

# Zoonoses Associated with Bats

This document provides information on various diseases that can be passed from bats to humans. 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.

Bats (order Chiroptera) are reservoirs for many infectious agents, including parasites, bacteria, viruses, and fungi. The epidemiology of infectious disease in bats is not well understood but it is known that bats can transmit numerous infectious agents and provide a reservoir for emerging pathogens. The primary zoonotic diseases associated with North American bats are rabies, histoplasmosis, salmonellosis, yersiniosis and external parasites. Imported bats can also carry a number of zoonotic viruses including nipah virus, hendra virus, ebola virus, SARS coronavirus and others which can cause severe & fatal illness in humans and other animals. All live bats entering the U.S. require an import permit from the CDC and U.S. Fish & Wildlife Services and must be quarantined under elevated biosafety conditions. Long-term closed captive bat colonies which have passed quarantine require less stringent biosafety conditions.

Rabies is a fatal viral infection that can be transmitted by bites, scratches and mucus membrane exposure from an infected animal. Bats, humans and other mammals acquire the rabies virus through direct contact, bites or scratches from other infected animals and rarely via inhalation of infected bat guano (fecal material) in bat roosts or caves. Bats will develop symptoms and die once infected but may shed the rabies virus for a period before any symptoms are apparent. The clinical symptoms are depression, anorexia with possible neurological symptoms and unusual behavior. No vaccine or treatment is available for bats. Persons working with bats require rabies vaccination and routine assessment of their rabies titer. They should wear protective clothing and thick protective gloves when handling bats to prevent exposure. If a person is bitten or scratched by a suspect bat, the animal should be euthanized and tested for rabies. Persons with exposure to rabies must seek post-exposure rabies prophylaxis from a medical professional.

Salmonellosis and yersiniosis, are acquired by contact and ingestion of fecal material from infected animals. Histoplasmosis, cryptococcosis and blastomycosis are fungal infections that occasionally infect bats and can be present in bat guano. Animals infected with these bacterial and fungal diseases typically have diarrhea but some animals may show no symptoms of disease. Avoid direct contact with feces and urine and use gloves and hand-washing to avoid accidental ingestion of animal waste. When cleaning, avoid aerosolization and possible inhalation of pathogens. Any animal with diarrhea should be suspect of having a zoonotic disease.

External parasites such as fleas, ticks, batflies, batbugs and mites are occasionally transmitted by close contact with an infested bat or infested bat roosts. Bites from an external parasite such as a tick can transmit vector-borne zoonotic diseases such as bartonellosis, erlichiosis and borreliosis. Animals and animal housing areas should be treated for external parasites.

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 animals is primarily by direct contact, ingestion, indirect contact with invertebrate vectors and contaminated inanimate objects, or inhalation of aerosolized materials. We can protect ourselves from most diseases by using the following procedures:

- Handle animals appropriately and safely to avoid bites and scratches.
- Thoroughly wash any bite or scratch wounds and report injuries. Rabies exposure is reportable to public health authorities.
- Do not eat, drink, apply makeup or use tobacco products while handling animals or in animal housing areas.
- 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 animals. Launder the soiled clothing separate from your personal clothes and preferably at the animal facility.
- Wear respiratory protection when appropriate.
- Keep animal areas clean and disinfect equipment after using it on animals or in animal areas. Do not use cleaning techniques such as vacuuming or power washing which aerosolize animal waste and allows for inhalation of possible pathogens.

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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