



## Memorial-610 Hospital for Animals

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### Ringworm

#### WHAT KIND OF INFECTION IS IT?

"Ringworm" is the common name for the skin infection caused by a special group of fungi; it is not caused by a worm at all. The fungi feed upon the dead cells of skin and hair causing, in people, a classic round, red lesion with a ring of scale around the edges and normal recovering skin in the center. Because the ring of irritated, itchy skin looked like a worm, the infection was erroneously named. The fungi responsible are called "dermatophytes," meaning "plants that live on the skin" thus the more correct term for ringworm is "dermatophytosis." The characteristic "ring" appearance is primarily a human phenomenon. In animals, ringworm frequently looks like a dry, gray, scaly patch but can also mimic any other skin lesion and have any appearance.

#### WHERE WOULD MY PET PICK UP THIS INFECTION?

The spores of dermatophyte fungi are extremely hardy in the environment; they can live for years. All it takes is skin contact with a spore to cause infection. Infected animals are continuously dropping spore-covered hairs as infected hairs break off into the environment. Some animals are carriers, who never show signs of skin irritation themselves, but can infect others readily. There are several species of dermatophyte fungi.

Different species of fungi come from different kinds of animals or even from soil, so determining the ringworm species can help determine the source of the fungal infection.



#### CAN I GET THIS INFECTION?

Yes, ringworm is contagious to people; however, some people are at greater risk than others. The fungus takes advantage of skin belonging to those with reduced immune capacity. This puts young animals and children, elderly people and pets, those who are immunosuppressed, people on

chemotherapy, those taking medication after transfusion or organ transplant, and highly stressed people and animals at high risk. In general, if you do not already have ringworm at the time your pet is diagnosed, you probably will not get it.

#### HOW DOES THE DOCTOR KNOW THIS IS REALLY RINGWORM?

In some cases, we know for sure that dermatophyte fungi are present while in other cases we are only highly suspicious. Lesions on animal skin are rarely the classic ring-shape as in people (in fact, in animals, lesions are often not even itchy) thus some testing is usually necessary.

#### WOOD'S LIGHT

*Microsporum canis*, the most common ringworm fungus, will fluoresce apple green in approximately 50% of cases. Fluorescence is an easy test to perform and may provide a strong clue that dermatophytes are present. Further testing is usually needed, however, to absolutely confirm diagnosis.

#### MICROSCOPIC EXAMINATION

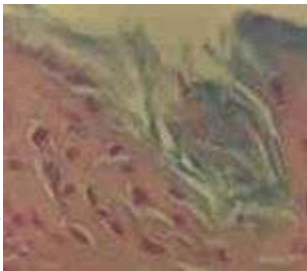
Your veterinarian may wish to examine some hairs for microscopic spores. If spores can be seen on damaged hairs then the diagnosis of ringworm is confirmed; however, as spores are very difficult to see, many veterinarians skip this step.

#### FUNGAL CULTURE

Here, some hairs and skin scales are placed on a special culture medium in an attempt to grow one of the ringworm fungi. The advantage of this test is that it not only can confirm ringworm, but can tell exactly which species of fungus is present. Knowing the identity of the fungus may help determine the source of infection. The disadvantage, however, is that fungi may require 10 or more days to grow out. Also, this is the only test that is helpful in determining if animal is an asymptomatic carrier. The other tests require an apparent skin lesion to test. A pet with no apparent lesions can be combed over its whole body and the fur and skin that are removed can be cultured. Carrier animals are usually cats living with several other cats.

## BIOPSY

Sometimes the lesions on the skin are so uncharacteristic that a skin biopsy is necessary to obtain a diagnosis. Fungal spores are quite clear in these samples and the diagnosis may be ruled in or out. Depending on the outcome of preliminary tests, your veterinarian may begin ringworm treatment right away or postpone it until after more definitive results are available.



*Skin biopsy from a cat with ringworm. Magenta colored "blobs" represent the actual fungus growing in the skin.*

## TREATMENT

Commitment is the key to success, especially if you have more than one pet. Infected animals are constantly shedding spores into the environment (your house) thus disinfection is just as important as treatment of the affected pet.

## ORAL MEDICATION FOR INFECTED PETS

There are primarily two medications being used to treat ringworm: griseofulvin and itraconazole. Veterinary dermatologists disagree as to which is better. Both medications are relatively expensive, must be given with food, and have significant potential to cause birth defects in pregnant pets. Treatment with either medication typically is continued for 1-2 months and should not be discontinued until the pet cultures negative. Stopping when the pet simply looks well visually frequently leads to recurrence of the disease.

### GRISEOFULVIN (brand name Fulvicin)

This medication must be given with a fatty meal in order for an effective dose to be absorbed by the pet. Persian cats and young kittens are felt to be sensitive to its side effects, which usually are limited to nausea but can include liver disease and serious white blood cell changes. Cats infected with the Feline Immunodeficiency Virus commonly develop life-threatening blood cell changes and should never be exposed to this medication. Despite the side effects, which can be severe for some

individuals, griseofulvin is still the traditional medication for the treatment of ringworm and is usually somewhat less expensive than itraconazole.

### ITRACONAZOLE (brand name Sporanox)

This medication is highly effective in the treatment of ringworm but is available in capsules far too large to be useful to most small animals. This means that a special company must reformulate the medication into a more useful size. Nausea is a potential side effect for this medication. The main reason it is passed by in favor of griseofulvin is expense. Itraconazole is also effective in treating many life-threatening fungal infections whereas Griseofulvin is usually only useful in treating ringworm.

By increasing the amount of Itraconazole in the environment, we may be creating resistance in more dangerous fungi that could become a problem over the years. On the average, cats treated with Itraconazole and nothing else were able to achieve cure two weeks sooner than cats treated with Griseofulvin.

## TOPICAL TREATMENT FOR INFECTED PETS

Both of the above medications work by inhibiting fungal reproduction rather than by directly killing the fungus. This is fine from the pet's perspective, as either medication should be able to clear the fungus without further therapy. However, we also would like to reduce contamination of the environment. This means actually killing the fungus on the pet so that the hairs dropped will not be infectious. There are many topical antifungals, including various creams, lotions and drops. In addition, chlorhexidene, an antiseptic, may be used in solution or shampoo form to cleanse the area and help reduce infection. For many years, cats with ringworm lesions were shaved to allow for easier topical treatment. We now know that shaving may be spreading the fungus, thus shaving is not always recommended (depending on the number of cats present in the home and the length of the hair).

### LIME SULFUR DIP

Dips are recommended twice a week and can be performed either by the hospital or at home. If you

attempt this kind of dipping at home, you should expect:

- Lime Sulfur will stain clothing and jewelry
- Lime Sulfur will cause temporary yellowing of white fur
- Lime Sulfur smells strongly of rotten eggs.

The dip is mixed according the label and is not rinsed off at the end of the bath. The pet should be towel dried. Shampooing is not necessary.

## **ENVIRONMENTAL TREATMENT**

The problem with decontaminating the environment is that very few products are effective. Bleach diluted 1:10 will kill 80% of fungal spores with one application and any surface that can be bleached, should be bleached. Vigorous vacuuming and steam cleaning of carpets will help remove spores and, of course, vacuum bags should be discarded. To reduce environmental contamination, infected cats should be confined to one room until they have cultured negative. The rest of the house can be disinfected during this confinement period. Cultures are done monthly during the course of treatment.

## **THE RINGWORM VACCINE FOR CATS**

In 1994, Fort Dodge released a vaccine which could be used either in the prevention of ringworm infection or in its treatment. Our hospital does not recommend the use of this product; while it may prevent the development of obvious lesions in a cat, it probably will not prevent infection. This means that vaccinated cats could more easily become carriers of infection. The vaccine is meant to be used in a treatment situation where many cats are infected. It was designed as a supplement to the treatments described above rather than as a preventive for cats in general.

## **WILL RINGWORM GO AWAY BY ITSELF?**

There have been several studies that showed that this fungal infection should eventually resolve on its own. Typically, this takes four months, a long time in a home environment for contamination to be occurring continuously. We recommend treatment for this infection rather than waiting for it to go away.

*Adapted from "Ringworm FAQ" by Wendy C. Brooks, DVM, DABVP*