UTAH DEPARTMENT OF HEALTH

Psittacosis

Disease Plan

Quick Links:

Last updated: March 23, 2016 by Dallin Peterson

Questions about this disease plan?

Contact the Utah Department of Health Bureau of Epidemiology: 801-538-6191.

✓ WHY IS PSITTACOSIS IMPORTANT TO PUBLIC HEALTH?

Psittacosis, also known as parrot fever and ornithosis, is a bacterial infection of humans that can cause severe pneumonia and other serious health problems. Public health can help veterinarians, the pet bird industry, and others concerned with psittacosis detect outbreaks early and can help prevent future illness.

✓ DISEASE AND EPIDEMIOLOGY

Clinical Description

The clinical presentation of psittacosis may include fever, headache, rash, myalgias (muscle aches), chills, and upper or lower respiratory tract disease. Systemic illness can occur with pneumonia. A cough may or may not be present, and respiratory symptoms often seem milder than would be expected based on chest x-ray findings. Human disease can be severe (including encephalitis and myocarditis), especially in untreated elderly people, although it is usually mild or moderate for others. Relapses of illness may occur.

C. psittaci can affect organ systems other than the respiratory tract and result in endocarditis, myocarditis, and hepatitis; fetal death has been reported in pregnant women.

Causative Agent

Chlamydophila psittaci (formerly *Chlamydia psittaci)* is an intracellular bacterium that causes psittacosis.

Differential Diagnosis

The differential diagnosis of psittacosis-related pneumonia includes infection with *Coxiella burnetti, Mycoplasma pneumoniae, Chlamydia pneumoniae, Legionella* spp, and respiratory viruses (e.g., influenza).

Laboratory Identification

Most diagnoses are established by clinical presentation and positive antibodies against *C. psittaci* in paired sera using microimmunofluorescent (MIF) methods. The MIF is more sensitive and specific than the previously used complement fixation (CF) tests; however, there is still some cross-reactivity with other chlamydiae (*C. pneumoniae*, *C. trachomatis*, and *C. felis)* so a titer result less than 1:128 should be interpreted with caution. Acute-phase serum specimens should be obtained as soon as possible after the onset of symptoms, and convalescent-phase serum specimens should be obtained at least two weeks after the first specimen. Because antimicrobial treatment can delay or diminish the antibody response, a third serum sample 4-6 weeks after the acute sample might help confirm the diagnosis. To increase the reliability of serologic results, acute and convalescent sera should be analyzed simultaneously at the same laboratory. *Chlamydophila psittaci* can also be isolated from the patient's sputum, pleural fluid, or clotted blood during acute illness and before treatment with antimicrobial agents; however, culture is

performed by few laboratories because of technical difficulty and occupational safety concerns. Recently, real-time polymerase chain reaction (rt-PCR) assays have been developed for use in the detection of *C. psittaci* in respiratory specimens. These assays can distinguish *C. psittaci* from other chlamydial species and identify different *C. psittaci* genotypes. While the assays appear to be highly sensitive and specific in avian samples, they have not yet been validated for use in human samples. Because proper sample collection techniques and handling are critical to obtain accurate test results, clinical laboratories performing these tests should be contacted directly for specifics on specimen submission.

Laboratories that test human specimens for *Chlamydophila psittaci*		
Laboratory	**Tests Performed**	**Telephone Number/ Website**
Focus Diagnostics Inc. (Quest subsidiary), Cypress, CA	Culture, MIF (IgM, IgA, IgG)	800-445-4032 www.focusdx.com
Laboratory Corporation of America, Burlington, NC	Culture, MIF (IgM, IgG)	800-222-7566 www.labcorp.com
Specialty Laboratories, Santa Monica, CA	MIF, (IgM, IgG, IgA)	800-421-4449 www.specialtylabs.com
ViroMed Laboratories Minnetonka, MN	Culture, MIF (IgG, IgM)	800-582-0077 www.viromed.com
Response and Surveillance Laboratory, Respiratory Diseases Branch, CDC Atlanta, GA**	MIF (requires paired sera), PCR, Culture, genotyping (multiple specimen types)	404-639-4921

*MIF = microimmunofluorescence, PCR = polymerase chain reaction
**CDC is a reference laboratory and samples must be submitted through State Health Departments

Treatment

Tetracycline antibiotics are the drug of choice for *C. psittaci* infection in humans. Most *C. psittaci* infections are responsive to antibiotics within 1-2 days; however, relapses can occur. Although *in vivo* efficacy has not been determined, macrolide antibiotics are considered the best alternative agents in patients for whom tetracyclines are contraindicated (e.g., children <8 years of age, pregnant women, and persons allergic to tetracyclines). Prophylactic antibiotics are not routinely administered after a suspected exposure to *C. psittaci*, but may be considered in some circumstances.

Symptoms	Drug	Adult dosage	Duration
Mild to moderate symptoms	oral tetracycline hydrochloride	500 mg every six hours	minimum of 10 days
OR			
	oral doxycycline	100 mg every 12 hours	minimum of 10 days
Severely ill patients	IV doxycycline hyclate	4.4 mg/kg/day divided into two infusions, maximum 100 mg/dose	10-14 days after fever abates

Case Fatality

With appropriate treatment, infection is rarely fatal.

Reservoir

C. psittaci is found primarily in psittacine birds (parrots, parakeets, macaws, love birds, and cockatoos). Pigeons, birds of prey, shore birds, and some poultry (turkeys, geese, doves, and ducks) may also shed the infectious agent.

Transmission

Human illness occurs from inhalation of the bacteria in dried droppings, secretions, and dust from feathers of infected birds. Most infections are typically acquired from exposure to psittacine birds, although transmission has also been documented in poultry and free-ranging birds including doves, pigeons, birds of prey, and shore birds. Many seemingly healthy birds may shed the agent when stressed by crowding or transport. Pet birds are often implicated, especially when owners clean a cage containing dried droppings. Occupational exposure can also occur when workers are exposed to areas with contaminated dust during clean up, repair, or demolition. Laboratory-acquired infections have occurred as well. Farms or rendering plants may also be a source of exposure. Other means of exposure include mouth-to-beak contact and handling of infected bird's plumage and tissues. Even brief exposures to birds or bird waste can lead to symptomatic infection; therefore, certain patients with psittacosis may not recall having contact with wild birds. *C. psittaci* is resistant to drying and can remain infectious for several months. Person-to-person transmission (through paroxysmal coughing during acute illness) has rarely been reported and is not considered to present a significant risk.

Susceptibility

Susceptibility is general; post-infection immunity is incomplete and transitory. Older adults may be more severely affected. There is no evidence that persons with antibodies are protected. Persons at risk include those exposed to pet birds, pigeons, and poultry and in specific occupations such as laboratory and wildlife workers. Human infection can result from even brief exposure to the contaminated excretions or secretions of infected birds.

Incubation Period

The incubation period for psittacosis can range from 1-4 weeks, but is usually 5-19 days.

Period of Communicability

Birds (diseased or seemingly healthy) may shed the agent intermittently, and sometimes continuously for weeks or months.

Epidemiology

Psittacosis occurs worldwide and year-round. Most human cases are sporadic. Human outbreaks of psittacosis occasionally occur in individual households, pet shops, aviaries, and avian exhibits in zoos. Outbreaks among birds can occur in poultry flocks or in other groups of birds, such as Asian pet stores. Quarantine of imported birds and treatment of infected birds with antibiotics reduce the risk of disease transmission from birds.

Utah averages 0-1 reported case of psittacosis per year compared to the nationwide average of 5 cases from 2011-2015.

Bioterrorist Potential

Psittacosis is listed by the Centers for Disease Control and Prevention (CDC) as a Category B bioterrorist agent. If acquired and properly disseminated, psittacosis could cause a serious public health challenge.

✓ PUBLIC HEALTH CONTROL MEASURES

Public Health Responsibility

- Determine the probable source (location) of the infection.
- Determine if and where transmission is occurring in Utah.
- Ensure case was properly treated.
- Addressed environmental concerns such as pet stores and animal handling facilities.
- Provide education to case and exposed contacts.

Prevention

Personal Preventive Measures/Education

To avoid exposure, the UDOH recommends that:

- Birds should be obtained only from a licensed pet store or aviary.
- Pet owners and animal handlers should be made aware of the dangers of household or occupational exposure to infected birds and the risk of inhalation of dried bird droppings, even from seemingly healthy birds that can shed the organism intermittently. The organism is environmentally labile but can remain infectious for several months if protected by organic matter. Medical personnel who take care of people in poultry processing plants or other workers in high-risk occupations should learn to include psittacosis in their differential diagnosis for workers who become sick with febrile illness and myalgia.
- Psittacine birds that are bought, traded, or otherwise procured should be raised and handled in a way that prevents psittacosis spread. Tetracycline can be used to control or prevent disease in birds, although treatment failures can occur.
- Any pet stores, farms, or processing plants that are epidemiologically-linked to human psittacosis should be part of a surveillance effort to identify other cases. Any infected birds should be treated or destroyed, and the environments should be thoroughly disinfected.
- All persons in contact with infected birds or contaminated materials should wear appropriate personal protective equipment to decrease the risk of exposure. Protective clothing, gloves, and an appropriately fitted respirator (N95 or higher rating) should be used when cleaning cages or handling infected birds.
- Precautions should be used against aerosolization of contaminated materials while cleaning cages by wetting the cage with a disinfectant solution and let sit for 5-10 minutes. (1:32 dilution or ½ cup of bleach per gallon of water)

Chemoprophylaxis

None.

Vaccine

None.

Isolation and Quarantine Requirements

Isolation: None.
Hospital: None.
Quarantine: None for humans. Birds may need to be quarantined.

✓ CASE INVESTIGATION

Reporting

Report all suspect and confirmed cases of psittacosis.

Reporting Table

Criterion	Reporting
Clinical Presentation	
Fever	C
Chills	C
Headache	C
Cough	C
Myalgia	C
Healthcare record contains a diagnosis of psittacosis	S
Death certificate lists psittacosis as a cause of death or a significant condition contributing to death	S
Laboratory Findings	
isolation of *Chlamydophila psittaci* from respiratory specimens (e.g., sputum, pleural fluid or tissue), or blood	S
fourfold or greater increase in IgG antibody against *C. psittaci* by complement fixation (CF) to a titer of at least 1:32 between paired acute- and convalescent-phase serum specimens	S
fourfold or greater increase in IgG antibody against *C. psittaci* by microimmunofluorescence (MIF) to a titer of at least 1:32 between paired acute- and convalescent-phase serum specimens	S
A *C. psittaci* antibody titer (IgM) by CF or MIF of greater than or equal to 1:32 in at least one serum specimen obtained after onset of symptoms	S
Detection of *C. psittaci* DNA in a respiratory specimen (e.g., sputum, pleural fluid or tissue) via amplification of a specific target by PCR assay	S
Epidemiological Risk Factors	
Exposure to the same dried bird secretions as a confirmed case of psittacosis	C
Exposure to birds, bird owners, pet shop employees, veterinarians, and those working in poultry processing plants	C

Notes:
S = This criterion alone is sufficient to report a case.
O = At least one of any “O” criteria in each category (e.g., clinical presentation and laboratory findings) in the same column is required to report a case.
C = This finding corroborates (e.g., supports) the diagnosis of—or is associated with— psittacosis, but is not required for reporting.

Case Definition
Psittacosis (2010)

Clinical Description

Psittacosis is an illness characterized by fever, chills, headache, myalgia, and a dry cough with pneumonia often evident on chest x-ray. Severe pneumonia requiring intensive-care support, endocarditis, hepatitis, and neurologic complications occasionally occur.

Laboratory criteria for diagnosis

- Isolation of *Chlamydophila psittaci* from respiratory specimens (e.g., sputum, pleural fluid, or tissue), or blood, OR
- Fourfold or greater increase in antibody (Immunoglobulin G [IgG]) against *C. psittaci* by complement fixation (CF) or microimmunofluorescence (MIF) between paired acute- and convalescent-phase serum specimens obtained at least 2-4 weeks apart, OR
- Supportive serology (e.g., *C. psittaci* antibody titer [Immunoglobulin M (IgM)] of greater than or equal to 32 in at least one serum specimen obtained after onset of symptoms), OR
- Detection of *C. psittaci* DNA in a respiratory specimen (e.g., sputum, pleural fluid or tissue) via amplification of a specific target by polymerase chain reaction (PCR) assay.

Case classification

Probable: An illness characterized by fever, chills, headache, cough and myalgia that has either:

- Supportive serology (e.g., *C. psittaci* antibody titer [Immunoglobulin M, IgM] of greater than or equal to 32 in at least one serum specimen obtained after onset of symptoms), OR
- Detection of *C. psittaci* DNA in a respiratory specimen (e.g. sputum, pleural fluid or tissue) via amplification of a specific target by polymerase chain reaction (PCR) assay.

Confirmed: An illness characterized by fever, chills, headache, cough and myalgia, and laboratory confirmed by either:

- Isolation of *Chlamydophila psittaci* from respiratory specimens (e.g., sputum, pleural fluid, or tissue), or blood, OR
- Fourfold or greater increase in antibody (Immunoglobulin G [IgG]) against *C. psittaci* by complement fixation (CF) or microimmunofluorescence (MIF) between paired acute- and convalescent-phase serum specimens obtained at least 2-4 weeks apart.

Comment

Although MIF has shown greater specificity to *C. psittaci* than CF, positive serologic findings by both techniques may occur as a result of infection with other Chlamydia species and should be interpreted with caution. To increase the reliability of test results, acute- and convalescent-phase serum specimens should be analyzed at the same time in the same laboratory. A real-time polymerase chain reaction (rtPCR) has been developed and validated in avian specimens but has not yet been validated for use in humans[(1)].

Classification Table

Criterion	**Case Definition**	
Clinical Presentation	Confirmed	Probable
Fever	O	O
Chills	O	O
Headache	O	O
Cough	O	O
Myalgia	O	O
Laboratory Findings		
isolation of *Chlamydophila psittaci* from respiratory specimens (e.g., sputum, pleural fluid or tissue), or blood, or	O	
fourfold or greater increase in antibody (IgG) against *C. psittaci* by complement fixation (CF) between paired acute- and convalescent-phase serum specimens obtained a minimum of 2 weeks apart	O	
fourfold or greater increase in antibody (IgG) against *C. psittaci* by microimmunofluorescence (MIF) between paired acute- and convalescent-phase serum specimens obtained a minimum of 2 weeks apart	O	
titer of antibody against *C. psittaci* (IgM) of at least 1:32 by CF or MIF in one or more serum specimens obtained after onset of symptoms		O
detection of *C. psittaci* DNA in a respiratory specimen (e.g., sputum, pleural fluid or tissue) via amplification of a specific target by PCR assay		O
Epidemiological Risk Factors		
exposure to the same dried bird secretions as a confirmed case of psittacosis	C	C
exposure to birds, bird owners, pet shop employees, veterinarians, and those working in poultry processing plants	C	C

Notes:

S = This criterion alone is sufficient to classify a case.

O = At least one of any “O” criteria in each category (e.g., clinical presentation and laboratory findings) in the same column is required to classify a case.

C = This finding corroborates (e.g., supports) the diagnosis of—or is associated with— psittacosis.

Case Investigation Process

- Complete CMR in UT-NEDSS.
- Verify case status.
- Complete disease investigation form.
- Determine whether patient had travel/exposure history consistent with acquisition of disease in Utah or elsewhere.
- If patient acquired disease in Utah, identify the source of transmission and assist with eliminating it.
- Contact Utah Department of Agriculture and Food so they can follow up on the birds.
- Rule out bioterror agent

Outbreaks

Any cluster of illness among humans would be considered an outbreak.

Identifying Case Contacts

Psittacosis is rarely spread person-to-person.

Case Contact Management

None.

✓ REFERENCES

National Association of State Public Health Veterinarians (2008). Compendium of measures to control *Chlamydophila psittaci* infection among humans (Psittacosis) and pet birds (Avian Chlamydiosis).

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Heymann, D.L. (2015). Control of Communicable Diseases Manual (20th Edition).

Pickering, L.K. (2012). 2012 Report of the Committee on Infectious Diseases (29th Edition), Red Book.

✓ VERSION CONTROL

V. March 2015: Updated prevention paragraph, incubation period, and important to public health paragraph. Added new treatment table and bioterrorist potential paragraph.

V. November 2015: Updated format of entire plan. Added reporting and classification tables. Added minimum data set.

✓ UT-NEDSS Minimum/Required Fields by Tab

Demographic

- ☑ County
- ☑ State
- ☑ Street
- ☑ City
- ☑ City
- ☑ Zip Code
- ☑ Birth Gender
- ☑ Ethnicity
- ☑ Race
- ☑ First Name
- ☑ Last Name
- ☑ Phone Number

Clinical

- ☑ Date Diagnosed
- ☑ Date of Birth
- ☑ Died
- ☑ Date of Death
- ☑ Disease
- ☑ Onset Date
- ☑ Hospitalized
- ☑ Chills
- ☑ Cough
- ☑ Fever
- ☑ Headache
- ☑ Myalgia

Laboratory

- ☑ Organism
- ☑ Specimen Source
- ☑ Test Result
- ☑ Test Type
- ☑ Collection Date

Epidemiological

- ☑ Imported From
- ☑ Does patient have a job or hobby with bird exposure?
- ☑ Is this case epi-linked to a serologically-confirmed case?

Investigation

- ☑ Does patient have recent exposure to birds or bird feces?
- ☑ Were animals ill?
- ☑ Animal type
- ☑ Dates of exposures

Reporting

- ☑ Date First Reported to Public Health

Administrative

- ☑ Outbreak Name
- ☑ Outbreak Associated
- ☑ State Case Status