

ECC-HOU-125-SOP Ringworm Protocol

Summary: Ringworm, is a fungal infection of the skin. It can be spread by contact with an infected animal, its bedding or other fomite. The fungus can also survive in the soil. Ringworm is usually self-limiting, and many animals will recover without treatment, but in the shelter environment, we typically treat to prevent the spread of the infection to other animals or people.

Operational Procedure: The Lifesaving Centers will treat and monitor animals in care with a ringworm diagnosis. Potential adopters will be advised of treatment status and instructed on continuance of treatment and monitoring.

Definitions:

- Ringworm: a fungal infection most typically caused by *Microsporum canis*, *Microsporum gypseum*, or *Trichophyton mentagrophytes*. Clinical signs include circular, crusty areas of hair loss, and possibly diffuse hair loss. It is a zoonotic condition.
- Lime sulfur dip: A topical rinse used to kill ringworm. It needs to be diluted as per manufacturer's instructions. Proper application includes saturating the coat with sprayer and/or towel/sponge, then allowed to dry on the coat.
- DTM: Dermatophyte Test Medium. This is the diagnostic test most commonly used for ringworm and is a fungal culture. The media turns a red color with dermatophyte growth. Contaminants can also be grown.
- Ringworm (Fungal) PCR: Fungal Polymerase Chain Reaction. This lab test is used to determine if the DNA of the fungus causing ringworm is present in the submitted sample.
- Zoonotic: A disease that is transmissible from animals to people. Ringworm is an example.

Procedures:

Initial Diagnostic Testing:

1. Woods lamp screening should be performed on any lesion consistent with ringworm.
2. Consider performing Woods lamp screening before moving an animal to group housing or to foster care.
3. Sample collection for DTM or PCR:
 - a. Samples should be collected in a uniform manner for every DTM.
 - b. For single lesions: Using a sterile toothbrush, brush the entire body (nose to tail) 15 times, then the lesion 5 times.
 - c. For multiple (or no) lesions: Brush the animal 20 times with whole body

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strokes.

4. For centers with in-house DTM fungal culture capability, refer to ***ECC-HOU-121-Ringworm In-house Fungal Culture Protocol***.
5. If there is a need for faster results or for centers that do not have DTM capability, submit a Ringworm PCR (Idexx code 3565).
 - a. If positive PCR, continue with treatment.
 - b. If negative PCR, discontinue treatment – not considered infected.

Topical Treatment:

1. Start twice weekly lime dips after obtaining initial sample. Lime-sulfur should be used at **8 ounces to the gallon**.
2. Safe to use on pregnant and nursing animals and neonates > 2 weeks old.
 - a. Wipe nursing mom's teats after topical treatment, and keep juveniles warm with a heating lamp or warming blocks if necessary
3. Topical therapy is needed to treat the hairs. Systemic therapy (outlined below) will kill spores in the hair follicle but will not kill spores on the hair coat.
4. Continue twice weekly lime dipping until cleared.

Systemic Treatment:

1. Start treatment as soon as positive PCR or DTM is determined or if high suspicions (wood's lamp positive) while waiting on confirmation.
2. The average treatment time is 6 weeks.
3. Continue twice weekly lime sulfur dips during this time.
4. For animals 4 weeks of age or older, start terbinafine (an anti-fungal) 20-30mg/kg once daily, until the animal is cleared.
 - a. Cat dosing schedule, using 250mg tablets +/- suspension:
 - i. Kittens <2kg or any cat if tablets unavailable: liquid suspension at 30mg/kg (calculate exact dose)
 - ii. Cats 2.0-2.8 kg receive one-quarter of a tablet (62.5 mg) per dose.
 - iii. Cats weighing 2.8–5.5 kg receive one-half a tablet (125 mg) per dose.
 - iv. Cats >5.5 kg receive one tablet (250 mg) per dose
 - b. Dogs: calculate dose at 30-40mg/kg once daily (may administer liquid or tablets)
5. Itraconazole is an alternative option (at vet's discretion) and can be considered in cases where terbinafine is ineffective or not well-tolerated.
 - a. Itraconazole 5mg/kg PO SID, pulse dosing – one week on, one week off for 6 weeks.

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- b. Use a commercially available product, **not compounded** itraconazole.

Follow-up Diagnostic Testing

1. A Ringworm PCR can be used to clear an animal. Because false positives are more common in PCR testing, submit a culture at same time.
2. There should be a high suspicion that the infection has been cleared.
 - a. Animal is rechecked by staff every 2-3 weeks, if in foster care
 - b. PCR is performed when lesions are resolved and new hair growth visible and no new lesions.

Refractory Cases:

1. Verify environmental decontamination (deep cleaning at least once weekly).
2. Verify appropriate lime dipping procedure.
3. Verify appropriate medication dose, particularly with growing animals.
4. Treatment plan to be determined by veterinarian. Consider changing to itraconazole from terbinafine.

Housing:

1. These animals would ideally be housed separately from all others and isolated, including in foster homes.
2. Precautions for ringworm animals:
 - a. Wear protective clothing when working with affected animals (long sleeved gown, gloves, shoe covers or boots used only for that purpose). Discard or launder protective clothing daily.
 - b. Work with non-infected rooms/areas first
 - c. Bedding and toys should be changed or cleaned daily whenever possible
 - d. Use designated cleaning tools (poop scoops, scrub brushes, swiffers).
3. No sleepovers or outings
4. Ringworm positive dogs/puppies may not go to play groups or common areas, should not be introduced to other animals. They may be walked away from other dogs or on roads (safely) with limited dog travel if vaccine status allows. Run mates will also be restricted as above and treated as necessary.

Sanitation:

1. Fungal spores do not “live” in the environment and do not multiply. The purpose of cleaning is to mechanically remove spores so that cultures are not confounded by environmental contamination.
2. The most important part of decontamination is the mechanical removal of debris followed by washing and disinfection.

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3. Wash all bedding/towels in bleach and hot water. Do separately from other area laundry. **Do not overload washer.**
4. Clean all dishes separately from other area's dishes.
 - a. Simple hot water and dish soap with thorough washing/rinsing is adequate; dishwasher cleaning is preferred.
5. Room cleaning (daily)
 - a. Remove all organic debris using a damp mop, swiffer or vacuum. Discard vacuum bag or empty into trash bag (preferably outside) and discard after use. This includes floors, walls, countertops, windowsills, and carriers.
 - b. Do not sweep with a broom.
 - c. Spot clean floors and non-porous surfaces as needed with Rescue at 1:16 concentration. Rinsing is not necessary.
 - d. Ensure floors and surfaces stay wet with Rescue for a contact time of 5 minutes.
6. Deep cleaning (1-2x weekly)
 - a. Entire room should be deep cleaned 1-2 times per week.
 - b. Perform deep cleaning the same day as lime dipping.
7. Litter boxes:
 - a. Change daily
 - b. After removing organic debris, spray with Rescue at 1:16 concentration and let soak for 5 minutes.

Fostering:

1. Foster homes should be disinfected using the same procedures with Rescue at 1:16 concentration.
2. Fosters will be sent home with diluted Rescue.

Adoption:

1. Ringworm animals can be adopted with adopter disclosure, including zoonotic risk.
2. Ringworm animals cannot go on adoption events, nor should their run mates, unless an exception is made by management.

Spay/neuter:

1. Ringworm animals can be spayed or neutered as long as the animal is otherwise healthy and lesions do not involve the surgical site.
2. They will be the last planned surgery of the day.
3. If being spay/neutered while undergoing treatment, lime sulfur dip should be performed the day before procedure
4. Contact the clinic ahead of time to notify of ringworm status to ensure appropriate

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housing and biosecurity measures.

Related documents: *ECC-HOU-121-Ringworm In-house Fungal Culture Protocol*

Sources:

Diagnosis and treatment of dermatophytosis in dogs and cats. Clinical Consensus Guidelines of the World Association for Veterinary Dermatology. Karen A. Moriello, Kimberly Coyner, Susan Paterson and Bernard Mignon. *Vet Dermatol* 2017; 28: 266–e68

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