**Biohazardous Agent Reference Document (BARD) and**

**Information for Healthcare Providers in Event of an Exposure**

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| The BARD is an additional guidance tool. It is not a substitute for a risk assessment, biosafety training, lab-specific training, SOP as required by the IBC or a formal [IBC master protocol registration](https://www.uvm.edu/rpo/biosafety-oversight). This document must be readily available in the laboratory, and it is the responsibility of the Laboratory Supervisor or Principal Investigator to ensure that all personnel have read and understood the information. The BARD is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Please bring this IBC-approved BARD with you to the UVMMC Emergency Department if there has been an exposure and someone requires medical assistance.  INSTRUCTIONS for BARD Preparation   1. Complete the blue Information for Healthcare Providers section. 2. Review the standard information contained in the green section of this document. 3. Add/revise information that is specific to your work in the laboratory (such as strain-specific information). Please be sure that the track changes function is turned on to indicate any changes that you make. 4. Submit the BARD along with your IBC master protocol registration or amendment. 5. Once approved by the IBC, all personnel must review this BARD. The PI will attest during the submission of the registration or amendment to add new personnel that each lab member has read and understands the material. | |
| **Information for Healthcare Providers**  Dear Healthcare Provider,  This individual works in a UVM research laboratory and has been exposed to a pathogen or toxin. Information about the materials this person may have been exposed to is listed below. You may also find useful additional information in subsequent pages of this reference document. | |
| **Pathogen Name:** | Hantavirus |
| **Pathogen/Toxin Classification:** |  |
| **List All Strains Used in the Laboratory:** |  |
| **List Resistant Genes Known to be Encoded:** |  |
| **Modes of Transmission *(mucous membranes, needle stick, inhalation)*:** | Inhalation of aerosolized rodent urine, saliva, respiratory secretions, particles of feces, dust, or other contaminated matter. Rodent bites or other cutaneous injury, ingestion of contaminated food or water, mucous membrane contact. |
| **Known Medical Precautions and Treatment** | |

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| **Prophylaxis** | None available |
| **Vaccines** | None available |
| **Treatment and/or Post-exposure Intervention** | Supportive treatment. Ribavirin improves outcome of HFRS, but not investigated for HPS. |
| **Surveillance** | Monitor for symptoms and test using serology or RT-PCR. Report any exposures or signs and symptoms to your supervisor. |
| **Additional Medical Precautions (immunosuppression, pregnancy, allergies)** |  |

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| **Health Hazards** | |
| **Host Range** | Humans, voles, mice, rats |
| **Signs and Symptoms** | **Hemorrhagic fever with renal syndrome (HFRS)**: high fever, chills, headaches, blurred vision, malaise, anorexia; followed by abdominal or lumbar pain, gastrointestinal upset, facial flushing, petechiae, erythematous rash, lasting  3 – 7 days. May also exhibit sudden hypotension, shock, hemorrhagic manifestations. Progresses to increased blood pressure, significantly decreased urinary output, severe hemorrhage.  **Hantavirus pulmonary syndrome (HPS):** fever, muscle pain, malaise, headache, dizziness, abdominal pain, gastrointestinal upset, lasting  3 – 6 days. Followed by rapid progression of non-cardiogenic pulmonary edema, hypoxemia, cough, pleural effusion, gastrointestinal upset, rapid breathing, rapid heart rate, myocardial depression, cardiogenic shock. Hypotension and decreased urinary output may also occur. |
| **Infectious Dose** | Unknown |
| **Incubation Period** | 2 – 4 weeks (range from a few days to 2 months) for HFRS, 14 – 17 days for HPS |
| **Exposure Procedures** | |
| **Mucous membranes** | Flush eyes, mouth or nose for 15 minutes at eyewash station. |
| **Other exposures** | Wash area with soap and water for 15 minutes |
| **Medical Follow-Up** | Contact UVMMC Infectious Disease Dept. directly at **(802) 847-2700** for immediate assistance |
| **Reporting** | Report all exposures or near misses to:   1. Your immediate Supervisor 2. SOS at 802-656-2560 and ask to have the EH&S team paged 3. Risk Management: <https://www.uvm.edu/riskmanagement/incident-claim-reporting-procedures> |
| **Laboratory Hazards** | |
| **Laboratory Acquired Infections** | 226 reported cases for lab-acquired infection with Hantaan virus |
| **Sources** | Blood, urine, cerebrospinal fluid, respiratory secretions, feces, & tissues from infected humans and animals, and laboratory cultures. |
| **Characteristics** | |
| **Morphology** | Family of zoonotic, enveloped viruses, belonging to the family Bunyaviridae |
| **Strain Specific Characteristics** | Sin Nombre: HPS, 50% mortality  Seoul: HFRS (moderate)  Andes: HPS (renal variant)  Puumala: HFRS (mild)  Hantaan: HFRS (severe), 5 – 15% mortality |
| **Containment Requirements** | |
| **BSL - 2** |  |
| **BSL - 3** | All work involving infectious or potentially infectious materials or cultures (RG3) |
| **ABSL - 2** |  |
| **ABSL - 3** | Work with infected animals (RG3) |
| **Aerosol generating activities** | Centrifugation, homogenizing, vortexing or stirring, changing of animal cages, animal surgeries, cell sorting, pipetting, pouring liquids, sonicating, loading syringes |
| **Primary containment device (BSC)** | Use for all activities with infectious material, loading or unloading of centrifuge rotors, any other procedures which may generate aerosols |
| **Personal Protective Equipment (PPE)** | |
| ***Minimum PPE Requirements*** | Double nitrile gloves, shoe covers, full coverage protective clothing, solid-front gown with tight-fitting wrists, appropriate eye/face protection, respiratory protection. Wash hands after removing all PPE. Medical clearance, fit testing and training is required annually per UVM’s Respiratory Protection Program: <https://www.uvm.edu/riskmanagement/personal-protective-equipment> |
| ***Additional Precautions***  ***(Risk assessment dependent)*** | Sharps use strictly limited. Non-intact skin should be allowed to scab over before entering the laboratory, and should then be covered with waterproof dressings. Remove hand jewelry before donning gloves. |
| **Viability** | |
| **Disinfection** | Susceptible to 1% sodium hypochlorite, 1-5% chlorine dioxide, 1-5% parachlorometaxylenol, 1-5% peracetic acid, absolute methanol, or Virkon with 10-minute contact time. 70% ethanol with a 30-minute contact time. |
| **Inactivation** | Inactivated by heat above 56°C (15 minutes for cell culture, 2 hours for dried virus) |
| **Survival Outside Host** | Capable of surviving 12 – 15 days in contaminated animal bedding, 5 – 11 days at room temperature in cell culture media, and 18 – 96 days at 4°C in cell culture media |
| **Spill Clean Up Procedures** | |
| **Small Spill** | Notify others working in the lab. Allow aerosols to settle. Don appropriate PPE. Cover area of the spill with paper towels and apply approved disinfectant, working from the perimeter towards the center. Allow 30 minutes of contact time before clean up and disposal. Dispose in double biowaste bags and biobox. |
| **Large Spill** | **Inside of a lab:** Call UVM Service Operations at 656-2560 and ask to speak to a dispatcher. Ask them to page Risk Management and Safety.  **Outside of a lab:** Pull the nearest fire alarm and evacuate the building. Wait out front of the building for emergency responders to arrive. |
| **References** | |
| **Canadian PSDS** | <https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/hantavirus.html> |
| **BMBL** | <https://www.cdc.gov/biosafety/publications/bmbl5/> |
| **CDC Guidelines** | <https://www.cdc.gov/hantavirus/technical/hanta/virology.html> |
| **Journal of Medical Microbiology** | <http://www.microbiologyresearch.org/docserver/fulltext/jmm/49/7/mjm4907.587.pdf?expires=1502118814&id=id&accname=sgid026657&checksum=F78506A43028517CEDB28BDF1E3E8885> |