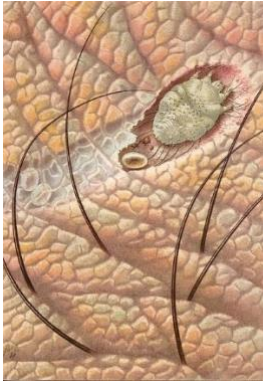


CFC protocol for sarcoptic mange lesion found on a dog in clinic

General information about sarcoptic mange:

A) What does sarcoptic mange look like and what are its signs on a dog:



Sarcoptes scabiei mite (1,2)

Sarcoptic mange is caused by a parasitic mite (*Sarcoptes scabiei*) found in all parts of the world. Sarcoptes mites are eyeless mites with four pairs of legs and burrow just beneath the surface of the skin. Females are 0.3–0.45 mm long, and males are just over half that size. (1, 2, 3) The action of the mites moving within and on the skin produces an intense itch that may resemble an allergic reaction. A delayed Type IV hypersensitivity reaction to the mites, their eggs, or scybala (packets of feces) occurs approximately 30 days after infestation. The presence of the eggs produces a massive allergic response that, in turn, produces more itching. (2)

It is important not to confuse sarcoptic mange with demodectic mange, which is caused by a different parasitic mite. Sarcoptic mange, also known as scabies or itch mite, is a zoonotic disease or a disease transmissible from pets to people. These mites bury into the skin of healthy adult dogs and puppies, creating a maze of tunnels which are deeper and deeper as they chew through skin tissue, causing severe itching, and feeding on material in and on the skin. A fair comparison is a microscopic ant farm expanding beneath your dog's skin. Some people are not affected by Sarcoptic mites either because they have natural immunity or because the mites don't like their scent. (1, 2, 3)

B) What does *Sarcoptes scabiei* do to your dog?

The presence of the sarcoptic mite causes intense itching and misery. Symptoms begin to appear about 10 days after exposure to the mite. Individuals who already are sensitized from a prior infestation can develop symptoms within hours. Dark track marks are sometimes visible with a magnifying glass. (2, 3) Dogs will chew and scratch its skin constantly, which leads to the loss of large amounts of hair, especially on the legs and belly. Eventually, the skin will become red and inflamed, thickened, and dark. The surrounding lymph nodes may become enlarged. Other possible symptom includes ear tips with red pustules with yellow crusts. Commonly affected areas include elbows, ears, armpits, hocks, chest, and belly, as these mites usually prefer areas that have less hair. As the mange worsens it can spread over the entire body. More subtle signs may include lethargy, depression, loss of appetite, and weight loss. Intense discomfort can lead to nervous, restless or agitated behavior and possibly a habitual scratching habit. Sleep deprivation is not uncommon due to nocturnal scratching. Itching may intensify in warm conditions. Unlike allergies, itching is non-seasonal. Self-injury or infection may result from heavy scratching and biting. Sarcoptic mange may occur in any dog at any age. (1, 2, 3, 4) Sarcoptic mange is highly contagious to other household pets and humans. The mite is fast, mobile, and invasive, penetrating the skin in 25–30 minutes. Although sarcoptic mites are not able to complete their life cycle on humans, they will cause severe itching until they die. (1, 3)

C) How is the *Sarcoptes* mite transmitted?

Sarcoptic mites may be found in areas where infected dogs or wildlife frequent, so keeping your dog away from these areas to attempt to prevent infection is important. (1) Sarcoptic mange in dogs can be transmitted two ways: directly and indirectly. Most people associate sarcoptic mange with direct transmission, when the mites are passed by casual contact with an infected host (pet, person, or wildlife). Indirect transmission can also happen when the mite is present in the environment with no host present. A dislodged mite can survive up to 5 days on their own. Merely visiting an area where an infested host has deposited a few mites can cause your dog to become a victim in no time. Mites get hungry when

they're off a host and they are able to sense available food sources through heat and odor. It takes only a few mites to cause significant itching. (3)

B) What is the life cycle of the *Sarcoptes scabiei* mite:

All it takes is one fertile female mite to start the life cycle in a dog. Within 2 hours of infestation, she will begin laying eggs, which will hatch in 2-4 days. After being fertilized just once, she will lay up to 90 eggs in her lifetime. (3) Eggs are laid in small numbers as the mite burrows, and as these hatch, six-legged larvae climb out on to the skin and search for hair follicles. In the nymphal stages, the mite feeds and moults. If male, the nymph gives rise to the adult. In the case of females, another moult occurs before adulthood. The life cycle of a female sarcoptic mite takes 17 to 21 days, whereas that of the male mite takes 9 to 11 days to reach adulthood. (3)

C) How is sarcoptic mange diagnosed?

Diagnosis of sarcoptic mange is commonly made by a skin scraping examined under the microscope. However, only 10-50% of cases of sarcoptic mange result in a positive scrape because the mites burrow deep into the skin. Therefore, just because no mites are seen in the scraped sample it does not mean your dog does not have sarcoptic mange. There is a simple home test known as the pinna-pedal reflex test which is reportedly about 85% accurate in detecting the presence of *Sarcoptes* mites. The test is performed by vigorously rubbing one earflap, moving from the tip of the ear down to the base of the ear for at least five seconds. A result is positive if the dog reacts with a reflex with a hind leg moving as if to scratch the ear. However, this test can be a red herring as dogs with *Demodectic* mites may also respond with a scratching reflex. Therefore, a presumptive diagnosis is mostly made based on clinical signs and history. It is helpful to backtrack and identify locations where the dog has been both in the last 10 days for a diagnosis. (1, 3, 4)

D) How is sarcoptic mange treated?

There are several medications that are effective against *Sarcoptes* mites. Your veterinarian will discuss the best treatment for your pet's condition and lifestyle. Treatment varies from medicated baths and dips to injections and oral

medications. Many pets will require a combination of treatments to resolve the infestation. If your dog is still scratching four to five days after treatment has started, please contact your veterinarian. (1, 5)

1. Natural treatments: Mite Avenge is a natural treatment that can get your dog out of misery quickly. Most dogs feel remarkably better within a day or two of treatment with Mite Avenge. Average cases require 3 treatments of Mite Avenge, once every 7 days. Mite Avenge breaks the *Sarcoptes scabiei* life cycle far faster than chemicals, and being a natural miticide, it is gentle and non-toxic, having nearly zero chance of reactions or side effects. Keep in mind that Mite Avenge **cannot be used on cats**. **Herding breeds** like Collies, Shetland Sheepdogs, Old English Sheepdogs, and others are known to carry the MDR1 gene mutation, making chemical treatments potentially deadly to these breeds. (3)

2. Dips: Some of the dips used to treat *Sarcoptes* include amitraz and lime-sulfur, which are noxious poisons. Your veterinarian will provide you with information on how to use these dips. Most topical chemical treatments do not kill on contact; the kill is delayed as the mites' nervous system is slowly destroyed. The dog is shaved and the skin is drenched with these chemicals. Because chemicals are absorbed fast through the skin and they spread quickly through capillary action, strong side effects in the dog can kick in quickly. The same properties that kill mites can also cause neurological and physiological reactions in dogs. The incidence of side effects of chemicals in dogs is high, and failure rate is also high (roughly 30%). (3)

3. Topical medications: Medications such as selamectin, imidacloprid, moxidectin, fipronil, and many others are applied topically to one or two of the affected spots every 14-30 days in dry skin, or as your veterinarian recommends. Most of these medications need to be given multiple times. (3)

4. Oral medications: Just like topical medications, there are a wide variety of oral medications available for the treatment of sarcoptic mange. Oral medications may be prescribed in the form of liquid, pill, or flavored chew, depending on the medication prescribed. Oral medications systemically spread throughout the dog's entire body and consist of neurotoxic chemical pesticides often used 'off label' for Sarcoptic and Demodectic mange, including milbemycin (the active ingredient of Interceptor® and Sentinel®), afoxolaner (NexGard®), fluralaner

(Bravecto®), and sarolaner (Simparica®). Unfortunately, mites are quickly developing resistance these products. These drugs may take up to 2 months or more to eliminate a Sarcoptes infestation and they stay in a dog's system well after treatment has stopped. After the poison has eliminated the mites, it can take several more weeks for the itchiness (pruritis) to resolve. (3) These drugs often come with long lists of potential side effects. (1, 3) Your dog may also require treatment for any secondary bacterial or yeast infections that have arisen as a result of a scabies infection. To prevent further self-inflicted damage from biting and chewing, your veterinarian may also suggest medicated baths or anti-itch medications. Occasionally, an Elizabethan collar may be recommended. (4) With both chemical and natural treatments, all other household dogs must be treated whether they are symptomatic or not. (3)

5. Keep the dog at home: If you have Sarcoptes mites on your pet or at home, in addition to the above-mentioned measures to eradicate these mites from the dog and dog's living environment, avoid taking your pet to other places (i.e. parks, groomer, therapist, and/or vet) (5).

E) Removing Sarcoptes mites from home/yard/environment:

1. Remove clutter in areas where your dog stays/sleeps. It's imperative that you clean out and sanitize all areas where your dog has been at home the same day you applied the scabies mite treatment to the dog. You can find scabies mites almost anywhere - in piles of newspapers and discarded papers, bedding, carpets, toys, air ducts, dusty attics, even lampshades and dirty laundry. Vacuum all your floors, carpets, and rugs and discard the vacuum cleaner bag/cannister in an outside garbage container right away. (5)

2. Disinfect all inanimate objects. You should also disinfect all inanimate objects as well as floors and bathroom surfaces by mopping with a bleach solution (one ounce of bleach for every gallon of water) and/or applying a disinfectant spray. Sterifab is proven to be one of the best ways to get rid of Sarcoptes mites. Sterifab is also highly successful in killing ticks, fleas, and a host of other insects. (5)

3. Wash all soft/cloth objects that have been in contact with your dog (sheets, blankets, coats, booties, bedding toys, stuffed animals, combs, etc.) in HOT water.

Wash these items in a diluted bleach solution (an estimated amount of one ounce of bleach for every gallon of water) in hot water (hottest setting in the washer setting) at least once a day, until no more sarcoptic mange lesions are observed in any of the pets or humans in the household. Be sure to wear disposable gloves when handling any of these items to help prevent the scabies mites from infesting the surrounding area and/or infesting you. Once you've washed these items, you should either put them in a hot dryer or hang it on a clothesline in direct sunlight. If you are unable to wash these items immediately, you should store them in an airtight plastic bag. If you are unable to wash these items at all, you should store them in an airtight plastic bag for at least a week. (5)

F) What to do if a *Sarcoptes* mange looking lesion is found on a dog in clinic:

- 1. Remove dog from clinic.** Immediately after a potential sarcoptic mange skin lesion is discovered on a dog's skin, the client should be politely informed that we have a protocol in place to contain a potential *Sarcoptes* mite infestation that requires the potentially infected dog to be removed from the clinic immediately.
- 2. Provide information to the owner.** Once the owner and dog have left the premises, provide owner with written information (see file) as to how to proceed to treat, exterminate, and prevent *Sarcoptes* mites at home. Recommend client to seek veterinary advise.
- 3. Wash all objects that the dog has been in contact with (blankets, towels, toys, etc.) in HOT water.** Place these items along with clothes worn by any staff that would have become in contact with the infested dog in a plastic bag and wash immediately in a diluted bleach solution (an estimated one-ounce bleach in one gallon of water) in the hottest setting in the washer. Be sure to wear disposable gloves when handling these items to help prevent the scabies mites from infesting the surrounding areas or infesting you. Once you've washed these items, you should put them in a hot dryer ('Sanitize' setting in our washer). If you are unable to wash these items immediately, you should store them in an airtight plastic bag until you are able to wash them.

4. Change clothes. Anyone that has been in contact with the dog should change their clothes and place them in the bag containing the blankets to be washed immediately. Proceed to wash as described above.
5. Vacuum the room thoroughly. Once the dog and the blanket or any other items that were in contact with the dog have been removed, vacuum the floor in the entire room VERY thoroughly, making sure to get under the chairs, desk, bench, etc. Empty the vacuum cleaner canister into a plastic bag and dispose of it directly into the outside dumpster. Wash the vacuum cleaner canister with a diluted solution of chlorine (one ounce of chlorine for every gallon of water).
6. Treat all inanimate objects with disinfectant spray. Disinfect all surfaces by mopping and/or applying a disinfectant spray. Sterifab is proven to be one of the best ways to get rid of Sarcoptes mites. Sterifab is also highly successful in killing ticks, fleas, and a host of other insects. (5)

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