Psittacosis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify sources of transmission (e.g., a pet shop or poultry processing plant) and to prevent further transmission from such sources.

2. When the source is a risk for only a few individuals (e.g., a pet bird with avian chlamydiosis), to inform those individuals how they can reduce their risk of exposure.

B. Legal Reporting Requirements

1. Health care providers: notifiable to local health jurisdiction within 24 hours

2. Health care facilities: notifiable to local health jurisdiction within 24 hours

3. Laboratories: *Chlamydophila psittaci* notifiable to local health jurisdiction within 24 hours; specimen submission is on request only


5. Local health jurisdictions: notifiable to Department of Health (DOH) Office of Communicable Disease Epidemiology (OCDE) within 7 days of case investigation completion or summary information required within 21 days

C. Local Health Jurisdiction Investigation Responsibilities

1. If bioterrorism is suspected, immediately report the case to DOH: 1-877-539-4344 or 206-418-5500.

2. Facilitate the transport of specimens to Washington State Public Health Laboratories (PHL) for confirmatory testing.

3. Identify potentially exposed persons and educate them about signs and symptoms of disease to facilitate early diagnosis.


2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

*Chlamydophila* (formerly called *Chlamydia psittaci*) is an obligate intracellular bacterium.

B. Description of Illness

Psittacosis (also known in humans as ornithosis and parrot fever) usually presents as an acute febrile respiratory illness. However, the severity of the disease ranges from...
asymptomatic infections to severe pneumonia. Symptoms commonly include fever, chills, headache, muscle aches, and nonproductive cough that can be associated with shortness of breath. An enlarged spleen and nonspecific rash can also occur. Rarely, *C. psittaci* can affect organ systems other than the respiratory tract and result in complications such as endocarditis, myocarditis, hepatitis, and encephalitis. Death from psittacosis is rare.

C. **Psittacosis in Washington State**

Department of Health receives 0 to 4 reports of psittacosis per year. In the United State, illness is commonly associated with indoor exposure to pet birds and less commonly farm or wild birds. Risk groups include bird owners, pet shop employees, poultry farmers, veterinarians, and workers in abattoirs and processing plants. Outbreaks of psittacosis in poultry processing plants have been reported in the United States.

D. **Reservoirs**

The primary reservoir is psittacine (parrot-type) birds such as parakeets, parrots, lovebirds and macaws but chlamydial organisms have been isolated from more than 100 species of birds including poultry, pigeons, canaries, and sea birds. Birds that appear to be healthy can be carriers and shed the infectious agent intermittently for weeks to months, particularly when subjected to the stress of crowding or shipping. Co-infection in birds with *C. psittaci* and an avian adenovirus may increase risk of shedding.

E. **Modes of Transmission**

Transmission occurs when a person inhales *C. psittaci* organisms that have been aerosolized from dried feces or respiratory tract secretions of infected birds. Other modes of transmission include direct mouth-to-beak contact and handling infected birds’ plumage and tissues. Person-to-person transmission (associated with paroxysmal coughing and severe disease) has been described in two outbreaks, one in Scotland in 2012, and one in Sweden in 2013. Both index patients in these outbreaks were hospitalized with severe disease. Healthcare workers and close contacts of the index patients represented the majority of these rare secondary cases.

F. **Incubation Period**

The incubation period is generally 5 to 14 days but can be as long as 4 weeks. In the documented human-to-human cases, incubation ranged from 7 to 20 days.

G. **Period of Communicability**

It is unclear how long the period of communicability for person-to-person transmission is, due to few documented cases.

Apparently healthy birds can be carriers for life, resulting in intermittent shedding of the organism. Shedding may be precipitated by any stress exerted on the bird (e.g., transport, change of feed, a new cage mate, chilling). Such stress can also lead to the onset of overt disease (avian chlamydiosis) in the bird.

H. **Treatment**

Tetracyclines are the drugs of choice for adults. Remission of symptoms usually is evident within 48 to 72 hours. However, relapse can occur, and treatment must continue for at least 10 to 14 days after fever abates.
3. CASE DEFINITIONS

A. 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.

B. Laboratory Criteria for Diagnosis

1. Isolation of Chlamydophila psittaci from respiratory secretions (e.g., sputum, pleural fluid, or tissue) or blood, or

2. 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

3. 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

4. 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

C. Case Classification (2010)

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.

D. Comment

Although MIF has shown greater specificity than CF to C. psittaci, positive serologic findings by both techniques may occur as a result of infection with species in the genus Chlamydia 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 realtime polymerase chain reaction (rtPCR) developed and validated in avian specimens has not yet been validated for use in humans.
4. DIAGNOSIS AND LABORATORY SERVICES

A. Laboratory Diagnosis

Psittacosis is most commonly diagnosed by serologic testing. Antibodies to *Chlamydophila psittaci* can be detected using microimmunofluorescence (MIF), complement fixation (CF), and immunofluorescent antibody tests (IFA). MIF is the most sensitive and specific of these tests, however, there is still some cross-reactivity with other chlamydial species, such as *Chlamydia pneumoniae*, *C. trachomatis* and *C. felis*. Thus, all tests are imperfect.

*C. psittaci* can also be isolate from sputum, pleural fluid, and clotted blood, but culture is rarely done due to technical difficulties and safety concerns in the laboratory. Polymerase chain reaction (PCR) assays can detect *C. psittaci* nucleic acid in clinical specimens and also distinguish *C. psittaci* from other chlamydial species but are not routinely available.

Confirmatory laboratory testing should be performed by a reference laboratory such as the Centers for Disease Control and Prevention (CDC).

B. Tests Available at Washington State Public Health Laboratories (PHL)

PHL does not perform testing for psittacosis but will forward specimens to the CDC. Contact Office of Communicable Disease Epidemiology (OCDE) for approval prior to submitting specimens.

Note that PHL require all clinical specimens have two patient identifiers, a name and a second identifier (e.g., date of birth) both on the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date.

C. Specimen Collection

**Serum:** Collect acute serum at the first clinical encounter and convalescent serum at least 2 weeks after the first specimen. A third serum sample collected 4 to 6 weeks after the acute sample might be necessary to confirm the diagnosis since treatment with antibiotics can delay or diminish the antibody response. For best results, acute and convalescent sera should be tested simultaneously at the same laboratory.

Acute and convalescent sera should be refrigerated and transported cold. Specimens should be submitted with a completed DOH PHL Serology form available at: [http://www.doh.wa.gov/Portals/1/Documents/5230/302-017-SerVirHIV.pdf](http://www.doh.wa.gov/Portals/1/Documents/5230/302-017-SerVirHIV.pdf)

**Culture or PCR:** Respiratory specimens (e.g. sputum, pleural fluid, or tissue) or whole blood specimens can be submitted upon consultation with OCDE. Specimens should be collected prior to starting antibiotics.

5. ROUTINE CASE INVESTIGATION

A. Evaluate the Diagnosis

Review the clinical presentation and laboratory results. Confirmatory laboratory testing should be performed by a reference laboratory such as Centers for Disease Control and Prevention (CDC). Facilitate submission of laboratory specimens to Washington State Public Health Laboratories for confirmation at CDC.
B. Identify Source of Infection

Review clinical presentation and history to determine appropriate potential exposures. Investigate possible exposures during the period 5 days to 4 weeks (particularly 5–14 days) before onset, including a history of:

1. Contact with pet birds,
2. Occupational exposure to wild or domestic birds (or their droppings or plumage),
3. Pet shop visit (even without direct bird contact), and
4. Work in a laboratory.

C. Infection Control Recommendations/Case Management

Standard infection-control practices and droplet transmission precautions are generally sufficient for the medical management of humans with psittacosis. However, enhanced protection may be needed when caring for severely ill patients with atypical pneumonia, for example, using airway protection with facemasks and treating the cases in isolation in order to prevent nosocomial transmission from patients hospitalized with psittacosis. Staff treating a severely ill psittacosis patient should be informed of the symptoms so they can self-monitor.

Work and child care restrictions are not needed.

D. Identify Potentially Exposed Persons

Identify and contact persons who participated with the case in any of the activities listed above, and educate them about the signs and symptoms of psittacosis. Additionally, for severe or hospitalized cases, notify any healthcare workers who treated the patient, as well as close contacts of the patient who may have been exposed. Any persons who are ill or become ill should seek medical attention and inform their healthcare provider of possible exposure to facilitate proper diagnosis and therapy.

E. Environmental Evaluation

Notify local environmental health program of human cases. A follow-up investigation into the source of the bird infection, quarantine and treatment will be needed. This response should be in accordance with the current “Compendium of Measures To Control Chlamydophila psittaci Infection Among Humans (Psittacosis) and Pet Birds (Avian Chlamydiosis), 2010” found at: http://www.nasphv.org/Documents/Psittacosis.pdf

6. MANAGING SPECIAL SITUATIONS

A. Avian Chlamydiosis (C. psittaci infection in birds)

When avian chlamydiosis is diagnosed by a veterinarian, public health should interview persons who have been exposed to the bird(s) and instruct them to monitor themselves for symptoms of psittacosis. In addition, actions need to be taken to prevent further spread from the infected bird. Detailed instructions for this type of follow-up can be found in the current “Compendium of Measures to Control Chlamydophila psittaci Infection among Humans (Psittacosis) and Pet Birds (Avian Chlamydiosis), 2010” available at http://www.nasphv.org/Documents/Psittacosis.pdf.

7. ROUTINE PREVENTION

A. Vaccine Recommendations

There is no vaccine for psittacosis.

B. Prevention Recommendations

The following recommendations are taken from “Compendium of Measures to Control Chlamydophila psittaci Infection among Humans (Psittacosis) and Pet Birds (Avian Chlamydyiosis), 2010” available at http://www.nasphv.org/Documents/Psittacosis.pdf.

1. **Educate persons at risk.** Inform all persons in contact with birds or bird-contaminated materials about the zoonotic nature of psittacosis.

2. **Bird caretakers with respiratory or influenza-like symptoms should seek medical attention and inform their health care provider about bird contact.**

3. **Protect persons at risk.** When cleaning cages or handling infected birds, caretakers should wear protective clothing, which includes gloves, eyewear, a disposable surgical cap, and an appropriately fitted respirator with N95 or higher rating. In addition, necropsies of potentially infected birds should be performed in a biological safety cabinet. The carcass should be moistened with detergent and water to prevent aerosolization of infectious particles during the procedure.

4. **Maintain accurate records of all bird-related transactions for at least one year to aid in identifying sources of infected birds and potentially exposed persons.** Records should include the date of purchase, species of birds purchased, individual bird identification, source of birds, and any identified illnesses or deaths among birds. In addition, the seller should record the name, address, a customer and individual bird identification (e.g., band or microchip number).

5. **Avoid purchasing or selling birds that have signs consistent with avian chlamydiosis.** Signs include lethargy, ocular or nasal discharge, diarrhea, ruffled feathers, or low body weight.

6. **Avoid mixing birds from multiple sources.** To prevent epornitics (i.e., disease outbreak in birds) and potential pathogen transmission to humans, additional control and prevention methods (e.g., health screening, extended quarantine, and C. psittaci testing) may be required when birds from multiple sources are co-mingled.

7. **Isolate newly acquired, ill, or exposed birds.** Isolation should include housing in a separate air space from other birds and non-caretakers. Isolate birds, including those that have been to shows, exhibitions, fairs, and other events, for at least 30 days and test before adding them to a group.

8. **Test birds before they are to be boarded or sold on consignment.**
9. Screen birds with frequent public contact (e.g., bird encounters, long term care facilities, schools) routinely for anti-chlamydial antibodies and DNA or bacterial protein. Such testing may be used to reduce potential human exposure from birds.

10. **Practice preventive husbandry.** Position cages to prevent the transfer of fecal matter, feathers, food, and other materials from one cage to another. Do not stack cages, and be sure to use solid-sided cages or barriers if cages are adjoining. The bottom of the cage should be made of a wire mesh. Litter that will not produce dust (e.g., newspapers) rather than wood shreds should be placed underneath the mesh. Clean all cages, food bowls, and water bowls daily. Soiled bowls should be emptied, cleaned with soap and water, rinsed, placed in a disinfectant solution, and rinsed again before reuse. Between occupancies by different birds, cages should be thoroughly scrubbed with soap and water, disinfected, and rinsed in clean running water. Exhaust ventilation should be sufficient to prevent accumulation of aerosols and prevent cross contamination of rooms.

11. **Control the spread of infection.** Care for healthy birds before handling isolated or sick birds. Isolate birds requiring treatment. Rooms and cages where infected birds were housed should be cleaned and disinfected thoroughly after removal of infected birds. When the cage is being cleaned, transfer the bird to a clean cage. Thoroughly scrub the soiled cage with a detergent to remove all fecal debris, rinse the cage, disinfect it (most disinfectants require 5-10 minutes of contact time) and rinse the cage again to remove the disinfectant. Discard all items that cannot be adequately disinfected (e.g., wooden perches, ropes, nest material, substrate/litter). Minimize the circulation of feathers and dust by wet mopping the floor frequently with disinfectants and preventing air currents and drafts within the area. Reduce contamination from dust by spraying the floor with a disinfectant or water before sweeping it. A vacuum cleaner or pressure washer may aerosolize infectious particles and should be used with caution. Frequently remove waste material from the cage (after moistening the material), and burn or double-bag the waste for disposal. There is no documented transmission of *C. psittaci* via ventilation systems from pet bird aviaries or pet stores to humans, nor are there any studies specific for *C. psittaci* viability in these systems. Properly maintained ventilation systems are at low risk of harboring *C. psittaci*. Theoretically, desiccation from forced air movement may reduce viability of the organism. Use of a high efficiency particulate air (HEPA) filter on air system return may be an option to reduce particulate matter in the air.

12. **Use disinfection measures.** All surfaces should be thoroughly cleaned of organic debris before disinfection. *Chlamydophila psittaci* is susceptible to most disinfectants and detergents as well as heat; however, it is resistant to acid and alkali. Examples of effective disinfectants include 1:1,000 dilution of quaternary ammonium compounds (e.g., Roccal or Zephiran); 1% Lysol; or freshly prepared 1:32 dilution of household bleach (i.e., ½ cup bleach per gallon of water). Many disinfectants are respiratory irritants for both humans and birds and should be used in a well-ventilated area. Avoid mixing a disinfectant with any other product.

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UPDATES

January 2010: Updated case definition

January 2011: The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision. Section 4 was updated to reflect current lab submission requirements and forms.

December 2013: Combined Controlling Further Spread into Section 5; updated to 2010 psittacosis compendium.

December 2014: Included additional information on documented human-to-human transmission in sections 2E-G and 5C-D. Updated information from the NASPHV Compendium on Psittacosis in Section 7.