

	<u>U L A M</u> Unit for Laboratory Animal Medicine	Standard Operating Procedure
Title: Animal Transportation		
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A. PURPOSE:

Transportation of research or teaching animals within or between campus buildings is an essential component of the research enterprise. The integrity and well being of the animals being transported are necessary for the quality of the research and the welfare of the animals (Guidelines, 2006). For animals, it is important to maintain their health status by avoiding exposure to potential pathogens, preventing injury, and reducing stressors such as temperature extremes, odors, excessive noise, and confrontations with other animals. Performing the task of animal transportation requires heightened attention to detail to ensure safety and well being for the personnel in areas where the animals must pass. Human health concerns include allergies of animal origin, injury from escaped animals, and exposure to hazards such as microorganisms, chemicals, or radioactive materials.

The *Guide for the Care and Use of Laboratory Animals* states that animal transportation “should be planned to minimize transit time and risk of Zoonosis, protect against environmental extremes, avoid overcrowding, provide food and water when indicated, and protect against physical trauma.” This document will expand upon these principles for the investigators and laboratory and technical staff at the University of Michigan.

B. PROCEDURES: To ensure that regulations and concerns are addressed regarding animal transport, the Unit for Laboratory Animal Medicine (ULAM) has established the following general guidelines for the University of Michigan:

1. All methods of transporting animals must provide for the health and welfare of animals.
2. Transportation of animals must be done in a direct and timely manner, avoiding public areas as much as possible. In selecting the route, care should be taken to utilize the least congested areas and to avoid human patient areas, whenever possible.
3. Animals must not be transported with any other animal, substance, or device that may potentially cause injury to the animal being transported.
4. Enclosures containing animals must be secure and carefully handled. The enclosures must be maintained in a manner that will prevent them from tipping or falling and must be handled in a manner that will minimize any physical trauma or distress to the animals.
5. Temperature extremes must be avoided when animals are transported. While the caging will insulate animals, exposure to extreme ambient temperatures can have

adverse effects. When temperatures fall below 40°F (4.4°C) or above 85°F (29.4°C), special precautions (in addition to the environmentally controlled vehicles used by ULAM) may need to be taken.

6. The USDA regulations must be followed when transporting animal species covered under the Animal Welfare Act (AWA). [Note: the AWA can be accessed from the sitemap link at www.ulam.umich.edu under Laboratory Animal Resources]. These animals include: dogs, cats, non-human primates, calves, sheep, goats, pigs, rabbits, guinea pigs, hamsters, and other mammals not specifically excluded (exclusions are laboratory mice, rats and birds). Transportation of animals must also comply with the applicable local and state laws and regulations.
7. Animals should be transported in covered or opaque cages, carriers, or containers. These primary enclosures must be constructed of materials that can either be sanitized or disposed of, and must be designed to prevent the spread of fomites, microorganisms, chemicals, or radioactive materials where indicated. The containers shall:
 - a. Be escape proof. There must be a means to prevent unintended opening, such as a latch or locking mechanism, tape, rubber band or a box-within-a-box. This applies to transport within the hallways, as well as between buildings.
 - b. Provide adequate ventilation (Note: stacking rodent cages or using enclosed impermeable containers or trash bags without air holes does not provide adequate ventilation)
 - c. Provide food and a source of water when rodents will be held within the transport container for longer than 4 hours.
 - d. Use the same density requirements for general animal housing as described in the *Guide to the Care and Use of Laboratory Animals*.
 - e. Be able to be sanitized, if not disposed, after use to prevent possible cross-contaminations between conventional animals and Specific Pathogen Free (SPF) or conditioned animals (those with a relatively unknown vaccination and health history, prior to vendor acquisition). General use of the primary transportation container (i.e. cage) requires sanitation after each use. Note: if a transportation container is being used repeatedly for moving animals of the same species and health status throughout the course of a day, then it only needs to be sanitized at the end of the day.
 - f. Protect the transporter from exposure to licks, bites, scratches or other animal contact during transit.
8. Cargo areas of vehicles used in the transportation of animals must be cleaned and disinfected as needed to prevent contamination of future animal deliveries. Sanitation of the interior of the truck can occur either after transporting the contaminated animals/equipment or prior to transporting the next shipment of animals/equipment. The interior floor and lower walls or any surface that could be in contact with the animals or equipment should be sanitized with a ULAM-approved disinfectant.
9. Investigators may apply for an exception with the UCUCA (University Committee on Use and Care of Animals) office for the transportation, receipt and shipment of animals if they have requirements that differ from these guidelines

C. PERSONAL PROTECTIVE EQUIPMENT (PPE) DURING ANIMAL TRANSPORT:

1. The appropriate use of PPE protects both research animals from human pathogens and cross contamination of humans with animal pathogens. People who are in direct contact with research animals should cover their street clothing and exposed body surfaces with PPE to reduce the risk of pathogen contamination through contact or aerosolization. In non-ULAM areas, a standard-issue clean lab coat should suffice. The appropriate disposal of PPE is also necessary so that the PPE does not act as a fomite for transmitting pathogens. For example, if PPE is worn while disinfecting incoming shipping containers, the PPE should be disposed of before moving on to other tasks (Guidelines, 2006). Additional information is located on the UCUC Occupational Health and Safety web hotlink for Biohazards / "Protective Clothing Chart". More species-specific information can be found in Section D.

D. SPECIAL INSTRUCTIONS REGARDING TRANSPORT OF CERTAIN SPECIES:

SPF Rodents

1. Required PPE for transport from animal rooms: None, unless posted otherwise (UM Protective Clothing Chart)
2. SPF rodents should always be transported in a micro-isolation style cage (one with a filtered top) with the water bottle reversed to avoid flooding. Upon return to a housing area, the rodents should be transferred to a clean cage with the water bottle correctly placed, with the sipper tube located inside the cage and below the wire bars. The transport cage should not be returned to the rack, but rather returned to the soiled side of the cage wash facility for sanitation.
3. Cages that have contained animals inoculated with infectious or chemical hazards must be transferred to a clean transport cage within the room, while leaving the dirty cage within the housing room. If the cage, following transport, contains animals that may still pose a hazard, the transport cage should be labeled with the investigator's name and protocol number and returned to the original housing room. Potentially infectious or hazardous cages should not be taken directly to the cagewash area.

Nonhuman Primates (NHP)

1. Required PPE for transport from animal rooms: The individual handling the NHP transport container should be clothed in a dedicated long-sleeved garment, long pants, exam gloves, eye protection and a surgical mask (UM Protective Clothing Chart). Mucous membrane exposure must be minimized through the use of PPE that will prevent droplet splashes to eyes, mouth, and nasal passages.
2. For transporting NHPs in corridors, these animals should be maintained in an enclosed cart to minimize exposure to aerosol contamination. An ideal transport arrangement would involve two individuals: one person to transport the NHP (in a modified transport cage that can be secured) while wearing appropriate PPE, and one person to stay "clean" (no PPE) to assist with transport as needed by opening doors, summoning elevators, etc.
3. The individual wearing PPE should change to a clean set when they leave the NHP housing room and move to the corridor, and they should also have spare gloves, a

bottle of disinfectant (in case of animal fluid or waste spills), and additional anesthetic (see #7).

4. If a person must transport a NHP alone, they must keep one hand ungloved to open doors and summon elevators, but need to have spare gloves available in the event of a monkey health emergency.
5. Animals should not be allowed to remain in the corridors except when being transported directly to another room. Transport carts (obtained through ULAM) must be used to transport these animals through public corridors and on elevators.
6. Elevators should be entered with animals for transport only when no other personnel are riding the elevator. If someone attempts to get on the elevator with the handler and NHP, the animal handler should make every effort to discourage this and explain that there is a potential biohazard on the elevator. (BPU protocol: Biological Safety Practices, SOP 0024: Transporting Anesthetized Rhesus Monkeys).
7. Anesthetic Capability: Individuals caring for NHPs that have been anesthetized for movement need to carry supplemental anesthetic, a needle and syringe in order to provide additional anesthetic to the animal in the event of an unanticipated prolongation of the transportation process (e.g., power outage, broken elevator).
8. Zoonotic Diseases: The pathogen of greatest concern is *Cercopithecine herpesvirus 1*, or B virus. Transmission to humans occurs through exposure to contaminated animals (scratches, bites, splashes to mucosal membranes, contact with infected animal tissues) or contaminated equipment (needle sticks, sharp cage parts) and may be fatal. Progression of the disease involves symptoms attributed to central nervous system infection, including alterations in vision, seizures, and respiratory failure.

Dogs

1. Required PPE for transport from animal rooms: None, unless posted otherwise (UM Protective Clothing Chart).
2. Minimize Noise: Dogs can be quite vocal during transportation. One should try to transport at times when public encounters would be minimized (e.g., before 7:00 AM).

Livestock species (calves, sheep, pigs)

1. Required PPE for transport from animal rooms: None unless posted otherwise (UM Protective Clothing Chart)
2. Minimize Noise: Livestock species can be quite vocal during transportation. Try to sedate or anesthetize those animals that are likely to vocalize during transport, or transport at times when public encounters would be minimized (e.g., before 7:00 AM).
3. Zoonotic Diseases: Sheep commonly can carry two Zoonotic diseases – Q fever (*Coxiella burnetii*) and Orf (contagious ecthyma or poxvirus) Documentation about safe practices to prevent Q Fever exposure can be accessed under the UCUC Occupational Health and Safety hotlink for Zoonosis. These animals should be transported in an enclosed cart to minimize exposure to aerosol contamination. Animals should not be allowed to remain in the corridors except when being transported directly to another room. Transport carts (obtained from ULAM) must be used to transport these animals through public corridors and on elevators.

Aquatic Species

1. Required PPE for transport from animal rooms: None, unless posted otherwise (UM Protective Clothing Chart)
2. Be sure that the transporting environment is appropriate for the species – aquatic frogs and fish need to be transported in water, or in such a way that they do not suffer respiratory difficulty during transport.

E. SPECIAL INSTRUCTIONS REGARDING MOVEMENT OF ANIMALS OFF-CAMPUS:

1. Unless the Principal Investigator (PI) transfers shipment responsibility to ULAM (see below), the PI is responsible for the transport of animals from the Ann Arbor campus to other locations, be it an intra-state, interstate, or international destination. When animals are moved to off-campus locations, the containers must be labeled “Live Animals.” Containers must meet applicable laws and standards, e.g. those from the International Air Transport Association (IATA) at www.iata.org.

NOTE: Transportation of animals in vehicles not specifically designated for such purposes (e.g., personal cars) is highly discouraged. Any PI who has plans for transport in such vehicles should have a completed description of this method in their approved protocol.

2. ULAM services can be used for transporting rodents between the Ann Arbor campus and the remote locations. The investigator contacts the ULAM Shipping Coordinator to request shipment of rodents at least 3 weeks in advance of the desired shipping date. **The ULAM Shipping Coordinators are: Eric Wall (erwall@umich.edu), Lea Ann Chlebek (lchlebek@umich.edu), Cherie Chang (leeo@umich.edu)** Phone: 734-936-1699 / Fax: 734-936-3235
3. For larger species, all appropriate laws and standards for cages must be followed. This includes transport of sheep and nonhuman primates between campuses.

F. SPECIAL INSTRUCTIONS REGARDING ANIMALS WITH EXPERIMENTAL HAZARDS:

Transporting live or dead animals containing radioactive isotopes:

1. Any time an authorized radionuclide user treats an animal with radioactive material they must follow “Standard Procedures and Protocols for Using Radioactive Material in Animals” [available through Radiation Safety Service (RSS)]. Researchers wishing to administer radioactive material to any animal must file an Application for Authorization to Use Radioactive Material with RSS and have it approved by the Radiation Policy Committee before initiating any research project work.
2. Animals that have received radioactive material must be transported in such a manner as to prevent any contamination of hallways, elevators, etc. Solid bottom transfer containers are MANDATORY. Such animals may not be transported across public streets or sidewalks without RSS approval and/or assistance. Investigators planning to transport live animals containing radioactive materials from one location to another must contact the RSS office [phone: 764-4420, or website

<http://www.oseh.umich.edu/osehstaff.html>] for specific guidance. Requests for animal transport can be made by contacting RSS directly.

3. Enclosures used to transport live animals must be properly identified. Each animal cage must bear a cage card with the Authorized User / Investigator's name, radionuclide used, activity (micro curie or mill curie) administered, and the date of administration. Animal carcasses and pathological waste must be packaged in strong, yellow leak-proof plastic bags provided by RSS, and sealed with 'Caution Radioactive Material' labeling tape. Bags must be labeled with the Authorized User / Investigator's name, radionuclide(s), total collected activity, and date. Leave these bags in a designated radioactive animal freezer for your area / building. **RSS will collect and dispose of all forms of radioactive waste.**

Transporting animals treated with pathogens or carcinogenic material:

1. The UCUCA and Occupational Safety and Environmental Health (OESH; <http://www.oseh.umich.edu/>) are responsible for reviewing animal study proposals for research with animals, including work with hazardous infectious materials, toxins or chemical substances. The transportation of animals that are to be dosed at one location and moved to another needs to be particularly evaluated to assure that proper containment is used to minimize occupational exposure to persons involved with the move, and to minimize environmental contamination. Investigators planning to transport live animals that were previously administered an infectious, toxic or chemical substance, **must** undergo a risk assessment prior to transfer. This assessment can be done through (1) OESH Biosafety at 763-6973; (2) ULAM's containment coordinator at 764-0277; or (3) via email: ULAMBIOHAZARD@umich.edu.
2. Small laboratory animals, that have undergone a risk assessment at the time of protocol review and are determined to require containment housing, must be transported in contained caging systems. Use well-fitting filter top cages to prevent potentially contaminated materials from being released. A faculty veterinarian in consultation with an OESH specialist will evaluate transportation for larger animal species on an individual basis.
3. Warning labels are required on enclosures used to transport live or dead animals that have been exposed to chemical or biological hazards. The specific hazard must be identified.
4. Carcasses of contaminated animals must be handled according to the ULAM Containment SOP (this document can be accessed under the UCUCA Occupational Health and Safety hotlink for Biohazards). Use double bags to transport carcasses of small animals and carcass barrels to transport larger species to the cooler for disposal. It is good practice to double bag larger animals within the carcass barrel for additional containment purposes. The ULAM Supervisor for the specific animal facility can be consulted for more specific information about carcass disposal.
5. Disinfection - When any body fluids (blood, urine, saliva, mucus), feces, or dirty bedding contacts any surface outside the cage, it must immediately be removed and the area disinfected with an appropriate disinfectant, e.g., Quatricide®-PV or Clidox®-S (Pharmalac), or Virex II (Johnson's Wax). Additional deactivation may be necessary, depending upon the type of infectious, toxic or chemical hazard present.

G. HANDWASHING:

1. Washing of hands following live animal or carcass transportation is an important adjunct to the use of exam gloves or in place of exam gloves for prevention of the spread of infectious organisms or other contaminants to both personnel and animals. While the use of exam gloves will greatly decrease the spread of contaminants from a person's hands, they will not completely eliminate this transfer due to micro-breaks in glove materials, regardless of type (latex, vinyl or nitrile). For effective hand washing, antimicrobial soaps or alcohol-based hand rubs (60-95% alcohol) are recommended for use (NIH Manual 3044-2: Guidelines for Personnel Protection and Minimum Requirements for Protective Clothing in Animal Facilities; revised 3/9/05).

H. NOTES:

The Unit for Laboratory Animal Medicine (ULAM) is the designated representative and is responsible for oversight of these animal transportation guidelines, can grant exceptions when it is considered in the best interest of the animal(s), and is the contact for information concerning the transportation, receipt, and shipment of animals. Conflicts regarding animal transportation issues will be resolved by the ULAM administration or by The University Committee on Use and Care of Animals (UCUCA).

References:

Committee on Guidelines for the Humane Transportation of Laboratory Animals, N.R.C. *Guidelines for the Humane Transportation of Research Animals*. The National Academies Press, Washington, D.C. 2006 (Pre-publication copy)

Cornell University. Cornell Center for Animal Resources and Education. (IACUC approved)

Duke University Animal Transport (Non-Patient Care Areas) – Policy for Animal Transport Around Campus. Revised 1/27/2005.

ILAR. 1996. *Guide for the Care and Use of Laboratory Animals*.

National Institutes of Health Animal Transportation Guidelines.

Report of the Transport Working Group established by the Laboratory Animal Science Association (LASA). Guidance on the transport of laboratory animals, *Laboratory Animals*, 39: 1-39, 2005.

Texas A&M University. Office of the Vice President for Research. *Transporting Animals*.

University of Michigan. University Committee on the Use and Care of Animals. *Protective Clothing for Animal Care and Use*. Revised 12/20/99.

University of Michigan Behavioral Pharmacology Unit, SOP 0024. *Transporting Anesthetized Rhesus Monkey*. Revised Dec 2000.

University of Pennsylvania. The Office of Regulatory Affairs. *Transportation of Laboratory Animals – Philadelphia Campus*. Revised 6/23/99.

ULAM Documents referenced:

Protective Clothing Chart – UCUCA

ULAM Animal Containment Policies and Procedures

Procedures to Reduce Human Exposure to Q Fever (*Coxiella burnetii*)