



Chlamydia psittaci

Chlamydia psittaci is a small, Gram-negative bacterial pathogen responsible for causing respiratory psittacosis (also known as ornithosis); a zoonotic infection transmitted to humans from infected avian and mammalian species. Following an incubation period of 1-4 weeks, disease with *C. psittaci* can present as a mild flu-like illness, but can also lead to severe atypical pneumonia and non-respiratory health conditions, particularly in susceptible individuals. For those with serious disease and in pregnancy, infection may be life-threatening and relapses can occur.

Prior to taxonomic changes based on 16S sequencing, the term '*C. psittaci*' collectively referred to species currently known as *C. psittaci*, *C. abortus*, *C. caviae* and *C. felis*. In 1999 *C. psittaci* was divided into these four species and all members were renamed as the '*Chlamydophila*' until reversion of the genus name back to *Chlamydia* in 2015. Each of the members have different principal hosts and tissue tropisms and therefore have both different disease presentation and divergent risk factors for humans (See Table 1 below). Current nomenclature refers to a single avian species as *Chlamydia psittaci*.

Table 1: Diseases caused by *Chlamydiae* in man and in animals¹.

Genus	Host		Pathology in animals		Route for human transmission	Pathology in humans	
	Principal	Occasional	Common signs	Severe disease		Common signs	Uncommon / severe disease
<i>Cp. psittaci</i>	Birds (parrots, domestic poultry)	Dogs, horses, pigs	Hyperthermia, anorexia, lethargy, diarrhoea	Conjunctivitis pneumonia, pericarditis, death	Inhalation	Influenza-like illness	Endocarditis, encephalitis, pneumonia, death
<i>Cp. abortus</i>	Ruminants (sheep, goats, cattle)	Pigs, deer, horses, rabbits, koalas, guinea pigs, mice	Abortion, stillbirth, epididymitis	Endometritis	Inhalation	Influenza-like illness	Pneumonia, abortion, renal failure, respiratory distress, death
<i>Cp. felis</i>	Cats	–	Conjunctivitis	Pneumonia, chronic salpingitis	Direct contact	Conjunctivitis	Endocarditis, liver failure
<i>Cp. caviae</i>	Guinea-pigs	–	Conjunctivitis, genital tract infection	–	Direct contact	Conjunctivitis	–

C. psittaci is capable of infecting a range of birds and poultry, as well as mammals such as cattle, pigs, sheep and horses, with occasional outbreaks affecting the poultry industry. There are nine known genotypes: A-F, E/B, M56 and WC, and all capable of infecting humans².

Birds are particularly efficient at distributing *C. psittaci* owing to their high mobility, and wild populations can be particularly problematic for transmission due to their large migration radii. Transmission to humans most often occurs through inhalation of aerosolised excreta or secretions from infected birds, therefore people working with or exposed to birds on a regular basis such as zoo workers, pet-shop owners and poultry farmers are at the highest risk of infection. Despite this, other cases where no avian contact has been described have also been recorded³. In England and Wales, between 25 and 50 laboratory confirmed cases of *C. psittaci* are typically recorded each year⁴.

As culture is avoided due to the infectious risk to laboratory staff, diagnostic testing often relies on serology where a four-fold increase in IgM is considered diagnostic. However, polymerase chain reaction (PCR) offers a safer, more specific and rapid way to determine the presence of this pathogen where clinical findings or a history of avian contact indicate the possibility of a *C. psittaci* infection.

Micropathology Ltd

At Micropathology Ltd, we use a semi-nested PCR for the qualitative detection of *C. psittaci* with end point visualisation by ethidium bromide agarose gel electrophoresis. Nasopharyngeal swabs and bronchoalveolar lavages (BALs) are UKAS accredited sample types for this assay, however other samples may be tested, and reported alongside a caveat stating that the assay is not UKAS accredited for testing these sample types. This assay may also detect *C. abortus*, *C. felis* and *C. caviae*, however these organisms may be distinguished using sequencing of amplicon produced using this assay. Turnaround times are stated in the user manual (<http://www.micropathology.com/customer-downloads-handbook.php>) with results usually available in practice much sooner than the given time frame. Where there is a delay, we are usually confirming a result and addressing clinical data given with the specimen.

References:

¹ UK Standards for Microbiology Investigation, Chlamydial Zoonotic infections Virology | V 57 | Issue no: 2.1 | Issue date: 27.10.16. [V 57 - Chlamydial zoonotic infections \(rcpath.org\)](http://www.rcpath.org)

² Van Lent S, Piet JR, Beeckman D, van der Ende A, Van Nieuwerburgh F, Bavoil P, Myers G, Vanrompay D, Pannekoek Y. Full genome sequences of all nine Chlamydia psittaci genotype reference strains. J Bacteriol. 2012 Dec;194(24):6930-1. doi: 10.1128/JB.01828-12. PMID: 23209198; PMCID: PMC3510619.

³ John Mair-Jenkins, Tracey Lamming, Andy Dziadosz, Daniel Flecknoe, Thomas Stubington, nMassimo Mentasti, Peter Muir, and Philip Monk (2018) A Psittacosis Outbreak among English Office Workers with Little or No Contact with Birds, August 2015. PLoS Curr. 2018 April 27; 10

⁴ Common animal-associated infections quarterly reports: 2018: United Kingdom Health Security Agency (UKHSA) Quarterly reports on confirmed cases of non-foodborne zoonoses reported in England and Wales.