

**Wild Rodent Zoonoses**

***Hantavirus***

There are numerous species of hantavirus throughout the Americas, all occur among wild rodent populations. It is presumed that transmission is by inhalation of aerosolized secretions, including saliva, respiratory secretions, urine and feces. The viruses do not appear to cause disease among reservoir species, but cause severe disease in humans. Early symptoms are flu-like, including fever, myalgia and fatigue. Late symptoms of pulmonary disease are respiratory distress leading to respiratory failure. Late symptoms of hemorrhagic disease are anemia, often gastrointestinal bleeding, and renal disease. The only available treatment at present is supportive care.

***Lymphocytic Choriomeningitis***

The reservoir species of lymphocytic choriomeningitis virus is the common house mouse. Transmission is by inhalation of aerosolized secretions, including saliva, urine and feces or through contamination of skin wounds. Mice are symptomatic carriers. Symptoms in humans are initially flu-like and can advance to meningitis and encephalitis. Treatment is non-specific supportive care.

***Leptospirosis***

Leptospirosis is caused by a spirochete bacterium, *Leptospira interrogans*, with multiple pathogenic serovars. Leptospires are found in many animals, and rodents are an important reservoir species. Transmission occurs by direct contact with the urine of infected animals, either transcutaneously, particularly broken skin, or through mucous membranes. Less commonly, transmission can occur through inhalation of aerosolized droplets of contaminated fluids. Rodents have no clinical disease and can shed the bacteria throughout their lifetime. Primary disease in humans is flu-like disease, including fever, myalgia, vomiting, diarrhea and a rash. Secondary disease consists of renal failure, liver failure and meningitis. The disease is treatable with antibiotics.

***Rabies***

Rabies is a viral disease caused by a rhabdovirus. All mammals are susceptible to the disease and can transmit the disease. Transmission occurs by contact with saliva, mucous membranes or blood, usually by an animal bite or by inhalation of aerosolized bat feces. The disease process is similar throughout species, characterized by initial flu-like signs and pain at the site of inoculation, and followed by laryngeal paralysis, generalized paralysis, respiratory failure and death. Once signs are apparent, the disease is nearly always fatal in non-vaccinated patients with no successful treatment regiment.

***Vector-borne Diseases***

***Plague***

Plague is caused by a bacterium, *Yersinia pestis*. The reservoir species are wild rodents, primarily rats. Transmission of disease is mainly by vector, fleabite, but transmission can also occur by direct contact with contaminated animals or tissues or by inhalation of the virus in pneumonic forms. Rodents often are asymptomatic until death, but can have a high fever, lymphadenopathy (swollen lymph nodes) and severe pneumonia. Humans display flu-like symptoms with painful lymphadenopathy, “buboes”, and can develop pneumonia and respiratory failure or septecemia. The disease is treatable with antibiotics.

***Lyme Disease***

Lyme disease is caused by a bacterium, *Borrelia burgdorferi*. Wild rodents act as reservoir species for the bacteria, which is transmitted by a tick vector. In the Pacific coastal U.S. the tick vector is the western black-legged tick, *Ixodes pacificus. Risk of transmission is highest in the spring and fall when nymphs and adult ticks are seeking hosts. Rodents do not appear to be affected by infection with the bacteria. In humans, the disease is characterized by two stages. The first consists of flu-like symptoms and a rash, erythema migrans, which originates at the site of the tick bite and expands outwardly developing a bull’s-eye appearance. Late disease is characterized by neurologic, cardiac and arthritic disease. The disease is treatable with antibiotics, although a small portion of patients can develop long-term symptoms.*

***Gastrointestinal Disease***

Rodents can be the source of gastrointestinal disease, mainly Campylobacter, which is transmitted by the ingestion of feces or contact with any contaminated substance. This infectious agent causes acute gastroenteritis, characterized by diarrhea, vomiting, abdominal pain and fever. Most commonly clinical signs are short-lived, but may require supportive care or antibiotics.

***Allergic Reactions to Rodents***

By far the greatest occupational risk to working with rodents is allergic reaction or developing allergies. Those workers that have other allergies are at greater risk. Animal or animal products such as dander, hair, scales, fur, saliva and body waste, and urine in particular, contain powerful allergens that can cause both skin disorders and respiratory symptoms. The primary symptoms of an allergic reaction are nasal or eye symptoms, skin disorders, and asthma.

**How to Protect Yourself**

* Enroll in the UWM Occupational Health and Safety Program for Personnel in Contact with Laboratory Animals.
* Wash your hands. The single most effective preventative measure that can be taken is regular hand washing. Wash hands and arms after handling any animal or any related equipment, and never drink or eat in the animal rooms.
* Follow posted Personal Protective Equipment requirements. Never wear protective equipment outside of animal areas.
* **For more information:** http://www.cdc.gov