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# PASTEURELLA MULTOCIDA INFECTION IN CATS

## ABCD guidelines on prevention and management



Albert Lloret, Herman Egberink, Diane Addie, Sándor Belák, Corine Boucraut-Baralon, Tadeusz Frymus, Tim Gruffydd-Jones, Katrin Hartmann, Margaret J Hosie, Hans Lutz, Fulvio Marsilio, Karin Möstl, Maria Grazia Pennisi, Alan D Radford, Etienne Thiry, Uwe Truyen and Marian C Horzinek

**Overview:** *Pasteurella* species are part of the normal oral flora of cats. They are also a common cause of infection in this species and an important zoonotic agent.

**Infection in cats:** *Pasteurella* species are commonly isolated from subcutaneous abscesses and pyothorax in cats. They may also cause secondary lower respiratory tract infection and have been associated with spinal empyema and meningoencephalomyelitis.

**Infection in humans:** Disease in humans mainly occurs after a cat bite or scratch, but may also be transmitted via respiratory secretions from cats in close contact with a person. Signs of local infection after a cat bite appear in a few hours (3–6 h). Severe disease and a fatal outcome mostly occur in immunocompromised people, but have also been reported in immunocompetent healthy individuals. Cat ownership by immunocompromised people may carry a risk.

### Bacterial properties

*Pasteurella multocida*, a Gram-negative, facultative anaerobic, non-spore-forming pleomorphic coccobacillus, is a commensal bacterium and part of the natural flora in the nasopharynx and upper respiratory tract of the cat.<sup>1,2</sup> In one study, a 90% carrier state in gingival margins was shown.<sup>1</sup> Several subtypes have been associated with human infections: *P. multocida* subspecies *multocida*, *P. canis*, *P. multocida* subspecies *septica*, *P. stomatis* and *P. dagmatis*.<sup>3</sup>

### Epidemiology and pathogenesis

Cat bites frequently become infected (20–80%), and *P. multocida* is the most commonly cultured bacterium from infected bite wounds.<sup>1</sup> Apart from bites, scratches and licks, close contact has also been sufficient for infection. Bacteria usually enter through skin wounds, but inhalation of secretion droplets from the upper respiratory tract is another possible source.<sup>4</sup>

### Clinical presentation

*P. multocida* is one of the most frequent pathogens in infected skin wounds and subcutaneous abscesses.<sup>5</sup> It is also one of the common bacteria producing pyothorax in cats.<sup>6–8</sup> *Pasteurella* species may also cause secondary lower respiratory tract infection and have been associated with spinal empyema and meningoencephalomyelitis.<sup>9,10</sup>

#### European Advisory Board on Cat Diseases

The European Advisory Board on Cat Diseases (ABCD) is a body of experts in immunology, vaccinology and clinical feline medicine that issues guidelines on prevention and management of feline infectious diseases in Europe, for the benefit of the health and welfare of cats. The guidelines are based on current scientific knowledge of the diseases and available vaccines concerned.

The latest version of the *Pasteurella multocida* infection in cats guidelines is available at [www.abcd-vets.org](http://www.abcd-vets.org)



## Zoonotic potential

*P. multocida* infection leads to an important zoonotic disease.<sup>4</sup> Local infections are common, including in immunocompetent persons, and the high prevalence of the bacterium is an indication for the use of prophylactic antibiotic therapy (amoxicillin–clavulanate) after a cat bite [EBM grade II].<sup>1</sup> Septicaemia and severe, even fatal, disease may occur, especially in immunocompromised patients, patients with cirrhosis and those undergoing dialysis. In these circumstances the risk of keeping a cat must be discussed with the owner, especially because

transmission of the bacterium may occur just through close contact – not necessarily after a bite or scratch.

### Zoonosis

*P. multocida* infection leads to an important zoonotic disease.<sup>4</sup>



## Diagnosis

Diagnosis is made on the basis of bacterial culture from infected tissues or secretions. *Pasteurella* grows readily on chocolate and sheep-blood agar media, but fails to grow on MacConkey agar, the usual medium for Gram-negative bacteria. Strains are usually catalase-, oxidase-, indole- and sucrose-positive.

## Treatment

Penicillins and potentiated beta-lactams (amoxicillin-clavunilate potassium) are first-line antibiotics for the treatment of *Pasteurella* species infections [EBM grade II].<sup>1,5,12</sup>

## Disease in humans

*P. multocida* infection typically produces cellulitis and/or abscesses at the site of the bite or scratch, usually 3–6 h after inoculation.<sup>11,12</sup> Occasionally, the local infection can progress to necrotising fasciitis, septic arthritis and osteomyelitis.<sup>13</sup> Respiratory infection, pneumonia and bronchopneumonia also are common, mostly in patients with pre-existing lung disease.<sup>12</sup> Less frequently, a disseminating infection may produce septicaemia, which may lead to septic shock, meningitis, endocarditis, peritonitis, arthritis and other serious consequences.<sup>12</sup>

*Pasteurella* peritonitis transmission through a dialysis catheter after contact with a cat has been reported.<sup>14,15</sup>

Severe infections are usually seen in children, pregnant women, patients on chronic immunosuppressive therapy, and immunocompromised persons. Chronic liver disease and cirrhosis confer a particular risk of sepsis and peritonitis by *Pasteurella* species.<sup>16,17</sup> Although severe disease generally appears in immunocompromised persons, about one-third of septicaemic patients were previously healthy individuals.<sup>4</sup>

In addition to bites, scratches and licks, close contact with cats has also been sufficient for infection in humans.



Quinolones, cephalosporins and modern macrolides are also indicated.<sup>1</sup> In severe cases, therapeutic decision making must be based on antibiotic susceptibility tests.

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## Conflict of interest

The authors do not have any potential conflicts of interest to declare.

### EBM grades

The ranking system for grading the level of evidence of various statements within this article is described on page 533 of this Special Issue.

## KEY POINTS

- ❖ *Pasteurella* species are commensal bacteria present in the oral cavity of most cats.
- ❖ Cat bites, scratches or even simply close contact may transmit *Pasteurella* species to humans.
- ❖ Local infections are common in persons after a cat bite.
- ❖ Severe infections, septicaemia and peritonitis may occur in immunocompromised people, and less frequently in immunocompetent individuals in contact with cats.
- ❖ *Pasteurella* is common in subcutaneous abscesses and pyothorax in cats.
- ❖ Diagnostic confirmation of *Pasteurella* species infection is not difficult, as it grows readily in routinely used bacterial culture media.
- ❖ Penicillins and potentiated beta-lactams are first-line antibiotics in both humans and cats.
- ❖ The zoonotic potential is important, especially in immunocompromised people, and cat ownership in these situations must be discussed.



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