

Personal Protective Equipment (PPE) for Veterinary Personnel when handling rats suspected of Seoul virus infection

The National Association of State Public Health Veterinarians has developed a Compendium of Veterinary Standard Precautions that provides guidance intended to minimize transmission of zoonotic pathogens to veterinary personnel. The current 2015 Compendium is accessed at <http://www.nasphv.org/Documents/VeterinaryStandardPrecautions.pdf> and http://avmajournals.avma.org/doi/abs/10.2460/javma.247.11.1252?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed.

Seoul virus is a hantavirus that may be transmitted by aerosols. For veterinary procedures involving rats from confirmed facilities, airborne and droplet transmission precautions—as outlined in the Compendium—are recommended. Hand-washing, gloves, face shield or goggles, protective outer garments, and respiratory protection (such as N95 or N99 particulate respirators, or a powered air-purifying respirator [PAPR]**) are recommended. In addition, it is recommended that such personal protective equipment be used when handling the bedding or cleaning the cages of rodents suspected of Seoul virus infection.

**Ideally, training in a comprehensive respiratory protection program, including proper fitting, pulmonary function test, and instruction on respirator care and use, is required before using any respirator.

VETERINARY OFFICE OR RODENT FACILITY — GUIDANCE FOR COLLECTING BLOOD OR EUTHANIZING RATS SUSPECTED OF HARBORING SEOUL-VIRUS

- Ensure staff understand how to handle rodents, including any planned procedures (such as blood draws or euthanasia). Provide training in advance if needed.
- Schedule this appointment as the last appointment of the day, or at a time when the clinic is less busy. If possible, admit the client through a side entrance, rather than through the main lobby. When the client arrives, bring them directly into an exam room. Do not keep them waiting in the waiting room.
- Request that the client bring rat(s) in a bare cage or carrier with no bedding. Suggest the client provide a disposable towel that may be draped across the outside of the cage during transit. Safely dispose of this towel after the visit by double-bagging and incinerating it. Please see instructions on double bagging below.
- If the rodent is transported with bedding, spray the bedding with a disinfectant or a mixture of bleach and water and let soak for the appropriate contact time as per manufacturer's instructions (approximately 5-10 minutes). The recommended concentration of bleach solution is 1 part bleach to 10 parts water. Additional disinfectants approved for use with enveloped viruses, like Seoul virus, can be found in Appendix 3 in the Compendium for Veterinary Standard Precautions. Application of disinfectant should be done according to the product label.
 - After soaking, place wet materials in a biohazard bag for infectious waste. Gently close the bag at the top and seal shut with tape. Avoid squeezing or pressing the bag to get excess air out. Spray outside of this bag with disinfectant or bleach solution as described above.
 - Then place the taped, sprayed, biohazard bag into a second empty biohazard bag. Gently close this bag at the top and seal shut with tape. Avoid squeezing or pressing the bag to get excess air out. Spray outside of this bag with disinfectant or bleach solution as described above.
 - After these biohazard bags have been sealed and disinfected, do not open the bags.
 - Incinerate the double bagged materials, ensuring workers do not open the bags before incineration.
- Any staff that will be directly handling the rat or performing veterinary procedures should follow droplet and aerosol transmission guidance to include the following. For additional information please refer to the Compendium for Veterinary Standard Precautions.
 - Fluid impermeable disposable surgical gown

- Two pairs of non-powdered nitrile medical-grade gloves plus a thick protective glove worn underneath (ie, bite/scratch resistant). Protective gloves may be made of leather or of fabric with a rubber outer coating that is thick and resistant to puncture from rodent bites or scratches and is easy to disinfect.
 - A NIOSH-certified N95 filtering face piece respirator or higher or a powered air purifying respirator (PAPR) equipped with a high-efficiency particulate air filter (HEPA). Respirator use should be in the context of a complete respiratory protection program in accordance with the Occupational Safety and Health Administration (OSHA) Respiratory Protection standard (29 CFR 1910.134) and other requirements. Staff that will need to wear N95 (or higher) respirators should be medically-cleared, trained, and fit-tested for respirator use. Detailed information on respiratory protection programs, including fit testing procedures, can be accessed at OSHA's Respiratory Protection eTool: (www.osha.gov/SLTC/etools/respiratory).
 - Workers must be fit tested to ensure that facial hair will not interfere with the safe use of an N95 or other tight-fitting respirators. Tight-fitting respirators cannot be used by people with facial hair that comes between the sealing surface of the facepiece and the face; loose-fitting powered air purifying respirators (PAPRs) can be worn by those with facial hair.
 - If a filtering face piece respirator is worn, also wear a disposable full face shield or goggles to protect mucous membranes from any accidental splashes of rodent urine or blood.
- If euthanasia is requested, AVMA-approved methods of euthanasia for adult small mammals includes CO₂ administration with a gradually increasing concentration, an overdose of inhalant anesthesia, intraperitoneal injection of euthanasia solution, or an intracardiac injection if the animal is anesthetized. For neonates <7 days of age, acceptable methods include hypothermia, decapitation, or cervical dislocation. For more information on AVMA methods of euthanasia, please consult: <https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>
 - After euthanasia:
 - Spray rat with a disinfectant or a mixture of bleach and water. The recommended concentration of bleach solution is 1 part bleach to 10 parts water. Additional disinfectants approved for use with enveloped viruses, like Seoul virus, can be found in Appendix 3 in the Compendium for Veterinary Standard Precautions. Application of disinfectant should be done according to the product label.
 - Place dead, sprayed rat in a biohazard bag for infectious waste. Gently close the bag at the top and seal shut with tape. Avoid squeezing or pressing the bag to get excess air out. Spray outside of this bag with disinfectant or bleach solution as described above.
 - Place the taped, sprayed, biohazard bag into a second empty biohazard bag. Gently close this bag at the top and seal shut with tape. Avoid squeezing or pressing the bag to get excess air out. Spray outside of this bag with disinfectant or bleach solution as described above.
 - After these biohazard bags have been sealed and disinfected, **do not open the bags**.
 - Incinerate the double bagged rat, ensuring workers **do not open** the bags before incineration.
 - If blood collection for testing is requested, several methods can be used to collect blood specimens. One resource reviewing these methods is <http://www-rohan.sdsu.edu/~gra/grad/research/iacuc/docs/SOPs/Blood%20Collection%20Rodent.pdf>
 - Remove first pair of gloves, face shield, and protective gown following these guidelines: <https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf>
 - Remove second pair of gloves.
 - Wash your hands with soap and water before and after removing your gloves
 - If the work surface, or personnel's gloves or clothing become contaminated with rodent excreta or blood during the handling procedures, a spray bottle of disinfectant should be used to spray the contaminated area. After disinfection, clothing may be laundered normally.
 - After the visit, wipe down all surfaces, including the cage/carrier that the rat was transported in with an appropriate disinfectant (as outlined in the Compendium for Veterinary Standard Precautions). Allow to air dry.

REPORTING OF INCIDENTS

Workers should receive information about the signs and symptoms of Seoul virus infection. Employers should document which employees handle potential infected animals and the date(s) of potential exposure. If sudden flu-like symptoms occur within 8 weeks after exposure to a new rodent or after a bite, scratch, or breach of PPE, inform your employer, physician or medical professional about your rodent exposure so they may assess whether testing is warranted.