BIOSAFETY
APPENDIX S
ZOONOTIC AGENTS OF CONCERN IN BIRDS, AMPHIBIANS, REPTILES, AND FISH

REV. FEBRUARY 2019

Zoonotic Disease and Agent	Host	Transmission & *Incubation Period*	Signs/Symptoms	Personal Protective Equipment
Campylobacteriosis *Campylobacter jejuni Campylobacter fetus*	Birds	Fecal – oral route. *C. jejuni 1 – 10 days C. fetus 2–5 days*	C. *jejuni* – Watery diarrhea, may be with mucus and blood; abdominal pain, fever and nausea and vomiting, usually brief and self-limiting. C. *fetus* – Chills, sweats, fever, cough, headache, weight loss and abortion in the latter half of pregnancy.	Lab coat/overall, nonporous gloves, face protection when splashing is anticipated.
Cryptosporidiosis *Cryptosporidium spp*.	Many animal species	Fecal – oral route. May involve contaminated air. *3 – 7 days*	Characterized by cramping, abdominal pain, profuse watery diarrhea, anorexia, and weight loss. Immunosuppressed people may develop severe disease.	Lab coat/overall, nonporous gloves, face protection when splashing is anticipated.
Erysipiloidiosis *Erysipelothrix rhusiopathiae*	Birds, Fish	Direct contact with pharyngeal or intestinal lymphoid tissue, feces of carrier animals, lesions (especially skin), or contaminated fomites including soil. *1 – 7 days*	If localized, usually on the hands, a slightly raised, nonpitting dark reddened cutaneous zone slowly progressing peripherally, severe burning pain, sometimes intense itching. If generalized, fever, generalized weakness, muscle aches and headache.	Lab coat/overall, nonporous gloves, face protection when splashing is anticipated from handling feces.
Histoplasmosis *Histoplasma capsulatum*	Birds, Bats	*H. capsulatum* grows in soil and material contaminated with bat or bird droppings. Spores become airborne when contaminated soil is disturbed. Breathing the spores causes infection. The disease is not transmitted from an infected person to someone else. *3-17 days, average 10 days*	Most infected persons have no apparent ill effects. The acute respiratory disease is characterized by respiratory symptoms, a general ill feeling, fever, chest pains, and a dry or nonproductive cough. Distinct patterns may be seen on a chest x-ray. Chronic lung disease resembles tuberculosis and can worsen over months or years. The disseminated form is fatal unless treated.	Lab coat/overall, nonporous gloves, face protection and respirator when risk of aerosolized spores is anticipated.
Leptospirosis *Leptospira interrogans*	Amphibian, reptiles	Through non-intact skin and mucous membranes and is often related to direct contact with urine or tissues of infected animals. Inhalation and ingestion may be possible routes. *2 – 30 days, usually 7 – 12 days*	Fever with sudden onset, headache, chills, generalized weakness, and conjunctival suffusion (reddened, watery eyes).	Lab coat/overall, nonporous gloves, face protection when splashing is anticipated.
Listeriosis *Listeria monocytogenes*	Birds, isolated from fish	Vertical transmission, either transplacental or milkborne (ingestion). Also by direct contact. *Uncertain, probably a few days to 3 weeks.*	Infection is usually subclinical except in neonates. Febrile systemic, neurologic or respiratory tract disease. May include abortion, reddened eyes and pustular skin lesions.	Lab coat/overall, nonporous gloves, face protection when splashing is anticipated.
Mycobacterioses *Mycobacterium marinum, M. ulcerans, M. avium*	Birds, fish, amphibians	Direct contact or inhalation of infectious materials from soil, milk, water, and fish, especially with exposure with non-intact skin. . With the exception of organisms causing skin lesions, transmission is not due to person-to-person contact. *2-4 weeks, up to 2-4 months*	Skin ulcers and soft tissue wound infections- Slowly developing nodule at entry wound followed by Ulceration. Pulmonary disease resembling tuberculosis – SeeTuberculosis.	Lab coat/overall, nonporous gloves, face protection when splashing is anticipated.

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Pastuerellosis Pasteurella spp.	Birds, cats	Animal bite or scratch, non-intact skin contamination from infected materials, ingestion, and inhalation through contaminated bird feces. *For a wound infection – more than 24 hours. Unknown for other routes.*	Wound infection – local redness, swelling, severe pain, occasionally mild fever and regional lymph node swelling. Upper and lower respiratory tract infections and abdominal/pelvic infection are possible with signs related to the area that is affected. Septicemia – infrequent form of infection with fever and generalized signs.	Lab coat/overall, nonporous gloves, face protection, and respirator when inhalation is anticipated.
Psittacosis *Chlamydia psittaci*	Birds, amphibians	Direct contact or inhalation of infectious materials from exudates, secretions or desiccated feces. *4 – 15 days, usually 10 days*	Fever, headache, generalized weakness, chills and upper or lower respiratory tract disease. May see extensive pneumonia and inflammation of the liver in serious infections.	Lab coat/overall, nonporous gloves, face protection, and respirator when inhalation is anticipated.
Q Fever *Coxiella burnetii*	Many animal species	Inhalation, ingestion. *2-4 weeks.*	Sudden onset with fever, chills, retrobulbar headache, weakness muscle aches and profuse sweating. Some cases-nonproductive cough and chest pains.	Lab coat/overall, nonporous gloves, face protection, and respirator when inhalation is anticipated.
Salmonellosis *Salmonella spp.*	Many animal species	Fecal – oral route. *6 – 72 hours, usually 12 – 36 hours.*	Infection causes a sudden onset of headache, abdominal pain, diarrhea and sometimes vomiting. Focal infections can be localized in any tissue of the body with signs related to the area of infection. Immunosuppressed people are at extra risk.	Lab coat/overall, non-porous gloves, face protection when splashing is anticipated.
Tuberculosis *Mycobacterium tuberculosis, M. africanum, M. bovis, M. leprae*	Many animal species	Aerosols from infected animals or tissues, ingestion or wound contamination. *4 – 12 weeks.*	Most common form reflects involvement of the pulmonary system and is characterized by cough, sputum production and eventually coughing up blood. Extrapulmonary forms of the disease can involve any tissue or organ system. General symptoms as the disease progresses include weight loss, fatigue, fever, chills and wasting.	Lab coat/overall, non-porous gloves, face protection, and respirator when aerosolization is anticipated.
Tularemia *Francisella tularensis*	Many animal species, arthopods	Direct contact of skin with blood or tissues of infected animals, bite from an infected ectoparasite or animal, ingestion of contaminated meat or water, inhalation. *1 – 10 days, usually 3 – 5 days*	Symptoms are associated with portal of entry. Skin exposure most common – sudden onset of fever, chills, headache and generalized weakness with decaying ulcer at the site. Ingestion – vomiting and diarrhea. Inhalation – pneumonia.	Lab coat/overall, non-porous gloves, face protection, and respirator when inhalation is anticipated.
Vibriosis *Aeromonas hydrophila, Vibrio spp.*	Shellfish, freshwater or marine fish	Often associated with trauma such as a penetrating fish spine, exposure to untreated water, ingestion of raw or undercooked fish. *4 – 96 hours, usually 12 – 24 hours.*	Diarrhea, occasionally bloody, abdominal pain, vomiting, fever. Wound infection – variety of skin lesions, including cellulitis and necrosis usually progressing to systemic involvement. Septicemia – systemic illness, fever or hypotension.	Lab coat/overall, non-porous gloves, face protection when splashing untreated water is anticipated.

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West Nile Virus *Flavivirus spp.*	Birds are reservoir, mosquito vector	Most commonly spread through mosquito bite from infected bird, not spread through casual contact. *3-14 days.*	Symptoms vary but range from asymptomatic to fever, headache, and body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach and back	Lab coat/overall, non-porous gloves when handling infected birds.

References:

- Occupational Health and Safety in the Care and Use of Research Animals, National Research Council, National Academy Press, Washington D.C. 1997.
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- Biosafety in Microbiological and Biomedical Laboratories, Center for Disease Control and Prevention, US Government Printing Office, Washington, DC 1999.