

Diagnosis of Demodicosis in Dogs & Cats

This article is the first of 2 articles on demodicosis in dogs and cats—this first article will cover diagnosis of demodicosis; the second will address treatment, including medications, follow-up, complications, and prognosis.

P PROFILE

Definition

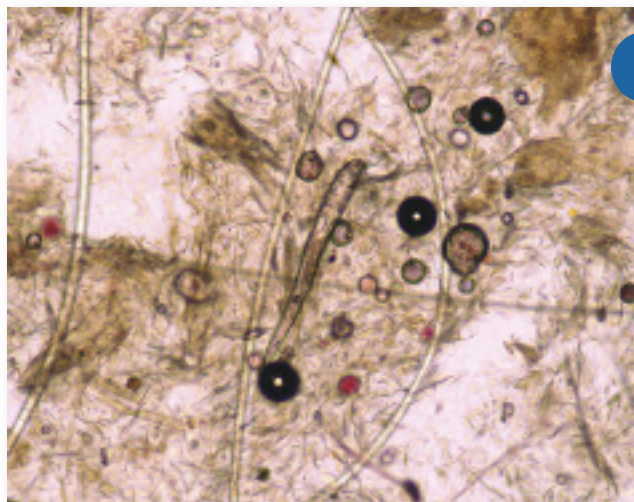
Demodicosis occurs when *Demodex* mites, which are part of an animal’s normal flora, proliferate in the skin (most often the hair follicle).

Causes

- Three species of *Demodex* mites affect dogs: *D canis*, *D injai* (long-bodied mite; **Figure 1**), and *D cornei* (short-bodied mite).^{1,2}
- Two species affect cats: *D cati* (long-bodied mite) and *D gatoi* (short- and wide-bodied mite; **Figure 2**).³

Signalment

- Demodicosis can develop at any age.
- No sex predilection is seen in dogs or cats.
- Breeds at highest risk for developing juvenile-onset generalized demodicosis due to *D canis* include shar-peis, pit bulls, Boston terriers, English bulldogs, boxers, miniature pinschers, Great Danes, and pugs.⁴
- Emerging evidence suggests that wire-haired fox terriers, and terriers in general, may also be predisposed to demodicosis.⁴⁻⁶
- There is no recognized breed predilection in cats.



1

Long-bodied canine *Demodex* mite (original magnification, 1000x)



2

Feline *Demodex* mites: *D cati* and *D gatoi* (original magnification, 40x)

CONTINUES

Canine demodicosis can mimic any skin disease; the rule of thumb is “demodicosis until proven otherwise.”

Risk Factors

- Risk factors that affect both dogs and cats include chronic severe disease states, neoplasia, long-term glucocorticoid use, and chemotherapy.
- In dogs, risk factors for juvenile-onset generalized demodicosis include pyoderma, coccidiosis, hookworms, short hair coat, and lack of participation in a preventive care wellness plan.⁴
- Focal demodicosis is common in puppies, and physiologic stress and debilitation are risk factors.
- In cats, *D gatoi* is contagious. Cats at risk for this infestation tend to come from high-density populations.

Pathophysiology

- Clinical disease results from overproliferation of mites in the skin due to defects or compromise of the skin’s immune system.
- Studies using dog leukocyte antigen class II have identified common markers in young dogs with generalized demodicosis, suggesting that this antigen may be an important immunologic risk factor for the disease in dogs.⁷
- *Demodex* mites found on skin scrapings, plucked hair, ear swabs, and fecal samples are considered clinically significant when interpreted in conjunction with typical clinical signs.⁸

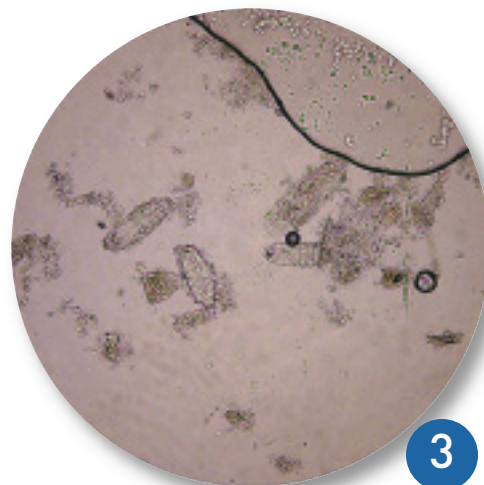
Dx DIAGNOSIS

See the **Table**, page 18, for a description of clinical signs of demodicosis in dogs and cats.

Definitive Diagnosis

- **Dogs**
 - Any finding of mites indicates demodicosis.^{5,6} Mixed infestations of *D canis* and *D injai* can occur.
 - Mites are found on deep-skin scrapings or via hair trichograms; the latter are useful for sampling sites that are close to the eyes or difficult to scrape (eg, interdigital areas).
 - Hair plucking may be the diagnostic test of choice for sampling dogs with greasy hair.^{5,6}
- **Cats**
 - With otic demodicosis, mites are found on mineral oil cytologic testing of ear exudates.

- *D cati* mites tend to be easily found on skin scrapings.
- *D gatoi* mites can be difficult to find even when the patient is severely pruritic. For these mites, suggested tests include wide superficial skin scrapings, hair plucking, fecal flotations (**Figure 3**), or response to therapy.



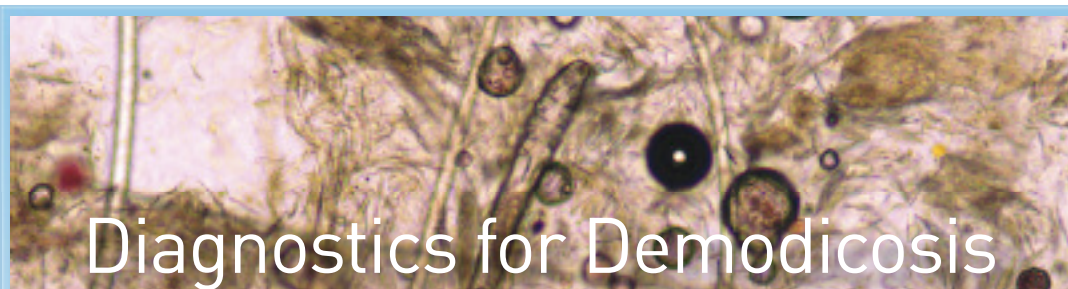
Demodex gatoi mites found on fecal sample from cat with pruritus, self-trauma, and hair loss on ventral abdomen (original magnification, 400×)

Differential Diagnosis

- **Dogs:** Canine demodicosis can mimic any skin disease; the rule of thumb is “demodicosis until proven otherwise.”
- **Cats:** Consider demodicosis in any cat with hair loss, symmetric alopecia, or pruritus.

Laboratory Testing

- **Bacterial cultures of skin:** Should be performed if deep pyoderma is present or if there is a history of glucocorticoid use or long-term antibiotic therapy (dogs)
- **Complete blood count or serum biochemical profile:** In dogs with deep pyoderma that may be septic or dehydrated
- **Fecal flotation examination:** In pruritic cats to identify *D gatoi*
- **Genetic testing for ABCB1- δ genotype:** To screen for drug sensitivity to avermectins in breed-sensitive dogs (eg, herding dogs, sight hounds); recommended for dogs with severe generalized demodicosis³



Diagnostics for Demodicosis

Following is a selection of articles previously published in *Clinician's Brief* that address the various diagnostic tests discussed in this article. Go to **cliniciansbrief.com** and use our newly updated Advanced Search function to locate downloadable PDFs of the articles listed below.

- Procedures Pro: **How to Do a Blood Smear** (May 2004)
- Procedures Pro: **Skin Biopsy** (July 2004)
- Procedures Pro: **How to Do a Skin Biopsy** (August 2005)
- What's the Take-Home?: **Otic Demodicosis** (March 2006)
- Diagnostics: **Fecal Examination Techniques** (April 2010)
- Ask the Expert: **Five Questions for a Dermatologist** (June 2010)
- Procedures Pro: **Interpreting Small Animal Thoracic Radiographs** (July 2010)
- Applied Cytology: **What Your Hematology Analyzer Can't Tell You** (January 2011)

Laboratory testing is most helpful when searching for the underlying cause of adult-onset demodicosis in dogs.

- **Impression smears:** To diagnose concurrent microbial overgrowth in dogs and cats

Additional Laboratory Testing

- Except for fecal flotation examinations in cats, laboratory testing is most helpful when searching for the underlying cause of adult-onset demodicosis in dogs or a medical condition associated with *D cati* in an adult cat. Testing may include but is not limited to:
 - ▶ Blood smear evaluation
 - ▶ Complete blood count
 - ▶ Fecal flotation
 - ▶ Infectious disease titers
 - ▶ Radiography of thorax and abdomen
 - ▶ Retroviral screening
 - ▶ Serum biochemical analysis

▶ Urinalysis.

- Fine-needle aspirates of lymph nodes may contain mites.
- Skin biopsy may be helpful in shar-pei dogs and dogs with severe pododermatitis.

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

FIND MORE

The second article on this topic, **Treatment of Demodicosis in Dogs & Cats**, will be published in the May issue of *Clinician's Brief*.

Demodicosis in Dogs & Cats

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DOGS

Localized demodicosis

- Occurs primarily in puppies
- Mites found only in lesional areas; lesions focal & limited (1–4 sites)
- Signs include focal areas of hair loss, erythema, hyperpigmentation, & follicular plugging (comedones)
- Pruritus varies



Juvenile generalized demodicosis

- Mean age of onset 6 months
- Begins as localized demodicosis & becomes more diffuse
- Mites can be found in lesional and nonlesional areas; all stages of life cycle are commonly found
- Signs include hair loss, erythema, hyperpigmentation, papular rash, follicular plugging, concurrent superficial or deep pyoderma (furunculosis), pain, fever, matting of hair coat, & skin exudation
- Pruritus is variable
- In some patients, presents only as deep pododermatitis (swelling, lameness, pain, exudation, lichenification, proliferation of pedal tissue) & generalized or regional lymphadenopathy
- Dogs can be septic & severely debilitated by disease

Adult-onset demodicosis

- May be focal or generalized
- Occurs in dogs with concurrent systemic illness
- Proliferation of mites may precede signs of systemic illness
- In my experience, dogs with adult-onset demodicosis have no history of demodicosis as a young dog

D injai demodicosis

- Associated with wire-haired fox terrier dogs that have dorsal greasy skin of the trunk
- Usually pruritic and may be concurrent with atopic dermatitis⁶
- Some dogs, especially terriers, may present with intense pruritus⁷

CATS

Otic demodicosis

- Affects cats of any age; common in kittens
- Signs include ceruminous discharge & pruritus



D gatoi demodicosis

- Can occur in cats of any age
- Common signs are pruritus & evidence of contagion
- Can present as symmetric alopecia
- Pruritus can be severe & lead to self-trauma
- Often introduced into household after adoption of a new cat or kitten from a rescue center, shelter, or other high-density population

D cati demodicosis

- Not known to be contagious
- Signs can be similar to those of *D gatoi*
- Most often associated with systemic illness (eg, diabetes mellitus) or long-term use of glucocorticoids & progestins

Mixed infections

- Not uncommon