# Zoonoses Associated with Rodents – Wild

This document provides information on various diseases that can be passed from wild mice, voles, deer mice, gophers, cotton rats, kangaroo rats, squirrels, ground squirrels, marmots, woodchucks, beaver, muskrat, porcupines, and other wild rodent species to people. Often these diseases do not make the animal appear sick but can cause serious illness in humans. Persons with specific medical conditions such as a chronic illness, immunodeficiency and pregnancy may be at higher risk of developing disease or complications from a zoonotic disease and should consult with their physician before working with animals. Rodents that are captured from wild populations and /or are housed outdoors may carry zoonotic diseases. Zoonotic diseases associated with wild rodents include rat bite fever, tularemia, hantavirus, lymphocytic choriomeningitis virus, other arenavirus infections, leptospirosis, salmonellosis, yersiniosis, pathogenic E. coli infections and campylobacterosis.

Rat Bite Fever caused by Streptobacillus moniliformis or Spirillum minus is a bacterial infection of rodents that is transmitted through bites, scratches, direct contact with animals and their urine, saliva and feces or ingestion of contaminated food or water. Infected rodents typically exhibit no symptoms of disease. Tularemia is another bacterial infection of rodents. Infected rodents appear lethargic but they may shed bacteria before showing illness. Any wild rodent may carry tularemia but aquatic rodents such as beaver and muskrats have higher carriage rates. Tularemia is transmitted to people in the same manner as rat bite fever but in addition can be transmitted through the bite of an infected tick and via airborne transmission if feces, urine or body fluids are aerosolized. Both diseases in humans initially present as a fever, headache, swollen lymph nodes and possibly a rash or ulcer in the area of a recent bite or scratch wound. Any bites or scratches should be thoroughly washed immediately to minimize the chance of infection.

Rodents infected with hantavirus, lymphocytic choriomeningitis virus (LCMV), other arenavirus infections and leptospirosis usually do not exhibit signs of disease. The disease agents are typically shed in the urine of infected animals and people acquire the infection by inhalation, oral ingestion and direct contact with contaminated urine or feces. These are occasionally transmitted from bite wounds and Leptospira can infect people through abraded skin. These diseases often initially appear as a mild flu-like illness in people but may progress to severe disease. There are several arena viruses which infect rodents including LCMV, Junin virus, Machupo virus, Lassa virus and Whitewater Arroyo virus. The incidence of viral infection varies by rodent species and geographic region. LCMV and other arenavirus infections can cause severe meningitis and hemorrhagic fever in people. In addition, they are considered hazardous to the unborn fetus and may cause pre-term delivery or other complications in pregnant women. Hantavirus and LCMV are endemic in wild rodent populations in North America. For hantavirus information, please refer to the UI Hantavirus guidelines if working with either wild rodents or in rodent-infested areas and buildings.

Salmonellosis, yersiniosis, pathogenic E. coli infections and campylobacterosis are acquired by contact and accidental ingestion of fecal material from infected rodents. Animals infected with these diseases may have diarrhea but some may show no symptoms of disease. Any animal with diarrhea should be suspected of having a zoonotic disease.

Wild-caught & outdoor-housed rodents are much more likely to carry these infections than those raised and housed in a laboratory setting.

Individuals with exposure to animals and animal environments may develop allergic reactions to animal proteins (allergens). Approximately 20-30 percent of individuals working with laboratory animals will develop an allergic reaction to animal proteins and 5-10 percent of individuals will develop asthma. Personnel may be exposed to allergens through inhalation and contact with skin, eyes and mucous membranes. Animal allergens may be present in animal dander, hair, skin, urine, saliva, serum and any contaminated feed or bedding materials. Risk factors for developing an allergic reaction include history of previous allergies to animals. The signs and symptoms of an allergic reaction are nasal discharge and congestion, conjunctivitis, tearing and eye itching, skin redness, rash or hives and lower airway symptoms (coughing, wheezing and shortness of breath). Individuals with symptoms suggestive of an allergic reaction related to a workplace allergen should report their concerns to their supervisor and consult a physician.

Transmission of zoonotic diseases from rodents is primarily by direct contact, bites, indirect contact with contaminated objects, oral ingestion or inhalation of aerosolized bedding, feces and urine. We can protect ourselves from most diseases by using the following basic hygiene procedures:

- Do not eat, drink, apply makeup or use tobacco products while handling animals or in animal housing areas.
- Wear respiratory protection when appropriate.
- Wear gloves when handling animals, animal tissues, body fluids and waste and wash hands after contact.
- Wear dedicated protective clothing such as a lab coat or coveralls when handling rodents. Launder the soiled clothing separate from your personal clothes and preferably at the animal facility.
- Report ill animals so that they can receive veterinary care.
- Keep animal areas clean and disinfect equipment after using it on animals or in animal areas.
- Thoroughly wash any bite or scratch wounds and report injuries.

Most importantly, familiarize yourself about the animals that you will be working with and the potential zoonotic diseases associated with each species. If at any time, you suspect that you have acquired a zoonotic disease, inform your supervisor and seek medical care.

**If you have further questions, contact:**

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