

Ringworm

Ringworm is a fungal skin infection, also called dermatophytosis. In dogs and cats, the two most common ringworm species are *Trichophyton*, *Microsporium canis* and *Microsporium gypseum*.

Zoonotic Risk

The three species of ringworm differ in their contagiousness and risk of zoonosis.

M. canis is considered contagious to other animals and a zoonotic risk.

M. gypseum is not considered contagious and is not a zoonotic risk.

Trichophyton is not considered contagious and is not a zoonotic risk.

Ringworm Protocol (CATS)

Step 1 Diagnostics: Establish Species

1. Wood's lamp exam
 - a. Only *M. canis* fluoresces under the wood's lamp.
 - b. Wood's lamp positive lesions = hairs which glow bright, apple green.
 - i. This is a metabolite of the ringworm organism, not the ringworm fungus itself
 - c. Doxycycline, pyrantel, urine, food debris, and many other fluids may fluoresce yellow or orange. If it can be rubbed or washed off, it is not ringworm. If it is yellow or orange, it is not ringworm.
2. If a lesion is Wood's lamp positive- this confirms *M. canis* ringworm infection.
 - a. Admissions staff should wood's lamp any cat under 6 months on intake.
 - b. If a positive cat is suspected, they are encouraged to seek a DVM to confirm the diagnosis immediately. If a DVM is not available, admissions staff needs to email or alert DVM in person and a confirmatory exam will be prioritized. In the meantime, suspected positive cats should be held in general population with signage indicating possible ringworm status and PPE requirements.
3. If a lesion is Wood's lamp negative, but a DVM is still concerned, a ringworm PCR should be collected and sent to IDEXX for PCR analysis.
 - a. DVMs are encouraged to perform trichograms to establish a definitive diagnosis in wood's lamp negative cats with suspicious lesions.
 - b. In the meantime, suspected cat should be held in general population with signage to indicate possible ringworm infection.

Step 2 Diagnostics: Species- dependent

1. *M. canis* is considered contagious and zoonotic. Proceed with treatment and isolation as described below.
2. *M. gypseum* and *Trichophyton* are not considered contagious and are rarely zoonotic. Proceed with treatment as a foster to adopt described below.

Pathway for Cats Infected with *M. Canis*

Treatment of *M. canis*:

1. Terbinafine at 30 mg/kg PO SID x 21 days. Use chart below for cats. An oral suspension can be compounded and ordered for small mammals if necessary.

Cat Weight	Dose (250 mg tablets)
<2.8 kg	¼ tablet PO SID
2.8-5.5 kg	½ tablet PO SID
>5.5 kg	1 tablet PO SID

2. Lime dips 2x/week until wood's lamp OR culture negative.
 - a. The concentration of lime-sulfur dip for shelter use is higher than labeled on the bottle. 8oz of lime-sulfur concentrate is added to 1 gallon of warm water.

Note: Terbinafine may be compounded into a liquid suspension. Consider using for litters of kittens as once it is mixed; it is only good for 7 days.

Instructions

1. Crush one 250 mg Terbinafine tablet
2. Add 1.5 ml liquid such as Versa-Free syrup
This creates a 166.7mg/ml oral suspension

Isolation of cats with *M. canis*:

1. Isolate ringworm positive animals and any animals which a DVM considers high suspicion who are awaiting PCR results.
2. Full PPE should be worn by anyone handling ringworm positive kittens
 - a. Gown
 - b. Gloves
 - c. Booties
 - d. Hairnet if needed- pull hair back

Monitoring and discharge from Ringworm ward for *M. canis* infection:

1. Requirements for discharge from the ringworm wards:
 - a. A negative wood's lamp exam

4. While it is advantageous to keep the foster area clean, a deep clean is not required until the ringworm kittens have left the foster home for adoption.
 - a. If a kitten is cleared from ringworm and permanently leaving the contaminated foster home environment, it must be bathed in lime-sulfur one final time prior to discharge to rid the coat of any spores.
5. Upon completion of fostering ringworm positive cats (i.e. all kittens have permanently left the home), the foster environment must be deep cleaned.
 - a. We recommend use of Rescue (1:16 dilution) or bleach (1:31 dilution). Please be aware that diluted bleach is only stable for 24 hours.
 - b. Deep cleaning entails removal of all debris (hair, dander) prior to surface cleaning at a minimum of three times. The cleaning solution (dilute Rescue or Bleach) must be in contact with a clean surface for a minimum of 10 minutes each time.
 - c. At minimum, all blankets and bedding must be washed twice in cold water with a wash cycle of at least 14 minutes. Bleach is not necessary but is anti-fungal and beneficial if available.
 - d. Any structures or surfaces unable to be cleaned (cat trees, furniture, toys, carpet) must be disposed of.

Resources:

At any time, the shelter manager and director may choose to humanely euthanize a ringworm positive animal if humane isolation facilities are not available. Ringworm can take anywhere from 3 weeks to months to treat, and isolation in sub-optimal facilities is neither humane for the animals nor realistic for our capacity for care.

Feral or return-to-home cats with Ringworm

It is considered inhumane to keep feral or under socialized cats in the shelter for the sole purpose of treating ringworm. Because ringworm is not life threatening and typically resolves on its own with time, all feral and/or return-to-home cats infected with *M. canis* should be returned to home and as soon as able to reduce risk of spread throughout the shelter.

Pathway for Cats Infected with *M. gypseum* and *Trichophyton* (“non-infectious ringworm”)

Treatment of non-infectious ringworm:

Treatment will include oral administration of terbinafine as well as topical treatment of lime-sulfur.

Isolation of non-infectious ringworm:

This is not considered necessary beyond the normal hygiene practices of the shelter. PPE and isolated rooms/wards are not needed.

Foster to Adoption of non-infectious ringworm:

Excluding other behavioral or medical holds, any animal with non-infectious ringworm can be made available for foster-to-adoption.

Like other foster-to-adopt programs, all medical concerns outside of the treatment of the identified ringworm would be the sole responsibility of the adopter. Upon entering the foster-to-adopt agreement, IHS will provide medication (terbinafine and lime-sulfur) for treatment of the ringworm and re-check exams every 2-3 weeks at no charge to the foster parent. At these appointments, repeat fungal PCRs should be submitted. A negative fungal PCR is considered curative. At that stage, the foster parent will be able to complete the adoption.

Ringworm Protocol (DOGS)

Unless stated specifically, a large majority of the principles regarding ringworm treatment in cats can be applied to dogs. Due to the rarity of ringworm in dogs compared to cats and the higher prevalence of *M. gypseum* and *Trichophyton* versus *M. canis*, the diagnostic component will differ than that in cats.

Diagnostics: All Dogs get PCR testing

1. A fungal PCR is to be submitted on every dog with a suspect ringworm lesion.
 - a. While a positive wood's lamp exam is diagnostic for *M. canis* infection, a PCR is required due to the immense negative effects of long-term sheltering in affected dogs as well as the general rarity of *M. canis* infection in dogs.

M. canis infection in dogs

1. Treatment will be like cats- terbinafine 30mg/kg PO SID and spot treatment with lime-sulfur diluted 8oz into a gallon, twice weekly.
 - a. Dogs should be individually prescribed terbinafine based on weight
 - b. Dogs should be individually prescribed lime-sulfur with directions for dilution on the label.
2. Isolation
 - a. Dogs are not to be co-housed with cats under any circumstances (i.e. dogs are not permitted in the "ringworm ward")
 - b. Instead, dogs will be sheltered "in place" in general population with signage indicating that PPE and isolation is required to prevent disease spread.
3. Monitoring
 - a. Dogs positive for *M. canis* should be re-checked weekly with the same principles applied as above with cats.
 - i. If a dog is wood's lamp positive with a PCR positive for *M. canis*, wood's lamp exams and/or cultures can be used to establish cure. A negative wood's lamp exam or a negative culture along with a weak wood's lamp exam is considered curative.
 - ii. Dogs with PCR cultures positive for *M. canis* without a positive wood's lamp exam will be monitored on a case-by-case basis.
4. Due to the zoonotic risk and contagiousness of ringworm, dogs will not be considered eligible for adoption until they are cured of their *M. canis* infection. Alteration of this process may be elected at the discretion of the lead DVM and/or management team.

Pathway for Dogs Infected with *M. gypseum* and *Trichophyton* ("non-infectious ringworm")

This process will be the same for dogs as described above for cats (foster-to-adopt).