



Dermatophytosis

Also Known As: Dermatophytosis, *Microsporum canis*, *Trichophyton mentagrophytes*, *Microsporum gypseum*, fungal infection

Transmission or Cause: Ringworm is transmitted from the environment to the animal. The fungus can infect the hair, nails, or skin and then be passed via the infected hair or scales of the skin to another animal. All bedding materials, combs, clippers, cages or any other objects with which an infected animal comes into contact become potential sources of infection. Other sources of infection include soil and rodents. Risk factors include poor nutrition, poor hygiene, and housing situations in which a large number of animals are closely grouped together. In addition, there is an increased risk for animals that are immunocompromised due to disease or immunosuppressive medications.



Affected Animals: Dogs, cats, humans, horses, cows, and other mammals. Ringworm can be transmitted between humans and animals.

Overview: The fungal skin disease dermatophytosis has come to be called ringworm because of the appearance of the skin lesion that characteristically occurs with this disorder: a circular area of hair loss with a red, raised outer rim. These lesions result from an inflammatory reaction to the fungus. Most often, dogs and cats are infected by the *Microsporum canis* fungus, but other types of fungi cause ringworm infections as well.



Cats, especially longhaired breeds, have a more generalized form of infection than dogs. These animals can be chronic carriers of a fungus even though they may not show any signs of infection themselves.

Ringworm fungi can be transmitted to humans; therefore, owners of infected animals should consider quarantining the pet indoors until the infection is cured. Precautions should be taken while treating animals in order to prevent human infection and environmental contamination.

Symptoms: Hair loss that is patchy or circular may be noted. Increased scales, reddened skin, bumps or pimples, darkened skin tone, and itching may be present. The face, ears, feet, and tail are the most commonly affected areas.

Description: Ringworm is an infection by a fungus that most often affects the hair, nails, and superficial layers of the skin. The most commonly noted fungal types seen in cats and dogs are *Microsporum canis*, *Trichophyton mentagrophytes*, and *Microsporum gypseum*.

Animals can come into contact with infective fungal spores in the indoor or outdoor environment. Contaminated soil is a common source of infection, as are other animals infested with ringworm. Not all animals that are exposed to fungal spores develop a fungal infection, and if an infection does occur, the dog or cat may not show clinical signs of the disease but instead serve as asymptomatic carriers.



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The classic clinical sign of ringworm is the circular patch of hair loss with a red ring of inflammation. However, not all animals infected by ringworm will have this type of lesion. In fact, because the symptoms of this disease can vary greatly, ringworm should be considered as a possible cause of skin disease in any eruptive skin disorder. Although most healthy dogs and cats can rid themselves of a fungal infection on their own, some cases can be very frustrating to cure. The asymptomatic carrier state can complicate matters. Since the presence of disease is hidden in these cases, owners will not know to take precautionary measures to protect against the spread of infection. Animals that do not respond to treatment, especially those living in multiple-cat households, should be referred to a veterinary dermatologist or specialist.



Diagnosis: Following a thorough history and physical exam, testing will be performed to rule out other skin diseases that have similar signs, such as a bacterial skin infection and skin mite infestation. A special light, called a Wood's lamp, can be used as a crude screening test for ringworm. Unfortunately, only 50 percent of a specific type of ringworm called *Microsporum canis* will fluoresce within the animal's fur with the characteristic apple green color. Therefore, a negative result from a Wood's lamp does not rule out the possibility of ringworm.

A more reliable way to diagnose ringworm is to conduct a fungal culture on hairs taken from around the skin lesions by plucking them with a clean instrument or brushing them with a new toothbrush. In order to identify the source of the infection, the fungal growth is evaluated under a microscope to determine the type of fungus present. This assessment of the material subsequent to its growth in a medium will rule out false positives that would otherwise be caused by environmental contaminants.

The veterinarian may evaluate plucked hairs under a microscope to look for evidence of fungal units associated with the hair shaft. However, this test is more time-consuming and only carries a 40 to 70 percent success rate in detecting a ringworm infection.

In animals with severe skin abnormalities, skin biopsies may be obtained. Although a skin biopsy can indicate a true fungal infection of the skin as opposed to a temporary presence, this procedure offers a less reliable diagnosis than a fungal culture. Often, this test is performed when the skin lesions are impossible to culture for ringworm.

Prognosis: Most healthy animals are capable of clearing a fungal infection on their own, but this process takes months. Because of the zoonotic potential of the disease, medical treatment should be used in order to expedite the elimination of ringworm and to decrease the contamination of the environment with infective fungal spores.

Treatment: Because ringworm is infectious, animals with the disease should be quarantined within the owner's home until the disorder can be cured. All infected animals or asymptomatic carriers within the household should receive topical therapy, which may include clipping down the hair and applying an antifungal ointment to the skin or shampooing and dipping the entire dog or cat in medicated products. The examining veterinarian will recommend the best approach depending on the location of the lesions. Topical treatment is continued until a negative fungal culture is obtained.

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Animals that do not appear to respond to topical treatment within two to four weeks may be given supplemental oral drug treatment in order to eradicate the infection more quickly. The most commonly used oral antifungal medication is griseofulvin, but some fungal infections may be resistant to it. Also, some animals, especially cats, cannot tolerate griseofulvin and may develop a serious side effect of fatal bone marrow suppression. Thus, serial complete blood count tests are performed on cats taking this drug to watch for evidence of bone marrow problems. Also, cats with the feline immunodeficiency virus should not be given this drug. Ketoconazole, itraconazole and fluconazole are also drugs used for the treatment of ringworm, as an alternative to griseofulvin for animals that cannot tolerate this medication, and because of their comparative safety and good efficacy, they are becoming the preferred medications for treatment of dermatophytosis. Periodic bloodwork to check liver function may be monitored in animals receiving long-term ketoconazole and itraconazole. Recently, terbinafine has also been used with success in selected cases of dermatophytosis in animals.

A vaccination against *Microsporum canis* has been developed for cats, but the safety and efficacy of this vaccination still needs to be researched. The use of the vaccine may be recommended in frustrating cases of ringworm infection.

Infections can be very difficult to eradicate in multiple-cat households or breeding facilities and often require the consultation of a veterinary dermatologist. Humans should wear gloves while treating the infected animal and follow the recommended protocol for avoiding infection, including a thorough disinfection of the indoor environment. If human infection does occur, prompt medical attention is advised. For detailed instructions on treatment of ringworm in multi-cat households, click on this link (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4361704/>)