

Association of Primate Veterinarians Guidelines for Domestic Transport of Nonhuman Primates in Biomedical Research

Purpose

The purpose of this guidance document is to provide veterinarians and other individuals associated with domestic transportation of nonhuman primates (NHP) with an overview of the critical aspects of the process including planning, execution, and post-transport phases. These guidelines are not meant to address international transportation and the associated regulatory requirements to import NHP into the United States.

Background

Transportation of research animals is critical to the timely conduct of medical research. The safety of research animals and human handlers is augmented by close adherence to regulations and standards described below. The health and wellbeing of NHP during transport is the responsibility of the facility of origin, the transporter, and the destination facility. All 3 entities must work together to ensure that appropriate regulations are followed regarding personnel training, routine wellness checks, environmental standards, transport containers, and emergency care. Appropriate care for animals during transport reduces stress and illness and provides better subjects for biomedical research. The following guidelines provide information on 1) finding a qualified transporter, 2) confirming that animals are adequately healthy for transport, 3) developing a plan to care for the animals during transport, including consideration of regulations, necessary documentation, and handling of medical emergencies, and 4) receiving animals upon arrival at the destination facility. Suggested checklists for the consignor and consignee are included following the references.

Guidelines

Preshipment considerations.

Transporter. Transporters should be registered appropriately in their state or municipality, including a USDA carrier or intermediate handler license or equivalent.² In addition, agencies should be able to provide proof of liability insurance, proof of registration with the Department of Transportation, and, where appropriate, local or state business licensing information.³ Facilities should do their due diligence in ensuring applicable national and interstate transport regulations are followed by a transporter prior to booking. Only trusted transport agencies and methods should be used. It is reasonable to request the transporter's SOPs for review, especially if the institution has no prior experience with the transport company. The institution should find out how the company handles emergencies such as vehicle malfunction or inclement weather during shipment—for example, are backup vehicles readily available to avoid extended delays? An appropriate transporter may be found by referral from colleagues, using AALAS (American Association of Laboratory Animal Science) or AZA (Association of Zoos and Aquariums) resources, or contracting with a reputable animal transport broker.

Staff training. All personnel involved in shipping NHP should be aware of the occupational health risks and the regu-

latory requirements.^{7,9,10} All activities must be performed in accordance with the Animal Welfare Regulations (AWR) and other federal, state, and local regulatory requirements and guidelines.^{2,5,6} Animals infected with known pathogens (for example, SIV) may be considered hazardous by the Department of Transportation and may require special permissions to allow shipment. Veterinarians and/or other responsible parties should seek training in these topics or secure the services of an animal transport broker for assistance.⁹ Training should include identification of animals in pain and distress; actions to take in the event of an animal health emergency; frequency of health, food, and water checks; and appropriate transport conditions.

Health screening. The veterinarian at the facility of origin should be aware of testing requirements before transportation. Sources to be consulted include, but are not limited to, the state of destination, the receiving institution, and the carrier or transporter.^{4,9} Depending on the recipient's requirements, a veterinarian may perform physical examinations on individual animals or visibly inspect a group of animals prior to transportation to ensure that their health status is appropriate for transport. Tuberculosis testing is required prior to transport of NHP.^{1,9} Details about this are included in established primary references.⁴ In the event that a health condition is diagnosed as part of the pre-shipment examination, the responsible veterinarian and the receiving institution should work together to determine whether the animal should still be transported.^{7,9,10} If a nonhuman primate is obviously ill, injured, or in physical distress, it must not be transported, except to receive veterinary care for the condition.

Regulatory considerations. Veterinarians with responsibilities that include NHP should be knowledgeable about regulatory requirements for federal, state, and local agencies before animals are transported.^{2,5} The USDA requires a NHP to be inspected by a licensed, accredited veterinarian no more than 10 d before an animal is delivered for transportation; the veterinarian should provide an associated signed health certificate.⁹ The health certificate and APHIS form 7020 "Record of Acquisition, Disposition or Transport of Animals (Other Than Dogs and Cats)" must accompany the animal during transport. Note that APHIS Form 7001 "United States Interstate and International Certificate of Health Inspection for Small Animals" is not accepted by all states. Some states require a numbered Certificate of Veterinary Inspection (CVI), which can be issued electronically. Both the shipping and receiving facilities should retain copies. If applicable, a certificate of acclimation must be signed by a veterinarian to indicate that the NHP is acclimated to temperatures lower than 50 °F (10 °C), but not lower than a minimum temperature specified on the certificate, based on accepted professional standards for species, age, and condition.² This certification must be dated no more than 10 d prior to transportation of the animal. State- or municipal-specific requirements may require additional testing prior to transportation. We recommend that APHIS and the state veterinarian for the receiving institution be consulted to confirm shipping requirements.

Intrashipment considerations.

Animal preparation and crating. Transport enclosures may be made of a variety of nontoxic materials (for example, wood, stainless steel, aluminum), and must be able to safely contain NHP while allowing them to, at minimum, sit comfortably and turn around freely. USDA and US FWS regulations should be reviewed to ensure that crates meet applicable requirements. All crates should be inspected prior to each use to ensure that they are clean and adequately constructed. Enclosures intended for air transport should also follow International Air Transport Association criteria for materials and construction.⁶ Some NHP may require sedation prior to crating; all sedated or tranquilized animals should be recovered prior to transportation. After animals are loaded into transport crates, the consignor must ensure that access doors are adequately secured prior to placement in the transport vehicle. Crates should be secured within the transport vehicle to ensure ventilation openings are not impinged, animals can be accessed for visual checks, feeding, and watering, and crates are protected from jostling or unintended movement in the transport vehicle. The consignor should place primate biscuits, fresh produce, and water in the crate with the animal and provide biscuits and produce to be fed during transportation.

Care of animals in transport. The movement of NHP is a team effort that includes veterinarians, shipping coordinators, and transporters. Factors to be considered include the full travel time involved, including layovers; the length of actual travel time and time zones crossed; the weather conditions during transport; and contingency planning for illness, delays, and emergencies.⁹ Careful planning is needed to ensure animal safety and well-being. Transportation should provide an appropriate level of biosecurity and minimize risks while protecting against environmental extremes, avoiding overcrowding, providing for animal needs and comfort, and protecting the animals and personnel from physical trauma. Special considerations may be necessary for specific life phases or conditions, such as pregnancy, advanced age, or preexisting medical conditions. Minimum standards for care during transport, such as temperature requirements, food and water provision, and frequency of health checks are outlined in the Animal Welfare Regulations.² Upon arrival, the receiving institution should review the intratransportation documentation, or shipping log, to ensure that the animals were checked, fed, and watered consistent with regulatory standards. Transport during times of extreme temperatures may be detrimental to well-being and may therefore not be possible due to inability to ensure appropriate heating or cooling.⁵ Defining and delegating responsibility to those who are knowledgeable about the needs of the species being shipped helps to ensure effective communication and planning of animal transport.⁵

Emergencies. An emergency plan should be in place to address unforeseen events during transportation. Transport personnel must be able to recognize signs of animal illness and know how to contact a veterinarian for consultation. If an accident or animal escape occurs during shipment, local law enforcement and/or animal control may be the first responders at the scene. It is unlikely that they have training in the safe handling of NHP. The transporter should be provided with contact information for the consignor or consignee that can be relayed to emergency responders as needed. In certain situations, the consignor may determine that a veterinarian or veterinary technician should travel with the animals. In rare cases, a situation may require

determination of whether euthanasia of an animal is necessary. The emergency procedure plan should include contact information for responsible parties who are qualified to make and carry out decisions, and the means to transport the animal to a location where euthanasia can be performed safely.⁸

Postshipment considerations.

Postshipment physical examinations and quarantine. Upon arrival of the animal, APHIS form 7020 should be completed and signed, and a copy sent to the consignor.² Animals should be offered food and water as soon as possible, especially after long-distance transport. Once in their cages at the receiving facility, the animals should be observed for evidence of illness by a trained technician or veterinarian.¹ Regardless of specific quarantine procedures after domestic transport, NHP should be given a period of acclimation before their use.⁵ In general, a period of at least 72 h should be allowed for acclimation prior to any manipulations for quarantine diagnostic testing or examination.¹

Quarantine is the separation of newly received animals from animals in the existing colony in order to prevent potential spread of infectious agents while the health status of the newly received animals is being determined.^{1,5} Requirements for post-shipment quarantine after domestic transport are determined by the receiving facility. Many institutions quarantine or isolate newly arrived animals, but federal regulations do not require quarantine after domestic transportation. Social housing of established partners should be considered during the quarantine period. The veterinarian should weigh the risk of disease transfer against the detrimental effects of single housing, especially in young animals.

Duration of quarantine should be based on a risk assessment of the source and receiving colonies.¹ The receiving facility should determine specific procedures needed to evaluate health and pathogen status of newly received animals. The potential for the presence of zoonotic pathogens carried by NHP must be considered in the facility's quarantine procedures.⁵

The following are general guidelines for veterinary care of NHP during quarantine.¹

1. Physical examination of the sedated animal by a veterinarian.
2. Tuberculin skin test every 2 wk for at least 3 negative tests.
3. Complete blood count, chemistry panel, viral serology, fecal parasite evaluation, and enteric pathogen culture as indicated.
4. Careful attention to clinical signs of disease, food/water consumption, and stool quality.
5. Treatment of non-life-threatening health problems, such as dental issues, should be delayed until the end of quarantine.

Disclaimer

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documents for use by the membership and primate specialists worldwide. A subcommittee of current APV members and subject matter experts that have expertise in the area of interest are recruited to draft a document that is then sent out for comment and input from the SAC committee, the APV Board of Directors, and the APV membership. The final version is approved by the Board of Directors before being published on the APV website. We would like to extend special thanks to the committee members that worked on and contributed to this document: Cassandra Cullin, DVM, DAACLAM (Oregon National Primate Research Center), Rachel Donocoff, DVM, DAACLAM (Bristol Myers Squibb), Cecilia de Souza Dyer, DVM, MS, DAACLAM (University of Pennsylvania), Lisa Halliday, DVM, DAACLAM (University of Illinois at Chicago), Casey Kissell, MLAS, DVM, DAACLAM (University of Pennsylvania), Philip LaToruette, DVM, DAACLAM (University of Pennsylvania – Gene Therapy Program), and Chelsea Wallace, DVM, DAACLAM (University of Pennsylvania – Gene Therapy Program).

References

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3. Federal Motor Carrier Safety Regulations (FMCSR). 2021. 49 CFR, §§350-399.
4. Fox JG, LC Anderson, G Otto, KR Pritchett-corning, MT Whary, eds. 2015. Laboratory animal medicine: 3rd ed. Amsterdam: Elsevier.
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6. **International Air Transport Association**. 2021. Live animal regulations.
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10. **World Organisation for Animal Health**. 2022. Terrestrial Animal Health Code, chapter 6.12: Zoonoses transmissible from non-human primates.

NHP Transport Consignor Checklist

Administrative preparation

- Confirm transport date with shipper/transporter, consignee, and load-out team
- Confirm entry requirements for destination with state Department of Agriculture of Fish and Wildlife Service (FWS)
- Establish plan for in-transit emergencies

Before shipment

- Send animal histories and/or applicable medical records to consignee for review
- Prepare shipment paperwork
 - Send certificate of bona fide scientific, educational, or exhibition use for consignee signature
 - Complete APHIS 7020 form (Record of Acquisition, Disposition or Transport of Animals (Other than Dogs and Cats))
 - Within 10 d of shipment, complete health certificate
 - TB test and additional testing as requested by consignee
 - Complete certificate of acclimation to low temperatures (if applicable)
 - Obtain state or FWS permits (if applicable)

Day of shipment

- Print required forms to include with shipment
 - APHIS 7020
 - Health certificate
 - Certificate of Acclimation to Temperatures (if applicable)
 - State or FWS permits (if applicable)
- Inspect crate prior to animal loading
 - Correct labels in place
 - Check interior for sharp points
 - Feed/water slots present and functional
 - Add bedding, chow/fruit, and water
- Prepare additional chow/sliced fruit to feed during transport

Loading

- Animal IDs confirmed immediately prior to crating
- Transfer monkeys into crates
 - If sedated, place in upright position to avoid occluding respirations
 - Write animal ID on crate
- Check sedated monkeys sufficiently recovered
- Secure crate door with screws/bolts
- Ensure crates properly secured to avoid movement during transit
- Paperwork packet(s) given to drivers

NHP Transport Consignee Checklist

Quarantine preparation

- Assign quarantine location
- Ensure correct housing in place (appropriate number/size/type)
- Ensure appropriate PPE availability
- Place signage on entry doors
 - Quarantine area
 - Required PPE

Monkey arrival

- Uncrate animals into quarantine housing
 - Feed chow and fruit
- Perform visual health check
- Sign APHIS 7020 form and return copy to drivers
- Verify trip log
 - Monkeys checked every 4 h
 - Food offered every 12 to 24 h
 - Water offered every 24 h

After arrival

- Check animal IDs match on APHIS 7020 form and health certificate
- Send signed copy of APHIS 7020 form to consignor
- File paperwork
- Allow a 3- to 5-d acclimation period before initial physical examination