

Peer Reviewed

Karen A. Moriello, DVM, Diplomate ACVD
University of Wisconsin–Madison

Treatment of Demodicosis in Dogs & Cats

This article is the second of two articles on demodicosis in dogs and cats. The first article (May 2011, page 18) covered diagnosis, including causes, signalment, laboratory testing, and risk factors, while this article addresses treatment measures.



PROFILE

Definition

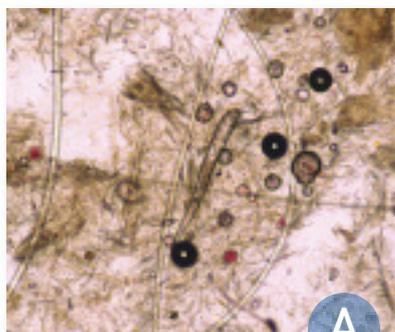
- Demodicosis arises when *Demodex* mites, which are normal flora in dogs and cats, proliferate in the skin (usually the hair follicle).
- The incidence and prevalence of the disease are unknown.
- Generalized demodicosis in dogs is associated with heritable factors, although no known heritable tendencies have been found in cats.



TREATMENT

Inpatient or Outpatient

- Demodicosis in dogs and cats can be treated on an outpatient basis.
- Concurrent bacterial/yeast overgrowth must be treated so that therapy does not fail. If there is a lack of appropriate response, the skin should be cultured to rule out a possible methicillin-resistant *Staphylococcus intermedius* group (SIG) infection.
- Dogs with adult-onset demodicosis and complications from underlying disease or dogs with deep pyoderma, fever, and sepsis may require hospitalization for supportive care



Three species of *Demodex* mites affect dogs: *D canis* (not shown), the long-bodied mite *D injai* (A), and the short-bodied mite *D cornei* (not shown); while two species affect cats: the long-bodied *D cati* (not shown) and the short- and wide-bodied *D gatoi* (B).

and diagnostic testing. Hospitalization of cats is rare and is related to medical issues underlying *D cati* infestations.

Medical

- Treat fever, pain, sepsis, and dehydration in dogs with concurrent deep pyoderma.
- Provide pain medication for dogs with pododemodicosis if needed.
- Recommend sedation and clipping of the hair coat (especially long-haired breeds) to facilitate medicated bathing.

CONTINUES

SIG = *Staphylococcus intermedius* group

The incidence and prevalence of demodicosis are unknown.

- Institute aggressive antimicrobial therapy pending culture and sensitivity.
- Initiate concurrent topical antimicrobial shampoo therapy (eg, benzoyl peroxide, chlorhexidine).
- Monitor patients with severe generalized demodicosis during initial therapy for development of peripheral edema; systemic miticidal drugs can cause massive mite kills and obstruction of lymphatics.

Tx at a Glance

- **All treatment plans must be “global”** in scope and address the pet’s overall health; otherwise, miticidal therapy will fail. This is especially true in dogs with concurrent bacterial pyoderma or yeast overgrowth.
- **Feline otic demodicosis, *D gatoi* infestation, and *D cati* infestation** require treatment; the latter also requires evaluation for an underlying disease.
- **Localized canine demodicosis** may resolve without treatment, but these patients must be carefully monitored because in a small number of cases the disease will become generalized.
- **Generalized juvenile demodicosis** requires treatment. Owners must be aware that treatment will be lengthy and that response to treatment is often not evident until after 3 to 4 months of therapy. Miticidal therapy may need to be changed depending on the dog’s tolerance or response.
- **Adult-onset canine demodicosis** requires both treatment and evaluation for underlying disease.

Demodicosis in dogs & cats can be treated on an outpatient basis.

Nutritional Aspects

- Ensure that clients are feeding complete, balanced, age-appropriate diets, especially if the pet’s body condition is poor.

Client Education

- **Dogs**
 - ▶ Explain that localized demodicosis may progress to generalized demodicosis in about 10% of affected dogs.
 - ▶ Clients need to thoroughly understand the cost and duration of treatment (see **In General**, page 20), especially for juvenile generalized demodicosis, and the possibility of relapse or lack of cure.
 - ▶ Emphasize the need for a thorough workup of dogs with adult-onset demodicosis and the implications of underlying disease; provide the pros and cons of treatment options.
- **Cats**
 - ▶ Explain the contagious nature of *D gatoi* and the need to treat all in-contact cats.
 - ▶ There is a strong likelihood of an underlying predisposing disease in cats with *D cati*, but cost of evaluation to uncover the cause needs to be considered.
 - ▶ Emphasize the pros and cons of treatment.



MEDICATIONS

Dogs

- **Amitraz^{1,2}**
 - ▶ Product availability is variable.
 - ▶ Use once weekly (extralabel use) by sponging onto the whole body; do not rinse off; apply thoroughly; do not let dog become wet between treatments.
 - ▶ Clip long-haired dogs to maximize contact with skin.
 - ▶ Do not use on dogs with deep pyoderma or open areas of sloughed skin.
 - ▶ Do not use concurrent monoamine oxidase inhibitors (MAOIs), clomipramine, selegiline, selective serotonin-reuptake inhibitors (fluoxetine, sertraline paroxetine), tricyclic antidepressants (clomipramine, amitriptyline), opioids, or such over-the-counter medications as dextromethorphan.³

MAOI = monoamine oxidase inhibitor, SC = subcutaneous

PROGNOSIS

- **Feline *D gatoi* infestation**
 - Mortality is low.
 - Prognosis is good for cure.
- **Feline demodicosis (*D cati*)**
 - Prognosis for cure depends on whether underlying disease can be identified and cured. If not, cat will require long-term treatment.
- **Localized demodicosis in puppy**
 - Prognosis for cure is good, especially if lesions resolve without treatment.
- **Generalized juvenile demodicosis**
 - Prognosis for cure is variable to guarded.
 - Reported cure rates vary for generalized juvenile-onset demodicosis.
 - Most dogs do not die from this disease, but dogs are sometimes euthanized as a result of the cost of management. If after 6 months to 1 year of treatment it is clear the dog cannot be cured, lifelong management will be required, including long-term treatment and numerous recheck visits.

- ▶ Apply the product in the veterinary clinic; use good ventilation. Ensure that individuals applying the solution do not have respiratory disease or blood glucose issues, are not pregnant, and are not taking MAOIs.
- ▶ Adverse effects include pruritus, polyuria/polydipsia, sedation, tremors, collapse, and hypothermia.
- ▶ Use yohimbine to treat toxicosis.
- **Metaflumizone plus amitraz** is labeled for the treatment of demodicosis in veterinary patients, but the manufacturer has made the decision to discontinue the manufacture and sale of this product. There have been rare

FIND MORE...

For a convenient downloadable client handout on **Demodicosis in Dogs & Cats**, go to cliniciansbrief.com.

pemphigus foliaceus-like drug reactions associated with the use of this drug combination.⁴

- **Ivermectin** (extralabel use)
 - ▶ 300 to 600 mcg/kg PO Q 24 H
 - ▶ Aqueous formulations are more palatable than propylene glycol-based formulations
 - ▶ Adverse effects include lethargy, muscle tremors, mydriasis, ataxia, severe neurotoxicosis (depression, stupor, coma, ataxia, seizures, death), and blindness.
 - ▶ *ABCB* delta 1 gene (MDR1) testing can be used to screen for sensitivity.
 - ▶ Do not use in ivermectin-sensitive dogs or breeds.
 - ▶ Dogs should have a negative heartworm test result before use.²
- **Milbemycin oxime**
 - ▶ 1.5 to 2 mg/kg PO Q 24 H²
- **10% Moxidectin and 2.5% imidacloprid**
 - ▶ Can be used every other week; however, weekly applications appear to be more effective.^{5,6}
- **Doramectin**
 - ▶ 600 mcg/kg body weight SC once weekly. Do not use in ivermectin-sensitive dogs. Shown to be effective in 2 small studies.^{7,8}

Cats

- **Feline otic demodicosis**
 - ▶ Topical ivermectin or topical milbemycin oxime^{1,2}
- **Generalized demodicosis due to *D gatoi* or *D cati***^{1,2}
 - ▶ Lime sulfur (topical leave-on agent) safest treatment: use once or twice weekly for 6 weeks; higher concentration recommended for faster resolution (8 oz in 120 oz of water; mix thoroughly; cats tolerate better if water is warm). Apply thoroughly (rose-garden sprayer can be used) and soak coat and skin.

Pain medication for dogs with pododemodicosis may be needed.

CONTINUES

In cats, lime sulfur is the safest treatment for *D gatoi* or *D cati* demodicosis.

- Do not rinse off solution. Keep cats warm. Use in well-ventilated area.
- ▮ Milbemycin oxime: 1.0 to 2.0 mg/kg Q 24 H. Well tolerated by most cats; can cause vomiting and diarrhea and, rarely, neurologic signs.
- ▮ Aqueous ivermectin: 300 to 600 mcg orally Q 24 H; can be mixed in canned cat food; neurotoxicosis may develop.
- ▮ Doramectin: 600 mcg/kg once weekly by SC injection.⁷
- ▮ 10% Moxidectin and 2.5% imidacloprid: used in small number of cats anecdotally; administered weekly or every other week.
- **Response to treatment trial**
 - ▮ Treat all cats suspected of having *D gatoi* infestation for at least 6 weeks.

Precautions/Interactions

- Dogs without an ivermectin-sensitive genotype can show signs of toxicosis if ivermectin is given with P-glycoprotein inhibitors.
- Some more commonly used agents in veterinary dermatology include erythromycin, itraconazole, ketoconazole, cyclosporine, and tacrolimus. (Note: Oral tacrolimus use to date has been limited but may increase as this drug becomes more affordable.⁹)
- In most cases, application of topical tacrolimus will not result in significant absorption. In humans, however, if the agent is used over large areas, significant absorption is possible.¹⁰
- Do not use glucocorticoids in these patients.



FOLLOW-UP

Patient Monitoring

- Treatment continues in dogs until at least 2 or preferably 3 consecutive skin scrapings are negative at 1- to 2-week intervals.
- The most common treatment error is stopping treatment too soon.

Complications

- Relapse of generalized demodicosis in dogs is not uncommon.
- Adult cats or dogs with demodicosis due to an underlying disease may not be able to achieve remission unless that disease is treated, cured, or controlled.



FUTURE FOLLOW-UP

- Dogs with generalized demodicosis will require lifelong monitoring for relapses. A dog is considered “cured” when no relapses have occurred for at least 1 year.
- Cats with *D gatoi* can be cured, and relapse is not an observed problem. *D cati* infestation will not resolve unless medical disease is treated or managed.



IN GENERAL

- Feline otic demodicosis and localized canine demodicosis in puppies \$
- *D gatoi* infestation \$\$
- Complicated *D cati* infestation \$\$\$\$
- Generalized juvenile-onset demodicosis \$\$\$\$ to >\$\$\$\$\$
- Adult-onset canine demodicosis >\$\$\$\$\$

Cost Key

\$ = < \$100	\$\$\$\$ = \$500-\$1000
\$\$ = \$100-\$250	\$\$\$\$\$ = > \$1000
\$\$\$ = \$250-\$500	

See Aids & Resources, back page, for references & suggested reading.