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Ringworm in Cats

What is ringworm and what causes it?

"*Ringworm*" is the common name given to a fungal infection of the superficial layers of the skin, hair and nails. Ringworm infections can occur in humans and in all domesticated species of animals. The name comes from the classical appearance of the round, red, raised 'ring' marking the boundary of inflammation in people infected with the disease. The common name of ringworm is somewhat misleading, in that it is not an infection caused by a worm, and the infected areas are not always ring-shaped. The organisms that cause ringworm infections belong to a specialized group of fungi known as *dermatophytes*, so the medical name for this disease is dermatophytosis.

Some species of dermatophytes are species-specific, meaning that they will only infect one species, whereas others can be spread between different species of animals or from animals to man. In cats, one species of dermatophyte, called *Microsporum canis*, is responsible for almost all ringworm infections, and this species is infectious to cats, dogs and man. Occasionally ringworm infections in cats may be caused by species such as *Trichophyton mentagrophytes*. Both of these species are zoonotic, meaning that they can also infect humans.

What does ringworm look like?

"The lesions of ringworm in cats may be very mild or even undetectable."

Ringworm can be challenging to detect in cats, since the lesions of ringworm may be very mild or even undetectable. Ringworm fungi feed on the keratin that is found in the outer layers of the skin, hair and nails. A "cigarette ash" scaling in the depths of the coat may be the only visible indicator of ringworm infection in cats. Some cats may have round thickened patches of skin with hair loss. Hair loss (*alopecia*) occurs when the spores infect the hair shafts, resulting in increased fragility of the infected hairs.

In cats, the main sites for these lesions are the skin on the head, chest, forelegs and along the ridge of the back. These lesions are not usually itchy. Occasionally, infection of the claws known as *onychomycosis* may occur. The claws become rough, pitted, and develop a scaly base; they may ultimately become deformed. Ringworm may sometimes cause a more generalized disease where a much larger area of the body is affected, often seen as patchy hair loss.

Some cats, especially longhaired breeds, may have ringworm without any clinical signs or hair loss. This condition is known as an asymptomatic carrier state. These cats may infect other animals or people, especially in shelter or multi-cat environments, without caregivers suspecting they may be infected.

How is ringworm transmitted?

"Ringworm is contagious and can be passed between infected and non-infected individuals through direct contact or by contact with contaminated objects."

Ringworm is contagious and transmission occurs by direct contact with the fungus. It may be passed by direct contact with an infected animal or person, or by handling contaminated objects or touching contaminated surfaces.

The fungal spores may remain dormant on combs, brushes, food bowls, furniture, bedding, carpet or other environmental surfaces for many months (reportedly up to 18 months). Spores may be killed with a solution of chlorine bleach and water (one pint of chlorine bleach (500 ml) in a gallon of water (4 liters), or a dilution of 1:10 to 1:100), where it is feasible to use it.

Contact with ringworm fungus does not always result in an infection. The amount of environmental contamination is an important factor in the development of a ringworm infection, as is the age of the exposed person or animal. Healthy adult humans usually are resistant to infection unless there is a break in the skin such as a scratch. Elderly people, young children, and adults with immune system weaknesses or skin sensitivities are especially susceptible to ringworm infection. If your child has ringworm, he or she may have acquired it from your pet or from another child at school. If you or any of your family members develop suspicious skin lesions, see your family physician immediately.

How long does it take to get it?

The incubation period between exposure to ringworm fungus and the development of ringworm lesions usually ranges from seven to fourteen days; some cases may take up to 21 days before signs of infection develop.

How is a ringworm infection diagnosed?

The majority of cases of feline ringworm caused by *M. canis* will glow with a yellow-green fluorescence when the skin and coat are examined in a dark room under a special ultraviolet lamp called a Wood's lamp. However, not all cases show clear fluorescence and some other dermatophytes like *Trichophyton mentagrophytes* do not fluoresce. Some skin ointments and other materials will fluoresce and may give a false positive result.

The preferred method for diagnosing ringworm in cats is by culture of the fungus in a laboratory. For this, samples of hair and skin scrapings are taken. A positive culture can sometimes be confirmed within a couple of days, but in some cases the fungal spores may be slow to grow, and culture results can take up to four weeks, meaning that a suspected case cannot be called negative for at least a month. Cats are often tested after one to two weeks of treatment, and then at weekly intervals until two consecutive ringworm cultures are obtained.

There are numerous causes of hair loss in cats. Before making a diagnosis of ringworm, your veterinarian may recommend additional testing to rule out some of these causes.

How is ringworm treated?

"...treatment of the disease is *always* indicated to minimize the spread of the infection..."

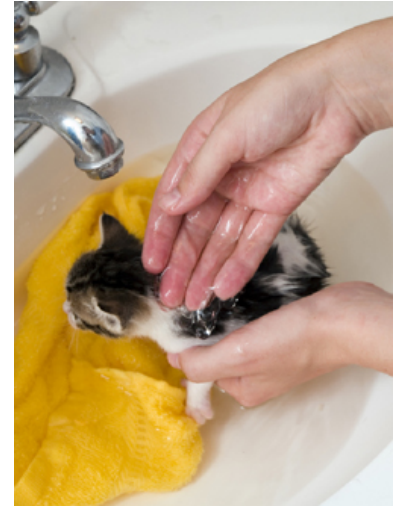
Although ringworm is a self-limiting infection in many cats, with resolution typically taking three to five months, treatment of the disease is *always* indicated to minimize the risk of spread of infection to humans, especially children, and other pets.

The most common way to treat ringworm in cats is to use a combination of topical therapy (application of creams, ointments or shampoos) and systemic oral therapy (administration of anti-fungal drugs by mouth). In order for treatment to be successful, all environmental contamination must be eliminated.

1. Topical treatment

Occasionally, topical therapy is used alone for treatment of ringworm, but more commonly it is used in combination with oral medication. Various creams and ointments are available to apply to localized areas of the skin affected by ringworm. If there are only one or two affected areas, shaving of the hair from these areas may be sufficient. If there is more generalized disease, or if your cat is a longhaired breed, your veterinarian may recommend clipping the pet's hair short to aid in treatment, along with bathing the cat with a medicated shampoo, typically twice a week. It is extremely important *only* to use preparations that have been specifically provided or recommended by your veterinarian. Topical treatment will usually be necessary for a period of several weeks to several months.

After bathing or treating your cat, be sure to wash your hands and sanitize any surfaces your cat been in contact with.



2. Oral treatment

In the majority of cases of ringworm, effective treatment will require administration of an oral anti-fungal drug. The most widely used drug for this purpose has traditionally been *griseofulvin*, although newer drugs such as *itraconazole* or *terbinafine* (*Lamasil*) are being used more frequently and are often preferred since they have fewer side effects. The response of individual cats to a treatment varies, and if therapy is stopped too soon, the disease may recur. Treatment must usually be continued for a minimum of six weeks, and in some cases, much longer therapy is required. Ringworm cultures are generally taken one to two weeks after the start of treatment to determine if your pet is still infected, and treatment is typically continued until two consecutive negative ringworm cultures are obtained.

If there is more than one pet in the household, try to separate infected from non-infected animals and just treat the infected ones. In some situations, it may be preferable to treat all of the pets. Your veterinarian will advise you on the best treatment given your individual circumstances.

3. Environmental cleaning

Infected hairs contain numerous microscopic fungal spores that can be shed into the environment. Infection of other animals and humans can occur, either by direct contact with an infected cat or through contact with fungal spores in a contaminated environment. In addition to minimizing direct contact with an infected cat, it is also important to attempt to keep the environment free of spores.

"It is also worthwhile to restrict the cat to certain rooms of the house that are easy to clean."

Clipping of infected hairs (with careful disposal) combined with topical antifungal treatment of affected areas of skin may help to reduce environmental contamination. Damp mopping or using electrostatic cleaners will aid you in removing pet hair from floors and furniture.

It is also worthwhile to restrict the cat to certain rooms of the house that are easy to clean. Environmental contamination can be minimized by thorough damp mopping or vacuuming of all rooms or areas that are accessible to your cat; this should be done as frequently as is possible (e.g. daily). In addition, the use of diluted bleach (1:10 to 1:100 bleach to water dilution) is recommended in areas that can be readily disinfected.

In multi-animal facilities such as animal shelters or kennels, treatment of ringworm can be extremely challenging and costly, and environmental contamination can be difficult to contain.

How long will my cat be contagious?

Infected pets remain contagious for about three weeks if aggressive treatment is used. The ringworm will last longer and remain contagious for an extended period of time if only minimal measures are taken or if you are not faithful with the prescribed approach. Minimizing exposure to other dogs or cats and to your family members is recommended during this period.

Ringworm cultures are generally taken several weeks after the start of treatment to determine if your pet is still infected. Typically two consecutive negative ringworm cultures indicate your cat has been successfully treated.



Will my cat recover from ringworm?

The vast majority of cats, if treated appropriately, will recover from a ringworm infection within a few weeks. While the appearance of the lesions may not change much during the first week or so of treatment, some improvement should be evident within two to three weeks. Symptoms may recur if the treatment was discontinued too early or was not aggressive enough (i.e. only topical treatment was used), or if the pet has some underlying disease compromising the immune system. Occasionally, despite appropriate treatment, the infection persists, and in this situation, your veterinarian may have to try alternative anti-fungal drugs.

What is the risk to humans?

Ringworm can be transmitted quite easily to humans, particularly children, and it is important to take appropriate steps to minimize exposure to the fungus while the cat is being treated (see *Environmental Cleaning* above).

"If any humans in the house develop skin lesions, especially small patches of skin thickening and reddening with raised scaly edges, early medical attention should be sought."

If any humans in the house develop skin lesions, especially small patches of skin thickening and reddening with raised scaly edges, early medical attention should be sought. Ringworm in humans generally responds very well to treatment. However, the ringworm fungus can remain infective for up to 18 months in the environment and re-infection may occur.

This client information sheet is based on material written by: Ernest Ward, DVM

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