Respiratory Protection Recommendations for Control of Infection from Chlamydia psittaci (Psittacosis)

Summary

Psittacosis refers to any infection or disease in humans caused by Chlamydia psittaci. This infection, also known as parrot disease, parrot fever, and chlamydiosis, can result in fatal pneumonia. The Centers for Disease Control and Prevention (CDC) recently made recommendations for control of psittacosis. According to the CDC, persons at high risk of becoming infected should be instructed to wear a respirator with at least an N95 rating (or a dust/mist mask if an N95 or higher efficiency respirator is not available) when cleaning cages, handling infected birds, or performing necropsies on potentially infected birds.

Background

Companion birds (pets) such as parakeets, parrots, macaws, cockatiels, pigeons, doves, and mynah birds can carry the bacterium C. psittaci. In birds, this bacterium can cause disease. These birds can shed the organism. Healthy appearing birds may be carriers of C. psittaci and may also shed the organism. When shedding occurs, the organism is excreted in the feces and nasal discharges of infected birds. Infection can be transmitted from birds to humans. The disease resulting from the infection of humans with C. psittaci is frequently referred to as psittacosis. Most C. psittaci infections in humans result from exposure to psittacine birds (e.g., parakeets, parrots, macaws, and cockatiels).

During the 1980s, public health surveillance indicated that exposure to caged pet birds accounted for 70% of the psittacosis cases for which the source of infection was known. Pet shop employees accounted for an additional 10% of cases. Other persons at risk include pigeon fanciers and persons whose occupation places them at risk of exposure (e.g., employees in...
poultry-slaughtering / processing plants, veterinarians, veterinary technicians, laboratory workers, workers in avian quarantine stations, farmers, and zoo workers). Because infection can result from transient exposure to infected birds or their contaminated droppings, persons with no identified avocational or occupational risk may become infected.

**Method of Transmission**

Human infection with *C. psittaci* usually occurs through the inhalation of the organism aerosolized from urine, respiratory secretions, or dried feces of infected birds. Other sources of exposure can include handling the plumage and tissues of infected birds. In the laboratory, infectious aerosols may be produced while dissecting infected animals or processing diagnostic specimens. Direct contact with or traumatic inoculation (e.g., needle sticks) may also result in disease. Person-to-person transmission occurs only rarely. The incubation period is 5-14 days.

**Persons at Risk:** Pet shop employees, pigeon fanciers, employees in poultry-slaughtering / processing plants, veterinarians, veterinary technicians, laboratory workers, workers in avian quarantine stations, farmers, and zoo workers.

**Recommendations**

The CDC has recommended control measures for veterinarians, physicians, and the companion bird industry to prevent transmission of *C. psittaci* infection to persons. The complete list of recommended controls can be found in the CDC publication. The listed recommendations are those that are thought to impact on respiratory protection or respiratory protection programs.

**Generation of Aerosols:** During treatment, precautions should be taken to minimize circulation of feathers and dust (e.g., by wet mopping the floor frequently with disinfectants, making liberal use of oil-impregnated sweeping compounds when sweeping between moppings and preventing air currents and drafts in the area). Contamination from dust can be reduced by spraying the floor with a disinfectant or with water before sweeping it. To prevent aerosolization of particles, the use of vacuum cleaners is strongly discouraged.

**Disinfection:** The organism is resistant to drying and can remain infective for several months. Because *C. psittaci* has a high lipid content, it is susceptible to most disinfectants and detergents. In the clinic or laboratory, a 1:1000 dilution of quaternary ammonium compounds (alkyldimethylbenzylammonium chloride [e.g., Roccal® or Zephiran®]) is effective, as is 70% isopropyl alcohol, 1% Lysol®, 1:100 dilution of household bleach (i.e., 2.5 tablespoons per gallon [10 mL/L]), or chorophenols. All items that cannot be adequately disinfected (e.g., wooden perches, nest material, and litter) should be discarded.

The quartenary ammonium compounds and household bleach dilution could be used for disinfecting contaminated respirators that will be reused. The filters cannot be disinfected so they should be discarded.

**Medical:** Take measures to protect persons at high risk from becoming infected. If respiratory illness develops in an exposed person, a physician should initiate early and specific treatment for
psittacosis. Recovery from a psittacosis infection does not confer immunity. No vaccine is available. Reinfection can occur. This means disease preventive measures are very important.

**Signs and Symptoms:** Workers exposed to birds should be informed of the need to seek medical attention if they develop influenza-like symptoms or other respiratory illness. Cases of symptomatic infection typically are characterized by abrupt onset of fever, chills, headache, malaise, and myalgia. A nonproductive cough usually develops.

**Respiratory Protection:** According to the CDC, “persons at risk should be instructed to wear a respirator with at least an N95 rating (or a dust/mist mask if an N95 or higher efficiency respirator is not available) when cleaning cages, or handling infected birds. Surgical masks will most likely not be effective in preventing transmission. When necropsies are performed on birds that are potentially infected, additional precautions should be taken, including a) wetting the carcass with detergent and water to prevent aerosolization of infectious particles and b) working under an examining hood that has an exhaust fan”.

**3M Position**

While the CDC does not state what type of respirator to be used with the N95 filter, perhaps they were thinking of a half mask respirator with N95 filters since they mention the “dust/mist mask”. Since the safe level of exposure to aerosols containing *C. psittaci* is not established, there is no assurance that the use of a respirator will prevent psittacosis. If a respirator is selected, a respiratory protection program meeting all the elements of the Occupational Safety and Health Administration (OSHA) standard, 29 CFR 1910.134, must be established. The CDC’s respirator recommendation as a measure of protection against *C. psittaci* is based on certification testing by the National Institute for Occupational Safety and Health (NIOSH). No biological testing is conducted by NIOSH and 3M makes no claims other than their intended use in occupational settings.

When 3M respirators are properly worn by a trained and fit tested worker and the respirator is used within a respiratory protection program meeting the OSHA requirements, the aerosol concentration level in the wearer’s breathing zone can be reduced and thus while the probability of *C. psittaci* infection may be lessened, there is no assurance that *C. psittaci* infection will be prevented.

**References**
