

Transmissible Diseases of Small Mammals

Our topics for this week are:

- Systemic, respiratory, digestive, skin, and vector-borne transmissible diseases of small mammals
- Sanitary practices needed when handling small mammals

Key Zoonoses

Apparently healthy captive-raised small mammals pose little risk of transmitting disease to healthy adult handlers who practice conventional personal hygiene. The risks of physical injury are greater than the risks of acquiring an infectious disease.

Direct Transmitted Systemic Disease

Wild rodents or rabbits are potential sources of infection in humans with hantavirus, babesiosis, leptospirosis, Lyme disease, lymphocytic choriomeningitis, plague, Rocky Mountain Spotted Fever, and Tularemia. Captive-borne, properly housed (away from ticks and wild animals) rodents and rabbits do not typically carry these diseases.

Sin Nombre Hantavirus is a virus transmitted by aerosol of body secretions, especially wild mouse or rat urine. The house mouse, common rat, and lab rodents have not been associated with the virus. *Sin Nombre* Hantavirus can infect the lungs, become systemic, and be fatal to humans. The Seoul Hantavirus affects rats without signs of disease. Infected humans may develop, headache, muscle pains, and nausea. In rare circumstances, a hemorrhagic fever and renal syndrome may occur.

Lymphocytic choriomeningitis, a viral disease of the brain, is carried by wild house mice and transmitted in their urine, but has been reported in pet hamsters and guinea pigs exposed to wild mice, the reservoir for the virus. Infected wild mice and hamsters carry the virus without signs of disease.

Wild rodents can transmit leptospirosis, a bacterial disease that predominately affects the kidneys and is shed in the urine.

Coxiellosis (Q Fever) is a bacterial disease that is transmitted by inhalation of dust contaminated by the body secretions of animals (urine, milk, feces, etc.) infected with *Coxiella burnetii*.

Rat bite fever is a bacterial disease (*Streptobacillus moniliformis*) that causes fever and sore joints in humans that is transmitted from healthy-appearing rodents to humans by bites or exposure to rodent urine, feces, or other body fluids.

Monkeypox has caused an outbreak in the United States after it was introduced by Gambian rats and spread to owners of pet prairie dogs that were exposed to the Gambian rats. Monkeypox can be carried by rodents, rabbits, and squirrels. In people, it causes disease similar to smallpox infection. Encephalitozoonosis (*Encephalitozoon cuniculi*) is a fungal infection of rabbits and less commonly, other small mammals, that is transmitted in body fluids, particularly

urine. Infections in humans are limited to those who are immunocompromized.

Respiratory Disease

Pasteurellosis from rodents or rabbits and Bordetellosis from guinea pigs or rabbits are zoonotic respiratory bacterial infections. Humans usually require an impaired immune response to develop severe or prolonged infections.

Ferrets are susceptible to human influenza. The risk of transmission is greater from humans to ferrets than from ferrets to humans. The disease is also more pathogenic in ferrets than in humans.

Digestive Tract Disease

Ingesting fecal contaminated materials is required to acquire the bacterial diseases, campylobacteriosis or salmonellosis from ferrets or hamsters. Of these, campylobacteriosis is the most common, although the source is generally from small mammals with diarrhea, not healthy appearing animals.

Yersiniosis (*Yersinia enterocolitica*, also known as *Y. pseudotuberculosis*) causes bloody diarrhea and can be transmitted by guinea pigs that may have no clinical signs of disease.

Skin Disease

Ringworm is a fungus infection of the upper layers of the skin.

A common organism carried by small mammals is *Trichophyton mentagrophytes*. Rodent and rabbit handlers may develop transient infections by contact with infected hair or skin scale being caught under a sleeve or collar and rubbed against the skin, or caught under the fingernails and scratched into the scalp. Rabbits also may carry a skin mite, *Cheyletiella parasitovorax*, which will cause itchy skin sores similar to chigger bites in handlers.

Vector-Borne

Lyme disease (borreliosis), which causes a variety of systemic signs and symptoms, is carried by wild mice and transmitted by ticks. Rocky Mountain Spotted Fever is a blood platelet disease transmitted from ticks which wild small mammals could carry into a human's environment. Plague ("Black Death") is a disfiguring and potentially fatal bacterial disease carried by wild rodents and rabbits in the southwestern and western United States, and transmitted by their fleas. Tularemia is a bacterial infection of wild rodents and rabbits that can be transmitted to humans by deerflies and ticks. Humans can acquire babesiosis, a blood parasite infection carried by wild mice, but the transmission requires the bite of a tick.

Sanitary Practices

Basic procedures are for handlers to wash their hands and to clean and disinfect table tops and cages used in handling. Restraint equipment should be disposable or cleaned and disinfected after each use.

Special facilities and training are required to safely handle small mammals. The typical small mammal handler should only handle captive-bred, appropriately housed small mammals. Sick small mammals should be isolated from apparently normal animals. Rodent cages should be kept clean and in a well-ventilated area and never located in food preparation or eating areas. A handler of small mammals should wear appropriate dress to protect against skin contamination

with hair and skin scales or saliva, urine, and other body secretions. Basic sanitary practices should be employed, such as keeping hands away from eyes, nose, and mouth when handling small mammals and washing hands after handling the animals. Handlers should not eat food or smoke while handling small mammals. Use of plastic gloves in handling all small mammals is advisable.

Small mammals should be prevented from any direct or indirect contact with wildlife, particularly wild rodents. All food should be kept in rodent-proof containers. Wild rodent feces should be wiped with damp paper towels wetted in a solution of chlorine (1/4 cup bleach in a gallon of water).

While wearing gloves, handlers should clean small mammal enclosures and all enclosure contents on a regular basis (at least weekly). Gloves should be changed between cleaning separate enclosures. Enclosure and enclosure contents should be cleaned outside the primary family dwelling. Ferret handlers should maintain current influenza vaccinations.

Now, let's recap the key points to remember from today's episode:

- Ferrets are susceptible to human influenza viruses
- Most transmissible diseases carried by wild rodents are not carried by captive bred, appropriately housed rodents
- Plastic gloves should be worn whenever handling small mammals

Abby says it is time to wrap up this episode.

More information on animal handling is available in my book, *Animal Handling and Physical Restraint* published by CRC Press. It is also available on Amazon and from many other fine book supply sources.

Don't forget serious injury or death can result from handling and restraining some animals. Safe and effective handling and restraint requires experience and continual practice. Acquisition of the needed skills should be under the supervision of an experienced animal handler.