

# **Zoonotic diseases in birds**

Biosafety Office training based on BIACUC protocols  
08-045, 09-029, 09-037, 10-025

For all fecal-oral transmission, assume the organism is present on the feathers

# Influenza A virus

**Agent:** *Avian Influenza virus*

**Disease:** Avian Flu

**Transmission:** Inhalation

**Protective clothing:** Respiratory protection is not recommended

**Disease in Man:** Symptoms range from typical human influenza-like symptoms (e.g., fever, cough, sore throat, and muscle aches) to eye infections, pneumonia, severe respiratory diseases (such as acute respiratory distress), and other severe and life-threatening complications and death. The symptoms of avian influenza may depend on which virus caused the infection.

- Infected birds shed influenza virus in their saliva, nasal secretions, and feces.
- The viruses do not usually infect humans. However, confirmed cases have been reported.
- Most cases of avian influenza infection in humans have resulted from direct or close contact with infected poultry or surfaces contaminated with secretions and excretions from infected birds.
- Seasonal influenza vaccine does not provide protection against avian influenza.

## References

Key Facts About Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus ). Center for Disease Control. May 7, 2007

<http://www.cdc.gov/flu/avian/gen-info/facts.htm>

Questions and Answers About Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus. Center for Disease Control. May 28, 2008

<http://www.cdc.gov/flu/avian/gen-info/qa.htm>

Avian Influenza A Virus Infections of Humans. Center for Disease Control. May 23, 2008

<http://www.cdc.gov/flu/avian/gen-info/avian-flu-humans.htm>

# Viral Encephalitis

**Agent:** Arboviruses (WNV, EEE, SLE, WEE)

**Disease:** *myalgia, polyarthralgia, encephalitis*

**Transmission:** zoonotic transmission - mosquito

**Incubation period:** varies 1-18 days depending on virus.

**Protective clothing:** Wear clothing that covers the arms, legs, and feet in order to prevent mosquito bites.

**Field studies:** Recommend mosquito repellents sparingly on exposed skin. An effective repellent will contain 20% to 30% DEET. Spray clothing with insecticides such as DEET or permethrin to prevent mosquitoes from biting through thin clothing. All confirmed exposures should be documented and reported to the IU Bloomington Biosafety Office.

**Disease in Man:** The majority of human infections are asymptomatic or may result in sudden onset nonspecific flu-like syndrome. Some people experience pain in multiple joints, fever, headache, and fatigue. Only a small proportion of infected persons progress to encephalitis.

**Treatment:** There is no specific medicine available that will kill the virus. However, supportive treatment can relieve some symptoms. Most people will recover from the illness, but permanent neurological problems and death can occur.

## References

<http://www.cdc.gov/ncidod/dvbid/Arbor/arbofact.htm>

Arboviral Encephalitides

[www.cdc.gov/ncidod/dvbid/arbor/arbdet.htm](http://www.cdc.gov/ncidod/dvbid/arbor/arbdet.htm)

<http://www.phac-aspc.gc.ca/msds-ftss/msds175e-eng.php>

# Enteropathogens

**Agent:** *Salmonella* spp. (200 serovars, most often *S. enteritidis* and *S. typhimurium*)

**Disease:** *Salmonellosis*

**Transmission:** fecal-oral route, direct contact, ingestion, directly or indirectly from contaminated food or water. Parenteral inoculation; importance of aerosol exposure is not known. **Infectious dose**, 100-1000 organisms.

**Incubation period:** 6-72 hours, usually 12-36 hours.

**Protective clothing:** long sleeves, gloves.

**Field studies:** Recommend frequent handwashing or use of waterless hand sanitizers. Refer for treatment as needed. All confirmed exposures should be documented and reported to the IU Bloomington Biosafety Office.

**Disease in Man:** acute gastroenteritis; sudden onset of abdominal pain, diarrhea, nausea and vomiting food borne disease; may progress to more serious septicemia, includes focal infections, abscesses, endocarditis, pneumonia; may also cause typhoid like enteric fever; some cases develop reactive arthritis (Reiter's syndrome) which may become chronic

**Treatment:** Sensitive to ampicillin, amoxicillin, trimethoprim-sulfamethoxazole, chloramphenicol, fluoroquinolones; many strains are antibiotic, or multi-drug resistant; drug susceptibility testing must be performed. Deaths are uncommon except in very young or very old or debilitated/immunocompromised; morbidity may be high.

References  
Salmonella spp. (excluding *S. typhi*, *S. choleraesuis*, and *S. paratyphi*) - Material Safety Data Sheets (MSDS). Public Health Agency of Canada. March 2001.  
<http://www.phac-aspc.gc.ca/msds-ftss/msds135e-eng.php>

# Enteropathogens

**Agent:** *Campylobacter jejuni*, *C. coli*, *C. fetus* subsp. *jejuni*

**Disease:** “Traveller’s diarrhea”

**Transmission:** Fecal-oral route, ingestion, parenteral inoculation. **Infectious dose**, 500 organisms or less by ingestion.

**Incubation period:** 2-5 days, with a range of 1-10 days; dose-dependent

**Protective clothing:** long sleeves, gloves.

**Field studies:** Recommend frequent handwashing or use of waterless hand sanitizers. Refer for treatment as needed. All confirmed exposures should be documented and reported to the IU Bloomington Biosafety Office.

**Disease in Man:** Acute enteric disease of variable severity; diarrhea, abdominal pain, malaise, fever, nausea and vomiting; prolonged illness in up to 20% of patients; blood in association with mucus and WCBs present in liquid of foul smelling stools; typhoidal-like syndrome, reactive arthritis may occur; rare cases of febrile convulsions, Guillain-Barré syndrome and meningitis

**Treatment:** Sensitive to erythromycin, tetracyclines, fluoroquinolones and aminoglycosides. Single- and multiple-drug resistant strains have been reported

## References

*Campylobacter* spp. Fetus - Material Safety Data Sheets (MSDS). Public Health Agency of Canada. November 1999.

<http://www.phac-aspc.gc.ca/msds-ftss/msds29e-eng.php>

# Enteropathogens

**Agent:** *Enterococcus*

**Transmission:** Fecal oral route, ingestion, parenteral inoculation

**Protective clothing:** long sleeves, gloves.

**Field studies:** Recommend frequent handwashing or use of waterless hand sanitizers. Refer for treatment as needed. All confirmed exposures should be documented and reported to the IU Bloomington Biosafety Office.

**Disease in Man:** Often normal human flora. When it causes disease: urinary tract infection, bacteremia and mixed infections of the abdomen and pelvis, wounds, occasionally ocular infections.

**Treatment:** urinary tract, ampicillin, tetracycline, nitrofurantoin, quinolones. Systemic, penicillin, ampicillin, vancomycin, plus gentamicin or streptomycin. Multi-drug resistant, chloramphenicol.

## Other infectious agents:

**Agent:** *Mycobacterium avium*, (avian TB)

**Disease:** Mycobacteriosis

**Agent:** *Toxoplasma gondii*

**Disease:** Toxoplasmosis

## References

Bailey and Scott's Diagnostic Microbiology . Weissfeld, Sahn, and Forbes. Mosby Elsevier, 2007. pp298-315

# Chlamydia Psittaci

**Agent:** *Chlamydia Psittaci* (obligate intracellular bacteria)

**Disease:** *chlamydiosis*

**Transmission:** Inhalation of the agent from desiccated droppings and secretions of infected birds; direct contact with infected birds; bite from an infected bird. Person to person is rare and can occur with paroxysmal coughing during the acute illness

Exposure to infectious aerosols and droplets created during the handling, care, or necropsy of infected birds and the handling of infected tissues (risk can be reduced by wetting the feathers with a detergent-disinfectant prior to necropsy)

**Incubation period:** 1-4 weeks usually 10 days.

**Protective clothing:** face protection (eyes,nose, mouth) and gloves.

**Field studies:** Recommend frequent handwashing or use of waterless hand sanitizers. All confirmed exposures should be documented and reported to the IU Bloomington Biosafety Office.

**Disease in Man:** fever, headache, myalgia, chills and upper or lower respiratory tract disease; extensive pneumonia demonstrable by X-ray; lethargy, anorexia, encephalitis; may be severe with high case fatality rates in older persons

**Treatment:** Resistant to penicillin; susceptible to tetracyclines and erythromycin

## References

<http://www.cdc.gov/mmwr/pdf/rr/rr4710.pdf>

<http://www.phac-aspc.gc.ca/msds-ftss/msds31e-eng.php>

# Lymes Disease

**Agent:** *Borrelia burgdorferi*

**Disease:** *Lymes*

**Transmission:** zoonotic transmission, bite of tick from an infected animal

**Incubation period:** 3-32 days after infection.

**Protective clothing:** long sleeves, gloves

**Field studies:** All confirmed exposures should be documented and reported to the IU Bloomington Biosafety Office.

**Disease in Man:** disease characterized by distinctive skin lesion (EM, a red macule or papule that expands in an annular manner), systemic symptoms, polyarthritis, and neurologic and cardiac involvement; malaise, fatigue, fever, headache, stiff neck and myalgia

**Treatment:** Sensitive to doxycycline (adults) and amoxicillin (adults and children < 9 years); erythromycin for those allergic to penicillins or tetracyclines

## References

[http://www.cdc.gov/ncidod/dvbid/LYME/ld\\_humandisease\\_symptoms.htm](http://www.cdc.gov/ncidod/dvbid/LYME/ld_humandisease_symptoms.htm)

<http://www.phac-aspc.gc.ca/msds-ftss/msds31e-eng.php>