What are mycobacterial infections in cats?

- **Mycobacterium** spp. infections in cats can be divided into three main groups: tuberculosis complex group (TB complex), feline leprosy syndrome (FLS) and non-tuberculous or atypical mycobacteria (NTM).
  - The **TB complex** includes *M. tuberculosis* (rare in cats), *M. bovis* and *M. microti*. Infections due to *M. bovis* and *M. microti* can be common in cats in TB endemic areas. Risk factors include contact with infection reservoir hosts (e.g. voles) or with environmental contamination (badgers). The cat is a spillover host and the risk of cat-to-human transmission is considered very low.
  - **FLS** is mainly caused by *M. lepraemurium*. Risk factors include contact with small rodents. Zoonotic potential is negligible.
  - **NTM** can be caused by a large number of saprophytic species present in the environment. The zoonotic risk is very low. Only *M. avium* has a major zoonotic potential, especially in immunocompromised people.

Infection

- Major risk factors are: an outdoor lifestyle, living in a TB endemic area and contact with small rodents (hunting).
- Most infections occur in immunocompetent cats, but cases of *M. avium* infection have been reported in immunocompromised cats. Siamese and Abyssinian cats may be predisposed to *M. avium* infection.
- Infection usually starts in the skin (rodent bites, contamination of wounds) and may spread systemically. FLS infections rarely become systemic.
- Systemic infections (lungs, liver, mesenteric lymph nodes, bone, eye and CNS) without cutaneous involvement are rare, and generally due to species in the TB complex or *M. avium*.

Clinical signs

- Skin lesions: solitary or multiple dermal nodules, skin ulcers and non-healing draining tracts, regional lymphadenopathy.
- Extensive granulomatous panniculitis is seen with NTM infections or following contamination of a surgical wound.

- Fever, respiratory signs (cough, dyspnoea), uveitis, organomegaly, generalised lymphadenopathy, signs of bone involvement (pain, lameness) can occur in case of systemic disease.

Diagnosis

- Skin lesions with a granulomatous inflammatory pattern on cytology or histopathology should be considered suspicious of mycobacterial infection.
- Acid-fast (e.g. Ziehl-Neelsen or ZN) staining should be performed on cytology or histology samples with granulomatous changes.
  - The presence of acid-fast bacteria is likely to indicate mycobacteria. Species identification is not possible.
  - The absence of acid-fast bacteria does not rule out mycobacterial infections. Samples should be submitted for culture and/or PCR for further investigation (keep some sample material in sterile frozen storage for future culture studies if required).
- Specific culture (in reference laboratories) and/or PCR and sequencing of fresh samples are the diagnostic tests of choice to confirm infection and identify the mycobacterial species. PCR can also be performed on paraffin-embedded tissue samples.

Disease management

- In many countries, euthanasia of infected animals is recommended taking into account the zoonotic risk and prognosis, depending on the species involved.
- Treatment compliance and zoonotic risk should be discussed with the owners prior to treatment, in particular if there are immunocompromised members of the household.
- An oesophagostomy tube or gelatine capsules may be used to facilitate compliance.
- Treatment is based on the combination of two or three antibiotics, usually rifampicin, plus a macrolide plus a fluoroquinolone. The choice of antibiotics should be based on the type of mycobacteria or antibiotic susceptibility tests, if available.
Mycobacteriosis in cats

- Long-term (> 6 months) treatment is recommended, as insufficient treatment may lead to relapses or the development of resistance.
- The surgical excision of nodules may be curative in some cases of FLS, due to the localised nature of the disease. Surgical de-bulking or debridement may be needed in some cases presenting with extensive severe disease (NTM infections), but wound dehiscence is a risk.
- Prognosis is guarded to favourable.

Zoonotic risk

- The TB complex species and *M. avium* complex species are zoonotic.
- Cats are spillover hosts for mycobacterial infections, so the risk of cat-to-human transmission is considered very low. The greatest zoonotic risk is the inhalation of organisms from cats with respiratory disease or the contamination of wounds with bacteria.