

**SCABIES SIGNALMENT**

Typical clinical signs of canine scabies include alopecia, crusting, and papular erythema.

PESTS AND PARASITES

Managing *Sarcoptes* Infestation in Dogs

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Abstract

Sarcoptes scabiei is a common mite that is often overlooked or misdiagnosed as allergic dermatitis. *S scabiei* is commonly carried by foxes and coyotes, but direct contact is not required for a patient to become infested. While a skin scrape is always important in the diagnosis of any parasite, in this case a negative skin scrape does not rule out infestation by *Sarcoptes*. If a practitioner is suspicious that *Sarcoptes* may be present, a treatment trial is warranted. Prevention and treatment of the mite can easily be achieved with the use of several prescribed antiparasitics, including selamectin and the drug class of isoxazolines. Although *Sarcoptes* is a zoonotic parasite, it is uncommon for humans to become infested, unless they are young or immunocompromised. Patients can greatly benefit from a veterinary nurse's knowledge and ability to educate clients on the prevention and diagnosis of *Sarcoptes*.



Take-Home Points

- Infestation by *Sarcoptes* is caused by the mite *Sarcoptes scabiei* and should be considered as a potential cause of dermatitis in any dog presenting with pruritus.
- A complete dermatologic history will aid in the diagnosis of *Sarcoptes*.
- Confirmation of infestation by *Sarcoptes* is made by microscopic identification of the mite; however, a negative skin scrape does not rule out *Sarcoptes*.
- Cats can be infested by *Notoedres cati*, a related mite.
- When identified microscopically, mites are round or oval shaped. They have 4 pairs of short legs and are approximately 200 to 400 μm in length.
- Treatment options include topical and oral antiparasitics, with no need for extensive cleaning of the household as the mite is not infectious once a host has been treated.
- Any secondary pyoderma must be addressed to ensure complete resolution of dermatitis.
- Treatment of all in-contact animals, in combination with client education regarding treatment compliance and prevention, will ensure the mite is eradicated from the home and will help prevent reinfestation.

Veterinary nurses play a significant role in the identification, diagnosis, and treatment of *Sarcoptes* infestation, often called “sarcoptic mange” or “scabies,” in dogs. The most important goal is to identify potential cases. By understanding differentiating clinical signs and obtaining a thorough history, veterinary nurses may even prevent other patients from becoming infested by identifying cases before they enter the hospital, thereby avoiding cross-contamination.

An itchy patient is one of the most common reasons an owner schedules an appointment with their pet’s veterinarian. The goal of the veterinary medical team is to determine the primary cause of pruritus and address any secondary infection.

Canine infestation by *Sarcoptes* is caused by the mite *Sarcoptes scabiei* (FIGURE 1) and should always be on the list of differentials for a pruritic patient. *S scabiei* infestation often mimics other inflammatory skin diseases, including atopic dermatitis, food allergies, contact reactions, and pemphigus foliaceus, as well as other parasitic infestations.

Despite the similarities between these conditions, there are a few distinct characteristics of scabies that veterinary nurses should be aware of:

- Infestation of *S scabiei* often presents as a sudden onset of marked, progressive pruritus.
- Scabies also tends to first affect areas of the elbows, hocks, tips of the pinnae, and ventrum because the mites prefer areas of skin with less hair.

A veterinary nurse’s daily role often includes obtaining

a complete medical history for each patient that enters the hospital. A complete dermatologic history should include:

- Approximate date of onset of pruritus
- Current level of pruritus on a scale of 0 to 10
- Previous treatments administered
- Patient’s response to those therapies

It is also helpful to note whether or not the patient has housemates or humans in the household exhibiting similar signs and whether the patient has been in contact with other canids.

It is important for the veterinary team to consider infestation by *Sarcoptes* as a diagnosis for a chronically allergic patient whose allergies are typically well managed but suddenly has developed intense pruritus with concurrent secondary pyoderma. Ruling out

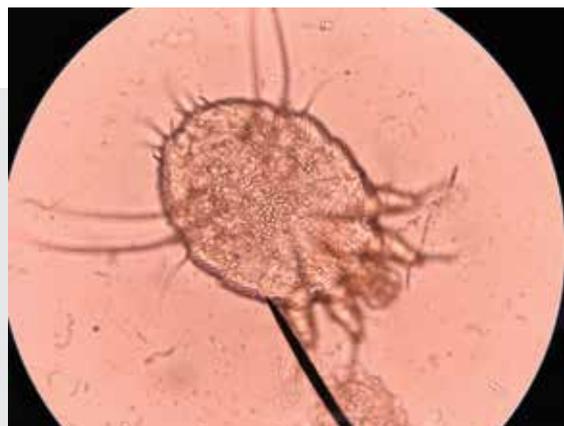


FIGURE 1. *Sarcoptes scabiei* mite



scabies as a contributing factor with an appropriate treatment trial may be warranted.

SCABIES LIFE CYCLE

The complete life cycle of a *S scabiei* mite takes approximately 17 to 21 days. Once an animal is infested by an adult mite, the mites begin to mate in molting pockets in the top layers of the patient's skin. Female mites then burrow through the skin and lay their eggs (ova). The eggs hatch into 6-legged larvae that travel back to the surface of the skin to begin feeding.¹ When identified microscopically, adult *S scabiei* mites appear round or oval shaped with a terminal anus. They have 4 pairs of short legs and are approximately 200 to 400 μm in length.²

SIGNALMENT, SIGNS, AND SOURCES OF INFESTATION

There is no breed or sex predilection for canine scabies. Classic clinical signs include alopecia, crusting, and papular erythema. If present for an extended period, scabies may cause generalized dermatitis and intense pruritus (**FIGURE 2**). Contact with other canids, including foxes and coyotes, or visits to dog parks, groomers, and even veterinary hospitals may be the source of the infestation.

DIAGNOSIS

Confirmation of infestation by *Sarcoptes* is made by identification of the mite, fecal pellets, or ova.² A diagnostic skin scrape is best achieved by performing long strokes against the skin, collecting any crusts or debris, and adding it to the slide. Achieving capillary

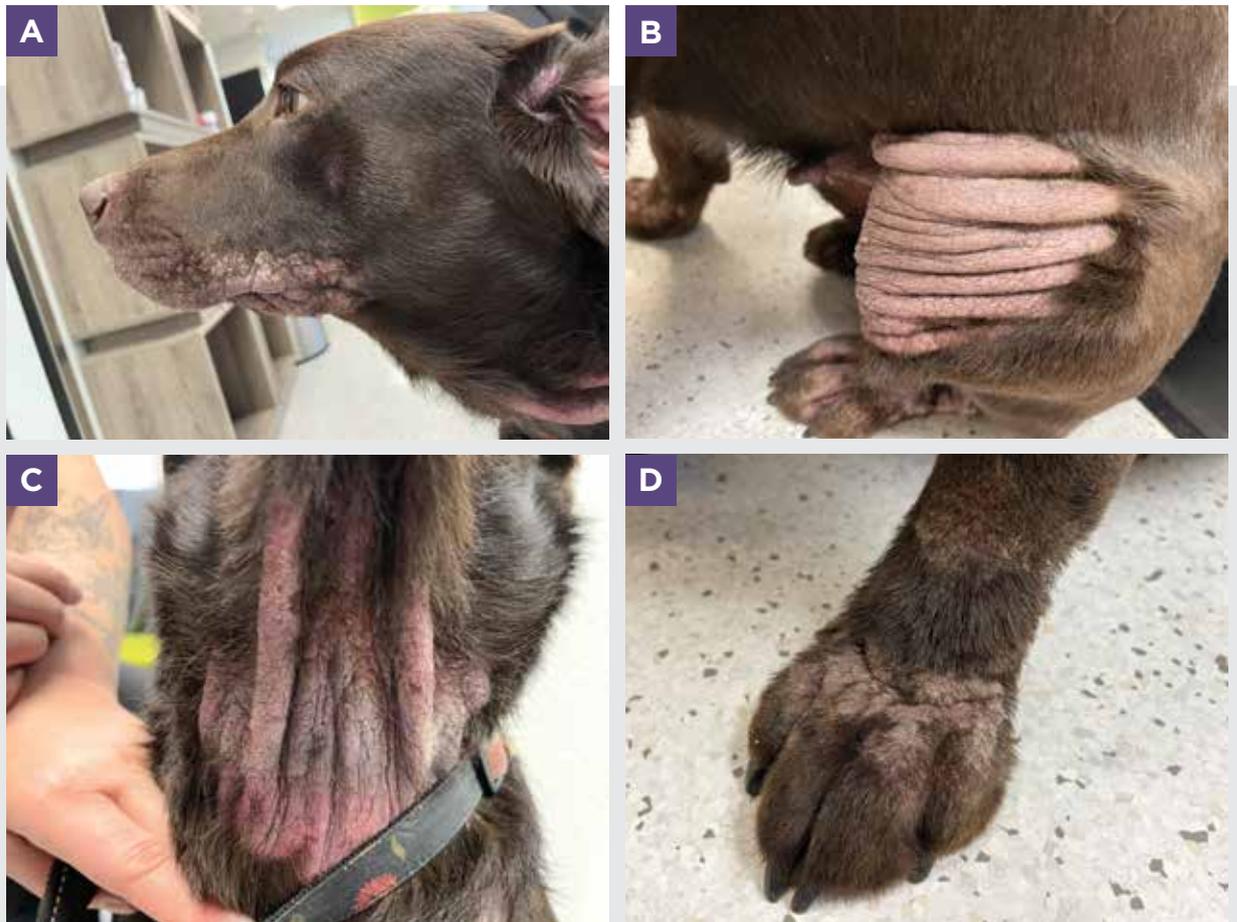


FIGURE 2. A 4-year-old neutered male Labrador retriever infested with *Sarcoptes scabiei*. Patient was presented with progressive pruritus and dermatitis affecting its ventrum, distal limbs, both pinnae, hocks, and elbows. Patient was not on any medications, including parasite preventives. A housemate's exam was within normal limits; however, the owner noted mild pruritus starting over the previous 3 weeks.



Feline Scabies

Feline scabies (notoedric mange) is caused by *Notoedres cati*; it is less common than *S scabiei* infestation in dogs but also highly contagious. Feline scabies mostly affects cats but may also affect dogs, foxes, and rabbits. The life cycle of *N cati* is closely related to that of *S scabiei*. Microscopically, *N cati* mites are slightly smaller, with terminal suckers and a dorsally located anus.²

Clinical signs for notoedric mange do differ slightly and include marked lichenification (skin thickening, hyperpigmentation, and exaggerated skin folds) and thick, adherent crusting (**FIGURE A**). Secondary alopecia and excoriations are often present. Like canine scabies, notoedric mange is extremely pruritic, and differential diagnoses include other parasitic infestations, atopic dermatitis, food allergy, and pemphigus foliaceus.

Treatment options for feline scabies are also similar to those for canine scabies; however,



FIGURE A. Cat with clinical signs of sarcoptic mange infection from *Notoedres cati* mites.

extreme caution should be taken with many antiparasitic agents due to the high levels of possible toxicity to feline patients. Lime sulfur dips have been proven to eradicate the mite, but thorough client education is necessary to ensure correct dilution and application of the product.¹ Other

effective treatment options include the isoxazolines sarolaner (Simparica; Zoetis, zoetisus.com) and fluralaner (Bravecto; Merck, bravecto.com), which have been shown to be efficacious in recent studies. Treating all in-contact cats will ensure successful eradication of the mite.⁵

bleeding is not necessary because the mites live in the top layers of the skin. For detailed instructions on performing a skin scrape, visit theveterinarynurse.com/review/article/how-to-perform-a-skin-scrape.

Just a few mites can cause intense pruritus, and mites are often difficult to obtain on skin scrapings due to the mites' burrowing nature; thus, a negative skin scrape does not rule out *Sarcoptes* infestation. A diagnosis may also be obtained by using an appropriate antiparasitic treatment and monitoring for full resolution of clinical signs.

A positive pinnal-pedal reflex is another distinct feature of dogs with scabies. While the examiner scratches the apex of the pinnae, the patient may bring its hind limb up in a scratching motion. This test has been reported to have a sensitivity of approximately 80% and a specificity of approximately 93%.³

TREATMENT AND PREVENTION

Overall, several treatment options, including some newer ones, are available for sarcoptic mange. Historically, topical therapies that were often labor intensive and time consuming for owners were required to eradicate the *Sarcoptes* mite. Today, there is 1 U.S. Food and Drug Administration–approved option: Selamectin applied every 30 days is effective against scabies. There is some evidence that a more frequent application of every 14 days (off label) is more effective at killing the mites, thus making patients more comfortable more quickly.¹

The drug class of isoxazolines (fluralaner, afoxolaner, sarolaner) is not approved for treatment of *Sarcoptes* in the United States; however, many recent studies have proven it effective, with a significant decrease in dermatitis and pruritus after 14 days and full resolution of clinical signs in 21 to 28 days.^{3,4} Some evidence shows that there may be an increase in pruritus



Although mites can live off (without) a host for an extended time depending on the environment, they only remain infectious for approximately 36 hours once a host has been treated.¹



following the antiparasitic application due to the mites dying under the skin; owners should be made aware that pets may get worse before they get better.²

For a successful treatment outcome, any secondary pyoderma must be addressed with a full 4 weeks' duration of antibiotics, and all animals that come in contact with the patient receiving treatment should be appropriately treated to avoid reinfestation. Following treatment of the patient, extensive cleaning measures of the home are not necessary beyond washing bedding and disinfecting hard surfaces. Although mites can live off (without) a host for an extended time depending on the environment, they only remain infectious for approximately 36 hours once a host has been treated.¹

CLIENT EDUCATION AND ZONOSIS

Educating clients on the zoonotic potential of scabies is another integral part the veterinary nurse will play once

a diagnosis has been made. It is important to mention to pet owners that despite the scabies mite mostly infesting canids, humans may also be transiently affected. Human infestation is usually self-limiting; however, a heavy burden within the home or prolonged close contact with an infested patient may increase the likelihood of humans becoming affected. Young children and people with a decreased immune status may experience a lengthened course of infestation. Affected humans typically present with extreme pruritus and papular erythema, most commonly along the beltline. If a client is concerned that they may also be infested, a visit to their dermatologist may be warranted to ensure they receive proper diagnosis and treatment.

SUMMARY

Veterinary nurses play a large role throughout the veterinary hospital each day and can be a great aid in all dermatologic cases. Because many parasitic cases mimic allergies, careful consideration of patient history and clinical signs are vital to helping the veterinarian make a correct diagnosis. Skin scrapings and cytology samples are always needed and will also help with diagnosing any secondary pyoderma that may be present. New and old antiparasitic medications have simplified scabies prevention and treatment and have made it easy to confirm or rule out the mite as a cause of intense pruritus. While scabies might seem like a difficult diagnosis to make, the medical team can turn an infested patient with intense pruritus into a happy, healthy patient. **TVN**

References

1. Miller WH, Griffin CE, Campbell KL. Parasitic skin diseases. In: *Muller and Kirk's Small Animal Dermatology*. 7th ed. Elsevier Mosby; 2013:284-342.
2. Duggan SB. Sarcoptic mange. In: Horne K, Schwassmann M, Logas D, eds. *Small Animal Dermatology for Technicians and Nurses*. 1st ed. Wiley Blackwell; 2020:131-138.
3. Vitale C, Nett C. Sarcoptic mange. *Vincyclopedia of Diseases*. February 14, 2018. Accessed November 1, 2022. <https://www.vin.com/members/cms/project/defaultadv1.aspx?pid=607&id=4953210&f5=1>
4. Romero C, Heredia R, Pineda J, et al. Efficacy of fluralaner in 17 dogs with sarcoptic mange. *Vet Dermatol*. 2016;27(5):353-e88. doi:10.1111/vde.12363
5. Becskei C, De Bock F, Illambas J, et al. Efficacy and safety of a novel oral isoxazoline, sarolaner (Simparica™), for the treatment of sarcoptic mange in dogs. *Vet Parasitol*. 2016;222:56-61. doi:10.1016/j.vetpar.2016.02.017

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Amber graduated from the Bel-Rea Institute of Animal Technology in 2009 and became a certified veterinary technician in 2010. Her focus has been small animal medicine, and her love for dermatology began in 2013 when she started working for a board-certified veterinary dermatologist. In 2019, she became a Veterinary Technician Specialist in dermatology. Since then, she has enjoyed enriching the lives of pruritic pets. Amber's hobbies include traveling, yoga, and spending time with her husband, children, and pug.

