

Canine Demodicosis: Overview & Update

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Canine demodicosis is an inflammatory condition of the skin caused by increased numbers of *Demodex* spp mites that are normally present in low numbers in the hair follicles and sebaceous glands.¹ At least 2 different species of mites (ie, *D canis*, *D injai*) are responsible for canine demodicosis. *D cornei* was once considered a separate species, but recent literature suggests it is a variant of *D canis*.²

Clinical signs include patchy to diffuse alopecia, erythematous papules, pustules, and comedones. Some patients, especially those infested with *D injai*, may have severe seborrhea oleosa.³ Secondary infections with bacteria and/or yeast are common and may result in more severe lesions.¹ (See **Figure 1**.)

Presentation can be localized or generalized. Localized demodicosis typically is limited to less than 6 patchy alopecic regions on the head or limbs,¹ whereas the

See related video, **Deep Skin Scrape**, at brief.vet/skin-scrape



▲ **FIGURE 1** Adult-onset demodicosis with severe, methicillin-resistant deep pyoderma with hemorrhage and resulting hemorrhagic crusts
Figure courtesy of Katherine A. Doerr-Siegfried, DVM, DACVD

Frequently Diagnosed Breeds

Demodicosis occurs more frequently in these breeds.

- American Staffordshire terrier
- Boston terrier
- English bulldog
- Shar-pei
- Staffordshire bull terrier
- West Highland white terrier

generalized form (see **Figures 2** and **3**) can affect an entire body region or 3 or more paws.¹

Dogs may be affected at any age. Juvenile-onset demodicosis typically presents in patients younger than 1 year of age, and presentation is usually localized.¹ It is suspected that some cases are due to a defect in the immune system that may be genetically linked, as evidenced by certain breed predispositions. However, immunosuppression caused by internal parasites or malnutrition may also predispose younger patients to a proliferation of *Demodex* spp mites.^{4,5} Patients that show clinical signs of adult-onset demodicosis are often older than 4 years of age. Fifty percent of these patients have an underlying condition—typically a disease that suppresses the immune system and predisposes them to demodicosis.⁶

Demodicosis can occur in any canine breed, but some breeds are more frequently diagnosed.^{1,4} (See **Frequently Diagnosed Breeds**.)



▲ **FIGURE 2** Adult-onset generalized demodicosis with secondary *Malassezia* spp dermatitis and bacterial pyoderma; generalized demodicosis affects an entire body region or 3 or more paws¹

Figures courtesy of Katherine A. Doerr-Siegfried, DVM, DACVD



▲ **FIGURE 3** Closer view of patient in **Figure 2**; note the diffuse comedones

Demodicosis can occur in any canine breed, but some are more frequently diagnosed.

Diagnosis

Canine demodicosis is diagnosed through microscopic observation of mites in deep skin scrapings (see **Figure 4**) and/or trichograms.¹ Deep skin scrapings are obtained by scraping the skin in the direction of the haircoat with a dulled surgical blade or a spatula until capillary oozing is obtained. The deep skin scraping or trichogram is positive when fusiform eggs, 6- or 8-legged larvae, 8-legged nymphs, or 8-legged adults are seen.¹ *D canis* adult mites typically are 40 × 250-300 μm with a moderately long tail. *D injai* adult mites are approximately 40 × 350 μm with a longer tail.¹ When pododemodicosis or chronic fibrosing lesions are present, or the patient is a shar-pei, mites may be difficult to obtain by skin scraping and a skin biopsy may be required for diagnosis.¹

In patients with adult-onset generalized demodicosis, additional diagnostics (eg, CBC, serum chemistry profile, thyroid function tests) may be required to identify underlying diseases that can suppress the immune system (eg, hypothyroidism, hyperadrenocorticism, malnutrition, neoplastic disease).⁷



▲ **FIGURE 4** Adult *D canis* mite seen on a deep skin scraping
Figure courtesy of Katherine A. Doerr-Siegfried, DVM, DACVD

TABLE 1 | Treatment Options for Canine Demodicosis

Treatment	Frequency* Extra-label	Adverse Effects
Amitraz	Once every 7 days ¹⁵	Sedation, allergic reaction, hypotension, hyperglycemia, and bradycardia ¹⁶
Ivermectin	Once every 24 hours ¹	Neurotoxicity, depression, hypothermia, vomiting ¹⁷
Milbemycin	Once every 24 hours ¹⁸	Neurotoxicity, mydriasis, hypersalivation, ataxia, pyrexia, seizures ¹⁷
Doramectin	Once every 7 days ¹⁸	Pupil dilation, lethargy, blindness, coma ¹⁷
Doramectin	Twice every 7 days ¹⁹	Pupil dilation, lethargy, blindness, coma ¹⁷
Moxidectin	Once every 7 days ²⁰	Topical combination with imidacloprid: well-tolerated in dogs ¹⁷
Afoxolaner	Once every 14 days ¹³	Seizures, vomiting, dry skin, diarrhea, lethargy, anorexia ¹⁷
Fluralaner	Once every 90 days ¹⁴	Decreased appetite, hypersalivation, diarrhea, vomiting ¹⁷
Lotilaner	Once every 28 days ²¹	Vomiting, diarrhea, lacrimation, hyperemic gingiva ²²
Sarolaner	Once every 30 days ¹²	Vomiting, diarrhea, lethargy, tremors, ataxia ¹⁷

*The only labeled treatment is amitraz every 2 weeks. The treatment plans recommended in this table are extra-label but are supported by research and the author's personal experience.

Treatment

Localized demodicosis may resolve without treatment within 2 months.¹ In breeding dogs, treatment should be withheld initially to determine whether the condition will resolve on its own or progress to generalized demodicosis. If progression occurs, the dog should not be used for breeding because it may pass the disease to subsequent generations.¹

In the United States, amitraz dip is the only product licensed to treat demodicosis.⁸ Extra-label treatments such as macrocyclic lactones (eg, avermectins, milbemycins) are used more often than amitraz

because administration is easier and more convenient.^{9,10} These products should not be used in breeds susceptible to the *ABCBI-1Δ* (*MDRI*) gene mutation.^{1,11} Examples of macrocyclic lactones include oral ivermectin or doramectin, topical moxidectin, and oral milbemycin. More recently, the isoxazoline class of parasiticides (eg, afoxolaner, fluralaner, lotilaner, sarolaner) has shown promise as an extra-label option.¹²⁻¹⁴ (See **Table 1**, page 23.)

Patients should be monitored with monthly deep skin scrapings from the 3 to 5 most severely affected areas, with treatment continuing for 30 days after the second negative monthly deep skin scrapings.⁵ A skin scraping is considered negative when no dead or live mites are observed. A patient is not considered “cured” until 1 year past the last negative deep skin scraping.¹ Juvenile-onset demodicosis has a higher chance of being cured if the patient has no underlying health concerns. Patients with adult-onset demodicosis may require chronic therapy unless an underlying disease process is discovered and treated.¹

Conclusion

The veterinary team should be knowledgeable about this disease for the sake of clients and patients. (See **Demodicosis Talking Points**.) Demodex mites are natural inhabitants of dogs’ skin and sebaceous glands. A weakened immune system can allow mite populations to increase, resulting in alopecia, erythema, and scabbing. Localized and generalized forms of canine demodicosis can occur, and onset can start at less than 1 year of age (ie, juvenile-onset) or older than 4 years of age (ie, adult-onset). Localized demodicosis may resolve without treatment, whereas adult-onset demodicosis is often associated with an underlying condition that requires concurrent therapy. ■

Demodicosis Talking Points

Following are the key points to communicate to clients:

- Juvenile-onset canine demodicosis is more likely to be localized and respond to appropriate treatment or resolve without medical intervention.
- Juvenile-onset generalized demodicosis can be hereditary, and breeding animals should be neutered.¹
- Underlying conditions should be considered when lesions occur for the first time in patients older than 4 years of age.
- Treatment may fail if an underlying condition and/or secondary skin infection is not treated concurrently or if therapy is discontinued too early.
- The patient is considered cured if a negative deep skin scraping is obtained 1 year after the last negative deep skin scraping.¹
- Approximately 10% of patients cannot be cured,¹ and clients must be advised of this possibility and the available options for long-term therapy.¹

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FUN FACT: In her spare time, Katherine enjoys surfing, cycling, and spending time with her family.

Fifty percent of adult-onset demodicosis patients have an underlying condition, typically a disease that suppresses the immune system.