

# Zoonotic Diseases

## Birds

### Zoonotic diseases

**Psittacosis (Ornithosis, Chlamydiosis):** Psittacosis is caused by the bacteria *Chlamydia psittaci*. *C. psittaci* is common in wild birds and can occur in laboratory bird colonies. Infected birds are highly contagious to other birds and to humans. The organism is spread to humans by aerosolization of respiratory secretions or feces from the infected birds. Typical symptoms in the bird are diarrhea, ocular discharge, and nasal discharge.

The infection in humans by *C. psittaci*, can cause fever, headache, myalgia chills, and upper and lower respiratory disease. Serious complications can occur and include pneumonia, hepatitis, myocarditis, thrombophlebitis and encephalitis. It is responsive to antibiotic therapy but relapses can occur in untreated infections.

Prevention: Only disease-free flocks should be allowed into the research facility. Wild-caught birds or birds of unknown status should be treated prophylactically for 45 days with chlortetracycline.

Animal Biosafety Level 2 practices are recommended for personnel working with naturally infected birds or experimentally infected birds.

Wearing NIOSH certified dust masks should be considered in rooms housing birds of unknown health status.

**Newcastle Disease:** Newcastle disease is caused by a paramyxovirus and can be seen in birds both wild and domestic. Transmission is mainly by aerosol but contaminated food, water and equipment can also transmit the infection within bird colonies. Pathogenic strains produce anorexia and respiratory disease in adult birds. Young birds often show neurologic signs. In humans the disease is characterized by conjunctivitis, fever, and respiratory symptoms.

Prevention: The disease can be prevented by immunizing susceptible birds and obtaining birds from flocks free of infection. Good personal-hygiene practices which include hand washing after handling animals or their waste should be in place.

**Salmonellosis:** Along with a variety of other species, *Salmonella*, and other enteric bacteria are capable of causing disease in humans. Salmonellae are transmitted by the fecal-oral route. Infection produces an acute enterocolitis and fever with possible secondary complications such as septicemia.

Prevention: Use of protective clothing, personal hygiene which include hand washing after contact with animals or their waste, and sanitation measures prevent the transmission of the disease.

**Campylobacter:** *Campylobacter* species can be found in pet and laboratory animal species. Transmission to humans is by the fecal-oral route and can produce an acute enteritis. Symptoms include diarrhea, abdominal pain, fever, nausea, and vomiting.

Prevention: Use of personal protective clothing, good personal hygiene, and sanitation measures will help to prevent the transmission of the disease.

## **Mice, Rats, Hamsters and other rodents**

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**Lymphocytic Choriomeningitis Virus:** Lymphocytic choriomeningitis virus infects wild mice world-wide and laboratory animal species including mice, hamsters and guinea pigs. Humans can be infected by inhalation and by contact with tissues or fluids from infected animals. Symptoms include fever, myalgia, headache and malaise. More severe symptoms can occur such as lymphadenopathy, meningoencephalitis and neurologic signs.

Prevention: Serologic surveillance of animal colonies at risk and screening of all tumors and cell lines intended for animal passage will help to prevent LCM. Personnel should wear gloves when handling animals and practice appropriate personnel hygiene which includes hand washing.

**Leptospirosis:** Leptospirosis is widely distributed in domestic and wild animals. The possibility of transmission to humans from most animal species maintained in the laboratory should be considered but livestock and dogs would be the most common reservoirs. Transmission of the organism to humans can occur through skin abrasions and mucous membranes by contact with urine or tissues of animals infected with Leptospirosis. Inhalation or ingestion of organisms can also transmit the diseases. Disease can vary from asymptomatic infection to severe disease ranging from flu-like symptoms to liver and kidney failure, encephalitis, and pulmonary involvement.

Prevention: Control of this infection in laboratory animal populations along with use of protective clothing and gloves by persons working with and caring for infected animals will help prevent disease.

**Rat-Bite Fever:** Rat-bite fever is caused by *Streptobacillus moniliformis* or *Spirillum mino.*, These organisms are in the respiratory tracts and mouths of rodents, especially rats. Most human infections are the result of a bite wound.

Symptoms include chills, fever, malaise, headache and muscle pain. A rash can develop along with painful joints, abscesses, endocarditis, pneumonia, hepatitis pyelonephritis, and enteritis.

Prevention: Animals need to be handled properly to prevent bites..

**Campylobacter:** *Campylobacter* species can be found in pet and laboratory animal species. Transmission to humans is by the fecal-oral route and can produce an acute enteritis. Symptoms include diarrhea, abdominal pain, fever, nausea, and vomiting.

Prevention: Use of personal protective clothing, good personal hygiene, and sanitation measures will help to prevent the transmission of the disease.

**Salmonellosis:** Along with a variety of other species, *Salmonella*, and other enteric bacteria are capable of causing disease in humans. Salmonellae are transmitted by the fecal-oral route. Infection produces an acute enterocolitis and fever with possible secondary complications such as septicemia.

Prevention: Use of protective clothing, personal hygiene which include hand washing after contact with animals or their waste, and sanitation measures prevent the transmission of the disease.

**Hantavirus Infection:** Hantaviruses occur in rodent populations world-wide. Rats and mice have been implicated in outbreaks and infection of laboratory personnel has resulted from infected rats. The virus is shed in the respiratory secretions, saliva, urine, and feces of infected animals and is transmitted to humans

by aerosol. Clinical signs in humans include fever, myalgia, headache, and cough followed by rapid respiratory failure.

Prevention: Hantavirus infections should be prevented through the detection of infection in incoming rodents and rodent tissues prior to their introduction into existing colonies. Animal biosafety level 4 guidelines are recommended for animal studies involving hantavirus infections in hosts such as *Peromyscus maniculatus* and wild caught rodents brought into the facility that are susceptible to hantaviruses.

**Rodentolepsis:** The tapeworm *Rodentolepis nana* infects rats, mice and hamsters. Humans can be infected by ingestion of tapeworm eggs resulting in abdominal distress, enteritis, anorexia and headache.

Prevention: Preventing contact with the tapeworm ova present in feces and on fomites will help to control this zoonotic disease. Hand washing after contact with animals or their waste and wearing disposable gloves is appropriate. As cockroaches, beetles and fleas can act as intermediate hosts in the life cycle of this tapeworm in rodents, effective pest control should be in place.

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Prevention: Use of protective clothing, personal hygiene which include hand washing after contact with animals or their waste, and sanitation measures prevent the transmission of the disease.

**Campylobacter:** *Campylobacter* species can be found in pet and laboratory animal species. Transmission to humans is by the fecal-oral route and can produce an acute gastrointestinal illness. Symptoms include diarrhea, abdominal pain, fever, nausea, and vomiting.

Prevention: Use of personal protective clothing, good personal hygiene, and sanitation measures will help to prevent the transmission of the disease.

# **Rabbits**

## **Zoonotic Diseases**

**Cryptosporidia:** *Cryptosporidium* species have a world wide distribution and can be found in many animal species including rabbits. Cryptosporidiosis is caused by a protozoan parasite which lives in the intestines of mammals. Cryptosporidiosis is transmitted by the fecal-oral route and can cause diarrhea in humans. Usually the diarrhea is self-limiting but in immunocompromised individuals the disease can have a prolonged course.

**Prevention:** Appropriate personal-hygiene practices which include washing hands after contact with animals or their waste should prevent spread of this organism

**Leptospirosis:** Leptospirosis is widely distributed in domestic and wild animals. The possibility of transmission to humans from most animal species maintained in the laboratory should be considered but livestock and dogs would be the most common reservoirs. Transmission of the organism to humans can occur through skin abrasions and mucous membranes by contact with urine or tissues of animals infected with Leptospirosis. Inhalation or ingestion of organisms can also transmit the diseases. Disease can vary from asymptomatic infection to severe disease ranging from flu-like symptoms to liver and kidney failure, encephalitis, and pulmonary involvement.

**Prevention:** Control of this infection in laboratory animal populations along with use of protective clothing and gloves by persons working with and caring for infected animals will help prevent disease.

**Ringworm:** Dermatophytes, which are fungi, cause ringworm in humans and animals. Infection in animals may be inapparent and is transmitted to humans by direct contact with infected animals or by indirect contact with contaminated equipment or materials. Dermatophytes produce flat, circular lesions that are clear in the center and crusted and red on the periphery.

**Prevention:** The use of protective clothing, disposable gloves, and hand washing along with good personal hygiene will help to reduce the spread of dermatophytosis in a laboratory animal facility.

## Fish

### Zoonotic Diseases

**Cryptosporidia:** *Cryptosporidium* species have a world wide distribution and can be found in many animal species including fish. Cryptosporidiosis is caused by a protozoan parasite is transmitted by the fecal-oral route and can cause diarrhea in humans. Usually the diarrhea is self-limiting but in immunocompromised individuals the disease can have a prolonged course.

Prevention: Appropriate personal-hygiene practices which include washing hands after contact with animals or their waste should prevent spread of this organism

**Mycobacteriosis/Nocardiosis:** Mycobacteriosis and nocardiosis are bacterial diseases of fish. In the fish external as well as internal lesions can be found resulting in anorexia, popeye, shin discolouration and external lesions such as ulcers, and fin rot. Transmission to humans is by bacteria entering abrasions. Persons infected with these bacteria may develop cysts or abscesses at the site of the abrasion that may ulcerate and scar.

Prevention: Wear protective gloves when cleaning fish aquaria or tanks as well as when handling or gutting fish.

## Reptiles and Amphibians

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**Cryptosporidia:** *Cryptosporidium* species have a world wide distribution and can be found in many animal species. It is transmitted by the fecal-oral route and can cause diarrhea in humans. Usually the diarrhea is self-limiting but in immunocompromised individuals the disease can have a prolonged course.

Prevention: Appropriate personal-hygiene practices which include washing hands after contact with animals or their waste should prevent spread of this organism

**Salmonellosis:** Along with a variety of other species, *Salmonella*, and other enteric bacteria are capable of causing disease in humans. Salmonellae are extremely common in reptiles and are transmitted by the fecal-oral route. Infection produces an acute enterocolitis and fever with possible secondary complications such as septicemia.

Prevention: Use of protective clothing, personal hygiene which include hand washing after contact with animals or their waste, and sanitation measures prevent the transmission of the disease.

## Related websites of interest:

- [Centers for Disease Control and Prevention Homepage](http://www.cdc.gov)---This site (http://www.cdc.gov) leads to a wide variety of infectious disease sites, including the
  - [CDC Website for Identification and Diagnosis of Parasites of Public Health Concern](http://www.dpd.cdc.gov/dpdx) (http://www.dpd.cdc.gov/dpdx)
  - [Emerging Infectious Diseases Journal](http://www.cdc.gov/ncidod/EID/index.htm) (http://www.cdc.gov/ncidod/EID/index.htm)
  - [CDC Rabies Website](http://www.cdc.gov/ncidod/dvrd/rabies) (http://www.cdc.gov/ncidod/dvrd/rabies)
- [The EPA Microbiology Website](http://www.epa.gov/nerlcwww/index.html)---This is the Environmental Protection agency's microbiology website. (http://www.epa.gov/nerlcwww/index.html)
- [Dr. Daniel Shapiro's Zoonosis Website](http://medicine.bu.edu/dshapiro/zool.htm)---This site provides lists of zoonotic diseases grouped by the animal species of contact, as well as literature citations. It was prepared by Dr. Daniel Shapiro, Director of the Clinical Microbiology Laboratories of the Boston Medical Center. (http://medicine.bu.edu/dshapiro/zool.htm)
- [The Zoonotic diseases Website of the University of California-Santa Barbara](http://research.ucsb.edu/connect/pro/disease.html)---This is an extensive site devoted to zoonotic disease information. (http://research.ucsb.edu/connect/pro/disease.html)
- [MedWeb](http://www.medweb.emory.edu/MedWeb)---This is a catalog of MANY health-related websites maintained by the Emory University Health Sciences Library. (http://www.medweb.emory.edu/MedWeb)
- [Microbes.info](http://www.microbes.info/) (http://www.microbes.info/)---This is a comprehensive, general microbiology website.
- [Internet Health Directory](http://www.internet-health-directory.com/Conditions_and_Diseases_Infectious_Diseases_Zoonoses.html) (http://www.internet-health-directory.com/Conditions\_and\_Diseases\_Infectious\_Diseases\_Zoonoses.html) --- A website that links together a large number of health related websites, including a variety of sites related to zoonotic diseases.