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## Psittacosis (Ornithosis, Parrot fever)

### Overview<sup>1, 2, 3, 5, 6, 7</sup>

Psittacosis, also known as (ornithosis) or Parrot fever, is a bacterial illness in humans caused by *Chlamydophila psittaci*. The same bacterial pathogen also causes illness in both pet and wild birds, and is referred to as avian chlamydiosis. Psittacosis is therefore a hazard to (bird) pet owners, pet shop employees (with birds), poultry farmers, workers in abattoirs and processing plants, and veterinarians. In the United States, most psittacosis patients have had some contact with a bird, usually as a pet. It is likely that all bird species are susceptible to *C. psittaci*. Infection may appear in birds years after exposure. Infected birds may also shed the agent intermittently for prolonged periods of time. Infected birds may be asymptomatic or sick, although it is during periods of illness that infected birds excrete the largest numbers of bacteria. Infected birds can exhibit signs of illness when they become subject to the stress of shipping, crowding, and breeding. Sick birds may show signs of depression, shivering, anorexia, emaciation, dyspnea, and diarrhea, frequently with closed eyes and ruffled feathers. If untreated, 10% of infected birds become chronic asymptomatic carriers.

Infected birds can actively shed the bacteria through bodily secretions (e.g., discharge from beaks, eyes, feces, and urine; their feathers and the dust around the cage can also become contaminated. Psittacosis is not a seasonal illness, and the pathogen, *C. psittaci*, can be found worldwide. Rarely ill cats, dogs, goats or sheep can spread infection.

The most common route of human exposure is through the respiratory tract. This can occur by direct contact with or inhalation of aerosolized dust particles or respiratory secretions from infected birds. **NOTE: Direct contact with birds is not required for infection.** Although more rare, it is also possible for transmission to occur through a bird bite that breaks the skin. The disease in humans begins after an incubation period of 1 to 4 weeks (generally 5 to 15 days). Psittacosis in humans may be subclinical, or cause a flu-like illness or pneumonia. Symptoms may include fever, headache, aching muscles and chills, while cough is characteristically dry or may be absent. If pneumonia occurs, symptoms such as shortness of breath or chest pain may occur. The illness usually lasts for seven to ten days and is mild or moderate. It may be severe in pregnant or older, untreated patients. Complications include encephalitis, endocarditis, myocarditis and thrombophlebitis. Relapses may occur, especially when there has been inadequate treatment. For a complete description of psittacosis, refer to the following sources:

- *Control of Communicable Diseases Manual (CCDM)*. 20<sup>th</sup> ed. Washington, D.C.: American Public Health Association, 2015.
- American Academy of Pediatrics. *Red Book: 2015 Report of the Committee on Infectious Diseases*. 30th ed. Elk Grove Village, IL. American Academy of Pediatrics; 2015.

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## **2010 Case Definition – Psittacosis / Ornithosis (*Chlamydophila psittaci*)<sup>4</sup> (1/16)**

### ***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 *C. 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.

#### **Comments**

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.<sup>1</sup>



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### Reference(s)

1. Mitchell, S.L., Wolff, B.J., Thacker, W.L., Ciembor, P.G., Gregory, C.R., Everett, K.D., Ritchie, B.W., & Winchell, J.M. (2009). Genotyping of *Chlamydophila psittaci* by real-time PCR and high-resolution melt analysis. *J Clin Microbiol*, 47(1), 175-181.

### **Information Needed for Investigation**

**Verify the diagnosis.** What laboratory tests were conducted and what were the results? This can be accomplished by referring to the Case Definition provided above, specifically the “**Laboratory Criteria for Diagnosis**” component. Complete the [Disease Case Report](#) (CD-1) by obtaining the information from the attending physician, hospital, laboratory, patient and/or a knowledgeable family member.

**Establish the extent of the illness.** Determine if household members, co-workers, or other close contacts are, or have been ill with a similar illness? If so, urge them to contact their health care provider for a medical evaluation. Obtain demographic, clinical and other epidemiological information necessary to complete the [Psittacosis Human Case Surveillance Report](#) on the case. The information may be obtained from the patient, health care provider, or a knowledgeable family member.

**Determine the source of infection.** Determine the cases’ occupation and the specific work duties, this information may help narrow the search for the route of exposure. Shared activities or exposures should be investigated for cases among co-workers, family and friends. Identify possible routes of exposure the 5 weeks prior to illness, did the patient report:

1. Exposure to birds? If yes, the type of birds and location?
2. Exposure to a human case of psittacosis?

*COMMENT: Psittacosis is generally acquired by inhaling dried secretions from infected birds. Direct contact with infected birds, including bites, can also spread the disease. However, direct contact with birds is not required for human infection to occur. In addition, rare cases of person-to-person transmission have been reported, possibly via aerosol spread during paroxysmal coughing. Rarely ill cats, dogs, goats or sheep can spread infection.<sup>7</sup> Sometimes the specific source of the infection will not be identified.*

**Provide Psittacosis information to persons at risk of infection and the general public as needed.** Efforts should be made to promote psittacosis awareness as needed (e.g. the danger of exposure to infected pet birds). A “[Psittacosis and Avian Chlamydiosis Checklist for Owners of Infected Bird](#)” and “[Psittacosis Prevention Checklist for Pet Stores and Aviaries](#)” is available online. Additional psittacosis information is available from the [Missouri Veterinary Emergency Awareness Manual, Third Edition, 2013](#) and a [Fast Facts Psittacosis sheet](#) from the Center for Food Security and Public Health, Iowa State University.

**Psittacosis Surveillance.** Review WebSurv to determine whether there have been other psittacosis cases. When cases are related by person, place or time, efforts should be made to identify a common source. Information obtained through the public health investigation will be used to identify possible sources of infection and to characterize persons or areas in which additional efforts are needed to raise awareness and reduce disease incidence.

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## **Notification**

Immediately contact the [District Communicable Disease Coordinator](#), or the [Senior Epidemiology Specialist for the District](#), or the Missouri Department of Health and Senior Services (MDHSS) – Bureau of Communicable Disease Control and Prevention (BCDCP), phone (573) 751-6113, Fax (573) 526-0235, or for afterhours notification contact the MDHSS/ERC at (800) 392-0272 (24/7) if an outbreak\* of psittacosis is suspected.

- If a case(s) is associated with a child care center, BCDCP or the local public health agency (LPHA) will contact the Bureau of Environmental Health Services, phone (573) 751-6095, Fax (573) 526-7377 and the Section for Child Care Regulation, phone (573) 751-2450, Fax (573) 526-5345.
- If a case(s) is associated with a long-term care facility, BCDCP or the LPHA will contact the Section for Long Term Care Regulation, phone (573) 526-8524, Fax (573) 751-8493.
- If a case is associated with a hospital-based long-term care facility. BCDCP or the LPHA will contact the Bureau of Health Services Regulation phone (573) 751-6303, Fax (573) 526-3621.
- If a case(s) is associated with a pet store, aviary or poultry operation exposure within Missouri, Office of Veterinary Public Health (DHSS) will contact the Missouri Department of Agriculture, Animal Health Division.

\*An outbreak is defined as the occurrence in a community or region, illness(es) similar in nature, clearly in excess of normal expectancy and derived from a common or a propagated source.

## **Control Measures**<sup>2, 5, 6, 7</sup>

- Educate the public regarding the danger of household or occupational exposure to infected birds.
- Children should be warned not to touch sick or dead birds.
- Pet birds should be bought from reputable suppliers and examined by a veterinarian when they are first acquired.
- Good hygiene, including frequent handwashing, should be used when handling birds.
- Birds and cages should be kept in well-ventilated areas.
- Any bird that has regular contact with the public (e.g., birds in schools, child care centers, and long-term care facilities) should be routinely screened for *C. psittaci*.
- Cages should be cleaned regularly to prevent the build-up of fecal material; so it does not accumulate, dry up and become airborne.
- Dampening the cage first with cleaning solution or disinfectant reduces aerosolization.
- Persons should consider wearing gloves and dust masks when cleaning areas with which birds have frequent contact such as cages and bird feeders.<sup>7</sup>
- Construction workers and others should use personal protective equipment when removing an accumulation of pigeon feces. Wetting the wastes before removal decreases aerosolization.
- If a person develops signs and symptoms of psittacosis, consult a health care provider and mention any bird contact to the provider.

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- Tetracycline or doxycycline are the antimicrobials typically used in the treatment of human psittacosis.
- Avoid birds that are obviously sick.
- Consult with a veterinarian on all bird illnesses.
- Birds suspected of being the source of human infection should be evaluated and managed by a veterinarian. Birds with avian chlamydiosis should be isolated and treated with appropriate antimicrobial agents for at least 30 to 45 days. Potentially contaminated caging and housing areas should be disinfected thoroughly before reuse. People cleaning cages or handling infected / suspect infected birds should wear personal protective equipment including gloves, eyewear, disposable hat, coveralls or disposable gowns, and a respirator with an N-95 or higher rating.
- Aviary and pet shop owners are encouraged to implement recommendations such as those described in the [Model Aviculture Program](#).
- Additional prevention and control recommendations can be found in: the “[Compendium of Measures to Control \*Chlamydophila psittaci\* Infection Among Humans \(Psittacosis\) and Pet Birds \(Avian chlamydiosis\), 2010](#)” and [Missouri Veterinary Emergency Awareness Manual, Third Edition, 2013](#).
- A “[Psittacosis and Avian Chlamydiosis Checklist for Owners of Infected Bird](#)” and “[Psittacosis Prevention Checklist for Pet Stores and Aviaries](#)” is also available online.

### **Laboratory Procedures**

Psittacosis is usually diagnosed using a combination of clinical signs and serology. Psittacosis testing information is available from the following online resource: “[Compendium of Measures to Control \*Chlamydophila psittaci\* Infection Among Humans \(Psittacosis\) and Pet Birds \(Avian chlamydiosis\), 2010](#)”.

The Missouri State Public Health Laboratory (MSPHL) does not perform laboratory testing for psittacosis. Acute and convalescent sera specimens may be sent to CDC in special circumstances or for epidemiological purposes. Specimens for testing at CDC should **not** be collected without prior authorization. ⇒ *NOTE: Healthcare providers are asked to discuss testing with the [District Communicable Disease Coordinator](#) and/or the Missouri State Public Health Laboratory (573 751-3334) prior to collection and shipment of specimens to CDC. Also advise the submitter that several months may elapse before psittacosis test results are available from CDC.* The University of Missouri’s Veterinary Medical Diagnostic Laboratory (VMDL) in Columbia offers testing for *C. psittaci* infection/harborage of birds. Interested individuals and their veterinarians may contact the VMDL for a schedule of fees and specimen shipping requirements. The telephone number of the VMDL is 1-800-862-8635 or 573-882-6811. The web site is <http://vmdl.missouri.edu/>.

### **Reporting Requirements**

Psittacosis is a Category III reportable disease and shall be reported to the [local public health agency](#) or to the MDHSS within three (3) days of first knowledge or suspicion, by telephone, facsimile, or other rapid communication.

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As a Nationally Notifiable Condition, all confirmed and probable cases are a **STANDARD** report to CDC. MDHSS will submit these reports to the CDC by electronic case notification (WebSurv) within the next reporting cycle.

1. For all reported cases of psittacosis complete a [Disease Case Report](#) (CD-1) and a [Psittacosis Human Case Surveillance Report](#).
2. Entry of the completed CD-1 into WebSurv negates the need for the paper CD-1 to be forwarded to the District Health Office.
3. Send the completed [Psittacosis Human Case Surveillance Report](#) to the District Health Office.
4. MDHSS will report to CDC following the above reporting criteria (see box).
5. All outbreaks or “suspected” outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the District Communicable Disease Coordinator. This can be accomplished by completing the [Missouri Outbreak Surveillance Report](#) (CD-51).
6. If an outbreak is associated with food, person-to-person transmission, environmental contamination, animal contact, or indeterminate/other/unknown etiology, a [National Outbreak Reporting System – Foodborne Disease Transmission, Person-to-Person Disease Transmission, Animal Contact](#) form (CDC 52.13) is to be completed and submitted to the District Health Office at the conclusion of the outbreak.
7. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the District Communicable Disease Coordinator.

## References

1. American Public Health Association. *Psittacosis*. Badaruddin H, In: Heymann, D L (ed), *Control of Communicable Diseases Manual*. 20<sup>th</sup> ed. Washington, DC: American Public Health Association, 2015: 491-493.
2. American Academy of Pediatrics. *Chlamydomphila (formerly Chlamydia) psittaci*. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2015 Report of the Committee on Infectious Diseases*. 30<sup>th</sup> ed. Elk Grove Village, IL. American Academy of Pediatrics; 2015: 286-288.
3. Elsevier Inc. *Psittacosis (Due to Chlamydia psittaci)*. Schlossberg, D In: Bennett JE, Dolin R, Blaser MJ eds. *Mandell, Douglas, and Bennett’s Principles and Practices of Infectious Diseases: Vol. 2*. 8<sup>th</sup> ed. 2015: 2171-2173.
4. Centers for Disease Control and Prevention’s (CDC) National Notifiable Diseases Surveillance System (NNDSS) and Case Definitions. <http://wwwn.cdc.gov/nndss/conditions/psittacosis/>. (1/16).
5. National Association of State Public Health Veterinarians, [Compendium of Measures to Control Chlamydomphila psittaci \(formerly Chlamydia psittaci\) Infection Among Humans \(Psittacosis\) and Pet Birds, 2010](#). <http://www.nasphv.org/Documents/Psittacosis.pdf>. (1/16)
6. Missouri Veterinary Emergency Awareness Manual, Third Edition, 2013. Missouri Veterinary Medical Association, Missouri Department of Agriculture, and Missouri Department of Health and Senior Services. <http://health.mo.gov/emergencies/ert/pdf/vetmanual.pdf> (1/16).

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7. Department of Health, Victoria, Australia. *Psittacosis In: Blue Book – Guidelines for the Control of Infectious Diseases*. Communicable Disease Prevention and Control Unit Victorian Department of Health. <http://ideas.health.vic.gov.au/bluebook/psittacosis.asp> (1/16).
8. Psittacosis Fact Sheet, Center for Food Security and Public Health, Iowa State University. [http://www.cfsph.iastate.edu/FastFacts/pdfs/psittacosis\\_F.pdf](http://www.cfsph.iastate.edu/FastFacts/pdfs/psittacosis_F.pdf) (1/16).

### **Other Sources of Information**

1. The Merck Veterinary Manual. 10<sup>th</sup> Ed. Ed. Cynthia M. Kahn. Whitehouse Station, NJ: Merck & Co., Inc., 2010. <http://www.merckvetmanual.com/mvm/index.jsp> (1/16) (search “psittacosis” or “psittaci”).
2. Zoonoses and Communicable Diseases Common to Man and Animals. “Avian Chlamydiosis.” 2<sup>nd</sup> ed. Eds. Pedro Acha and Boris Szyfres. Pan American Health Organization, Washington, DC, Scientific Publication No. 503, 1994: 250-255.
3. Psittacosis, Lessnau, K.D., eMedicine Journal, updated August 3, 2015. <http://www.emedicine.com/med/topic1951.htm> (1/16).