Sarcoptic Mange

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Profile

Definition

- Sarcoptic mange (ie, sarcoptic acariasis) is a transmissible dermatosis caused by the burrowing acarid mite *Sarcoptes scabiei*.
- Infestation, referred to as *scabies*, often results in acute and intense pruritus.
- Common in domestic dogs and rare in cats, sarcoptic mange can affect other mammalian species (eg, foxes, rabbits, guinea pigs, ferrets, sheep, goats, cattle, pigs, Spanish ibex, humans).
- Scabies occurs worldwide but is more prevalent in some regions because of environmental conditions.

Signalment

- No age, sex, or breed predilections
- Young patients may be at increased risk because of exposure in overcrowded areas (eg, shelter, kennel, pet store, breeding mill, boarding or training facility).

Causes

- *S scabiei* is an obligate parasite that spends its entire 14–21-day life cycle on the host.
- Scabies mites are named as variants of their preferred host species.
  - *S scabiei var canis* (dog)
  - *S scabiei var vulpis* (red fox)
  - *S scabiei var ovis* (sheep)
  - *S scabiei var bovis* (cattle)

Although transmission may occur otherwise, direct contact with a scabies-infested animal, especially in an overcrowded area, increases the risk for transmission.

Risk Factors

- Variants tend to infect certain hosts but can cause disease in other species.
- Feline scabies is caused by *Notoedres cati*; however, *S scabiei* has reportedly caused disease in cats (rare).\(^1\)
  - Location of the mite anus helps distinguish between *S scabiei var canis* and *N cati* (terminal in the former, dorsal in the latter).

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Although transmission may occur otherwise, direct contact with a scabies-infested animal, especially in an overcrowded area, increases the risk for transmission.
Pathophysiology

- Clinical disease can develop when an affected animal’s mites are transmitted to the skin of another animal.
- After the mites penetrate the skin, they burrow, feed, and reproduce in superficial skin layers, often in areas with little hair.
- Pruritus occurs
  - When mite population increases
  - Through suspected hypersensitivity reaction to mite antigens
- Because *S. scabiei* and house dust mites share similar antigens, antibody cross-reactivity (influencing allergy test interpretation) and cosensitization are possible.

History

- Historical clues suggestive of scabies may include
  - Acute and severe nonseasonal pruritus
  - Exposure to roaming foxes
  - Recent history of adoption or boarding
  - Cohabitation with multiple animals, several of which may be pruritic
  - Lack of acaricidal therapy in monthly ectoparasite preventives
  - Fair-to-poor response to previously administered antiinflammatory glucocorticoids and/or cyclosporine
  - Humans in the household may be pruritic and have erythematous papules.

Clinical Signs

Dogs

- Pruritus
  - Moderate to extreme
  - Observable at physical examination
- Distribution
  - Sparsely haired body regions: Pinnal margins (not otic canals), periocular skin, elbows (Figure 1), hocks, and ventral trunk
    (Figure 2)
  - May become widespread as alopecia becomes more severe
  - Dorsum and paws are often spared (Figure 3).
- Lesions
  - Peracute: Lesional pruritus that may mimic allergic skin disease
  - Acute: Erythematous maculopapular eruptions that eventuate into crusted papules with excoriations and alopecia
  - Chronic: Diffuse exfoliation with hyperpigmented lichenification
  - Aural hematoma can occur at any disease stage.
  - Some dogs may not develop skin lesions despite intense pruritus (ie, scabies incognito), while others (ie, immunosuppressed) have widespread lesions with minimal pruritus (ie, crusted or Norwegian scabies).
- Secondary skin infection
  - Superficial pyoderma and/or *Malassezia* spp dermatitis are common sequelae.

**Photos**

1. Pruritic papular rash with lichenification on ventral trunk of a dog with sarcoptic mange.

2. Sarcoptic mange presenting as crusting excoriation along the left caudolateral elbow of a dog.
Cats
- Pruritus is nonexistent to moderate.
- Distribution on bridge of nose, face, pinnae, paws, and tail
- Lesions include crusted papules and alopecia.
- Extracutaneous signs include poor body condition and peripheral lymphadenomegaly.

### Distribution pattern of disease for canine scabies

- **Common**: Paucity of *S. scabiei* exists when dogs are hypersensitive to mite antigens, so negative skin scrapings and/or fecal examination do not exclude scabies.
- **Less Common**: Mites are usually numerous and easy to find on skin scrapings from immuno-suppressed dogs (crusted scabies).

### Laboratory Testing
- **Indicated**: Skin surface cytology to exclude concurrent bacterial and/or fungal infection
- **May be Indicated**: ELISA serologic testing for IgG against *Sarcoptes* spp antigens
  - Available in some countries, but false-positive (eg, cross-reactivity with house dust mite) and negative (eg, dogs receiving glucocorticoids) results can occur.
- Skin biopsy to exclude other differentials
- CBC, serum chemistry panel, urinalysis, and feline retroviral testing when other comorbidities are suspected as based on history and physical examination
- Before extralabel macrocyclic lactone therapy
  - Testing for heartworms when status is unknown or questionable
  - *ABCB1Δ* genetic testing to screen for avermectin sensitivity in ivermectin-sensitive dogs (eg, herding dogs, sight hounds) before the use of extralabel macrocyclic lactone therapy

### Differential
- **Dogs**
  - Folliculitis (eg, superficial pyoderma, demodicosis, dermatophytosis)
  - *Malassezia* spp dermatitis
  - *Pelodera* spp mange
  - Allergic skin disease
  - Contact dermatitis
  - Ear margin dermatosis
  - Zinc-responsive dermatosis
  - Pemphigus foliaceus
  - Neoplasia

### Treatment
- Dogs with unexplained pruritus, particularly unresponsive to glucocorticoids (eg, prednisone 1 mg/kg q24h) should receive trial therapy for scabies before making a diagnosis of allergy.
Duration of scabicidal therapy should encompass at least two mite life cycles (at least 4–6 weeks) regardless of the product prescribed.

*S. scabiei* can be transmitted to other close-contact animals and humans; all close-contact animals (notably dogs) should be treated concurrently.

In general, systemic scabicide therapy (including correctly applied systemic spot-on) is more effective than topical treatment for scabies because of improved compliance.

Assuming all close-contact animals are treated, environmental decontamination is not typically needed, unless scabies outbreak occurs in an overcrowded facility.

Scabies-infested dogs and cats can be treated as outpatients; use of topical amitraz dips (dogs) should be reserved for in-hospital use.

### Nutritional Aspects
- The patient should receive an age-appropriate balanced diet.

### Client Education
- Humans who develop itchy skin (+ lesions) should contact their physician.

### Medications

**Note:** Recommended treatments are mostly considered extralabel as described.

#### Canine Sarcoptic Mange

**Systemic**
- Ivermectin: 0.2–0.4 mg/kg SC q14d 3–4 doses or 0.2–0.4 mg/kg PO q7d 4–6 doses
- Doramectin: 0.2–0.6 mg/kg SC q7d 4–6 doses
- Moxidectin: 0.2–0.3 mg/kg SC q7d or 0.2–0.3 mg/kg PO q7d 4–6 doses
- Moxidectin 2.5% + imidacloprid 10% topical spot-on: Applied q2–4wk 2–4 doses (based on manufacturer’s established body weight range)
- Selamectin topical spot-on: Applied q2wk 3–4 doses (based on manufacturer’s established body weight range)

**Topical**
- Amitraz: 0.025%–0.03% solution applied to entire skin surface q1–2wk 4–6 doses
  - Do not rinse.
  - May need to clip coat to facilitate contact
- Lime sulfur: 2%–3% solution applied to entire skin surface q7d 4–6 doses
  - Do not rinse.
  - May need to clip coat to facilitate contact
- Fipronil spray: 3 mL/kg applied as fine mist to entire skin surface q2–3wk 3 doses or 6 mL/kg sponged on the skin q7d 4–6 doses
  - May be better reserved for subclinical close-contact dogs

#### Feline Sarcoptic Mange

**Systemic**
- Ivermectin: 0.2–0.3 mg/kg SC q2wk 3–4 doses
- Doramectin: 0.2–0.3 mg/kg SC as a single dose or repeated in 2 weeks
- Moxidectin 2.5% + imidacloprid 10% topical spot-on: Applied q2wk 3–4 doses (based on manufacturer’s established body weight range)
- Selamectin topical spot-on: Applied q2wk 3–4 doses (based on manufacturer’s established body weight range)

**Topical**
- Lime sulfur: 2%–3% solution applied to entire skin surface q7d 4–6 doses
  - Do not rinse.
  - May need to clip coat to facilitate contact

### Precautions & Drug Interactions
- Dogs with an ivermectin-sensitive genotype (eg, herding dogs, sight hounds) should not receive extralabel macrocyclic lactone therapy (eg, ivermectin, doramectin, moxidectin) because of risk for neurotoxicosis signs.
- Neither spinosad-containing flea preventives nor systemic azole therapy (eg, ketoconazole, itraconazole) can be given concurrently with extralabel macrocyclic lactones in any dog (neurotoxicosis).
- Amitraz dip treatment should be used cautiously in small dogs and should not be used for Chihuahuas.
  - Do not administer concurrently with monoamine oxidase inhibitors in any dog.
  - Whether amitraz is optimal should be strongly considered;
in-hospital application is recommended, and administrative personnel are at risk for adverse effects.

- For nonclinical dogs, fipronil spray may be cost-effective in a multidog household.

Follow-up

Patient Monitoring

- Pruritus should be significantly improved after the first two doses of scabicidal therapy (within 3 weeks), but mild pruritus may linger for several weeks.
- If skin lesions fail to improve after 3–4 weeks of therapy, skin culture and/or biopsy may be indicated.

Complications

- Treatment failure may occur if
  - Using topical spot-on for patients with body weights nearing the upper limit of the manufacturer’s recommended body weight range (ie, underdosed therapy)
  - All close-contact animals (especially dogs) or secondary infections are not concurrently treated

In General

Relative Cost

- Canine sarcoptic mange: $–$$
- Feline sarcoptic mange: $–$$
- Sarcoptic mange in multipet household: $$$–$$$$

Cost Key

- $ = up to $100
- $$ = $101–$250
- $$$ = $251–$500
- $$ = $501–$1000
- $$$$ = more than $1000

Prognosis

- Good

Prevention

- Routine use of flea preventives containing acaricides may lessen chances for scabies after casual exposure to an infested animal.

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

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Cost Key

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