

Psittacosis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To determine if there are likely sources of infection that are of major public health concern (e. g., outbreak in a turkey processing plant, pet shop, or among demolition workers) and to stop transmission from such sources.
2. To identify other cases.

B. Laboratory And Physician Reporting Requirements

Physicians are required to report within one week of identification/diagnosis. Laboratory reporting is strongly recommended, but for obscure reasons is not currently mandated.

C. Local Health Department Reporting and Follow-Up Responsibilities

1. Report all confirmed and presumptive (but *not* suspect) cases to the OHD (see definitions below) by the end of the calendar week of initial physician/lab report. Use the standard case report form (OHD 43-36; "Notice of a Disease or Condition").
2. Begin follow-up investigation within 3 working days. Use the Psittacosis case investigation form (CDC 52.2; at present there is no OHD form). Send a copy of the completed form to the OHD within 7 days of initial report.

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Chlamydia psittaci. Chlamydiae are an unusual group of bacteria; they are obligate intracellular parasites, and hence cannot be cultured on artificial media. They are susceptible to several antibiotics and are killed by commonly used disinfectants (e.g., household bleach, Lysol®). *C. psittaci* organisms can remain infectious in dried bird droppings for months.

B. Description of Illness

Human

Infections range from asymptomatic to severe systemic illness with pneumonia. Cases usually have an acute onset of fever, chills, headache, malaise, and myalgias, with or without respiratory symptoms. A non-productive cough usually develops, and pneumonia is not uncommon, with chest x-ray findings of lobar, patchy, or interstitial infiltrates. As many as 80% of *recognized* persons with psittacosis may be hospitalized.

Psittacosis is sometimes referred to as "chlamydiosis," but this usage should be discouraged. Chlamydiosis is a general term that applies to infection with any of the chlamydial species (e.g., the STD caused by *C. trachomatis*, ocular trachoma also caused by *C. trachomatis*, and respiratory illness caused by the recently named *C. pneumoniae*, originally referred to as "TWAR").

Avian

As in humans, the spectrum of infection ranges from asymptomatic to fatal. Birds with generalized infections typically appear lethargic, anorexic, and have ruffled feathers. They may have serous or mucopurulent ocular or nasal discharge and/or diarrhea. Droppings may be greenish, turning white and watery if illness persists for several weeks.

C. Reservoirs

Wild and domestic birds, especially psittacine birds (parrots and cockatoos), budgerigars (parakeets), pigeons, and some poultry (primarily turkey and ducks; not much in chickens).

D. Modes of Transmission

Infection occurs by inhalation of the organism, typically in dust from dried bird droppings. Over 70% of cases reported to CDC over a 10-year period were the result of exposure to pet, caged birds. Dust can be generated by movement of the bird in the cage, but cage cleaning is probably a bigger problem. During the clean-up/removal of pigeon droppings prior to building remodeling, repair, or demolition, workers may be exposed to contaminated dust.

Pet bird owners have also become infected when bitten by large psittacine birds. Veterinarians or bird pathologists have been infected whilst handling carcasses or performing necropsies on infected birds.

Occupational exposure may take place in poultry processing or rendering plants where aerosols are generated by handling/processing of poultry viscera. While any domestic fowl may carry the organism, most industrial outbreaks have been associated with turkey processing. Such outbreaks may be difficult to distinguish from seasonal outbreaks of influenza and similar respiratory illness.

Person-to-person spread has only been reported (and this very rarely) in medical settings—via aerosol. Respiratory therapists may be at greatest risk.

E. Incubation Period

4-15 days, typically about 10 days.

F. Period of Communicability

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—transport, change of feed, a new cage mate, chilling, etc. Such stress can also lead to the onset of overt disease in the bird.

If humans are contagious at all, it is during periods of paroxysmal coughing. The extent of such transmission is probable negligible if not in fact nil, and proper antibiotic treatment promptly resolves any theoretical risk.

G. Treatment and Immunity

C. psittaci is susceptible to most broad spectrum antibiotics. The drug of choice for adults is tetracycline (q 6h, PO), continued for 10–14 days after defervescence. Symptoms typically resolve with 2–3 days of therapy, making compliance (and relapse) a problem. Doxycycline or erythromycin are usually effective; the latter is preferred when tetracyclines are contraindicated (e. g., patients <9 years old).

There are many strains of *C. psittaci* that can cause human disease, and cross-immunity is limited or non-existent. Even immunity to homologous strains is at best transient. New infections and clinical disease can develop within months of treatment and recovery, should the individual be reexposed.

3. CASE DEFINITIONS, DIAGNOSIS, AND LABORATORY SERVICES

A. Case Definitions

1. Confirmed Case

- Isolation of *C. psittaci* from a clinical specimen, *or*
- compatible illness and a four-fold rise in psittacosis complement-fixing antibody titer (to $\geq 1:32$) in specimens collected at least 2 weeks apart.

2. Presumptive Case

- Compatible illness in a person with a single serum antibody titer of $\geq 1:32$ and a history of exposure to an identified source and/or epi-linked to a confirmed case; *or*
- compatible illness in a person with a stable titer of $\geq 1:32$ in two serum samples.

Psittacosis

3. Suspect Case (*not reportable to OHD*)

Anyone with unexplained, compatible, febrile illness with a history of exposure to psittacine birds.

B. Diagnostic Problems

Early treatment with broad spectrum antibiotics usually produces rapid recovery, which is good, of course, but complicates our ability to confirm the diagnosis. First, treatment may inhibit the antibody response so a 4-fold rise may not occur. Second, the rapid recovery makes patients less likely to seek follow-up medical attention; hence, convalescent serum may not be available. Thus, many "real" cases are never confirmed.

Chlamydiae do not grow on artificial media, but can be cultured in chick embryos. Diagnosis usually depends on antibody or antigen detection methods. The chlamydial antigens used in the complement fixation (CF) test are not specific for *C. psittaci*, and cross reactions with other *Chlamydia* spp. are common.

Psittacosis can be difficult to distinguish clinically from legionellosis or other illnesses with systemic and respiratory findings, including Q fever, systemic fungal diseases, tuberculosis, respiratory form of tularemia, or bacterial pneumonias. A thorough travel and animal/bird contact history is critical to proper diagnosis.

C. Services Available at the Center for Public Health Laboratories

The CPHL can test blood/serum specimens for chlamydial antibodies using the CF test on single or, preferably, paired sera. The convalescent specimen should be collected 3 weeks after completion of therapy (or onset, if no therapy was instituted), and at least 2 weeks after the first specimen.

D. Veterinary Services

A variety of methods are available for avian diagnosis, but bird owners are often reluctant to pay for them. The Veterinary Diagnostics Laboratory (VDL) at OSU will necropsy birds that may have died of psittacosis (current charge, \$15). Other services are also available at modest charge, including screening of bird droppings for chlamydial antigens (typically 3 days of droppings, pooled in a single specimen). Interested parties can be referred to the VDL (503/737-3261) or to private veterinarians for more information or to arrange testing.

4. ROUTINE CASE INVESTIGATION

A. Determine the Source of Infection

After reviewing the case investigation form, interview the case or others who can provide relevant information. Pay particular attention to pet bird contact/ownership, occupations that would bring the case into contact with wild or domestic fowl or their droppings, or avocational pursuits that would result in these exposures.

B. Identify Potentially Exposed Persons

If a likely source is identified, look for other persons who may have had similar exposures (e. g., family members, co-workers). Persons with recent signs or symptoms compatible with psittacosis should be evaluated.

If droppings/bird carcasses were encountered at a work site, get the names and exposure histories for others who may have been exposed. As indicated, interview these individuals about recent illness; symptomatic persons should be referred for medical evaluation.

C. Environmental Evaluation

If the source of infection is a pet bird, obtain the history of ownership, date and place of acquisition, and bird's health history. Testing birds or sampling environmental surfaces in the home setting is rarely warranted for public health reasons.

5. CONTROLLING FURTHER SPREAD

A. Education

Birds should only be obtained from a licensed pet store or aviary. It is estimated that as many as 25,000 exotic birds are smuggled into this country each year. Smuggled birds have not been through the USDA 30 day quarantine period—which typically includes prophylaxis for presumptive psittacosis—and are much more likely to be a source of not only psittacosis but other exotic diseases that could threaten domestic poultry and other birds.

Birds should be housed in clean cages of ample size. Cages should be lined with newspaper that is changed frequently.

B. Dealing with Infected Birds

To prevent infection, special precautions are needed when dealing with birds that are known or suspected to be infected. Advise patients with birds about how to minimize aerosol generation of dry droppings when handling or cleaning the cage of pet birds. Wet mopping, use of oil-impregnated sweeping compounds, and/or spraying the area with a disinfectant mist are helpful. Soiled cage liners from infected birds should be burned or disinfected before discarding. To disinfect cages, first move the birds to another cage. Mist the cage with a spray disinfectant to minimize aerosolization of dried material, and then scrub it to remove fecal matter. Rinse the cage in clean water, and disinfect it with 1% solution of household bleach, 70% alcohol, Lysol® or quaternary ammonium compounds used according to the manufacturer's recommendations. Allow the cage to air dry, and then rinse it again in clean water before putting the birds back inside.

Where dust cannot be controlled, encourage the use of a tight-fitting partial face mask with a HEPA filter element. Simple dust or particle masks are probably ineffective barriers.

Cages and environmental surfaces (floors, countertops) in the room(s) holding the birds should be cleaned and disinfected on days 30 and 45 of the antibiotic-treatment schedule. All other items that cannot be disinfected (nest material, litter, etc.) should be discarded.

To treat or prophylax infected or exposed birds, bird owners should be referred to a qualified veterinarian. Birds that have been in the same room as the infected bird(s) should be placed on 45 days of low level tetracycline enhanced feed to prevent disease. Antibiotics should not be administered in water. Calcium sources (such as a cuttle bone) should be removed from the cage during the period of medicated feeding, as they can interfere with uptake of tetracycline. Medicated feed is available through veterinarians.

6. MANAGING SPECIAL SITUATIONS

A. Pet Shop-Associated Disease

Special control measures may be necessary at pet stores that have been linked to cases of human psittacosis, or where there has been a recognized avian outbreak. These measures typically include the quarantine, treatment, or (if the owner's preference) destruction of exposed birds. Cleaning of cages and other surfaces is also required, following the guidelines outlined above. Contact the Health Division for more information. Both USDA and Oregon Department of Agriculture veterinarians may be involved in bird tracing, and OR-OSHA may also be interested.

B. Outbreaks and Occupational Exposures

Contact OHD epidemiologists to discuss possible outbreaks. OR-OSHA is often involved in investigating occupational exposures.