed by the Occupational Medical Service and enrollment is required by all Federal employees who either are involved in the direct care of animals or their living quarters OR have direct contact with viable tissue, body fluid or waste.

Enrollment usually takes place during the pre-placement interview process. There will be a medical evaluation that includes an occupational medical history, safety and health counseling, TB test, and immunizations if necessary.

Contract and non-federal employees are eligible only for emergency medical care, evaluation and treatment of occupational injuries.

CG/ACTIONS SPEAK LOUDER

The goal of this section is to avoid injury by understanding normal primate behavior, including what may prompt aggressive behavior toward humans.

The better you can interpret the behavior, the safer your work environment.

Primates most commonly seen in research facilities are classified as either New or Old World. Some examples of New World primates are squirrel monkeys, owl

monkeys, marmosets, tamarins and capuchins. New World primates are found in Central and South America.

Old World monkeys are found in Asia and Africa. Some examples include the macaques, (rhesus, fascicularis or cynos, and pigtail monkeys), the colobines, African greens and baboons.

It is important to understand the behavioral differences exhibited by monkeys in the laboratory.

Behavior such as aggressiveness or anxiety may be similar within the same species, but quite different between species. Yawning and displaying of canine teeth represents anxiety in macaques. This anxiety may quickly change to aggression.

Scratching in squirrel or cebus monkeys, can indicate nervousness or stress.

During typical laboratory procedures, some monkeys respond to the approach of a human by fleeing to the back of the cage. Others approach the cage front. Some monkeys come to the front of the cage in order to bite, scratch, or grab clothing and gloves.

Laboratory monkeys may try to attack humans to defend their territory or protect their infants. Infants present in the room and conscious animals being un-caged can increase the anxiety of the entire room. Be especially careful during these times.

The size of the monkey does not matter! All monkeys are capable of scratching, biting or splashing human staff and can pose a serious health threat.

Splashes are particularly dangerous because of the potential for transmission of viral and bacterial infections, another reason why proper protective clothing is so important.

Primates reared in captivity develop complex social hierarchies and behave very much like they do in the wild. They also develop elaborate methods of communicating with facial expressions, body postures, and vocalizations.

In the laboratory, nonhuman primates may establish dominant-subordinate relationships with the human staff.

You can use these behavioral signals to interpret an animal's level of arousal and the likelihood of an aggressive act. The signals are only indicators of behavior; they are not absolute predictors.

If an animal feels threatened by human approach, it may move out of visual range to avoid confrontation and physical contact.

Direct stares are perceived as a threat by macaques.

Sudden quick movements or increased activity by staff may also trigger aggressive behavior accompanied by head bobs, ear flapping or raising and flashing eyebrows or eyelids.

If threats are ignored, macaques may respond by becoming visibly tense and the tail may be held erect or rigid.

The animal may shake the cage, bounce up and down, and make abrupt changes in posture, glances or open-mouth threats.

These behaviors are clear warning signals to care staff.

You may be able to arrest aggression by moving away from the animal.

A thorough knowledge of nonhuman primates' typical behavior combined with wearing appropriate personal protective equipment minimizes your risk for occupational exposure to injury and diseases.

Pay attention during routine husbandry especially during feeding without a food box.

Know the danger zones. Monkeys can and will reach out of cages to grab unsuspecting personnel.

Whenever your hand is anywhere near the cage your risk of a bite or scratch increases.

Primates prefer predictability. Personnel should attempt to follow feeding, cleaning and research schedules to avoid anxiety for the primates.

FIRST AID

If you are bitten or scratched by a nonhuman primate, administer first aid within five minutes to reduce the risk of B virus or bacterial infection.

Vigorously scrub contaminated skin for 15 minutes using a povidone iodine solution and a lot of water.

The bite kit should be labeled clearly and easily accessible in the work area.

You should know where to find it and how to use it.

If you have been splashed in the eyes, irrigate them at an eyewash station for 15 minutes.

After any injury or exposure notify your supervisor immediately, then report to the OMS clinic, Building 10, Room 6C306.

When OMS is closed, contact the on-call OMS care provider through the page operator before reporting to Suburban Hospital. NIH Animal Center staff would report to Shady Grove Adventist Hospital for medical evaluation.

The animal will be examined and cultured for clinical evidence of viral or other potentially infectious illness.

(Music under)

We have covered a great deal of information in this video. If you have any questions, ask your supervisor or principal investigator.

Don't become lax about precautions when you work with nonhuman primates every day; following precautions could save your life.

ANIMAL EXPOSURE SURVEILLANCE PROGRAM

Medical Support for Workers with Animal Contact

- I. Purpose
 - A. The purpose of the Animal Exposure Surveillance Program (AESP) is to provide:
 - 1. relevant health and safety information related to use and care of animals;
 - 2. occupationally indicated immunizations; and
 - 3. clinical evaluation and treatment for individuals with animal related injuries or illnesses.

- II. Relevant OMS Procedure Manual Sections
 - A. Pre-placement Medical Evaluation. Chapter III, Section 2.
 - B. Injuries Involving Nonhuman Primates (B Virus). Chapter III, Section 8.
 - C. Wound Care Guidelines. Chapter III, Section 9.
 - D. Occupational Allergy Clinic. Chapter III, Section 12.
 - E. Rabies Immunization. Chapter III, Section 21.
 - F. Tetanus-diphtheria Immunization. Chapter III, Section 23.
 - G. Serum Storage Program. Chapter III, Section 29.
 - H. Laboratory Animal Allergies. Chapter III, Section 33.
 - I. Retrovirus Exposure Surveillance Program (RESP). Chapter IV, Section 8.
 - J. Tuberculosis Surveillance Program. Chapter IV, Section 9.
 - K. Viral Hepatitis Surveillance Program. Chapter IV, Section 10.

- III. Attachments
 - A. Medical Evaluation Form – Attachment I
 - B. Surveillance Recall Memo – Attachment II
 - C. Surveillance Recall Memo, Second Notice – Attachment III
 - D. Non-compliance Memo – Attachment IV

- IV. Eligibility
 - A. Federal employees at the NIH are required to participate in this program if they:
 - 1. are involved in the direct care of animals or the animals' living quarters; or
 - 2. have direct contact with animals (live or dead), their viable tissues, body fluids, or waste.
 - B. The minimum features of this program that an employee must receive to be certified as participating are listed in Section XII.

- C. Contract employees, or employees of non-federal organizations, are eligible only for emergency medical care (i.e. evaluation and treatment of occupational injuries.)
- V. Identification and Enrollment
- A. Supervisors identify potential workplace health hazards including contact with research animals as part of the pre-placement medical evaluation process. Eligible employees (see IV.A.) are enrolled during the pre-placement medical evaluation.
 - 1. Supervisors may request a review of a position applicant's preexisting OMS clinical record to determine whether the worker has already received the services required for enrollment in the AESP (see Section XII below).
 - B. OMS enrolls eligible employees if they report an occupational injury or illness involving a research animal and they are not already enrolled.
 - C. At the completion of the enrollment, the employee is given two copies of the Medical Evaluation Form (Attachment I) documenting that the enrollment process has been completed. One copy is for the employee's records and the second is intended for the supervisor. It is the employee's responsibility to return the form to the supervisor. OMS forwards a third copy of the form to the Institute or Center (IC) Animal Program Director (APD) and retains a fourth copy of the form in the employee's clinical record.
 - D. If the enrollment occurs as a result of a review of the employee's OMS clinical record, the Medical Evaluation Form is mailed to the employee with copies of relevant educational materials.
- VI. Program Organization
- A. The surveillance program is subdivided into four broad categories:
 - 1. Small animal – i.e. fish, amphibians, birds, rodents, rabbits (see Section VII and XI)
 - 2. Large animal – i.e. cats, dogs, livestock (see Sections VII, VIII, and XI)
 - 3. Nonhuman primate – marmosets, monkeys, apes (see Sections VII, IX, and XI)
 - 4. Nonhuman primate tissues (see Sections VII, X, and XI)
- VII. Services offered to all AESP participants
- A. A pre-placement medical evaluation that includes an occupational medical history, safety and health counseling, tuberculin skin testing, appropriate immunizations, and enrollment in other applicable medical surveillance programs. A physical exam is almost never necessary.
 - 1. The occupational medical history includes a review of:
 - a. the functional demands and environmental factors associated with the proposed position;

- b. the type of animal (s) contacted;
 - c. other potential work-site health hazards; and
 - d. the individual's medical history.
 - 2. The participant is counseled regarding:
 - a. the value of Universal Precautions,
 - b. the availability of medical evaluation and treatment in OMS for occupational injuries and illnesses, including allergies (see Section VII-C below), and
 - c. the participant is provided information and handouts regarding allergic reactions to laboratory animals and relevant zoonoses based upon the animals used at the worksite (see the OMS Laboratory Animal Allergies procedure).
 - 3. A tuberculin skin test (PPD) is administered if there is no history of a prior positive test.
 - 4. A chest radiograph is also required if the participant:
 - a. offers a history of a prior positive test and cannot provide documentation of a normal chest radiograph two years or more following the discovery of the positive tuberculin skin test; or
 - b. is discovered to have a positive tuberculin test reactor. See the OMS Tuberculosis Surveillance Program for additional details.
 - 5. The participant is given a booster dose of tetanus and diphtheria (Td) toxoids if ten or more years have lapsed since the worker's last Td booster dose.
- B. Serum storage – AESP participants may elect to donate 6 ml. of blood so that the serum may be stored at -20°C for their future reference. Reference the OMS Serum Storage Program for additional details.
- C. Medical evaluation for treatment of work related injuries and illnesses – employees are required to promptly report all work related injuries and illnesses to OMS.
- 1. Injuries
 - a. Wound evaluation and treatment are performed in accordance with the OMS Wound Care Guidelines.
 - b. Injuries involving body fluids from nonhuman primates are addressed in Section IX C-F and in the OMS guidelines for evaluating and treating injuries involving nonhuman primates.
 - c. When the injury involves either a percutaneous or mucous membrane exposure to animal blood or other body fluid, 6 ml. of blood is obtained from the injured worker. The serum from this blood sample is stored for possible future reference.

2. Illnesses – infections
 - a. Many of the agents responsible for infections in laboratory animals are capable of infecting humans. Several infectious agents are covered in this surveillance protocol, but many are not.
 - b. Employees are counseled by the OMS practitioner during the enrollment evaluation to report gastrointestinal, respiratory, or dermal illness with signs or symptoms that resemble those occurring in the animals for which they care.
 3. Illnesses-allergies
 - a. Employees at risk for developing work related allergies include those with a history of pre-existing allergies (especially to household pets), asthma, seasonal rhinitis, or eczema.
 - b. During the preplacement medical evaluation, workers are counseled and provided a handout that describes: the risk for developing allergic reactions to laboratory animal proteins: how to avoid exposure to potential allergens; the physical signs and symptoms suggestive of an allergic reaction; and that they should promptly report related concerns to OMS for evaluation. See the OMS Laboratory Animal Allergy procedure and Occupational Allergy Clinic procedures for additional information.
- VIII. A participant with large animal contact may receive the following services in addition to those listed in Section VII.
- A. Rabies immunization
 1. Rabies immunization is provided to employees who:
 - a. work with the rabies virus;
 - b. have direct contact with quarantined animals potentially infected with rabies;
 - c. work with potentially infected animal body organs or perform post mortem examinations on selected animals with a history of poorly defined neurological disorders;
 - d. capture or destroy wild animals on campus; or
 - e. inspect facilities where the rabies virus is used.
 2. Immunization is performed as outlined in the Rabies Immunization section of the OMS procedure manual.
 - B. Serologic testing for toxoplasmosis
 1. A toxoplasmosis antibody titer is obtained for immunosuppressed workers and any female employee of childbearing capacity who anticipates occupational exposure to cats or their feces. A titer of greater than, or equal to, 1:16 by immunofluorescent testing is interpreted as protective.

2. Immunocompromised individuals and any female of childbearing capacity who lacks immunity to toxoplasmosis and plans to work with cats is informed of her susceptibility and is provided additional educational information.
3. The supervisor is advised to arrange a job reassignment for immunosuppressed workers and for susceptible employees for the duration of the pregnancy. When this is not possible, consultation with an Occupational Safety and Health Branch safety consultant is requested to identify other mechanisms to protect the employee.

C. Q Fever counseling and treatment

1. Employees at risk of exposure to Q fever include those who:
 - a. have direct involvement with the organism Coxiella burnettii in a research capacity, or
 - b. handle or use products of parturition or material contaminated by them (i.e., placenta, amniotic fluid, blood or bedding) from sheep, goats, cattle, or cats.
2. At the time of the pre placement medical evaluation, the participant is evaluated for his/her likelihood of developing chronic sequelae should they acquire Q fever. Employees with valvular or congenital heart defects and those who are immunosuppressed are advised of the potential risks involved, and medical clearance for duty will be determined by an OMS physician on a case-by-case basis.
3. Characteristics of infection with Coxiella burnettii
 - a. The incubation period averages 20 days, with a range from 14-39 days.
 - b. Signs and symptoms of acute infection include the sudden onset of severe headache, spiking fever to 104° F or greater, chills, and myalgia. The patient may present with pneumonitis or clinical hepatitis.
 - c. Treatment is initiated as soon as diagnosis is suspected.
 - d. Serologic confirmation of the diagnosis is accomplished three months later using enzyme immunoassay (EIA) testing of serum samples obtained at the time of initial report, at two weeks, and every 30 days from that day for three months.
 - e. The employee's work status depends upon the severity of symptoms. Human to human transmission of Q fever has not been documented.

- IX. Participants working with or caring for nonhuman primates and those workers performing necropsies on nonhuman primates are offered the following services in addition to those listed in Section VII.

A. Tuberculosis screening

1. Tuberculosis is a zoonotic disease that is difficult to detect in nonhuman primates and spreads rapidly in nonhuman primate colonies. Because there is no effective treatment for this infection in nonhuman primates, infected animals are euthanized to control the spread of the infection. Due to the devastating consequences of tuberculosis for nonhuman primates and associated research projects, special precautions are taken to reduce the risk that workers involved in the use and care of these animals will infect them with *M. tuberculosis*.
2. If the participant has a history of a previous positive reaction to a tuberculin skin test, further skin testing is not performed.
 - a. A Tuberculosis (TB) Quiz and Health Survey (see OMS Tuberculosis Program) are administered and the completed form is filed in the employee's OMS medical record.
 - b. A chest radiograph is obtained if the employee's responses to the quiz suggest active pulmonary tuberculosis or the employee cannot provide documentation of a normal chest radiograph within two years of the discovery of the positive reaction.
 - c. A chest radiograph is obtained if the participant received inappropriate chemoprophylaxis or treatment.
3. Participants working with nonhuman primates who do not have a history of a prior positive reaction to a tuberculin skin test receive one tuberculin skin test on enrollment. A second skin test is strongly advised and administered one to two weeks after the initial test.
 - a. If the first tuberculin skin test is positive, a medical history is obtained for symptoms suggestive of active pulmonary tuberculosis and a chest radiograph is obtained.
 - (1) If the individual did not have a documented negative skin test in the preceding 24 months (i.e., the test result does not represent a tuberculin skin test conversion), and there is neither clinical nor radiographic evidence of active pulmonary tuberculosis, the employee is counseled, referred for further care as indicated, and medically cleared for duty.
 - (2) If the employee had a documented negative skin test in the preceding 24 months and there is no radiographic evidence of active pulmonary disease, the employee is medically restricted from contact with live nonhuman primates until

appropriate medical treatment has been received for at least three days. If the employee is unable to obtain prophylaxis from his/her personal health care provider, OMS may offer prophylaxis.

- (3) If there is clinical or radiographic evidence of active pulmonary tuberculosis, the employee is medically restricted from returning to work. This restriction is not removed until the individual provides documentation establishing that the clinical or radiographic findings can reasonably be attributed to a condition other than active pulmonary tuberculosis. The worker is not cleared to return to the work place until the OMS medical director is reasonably convinced that the individual does not represent a health risk to others. Continued compliance with treatment is monitored by OMS.
 - (4) If the medical recommendation is that the employee not work or not work with live nonhuman primates, or not return to work, the employee, his/her supervisor, and the Animal Program Director for the IC are notified the day the decision is made.
 - b. If the initial tuberculin skin test is negative and the second test is positive, the response is indicative of a prior infection (booster phenomenon) and the course of action is as described in Section IX.A.3.a. (1).
 - c. If both of the tuberculin skin tests are negative, and there are no other medical contraindications, the employee is medically cleared for work.
 4. Evaluation of persons sustaining a potential work place exposure to *M. tuberculosis* is conducted as described in the OMS Tuberculosis Surveillance Program.
- B. Rubeola (measles) screening
1. Rubeola is one of the most frequently reported viral diseases of nonhuman primates.
 2. Due to the potential personal and public health consequences associated with rubeola infection, all employees working in rooms containing nonhuman primates must have laboratory evidence of protection to rubeola.
- C. Retrovirus testing
1. Human immunodeficiency virus (HIV-1) and human T-cell lymphotropic virus (HTLV I/II)
 - a. Employees who work with either HIV-1 or HTLV I/II or animals used in research involving these viruses are

- offered enrollment in the OMS Retrovirus Exposure Surveillance Program (RESP). RESP participants are provided regular serologic testing for retroviruses present in their work areas and for which there is a commercially available laboratory diagnostic test.
2. Simian immunodeficiency virus (SIV)
 - a. SIV is genetically and antigenically related to HIV-2. SIV infections occur naturally in African Green monkeys, baboons, sooty mangabeys, and chimpanzees. The infection commonly persists without any clinical manifestations. Several species of the genus *Macaca* (i.e. rhesus, cynomolgus) are highly susceptible and die following experimental or colony acquired SIV infection.
 - b. Testing at the CDC has shown that three of 472 individuals (0.6%) with nonhuman primate contact have antibodies to SIV. These occupationally acquired infections were discovered in 1992 and 1994. PCR testing was transiently positive for one of the workers; however, the virus could not be cultured in any of these cases. To date, each of these workers is asymptomatic and has no demonstrable immune deficiency.
 - c. Routine serologic testing for SIV/HIV-2 is offered through the RESP for participants using or caring for nonhuman primates that are or may be infected with SIV/HIV-2.
 3. Simian type D retroviruses (SRVs)
 - a. SRVs are a group of closely related viruses that are enzootic in many captive populations of macaques (e.g., rhesus, cynomolgus, squirrel, pig-tailed, bonnet, and langur monkeys). SRV has been identified as the etiologic agent of an infectious immunodeficiency disease in macaques that resembles infections with HIV-1 in humans.
 - b. The CDC has reported that two of 398 individuals (0.5%) with occupational contact with nonhuman primates had seroreactivity to SRV antigens. The investigators were unable to detect SRV-infected cells by PCR testing or to culture the virus. Neither worker has symptoms suggestive of an infection with a retrovirus.
 - c. Because there is no commercially available diagnostic test for SRV, OMS does not provide routine testing for SRV.

4. Simian foamy virus (SFV)
 - a. SFV has been detected in most nonhuman primate populations. However, nonhuman primates infected with SFV have no clinical evidence of the infection
 - b. The CDC has discovered serologic evidence of SFV infection in 13 of 398 individuals (3.3%) who worked with nonhuman primates. PCR testing was positive from several of these workers and the virus was cultured from two individuals. None of those infected has clinical evidence of their infection.
 - c. Because there is no commercially available diagnostic test for SFV, OMS does not provide routine testing for SFV.
 5. OMS provides post-exposure testing, not restricted to commercially available diagnostic tests, for documented exposures to primate retroviruses. OMS also provides chemoprophylaxis when clinically indicated for exposures to primate retroviruses. Additional details are contained in the RESP.
- D. Rabies immunization is offered to employees working with nonhuman primates in quarantine (see Section VIII A).
- E. B-virus (cercopithecine herpesvirus 1) testing
1. Injuries involving neurologic tissues or either ocular or oral secretions of rhesus, cynomolgus and other macaque monkeys (i.e. pig-tail and stump-tail monkeys) very rarely result in human infection with B-virus. However, due to the extreme morbidity and mortality of this infection in humans, special effort is taken to ensure prompt medical evaluation and first aid following a potential exposure to B-virus.
 2. The OMS procedure for Injuries Involving Nonhuman Primates (B virus) describes the: relevant medical history needed, first aid provided, diagnostic studies performed, and the advice given to the injured worker.
- X. Participants who work with nonhuman primate tissues may receive the following services in addition to those listed in Section VII.
- A. Periodic tuberculin skin testing is encouraged for participants working with non-fixed lung or lymph node tissue as described in Section IX.A.
- B. A single tuberculin skin test is offered to participants working with all other nonhuman primate tissue.
1. If the tuberculin skin test is negative and there are no other medical contraindications, the employee is medically cleared for work, and there is no follow-up.
 2. If the tuberculin skin test is positive, the course of action is as described in Section IX.A.3.a.(1) and (3).

- XI. Surveillance Recall
- A. Participants working with small and large animals are advised at the time of enrollment to return for Td boosting ten years from the date of their last booster dose.
 - B. Participants working with live nonhuman primates or non-fixed lung or lymph nodes from nonhuman primates are reminded by letter (Attachment II) to return to OMS as follows:
 - 1. If the prior tuberculin skin test was negative, the test is repeated every six months.
 - 2. If the prior tuberculin skin test was positive, regardless of whether chemoprophylaxis or treatment was received, the employee will be sent an informational TB health review annually with a letter asking the worker to call OMS if he or she has any symptoms suggestive of active tuberculosis.
 - C. Recall for retrovirus monitoring is described in the RESP.
 - D. Upon successful completion of the recall visit, the employee is given a Medical Evaluation Form (Attachment I) documenting that he/she is participating in the AESP.
- XII. Requirements for certification of enrollment and continuing participation in the Animal Exposure Surveillance Program (AESP):
- A. Participants working with small animals
 - 1. Medical counseling (Section VII.A.2).
 - 2. Tetanus immunization (Section VII.A.5).
 - B. Participants working with large animals
 - 1. Medical counseling (Section VII.A.2).
 - 2. Tetanus immunization (Section VII.A.5).
 - 3. Rabies immunization, if applicable (Section VIII.A).
 - 4. Serologic testing for toxoplasmosis, if applicable (Section VIII.B).
 - C. Participants working with live nonhuman primates
 - 1. Medical counseling (Section VII.A.2).
 - 2. Tetanus immunization (Section VII.A.5).
 - 3. Tuberculosis screening (Section IX.A).
 - a. If the enrollee fails to keep the recommended AESP periodic visit, OMS mails a reminder (Attachment III). The memorandum is copied to the employee's supervisor and Animal Program Director.
 - b. If the employee does not schedule and keep a follow-up visit within two weeks of the reminder notice, the supervisor and Animal Program Director are notified of the employee's noncompliance by memorandum (Attachment IV). The memorandum is copied to the employee.

4. Rubeola immunization/protection (Section IX.B)
 - a. Participants who lack documented protection to rubeola and who refuse vaccination, and those who cannot receive the vaccine due to a medical contraindication, are identified to their supervisor and APD as lacking protection to rubeola.
 5. Rabies immunization, if applicable (Section VIII.A).
- D. Participants working with nonfixed tissue from nonhuman primates
1. Medical counseling (Section VII.A.2)
 2. Baseline tuberculosis screening (Section VII.A.3)
- XIII. Surveillance Program Report
- A. A list of employees enrolled in the AESP is provided to the APDs for the ICs for their respective areas. The report is provided in the first week of October and April, and contains the following information for each participant:
1. Name
 2. Last four digits of the social security number
 3. Category of animal used or cared for
 4. Date enrolled
 5. Recall date for NHP workers, and
 6. Compliant or non-compliant status.
- B. Each APD reviews the list with supervisors, makes appropriate corrections, and returns the corrected list to OMS.

Attachment I

Occupational Medical Service Animal Exposure Surveillance Program (AESP) Medical Evaluation	Date
Employee's Name	SSN (Last 4)
Supervisor's Name	ICD

Employee is reporting for

 Enrollment in the AESP Routine periodic visit

Animal category

 Small Large Nonhuman primate Primate non-fixed tissues

Medical Recommendations

 The above employee is cleared for contact with the designated animal(s).

 The above employee is not cleared for nonhuman primate contact.

Restrictions include: _____

 The above student is cleared for contact with the designated animal(s) through _____

 Employees working with live nonhuman primates must return for medical evaluation in OMS at regular intervals. This employee must return to OMS in (*month/year*) _____

Note: It is the employee's/student's responsibility to provide this form to the supervisor.

OMS Representative's Signature	Date
--------------------------------	------

Attachment II

DATE:

TO:

FROM: Staff Nurse
Occupational Medical Service, DS

SUBJ: Periodic Medical Evaluation
Animal Exposure Surveillance Program

Your Occupational Medical Service (OMS) record indicates that you are due for a routine periodic medical evaluation as part of your participation in the Animal Exposure Surveillance Program (AESP). Please call me at 496-9278 within two days to schedule an appointment.

If you work with nonhuman primates, a tuberculin skin test for tuberculosis (PPD) is required every six months. All participants should receive a tetanus booster every ten years. Your records indicate that you are due for a:

_____ Tuberculin Skin Test
_____ Tetanus Booster

Please bring this letter with you on the day of your appointment.

If you have any questions regarding this information, please contact me at the above number.

Staff Nurse
Bldg. 13, Room G904

Attachment III

DATE:

TO:

FROM: Staff Nurse
Occupational Medical Service, DS

SUBJ: Periodic Medical Evaluation
Animal Exposure Surveillance Program

Occupational Medical Service (OMS) records indicate that you did not respond to a prior request to return to the clinic for medical evaluation as part of your participation in the Animal Exposure Surveillance Program (AESP). Please call me at 496-9278 within two days to schedule an appointment within two weeks of the date of this memorandum.

Please be aware that OMS is required to notify your supervisor and the Animal Program Director for your IC if you do not keep recommended AESP related appointments. Noncompliance may result in administrative action by your supervisor.

Staff Nurse
Bldg. 13, Room G904

cc: Supervisor
Animal Program Director

Attachment IV

DATE:

TO: Supervisor
Animal Program Director

FROM: Staff Nurse
Occupational Medical Service, DS

SUBJ: Noncompliance with Periodic Medical Evaluation
Animal Exposure Surveillance Program

Occupational Medical Service (OMS) records indicate that _____
has not complied with two requests to return to OMS for standard, periodic, medical evaluation as
part of his/her participation in the Animal Exposure Surveillance Program (AESP). He/she is no
longer registered as a participant in the AESP.

Staff Nurse
Bldg. 13, Room G904

cc: Employee

MMWR: Weekly

December 18, 1998/47(49);1073-6, 1083

Fatal Cercopithecine herpesvirus 1 (B Virus) Infection Following a Mucocutaneous Exposure and Interim Recommendations for Worker Protection

On December 10, 1997, a 22-year-old female worker at a primate center died from Cercopithecine herpesvirus 1 (B virus) infection 42 days after biologic material (possibly fecal) from a rhesus macaque (*Macaca mulatta*) splashed into her right eye. This report summarizes the clinical features of her illness and the subsequent investigation by CDC in response to a technical assistance request from the Occupational Safety and Health Administration (OSHA) and presents interim recommendations to prevent ocular splash exposures. This investigation documented the hazard of ocular splashes and indicated that dendritic corneal lesions, such as herpetic skin vesicles, are not always present in B virus infection (1).

The exposure occurred on October 29, 1997, while the worker moved the animal within cages during a routine capture of free-ranging monkeys. She was not wearing protective eyewear because the activities in which she was engaged involved caged macaques, and the activities were judged by the primate center to carry a low risk for exposure to B virus. Following the exposure, the worker wiped her eye with a paper towel and, approximately 45 minutes later, irrigated the eye for 2-3 minutes with tap water but did not file an incident report. The monkey involved was not identified.

On November 8, the worker's eye was red and swollen. At the emergency department (ED) of a medical center affiliated with the same university as the primate center, she informed the physician that she worked with nonhuman primates and may have been exposed to B virus. Dendritic corneal lesions typical of ocular herpes infections were not observed by Wood's lamp examination. The ED physician consulted the B virus protocol in place in the ED and then consulted an infectious diseases specialist by telephone. On the basis of the reported circumstances of the contact and the absence of previous recognized transmission of B virus following mucocutaneous exposure, the infectious diseases specialist concluded that B virus infection was unlikely but recommended follow-up with the infectious diseases clinic within the next few days. The ED physician prescribed sulfonamide eye drops.

An appointment at the infectious diseases clinic was not available immediately. On November 11, the worker called her primary-care physician for a referral because her eye symptoms were worsening. The physician referred her to an ophthalmologist, who elicited history of a recent cat scratch and prescribed doxycycline for suspected Parinaud's oculoglandular syndrome secondary

to cat-scratch fever. Routine eye cultures were obtained. Confirmatory serologic testing for *Bartonella* species, also ordered during the visit, subsequently was negative.

On November 13, the worker sought care from another ophthalmologist because of increased right retro-orbital pain and onset of photophobia, anorexia, nausea, and abdominal pain. After reconsultation with the infectious diseases specialist, the worker was immediately hospitalized for suspected B virus infection. The worker's temperature, normal on admission, reached 101.4 F (38.6 C) during the first day of hospitalization. Physical examination identified a swollen right orbit with conjunctivitis and one small tender right preauricular lymph node. Laboratory examination of urine found trace proteinuria. Cerebrospinal fluid (CSF) analysis identified 8 white blood cells per milliliter (83% lymphocytes {normal: 0-10 cells, 100% mononuclear}). Serum for Western blot testing and CSF specimens and eye swabs for B virus culture were sent to the B Virus Research and Resource Laboratory. All previously collected eye cultures were retrieved from commercial laboratories to minimize biosafety hazards to laboratory workers.

Acyclovir therapy (15 mg/kg intravenously every 8 hours) was started within 2 hours of hospital admission. On November 14, therapy was changed to ganciclovir (5 mg/kg every 12 hours) when a vesicular eruption was noted in the distribution of the first and second branches of the right trigeminal nerve. Magnetic resonance imaging (MRI) of the head was normal. The vesicles resolved over the following week. A sharp mid-cervical/high thoracic back discomfort occurred on November 19 but subsided over an 8-hour period. All symptoms resolved, and on November 24 the worker was discharged on outpatient intravenous (IV) ganciclovir therapy.

Despite uninterrupted ganciclovir therapy, on November 25 the worker woke with right foot weakness, inability to urinate, and lower abdominal pain, followed by a rapidly progressive ascending myelitis. The hospital readmission examination found profound right leg weakness, moderate left leg weakness, decreased hand grip strength bilaterally, and urinary retention. MRI revealed abnormalities extending from the cervical spinal cord to the upper thoracic cord. The worker was intubated electively within 13 hours and developed flaccid paralysis from C2 caudad.

The diagnosis of postviral acute demyelinating encephalomyelitis was considered by neurology consultants, and a short course of plasmapheresis and steroids was administered. On November 30 seizure activity (involuntary facial and eye movements) developed, and foscarnet, usually not recommended for B virus infection because of its toxicity, was added to ongoing ganciclovir therapy. During December 1-9, the worker developed nosocomial pneumonia with bacteremia, followed by adult respiratory distress syndrome. Repeat MRI revealed abnormalities extending from midbrain through the thoracic spinal cord. On December 10, the worker died from refractory respiratory failure.

Eye and CSF cultures obtained in the hospital on November 13 and November 14 were negative for B virus when tested at the B Virus Research and Resource Laboratory. Serum collected November 13 and November 21 and tested for reactivity to B virus by Western blot showed indeterminate and positive reactivity, respectively, confirming B virus infection.

Reported by: C Perlino, MD, Emory Univ School of Medicine; J Hilliard, PhD, B Virus Research and Resource Laboratory, Georgia State Univ, Atlanta; J Koehler, DVM, Div of Public Health, Georgia Dept of Human Resources. National Institute for Occupational Safety and Health; National Center for Infectious Diseases; and Office of Health and Safety, CDC.

Editorial Note

Editorial Note: C. herpesvirus 1 (B virus) causes persistent latent infections in greater than or equal to 70% of captive adult macaques (2) but not other primates. During intermittent reactivations, the macaque may shed B virus from the buccal mucosa, urogenital tract, and in conjunctival fluid (2). Reactivations may be asymptomatic or accompanied by clustered vesicles on an erythematous base.

This is the first report of a worker developing a recognized B virus infection following mucocutaneous exposure without injury. 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 infective biologic materials from macaques (3-5). One human-to-human transmission has been identified (6). The incubation period in humans has been as short as 2 days but more frequently is 2-5 weeks. Previously reported patients infected with B virus who were treated aggressively with either IV acyclovir or ganciclovir after onset of symptoms but before respiratory arrest or coma have survived (3). The death of this patient despite aggressive antiviral therapy may have resulted from factors related to the route of virus inoculation, the virulence of the virus infecting the patient, the patient's immune response, or timing of initiation of treatment following the exposure.

Interim Recommendations to Prevent Ocular Splash Exposures

Preventing worker exposure to biohazardous material is the best protection against infection. Reviews of injuries and biohazard exposures among workers exposed to nonhuman primates suggest that mucocutaneous contact with nonhuman primate body fluids is common; 16 (94%) of 17 contacts with primate body fluids in one survey involved ocular exposure (6,7). Each institution working with macaques should develop a written comprehensive personal protective equipment (PPE) program based on thorough hazard assessments of all work procedures, potential routes of exposure (e.g., bites, scratches, or mucosal exposures) and potential adverse health outcomes. This plan should clearly identify the PPE required for each task or working area and address training, inspection, maintenance, and periodic assessment of program effectiveness.

Previous recommendations for preventing B virus infections in humans advise presuming that all macaques are infected with B virus and protecting workers with a faceshield (or surgical mask and goggles or glasses) when handling uncaged active macaques (3,8). The incident described in this report indicates that proper eye protection also should be mandatory during activities such as entering areas containing macaques, conducting captures, and transporting caged macaques. Other activities where eye protection is necessary should be determined by the hazard assessment. All personnel who work in situations determined to be hazardous should wear eyewear conforming to established standards for eye and splash protection (9). Personal eyeglasses are not PPE.

Protective goggles designed for splash protection (available with antifog lenses for humid environments and in models that preserve peripheral vision) should be worn to protect the eyes against splash hazards in combination with a mask designed to protect other mucous membranes. Faceshields are commonly considered secondary eye protectors that are worn in combination with protective goggles (9,10). Although previous guidelines indicate a faceshield may be sufficient, ocular exposures have occurred to workers wearing faceshields, including to a worker who was wearing a combination surgical mask/faceshield while moving a macaque within cages. To minimize the potential for mucous membrane exposure, faceshields must prevent droplet splashes to the head from running down into the eyes and prevent mucous membrane exposure around the edges (sides, top, and bottom to below the chin) (10). Decisions to use faceshields as the sole means for preventing ocular exposure should only be made after full consideration of both the limitations of faceshields and regulatory (OSHA) considerations.

Exposure Management

If exposure prevention fails, the adequacy and timeliness of wound or exposure decontamination procedures are critical factors determining the risk for infection. Institutions that house or conduct procedures involving nonhuman primates or potentially contaminated tissues should develop institution-specific postexposure procedures (3,8). Such procedures would eliminate institutional barriers to patient access and ensure appropriate diagnostic testing and infection control. First, animal handlers should be instructed to cleanse immediately and thoroughly all bites, scratches, and/or mucosal surfaces or abraded skin exposed to macaque biologic materials and to report these exposures immediately (3). Following an exposure to the eye, existing guidelines recommend immediately flushing the eye with water for at least 15 minutes (3). Second, postexposure procedures also should provide potentially exposed workers with direct and rapid access to a local medical consultant knowledgeable about B virus and other biohazards associated with nonhuman primates. The employer should ensure that direct access to the knowledgeable consultant is available immediately following exposures and at any time the worker is concerned that potential occupational exposure to B virus may be relevant to worker symptoms. Finally, postexposure procedures also should include routing diagnostic specimens to the B Virus Research and Resource Laboratory, now at Georgia State University in Atlanta. These interim recommendations will be reviewed and may be revised or augmented following additional consideration by a working group convened by Office of Health and Safety, CDC.

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