

# Demodectic Mange

## (Demodicosis)

### Basics

#### OVERVIEW

- An inflammatory parasitic skin disease of dogs and rarely cats, caused by a species of the mite genus, *Demodex*
- Skin disease is characterized by an increased number of mites in the hair follicles and top layer of the skin (known as the “epidermis”), which often leads to secondary bacterial infections and infections deep in the hair follicles, often with resultant rupturing of the hair follicle (known as “furunculosis”)
- May be localized (in which one or a few small patches of affected skin are present, frequently seen on the face or forelegs) or generalized (in which numerous skin lesions are present on the head, legs, and body)
- “Demodectic mange,” “demodicosis,” and “red mange” (dogs) are all terms for the same skin disease
- Three species of *Demodex* mites have been identified in dogs: *Demodex canis*, *Demodex injai*, and *Demodex cornei*; two species have been identified in cats: *Demodex cati* and *Demodex gatoi*



#### GENETICS

- The initial increase in number of demodectic mites in the hair follicles may be the result of a genetic or immunologic disorder

#### SIGNALMENT/DESCRIPTION OF PET

##### Species

- Dogs—common
- Cats—rare

##### Breed Predispositions

- West Highland white terrier, Shih Tzu and wirehaired fox terrier—greasy inflammation of the skin with increased accumulations of surface skin cells, such as seen in dandruff (accumulations known as “scales”; condition known as “seborrheic dermatitis”) associated with *Demodex injai*
- American staffordshire terrier, Shar-Pei, Boston terrier, English Bulldog and West Highland white terrier have a predisposition for *Demodex canis*
- Potential of demodectic mange in cats is increased in Siamese and Burmese cats

##### Mean Age and Range

- Localized demodectic mange (in which one or a few small patches of affected skin are present, frequently seen on the face or forelegs)—usually in dogs <1 year of age; median age is 3–6 months
- Generalized demodectic mange (in which numerous skin lesions are present on the head, legs, and body)—both young and old dogs

- No age data collected for the cat

## SIGNS/OBSERVED CHANGES IN THE PET

### Dogs

#### **Localized, Juvenile-Onset**

- One or a few small patches of affected skin are present, frequently seen on the face or forelegs
- Lesions—usually mild; consist of reddened skin (known as “erythema”) and a light accumulations of surface skin cells, such as seen in dandruff (scales)
- Patches—several may be noted; most common site is the face, especially around the mouth and eyes and on the front legs; also may be seen on the trunk and rear legs

#### **Generalized, Juvenile-Onset or Adult-Onset**

- Numerous skin lesions are present on the head, legs, and body
- Can be widespread from the onset, with multiple, poorly circumscribed patches of reddened skin (erythema), hair loss (known as “alopecia”), and accumulations of surface skin cells, such as seen in dandruff (scales)
- As hair follicles become distended with large numbers of mites, secondary bacterial infections occur, often with resultant rupturing of the hair follicle (furunculosis)
- With progression of disease, the skin can become severely inflamed, leading to the escape of fluid and inflammatory cells in or on the skin (known as “exudation”), and the development of nodular, inflammatory lesions (known as “granulomas”)
- *Demodex injai* may be associated with a greasy inflammation of the skin with increased accumulations of surface skin cells, such as seen in dandruff (accumulations are “scales”; condition is “seborrheic dermatitis”) of the dorsal trunk, plugs of keratin and oil in the follicles of the skin (known as “comedones”), reddened skin, hair loss, and darkening of the skin (known as “hyperpigmentation”)

#### **Pododemodicosis**

- Painful, swollen lesions, associated with deep tissue bacterial infection (known as “pyoderma”)
- May affect just the feet

### Cats

- Often characterized by multiple partial to complete areas of hair loss (alopecia) of the eyelids, as well as the skin around the eyes, head, neck, flank and the under-surface of the body
- Lesions—variable itchiness (known as “pruritus”) with reddened skin (erythema), accumulations of surface skin cells, such as seen in dandruff (scales), and dried discharge on the surface of the skin lesions (known as “crusts”); those caused by *Demodex gatoi* often are quite itchy (pruritic) and may be contagious
- Inflammation of the outer ear, characterized by the presence of waxy material (known as “ceruminous otitis externa”) has been reported
- *Demodex cati* often is associated with disease that decreases the immune response (known as “immunosuppressive disease”)

## CAUSES

- Dog—*Demodex canis*, *Demodex injai*, and *Demodex cornei*
- Cat—*Demodex cati* and *Demodex gatoi*

## RISK FACTORS

### Dogs

- Exact mechanism related to the influence of the immune system on demodectic mange is unknown
- Studies indicate that dogs with generalized demodectic mange (in which numerous skin lesions are present on the head, legs, and body) have a subnormal percentage of interleukin-2 (IL-2) receptors on their lymphocytes and subnormal IL-2 production; depressed T-cell function; “lymphocytes” are a type of white-blood cell that are formed in lymphatic tissues throughout the body; lymphocytes and T-cells are involved in the immune process
- Genetic factors (especially for localized, juvenile-onset demodectic mange), decreased ability to produce a normal immune response (immunosuppression), and/or metabolic diseases may increase the likelihood that the dog will develop demodectic mange

## Cats

- Often associated with metabolic diseases (such as feline immunodeficiency virus [FIV], systemic lupus erythematosus [autoimmune disease in which body attacks its own skin and other organs], diabetes mellitus [sugar diabetes])
- *Demodex gatoi*—may be transferable from cat to cat within the same household

# Treatment

## HEALTH CARE

- Outpatient
- Localized demodectic mange (in which one or a few small patches of affected skin are present, frequently seen on the face or forelegs)—conservative; most cases (90%) resolve spontaneously with no treatment
- Generalized demodectic mange (in which numerous skin lesions are present on the head, legs, and body) in dogs—can be expensive and frustrating to treat; juvenile-onset cases may resolve with treatment while adult-onset cases are frequently controlled rather than cured; requires application of medication to kill the mites directly onto the skin (known as “topical treatment”) and/or medications administered by mouth (known as “systemic treatment”); antibiotics may be necessary to treat secondary bacterial skin infections
- Evaluate the general health status of dogs with either localized or generalized demodectic mange

## Medications

- Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

### AMITRAZ (MITABAN™; TAKTIC EC™; PROMERIS™)

- A treatment that is applied directly to the skin (topical treatment) to kill demodectic mange mites; agents that kill mites are known as “miticides”
- Use weekly to every-other-week until resolution of clinical signs and no mites are found on skin scrapings for 1 month; do not rinse off; let air-dry; use as directed by your pet's veterinarian
- ProMeris—apply to skin every 2–4 weeks, treat for 1 month following negative skin scrape
- Use a benzoyl peroxide shampoo before application of the amitraz to kill bacteria (known as “bactericidal therapy”) and to increase exposure of the mites to the miticide through flushing activity of the hair follicles
- Between 11% and 30% of cases will not be cured; may need to try an alternative therapy or control with maintenance rinse every 2–8 weeks
- These products are rarely used in cats (and not used on diabetic cats)

### IVERMECTIN

- Dog—daily administration by mouth has been very effective, even when amitraz fails; use as directed by your pet's veterinarian
- Treat for 30–60 days beyond negative skin scrapings (average length of treatment is 3–8 months)
- Reported as a treatment option in the cat; exact dose has not been established

### MILBEMYCIN (INTERCEPTOR)

- Administered by mouth
- Has been effective in 50–85% of cases
- Treat for 30–60 days beyond multiple negative skin scrapings
- Very expensive

### MOXIDECTIN AND DORAMECTIN

- Not used in ivermectin sensitive breeds
- Topical treatment weekly (or orally)

## CATS

- Exact treatment protocols are not defined
- Lime-sulfur dips applied to the skin (topical treatment) every 3–7 days for 4–8 treatments is the suggested treatment; often lead to good resolution of clinical signs
- Studies of treatment with ivermectin and milbemycin are lacking, although numerous anecdotal reports suggest effectiveness
- Doramectin also has been reported to be effective when given by injection under the skin (subcutaneous route) once weekly

## Follow-Up Care

### PATIENT MONITORING

- Repeat skin scrapings and monitor for evidence of resolution of signs

### PREVENTIONS AND AVOIDANCE

- Do not breed pets with generalized form of demodectic mange (in which numerous skin lesions are present on the head, legs, and body)

### POSSIBLE COMPLICATIONS

- Secondary bacterial infections and infections deep in the hair follicles, often with resultant rupturing of the hair follicle (furunculosis)

### EXPECTED COURSE AND PROGNOSIS

- Prognosis (dogs)—depends heavily on genetics, status of the immune system, and underlying diseases
- Localized demodectic mange (in which one or a few small patches of affected skin are present, frequently seen on the face or forelegs)—most cases (90%) resolve spontaneously with no treatment; less than 10% of localized demodectic mange cases progress to generalized demodectic mange (in which numerous skin lesions are present on the head, legs, and body)
- Adult-onset of demodectic mange in dogs—often severe disease and poorly responsive to non-responsive to treatment
- Feline cases with *Demodex cati* may have a poor prognosis associated with underlying disease

## Key Points

- Localized demodectic mange (in which one or a few small patches of affected skin are present, frequently seen on the face or forelegs)—most cases resolve spontaneously
- Generalized demodectic mange (in which numerous skin lesions are present on the head, legs, and body)—frequent management problem; expense and frustration with the long-term (chronic) nature of disease and treatment are issues; many cases are medically controlled, not cured; juvenile-onset is considered to have a genetic influence and affected animals should not be used for breeding

Blackwell's Five-Minute Veterinary Consult: Canine and Feline, Sixth Edition, Larry P. Tilley and Francis W.K. Smith, Jr. © 2015 John Wiley & Sons, Inc.