



## A Foster Parent's Guide to Ringworm

PAWS is committed to treating animals with ringworm, and kittens and cats with ringworm respond best to treatment in a home where they can be socialized, cared for, and monitored closely. A foster home provides a great environment for this type of care and monitoring.

Contrary to its name, "Ringworm" is not a worm at all but a fungus, properly called a "Dermatophyte," meaning "Plant that lives on the skin." The fungi live on the surface of the skin, in the skin follicles, and sometimes in hair shafts, feeding on dead skin tissue. In the past, the circular lesions made by the fungus were thought to be caused by a worm, hence the name Ringworm. While this circular lesion is one form ringworm can take, it is not the only pattern. Crusts, scabs, and areas of hair loss that are not circular can also be caused by a dermatophyte. The most common species causing fungal skin lesions in cats and dogs are *Microsporum canis*, *Microsporum gypseum*, and *Trichophyton mentagrophytes*.

### What does Ringworm look like?



The usual appearance of Ringworm is a round, hairless lesion, often with a crust along the leading/outer edge. The characteristic "ring" that we see on humans does not always appear as a ring on animals. The lesion may grow in size and become irregular in shape. The fungi causes hair shafts to break, hence the patches of hair loss. Most often ringworm lesions are seen on the face, ears, tail, and paws or lower leg. The lesions are usually scaly, may or may not be itchy, and often the skin is red and inflamed.

### How is Ringworm transmitted?

Transmission can occur by direct contact with another infected animal or person or contact with a infective spore in the environment. It can be passed from cats to dogs, from dogs to cats, from pets to humans, and from humans to pets. The fungal spores can live in the environment for a long time and can be found in carpets, bedding, grooming equipment, etc. and can infect an animal when it comes into contact with those objects. The incubation period is 7-21 days, meaning 7-21 days after contact will pass before any lesions occur. In many cases ringworm can be spread by contact with infected soil. The

fungus can live for months in soil if the nutrients are right. Fleas and mites can also spread ringworm, please keep current with flea treatments!

### **Can humans catch ringworm from animals?**

Yes. Humans can contract ringworm by touching an animal with ringworm or coming into contact with spores in the environment. Ringworm can spread while petting or grooming cats or dogs with ringworm. You can also get ringworm from mice, rats, cows, goats, pigs and horses. Ringworm on humans tends to have the more circular ring pattern.



### **Are all cats or dogs susceptible to ringworm?**

While all animals (including birds and humans!) are susceptible to ringworm, healthy adult animals usually have robust immune systems and do not develop signs of disease. Younger animals, including kittens, puppies, and kids, are more susceptible because their immune systems are not fully developed. Similarly, older animals or animals that have autoimmune disease or other underlying diseases are more susceptible. Many cats and dogs are carriers of ringworm but show no symptoms. They can, however, infect other animals or humans.

### **Diagnosis of ringworm**

A veterinarian will diagnose ringworm using a variety of tests. It is not possible to make a diagnosis just by looking at the skin. Typically, if ringworm is suspected based on the appearance of the skin, treatment is started immediately while testing is being completed.

A Wood's lamp is a light that is used to cause fluorescence (bright green illumination) of microbial byproducts on the skin or hair. It identifies a chemical reaction that occurs as a result of the infection but does not identify spores or infective material. While it is a helpful tool to identify dermatophytes, it does not identify all ringworm species and cannot be the only tool used to diagnose ringworm. It is NOT a blacklight, although it kind of looks like one.

A fungal culture is used to grow dermatophyte species that are present on the skin or fur. A brushing or scraping from the lesions is placed onto a culture plate that allows optimal growth conditions for fungus only. The resulting growth is then observed under a microscope and assessed for characteristics of ringworm, specifically fungal spores or "macroconidia." A positive result may be seen in as few as 4 days, but to be truly negative a culture must be monitored and produce no growth for 21 days.

Your foster animal will need repeat ringworm cultures while they are being treated. Plan to bring your foster to the clinic at least once every 2 weeks, and potentially once every week for repeat cultures. Cultures should be obtained 3-7 days after the most recent lime sulfur treatment.

### **Is there a way to treat ringworm?**

Yes! While most untreated ringworm infections will resolve on their own in 2-4 months, treatment is recommended to reduce the amount of time an animal is contagious and spreading ringworm, as well as to make the animal more comfortable as soon as possible. Some animals will not resolve without treatment and will continue to get worse. PAWS treats all of our in-house and foster animals.

### **Ringworm Treatment**

The best treatment for ringworm is a multi-pronged approach that involves treating the animal systemically, treating the animal topically, and ensuring a clean environment. At PAWS, we achieve this by giving an oral medication, a shampoo or dip, topical cream to put directly on visible lesions, and strict cleaning of the environment in which the animal lives.

Oral Antifungal Medication: The best oral medications for ringworm treatment are Terbinafine (tablets) and Itraconazole (liquid). These medications are very important for treating the infection going on within the skin of the animal. The medication dose is based on the animal's weight, if you are fostering kittens be sure to weigh the kittens weekly as they grow to make sure they are getting the correct dose.

Topical Lime Sulfur Solution: Lime Sulfur solution is the best method for reducing the number of infective fungal spores that are shed into the environment. While smelly and annoying, this treatment will dramatically reduce the amount of time an animal is infective to itself and other animals. Treatments should be done at least once every week, ideally twice a week with 8oz of solution diluted into 1 gallon of warm water. Apply the solution to the cat's fur using a spray bottle (avoiding the eyes, ears, nose, and mouth) and massage the solution into the fur all the way down to the skin. Do NOT rinse the solution, let it air dry!

If you are unable to perform the lime sulfur treatments at home, you can bring your foster animal in to the PAWS Grays Ferry facility on Mondays and Thursdays around 11am for treatment, which are the days that PAWS treats the in-house animals. Please arrange this with your foster coordinator.

Topical antifungal creams: Topical miconazole or terbinafine (Lamasil) can be applied to the visible lesions daily or twice daily. Make sure you do not apply the cream right before a Lime sulfur treatment! Creams can be purchased over-the-counter at most pharmacies and grocery stores. Be sure to use a product with Miconazole or Terbinafine as the active ingredient.

Environmental Decontamination: Environmental decontamination is crucial for efficient and effective treatment of ringworm. Without environmental decontamination, spores shed by an animal may remain infective for months, re-infect the animal, and prevent complete healing. The easiest environment to maintain and decontaminate is a limited environment (small space) that is easy to clean (porcelain, tile, plastic, metal surfaces), like a bathroom.

The MOST important thing during environmental decontamination is to remove all infective hairs and organic matter from the environment. Regular vacuuming, sweeping, and mopping is important, along with using a detergent or soap to break down any material that may be harboring infective spores. Use bleach mixed at a 1:32 ratio (1 part bleach to 32 parts water) on any surface that allows bleach cleaning at least every other day. The bleach solution should be sprayed on and allowed to sit for a minimum of 10 minutes before wiping off. Surfaces that may be able to be bleached include walls, floors, countertops, windowsills, carriers, toys, etc. A stronger bleach concentration of 1:10 (1 part bleach to 10 parts water) may be used, but please make sure you have adequate ventilation!

**\*\*Bleach is not effective at decontaminating spores within organic material, so it is very important to clean surfaces of organic debris and use a soap/detergent BEFORE using the bleach solution\*\***

Regularly wash all bedding in very hot water with detergent and color-safe bleach. Avoid carpets and toys that cannot be cleaned.

After interacting with animals infected with ringworm immediately wash hands thoroughly and change clothing; it is a good idea to wash clothing that came into contact with ringworm infected animals in hot water with color-safe bleach. Disposable gloves and isolation gowns are available at PAWS to make this process easier.

Steam cleaning of carpets and furnishings will also kill a large number of spores, this is best done after the pets have left the home or have been cleared of ringworm.

Ringworm spores can live in environments for a long time; clean an infected environment extremely thoroughly after the animals clear ringworm or move to a different environment!

If you are concerned that a room or space in your home may be contaminated with ringworm, talk with your foster coordinator about culturing the environment.

### **When is an animal cleared of ringworm?**

After a positive ringworm culture, an animal must have two negative fungal cultures in a row, taken at least 2 weeks apart from each other, to be considered clear of ringworm. Cultures take three weeks to be sure they are negative, but a positive result can be seen in as few as 4 days. Usually, it takes at least 6 dips in the lime sulfur solution (about 4 weeks) before a confirmed negative result is obtained. If an animal is identified as having lesions that look like ringworm, it will probably take between 21 and 60 days (1-2 months) until they are considered negative for ringworm.

# How-To Guide for Lime Sulfur Treatment of Cats

## 1. Prepare yourself

- Remove all jewelry, lime sulfur will stain some metals
- Wear old clothing, lime sulfur will stain clothing
- Acquire a pair of heavy duty dishwashing gloves or other plastic gloves

## 2. Prepare the solution

- Use an old plastic bucket or container, DO NOT mix directly in your sink or tub! Lime sulfur will stain things yellow!
- Dilute 8 ounces of lime sulfur concentrate in 1 gallon of warm water and mix well
- Place the solution into the bucket first, then fill to one gallon.
- If you have small kittens you can dilute 4 ounces of lime sulfur concentrate with a 1/2 gallon of warm water.

## 3. Spray the cat(s)

- Do not pre-wet the cat
- Do not use Miconazole cream 6 hours prior to the treatment
- Using a spray bottle or cloth, cover the entire animal with the lime sulfur solution
- Massage solution into fur, ensuring all hairs are coated down to the skin
- Use cotton balls, a tooth brush, or a designated washcloth for the head, face, ears, and noses. These areas are important as they are the most often affected
- **\*\*DO NOT ALLOW SOLUTION TO GET INTO EYES, EAR, NOSE, OR MOUTH\*\***
- Allow the cat to air dry, do not rinse off the solution. Air dry in a warm area, either in a crate or cat carrier.

## 4. Dispose of excess dip down the drain and rinse thoroughly to avoid staining

- Repeat in 3-7 days.

Helpful Resources for lime sulfur treatments

<https://vcahospitals.com/know-your-pet/ringworm-in-cats>

<http://www.youtube.com/watch?v=35zau-JS5TE&feature=fvsr>

<http://www.youtube.com/watch?v=Xjxm01mICxw&feature=related>

## Cleaning up ringworm

While ringworm animals are in your home, it is VERY important to thoroughly clean the environment to prevent re-infection of the animals and infection of healthy animals and people in the home.

The first step in any thorough clean is to remove all organic matter. Vacuum, sweep, mop, or wipe up any hair, food, dandruff, litter, bodily fluids, and other materials.

All non-porous surfaces should be cleaned daily with bleach diluted 1 part bleach to 32 parts water. The bleach solution must sit for a minimum of 10 minutes before being wiped off to be effective. A final cleaning once the cats have cleared ringworm or moved to a new environment must be done with a bleach solution diluted 1 part bleach to 10 parts water. This is a very strong concentration so make sure you have adequate ventilation.

Rugs, carpeting, drapes, and upholstery should be vacuumed at least once a day for one week. Change vacuum bags or clean vacuum canister with bleach solution every other day. Vacuum filters should also be replaced with special consideration to their disposal as ringworm spores can live in this environment indefinitely.

Bedding and any clothing that comes in contact with the cats should be washing in a washing machine on the hottest water setting with color safe bleach.

Fabric or cloth scratching posts should not be used since they can harbor ringworm spores and are not easily cleaned. Any scratching posts should be discarded after the cat is cleared of Ringworm or leaves the environment.

Toys and bowls should be soaked for at least 15 minutes in a bleach solution diluted 1 part bleach to 32 parts water every other day. They can be rinsed with hot water after they soak for 15 minutes.

Carriers should be cleaned with bleach diluted 1 part bleach to 32 parts water and the solution allowed to sit on the carrier for 10-15 minutes before being wiped off.

Change heating and air conditioning vents as recommended. A Swiffer can be used to wipe off vents, and areas that cannot be reached.

Bleach deteriorates once exposed to light. When mixing bleach solutions you should either use a spray bottle that is NOT clear or mix small batches and re-make the solution once every 24 hours.

Thank you so much for treating ringworm! It seems overwhelming at first but once you get into a routine it should take you no longer than 30 minutes or so of extra time a day to treat and manage these patients!