



Summary of recommendations for general practitioners based on the clinical consensus guidelines.

### Diagnosis and treatment of demodicosis in dogs and cats

Clinical consensus guidelines of the World Association for Veterinary Dermatology

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#### Pathophysiology

- Demodicosis is caused by a proliferation of *Demodex* mites, which are normal commensal parasites in the hair follicles of mammals, including dogs and cats. Puppies acquire these mites from their mother during the first days of life.
- *Demodex* mites in dogs: *D. canis* is most common. The other two demodex mites are the longer-bodied *D. injai* and the short-bodied *D. cornei*.
- *Demodex* mites in cats: *D. cati*, *D. gatoi* (contagious and pruritic), and a third unnamed species. *D. gatoi* inhabits the stratum corneum, unlike most *Demodex* species.
- Demodicosis in adult dogs and cats may be associated with immunosuppression (Leishmaniosis, hyperadrenocorticism, hypothyroidism, and glucocorticoid treatment or chemotherapy). In contrast, the juvenile form in young dogs may have a genetic base. Severe stress, malnutrition, and endoparasites are other important contributing factors.
- Multiple studies document **increased** levels of CD8+ cells & Toll-like receptor (TLR)-2 as well as serum levels of IL-2, IL-5, IL-6, IL-18, IL-10, and TGF beta and **reduced** levels of TNF-alpha, TLR-4 and TLR-6 and low circulating CD4+ T cells in dogs with demodicosis compared to healthy controls.

#### Clinical signs

##### CANINE

- Dogs can have two forms:
  - Generalized (> 4 lesions or > 50% body involvement)
  - Localized
- Early signs can be non-inflammatory alopecia and/or inflammatory dermatitis with mild erythema, comedones, and scaling that may be focal or may become generalized.
- Follicular plugging/casts, papules and pustules and hyperpigmentation can be seen. Pedal demodicosis is inflammatory with marked hyperpigmentation.
- *Demodex injai* has been over-represented in terrier breeds and their crosses. It may cause lesions similar to *D. canis*, but the unique and consistent sign is marked greasiness of the dorsal trunk.

##### FELINE

- *Demodex cati* can cause localized or generalized signs with erythema, alopecia, scale, and crusting similar to dogs. The pruritus is variable.
- *Demodex gatoi*, a contagious mite, can cause mild to severe pruritus with associated secondary lesions. The lesions are predominantly seen at the hind half of the body, including the caudal back, hind limbs, inguinal and ventral abdomen. It may mimic allergic dermatitis.

### Diagnostic tests (in order of most reliable and down to least)

- **Deep skin scraping:** Multiple skin scrapings are typically taken to confirm a suspicion of demodicosis. Finding more than one mite (at any stage) is suggestive of demodicosis.
- **Trichogram:** An alternate method for the diagnosis of demodicosis, particularly in areas inaccessible for scrapings (e.g., periocular, interdigital).
- **Tape strips** – This may be an alternative, but the affected skin should be squeezed before performing the cytological impression.
- **Skin biopsy** – It is typically not used to confirm a diagnosis of demodicosis, but rather to diagnose the potential underlying cause associated with it, or for certain breeds such as the Shar-pei where the skin is extremely thick and difficult to scrape.
- **Cytology: occasionally demodex mites can be found as “ghost mites” in cytological preparations, especially in severe demodicosis cases.**

### Therapeutic Recommendations

#### GENERAL RECOMMENDATIONS

- Most cases of mild localized disease resolve spontaneously.
- Miticidal treatment is recommended to be used for 4 weeks beyond two negative scrapings.
- Monitoring is required for at least 12 months for those cases that respond slowly before declaring them cured.
- Systemic antibiotics should be used only in cases with severe deep pyoderma.
- Topical antibacterial shampoos are generally adequate for mild to moderate cases of bacterial pyoderma.

#### CANINE

- **Amitraz:** Dogs with a long hair coat should be clipped first. Antimicrobial shampoo treatment should be performed before the amitraz treatment. Amitraz is used as a 0.025-0.05% solution every 1-2 weeks. Allergic reactions, skin irritation, hypotension, bradycardia, hypothermia, and sedation are potential side effects. It should be used with caution on small dogs and cats.
- **Ivermectin:** It is not licensed for use in canine demodicosis due to its potential toxicity. If justified and in exceptional cases, oral doses of 300–600 mg/kg p.o. once daily (at an incremental dose of 0.1mg/kg until the adequate dosage is reached) can be used and continued for four to eight weeks beyond parasitological cure. **Ivermectin should not be used in collie breeds, Australian shepherd dogs, Shetland, and old English sheepdogs or mixes thereof due to** a possible ABCB1-D1 (MDR-1) mutation. Dogs can be tested for the existence of the before mentioned mutation (blood test) before beginning ivermectin therapy through a number of laboratories.
- **Moxidectin:** It is not licensed for use in canine demodicosis. Case reports suggest 0.3– 0.5 mg/ kg p.o. daily can be recommended as an effective therapy after a daily dose increase similar to that recommended for ivermectin. The spot-on containing 2.5% moxidectin and 10% imidacloprid can be recommended as a weekly treatment for dogs with juvenile-onset and mild forms of the disease.
- **Doramectin:** It is not licensed for use in canine demodicosis. Case reports suggest a subcutaneous injection at a dose rate of 0.6 mg/kg weekly can be used.
- **Milbemycin oxime:** Administered orally at a dose of 1–2 mg/kg daily is effective and is licensed in some countries. **In dogs with an MDR1 gene defect, lower doses should be used since ataxia has been observed as a potential side effect.**
- **Isoxazolines:** These drugs include fluralaner, sarolaner, afoxolaner, and lotilaner. They are considered to be safe and very effective in the treatment of demodicosis despite the absence of

long-term studies. Adverse effects are rare to uncommon; the most commonly reported are transient gastrointestinal signs in the general population. Precaution should be taken in dogs with neurological signs, especially epilepsy.

- **Fluralaner** administered at 25 mg/kg 3-monthly from 6 months of age.
- **Sarolaner**, administered at 2mg/kg monthly, can be administered from 8 weeks of age.
- **Lotilaner**, administered at 20 mg/kg monthly, can be administered from 8 weeks of age.
- **Afoxolaner** is administered at least 2.5 mg/kg monthly and can be used from the age of 8 weeks.

#### FELINE

- Lime sulphur dips or washes every 5-7 days are reported to be effective. Skin irritation, disagreeable odor, temporary yellow staining of haircoats, staining of jewelry, clothes, wood, and other material are possible side effects.
- Spot-on formulations containing moxidectin/imidacloprid for 10 weeks at a weekly interval are effective in cats with *D. gatoi* infestations.
- Oral fluralaner has been successfully used in a cat with demodicosis, but further studies are warranted. The spot-on formulation is officially licensed for use in cats.

**The Committee strongly recommends that severely affected and treated dogs or their parents should not be used for breeding, and intact female dogs should be spayed in order to prevent further relapses.**

#### Zoonotic implications

Demodicosis in dogs and cats is not considered zoonotic.

*Summary authored by Dr. Kallahalli Umesh, WAVD Education Committee, 2023*