



## Ringworm Diagnosis and Treatment Guidelines

The Austin Pets Alive! Ringworm Adoption Center was created in November 2010 with the purpose of housing and treating cats infected with ringworm. This handbook was written as a guide to the diagnosis and treatment of ringworm- situations will arise that warrant specific advice from Austin Pets Alive! staff or a veterinary professional.

This handbook is divided into the following sections:

- I. Identification
- II. Cattery Outbreak Protocols
- III. Disinfection/Quarantine
- IV. Treatment
- V. Clearance Exams

Any questions about the protocol and procedures described in this handbook should be sent to [inquires@austinpetsalive.org](mailto:inquires@austinpetsalive.org).

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# I. Identification

At Austin Pets Alive! we clinically diagnose ringworm, meaning that we make a diagnosis on the basis of knowledge obtained by medical history and physical examination alone, without benefit of laboratory tests or microscopic examination. Fungal cultures can be more conclusive, but also provide false positives and negatives as with any other test, take up to 2 weeks to provide a result, and require resources and staff time that may be better spent elsewhere. APA! Diagnosis guidelines are outlined as follows:

## I.i Visual Light Recognition

- Multiple trained sets of eyes, at different times during cat's stay
  - Volunteers, staff, and fosters all trained to recognize signs
  -
- Consider history
  - Ringworm exposed?
  - Hoarding case?
  - Unthrifty/not grooming?
- Pay special attention to young, old, sick, stressed, or otherwise immunocompromised cats
- Tactile as well as visual exam
- Know the signs:
  - Areas of hair loss (frequently but not always circular)
    - Well-defined edges
  - Crusty skin, sometimes inflamed/moist
  - Pay special attention to face, ears, feet, and tails
- Err on the side of caution- treat suspicious crusty, flakey spots as potential ringworm

## I.ii Using a Wood's Lamp

- Find/create as dark a room as possible
- Use a true Wood's Lamp, not a blacklight light bulb or flashlight, for truly diagnostic results
- Give your eyes time to adjust to the dark room
- Hold lamp  $\leq$  4 inches away from cat
- Start at tail and work against grain of fur, pushing it forward as you go to look at the roots and skin
  - Pay special attention to the spots identified previously as suspicious
- Look for **hair shafts** that light up from root to tip- ringworm does not cause skin to fluoresce
  - If you find a spot of skin with no fluorescence but the skin is crusty, try gently peeling

the crust/scab up- there may be Wood's Lamp positive hairs underneath

- Look for apple- or neon-green glow, sometimes more blue
- Be wary of false negatives
  - Take your time
  - 90-95% of ringworm infections in cats will fluoresce under a Wood's Lamp given proper equipment and a trained technician
    - If a lesion matches ringworm in all ways except Wood's Lamp fluorescence, treat as ringworm
- Be wary of false positives
  - Medications → diffuse glow, can be wiped off with a baby wipe
    - Doxycycline (yellow glow)
  - Scabs → only the scab glows, yellow-green color, bleeds if picked at
  - Urine → diffuse glow, yellow, can be wiped off with a baby wipe
  - Dust → can be any color (including bright green), not attached to the cat's skin, can be brushed away
  - Certain fur colorations → weak glow, all over cat's body, bluish color, may be only on part of the hair shaft
- When in doubt ask a vet or manager!

### **I.iv Record-Keeping**

- Record all Wood's Lamp tests, positive or negative, in ShelterLuv or on Ringworm Treatment Tracker
- Record notes about urine scald, chin acne, scabs, etc. under "Physical Exams" tab in SL medical history
- If cat is diagnosed as ringworm positive or exposed:
  - Initial positive test must be recorded in ShelterLuv immediately
  - Ringworm diagnosis must be entered into ShelterLuv immediately
  - "Ringworm+" attribute must be marked on cat's records in ShelterLuv immediately.

## II. Cattery Outbreak Protocols

No diagnosis protocol can prevent 100% of ringworm outbreaks in the general population, whether due to incubation periods, presence of spores in the environment, false negative tests, or human error. The protocols outlined below are used to mitigate outbreaks when they do occur.

### II.i Isolation of Infected and Exposed Cats

- If a cat or cats are determined to have ringworm while they are part of the general population, they should immediately be moved to a foster home or the Ringworm Adoption Center.
- If infected cats are in single-cat enclosures or all cats in a particular enclosure are infected, proceed to deep-cleaning step.
- If infected cats are part of multi-cat enclosure, treat exposed but asymptomatic cats as follows:
  - If cat is a kitten <4 mos old, not grooming normally, or engages in >2-3 hours per day of grooming or cuddling with the cat who was diagnosed, dip using lime sulfur and place on ringworm exposure watch for 2 weeks in a single kennel:
    - Check for signs of ringworm at one week post-exposure and two weeks post-exposure.
    - During quarantine, exposed cats should be the last ones handled by staff/volunteers/visitors.
    - If exposed cats are adopted before ringworm clearance date, have “Ringworm Exposed/Monitoring Waiver” [Appendix A, “Ringworm Exposed/Monitoring Waiver”] be explained to and signed by adopter
  - If cat is in good health, grooming normally, and not extremely close with diagnosed cat, dip using lime sulfur and return to general population. Cat does not need to be placed on ringworm exposure watch.

### II.ii Deep-Cleaning Exposed Areas

- Deep-clean exposed enclosures after cats have been relocated
  - Remove everything
  - Remove excess fur, dirt, organic material
  - Scrub all surfaces with a detergent such as diluted dish soap or Simple Green
  - Spray all hard surfaces with Accel/Rescue diluted 1 part in 16 parts water, let sit for 5 minutes, then dry enclosure and rinse any remaining cleaner residue
  - Dry enclosure and set up using clean bedding, bowls, etc.
- Laundry must be washed in lightly-packed load on longest cycle available
- Areas outside enclosures that could have indirect exposure, including door handles, floors, tables, etc. should also be cleaned and disinfected
- In case of accidental exposure, carpet may be disinfected after two to three passes of a carpet steamer or shampooer

## III. Disinfection/Quarantine

Separation of ringworm positive and exposed cats is essential to the prevention of large outbreaks. Disinfection procedures are used in quarantine areas once or twice weekly to help prevent reinfection of cats as they recover.

### III.i Housing

- Ringworm cats onsite at APA! are housed in the Ringworm Adoption Center
- Susceptible cats who have been exposed to ringworm or who are being monitored for it may be housed in isolation kennels in the Main Cattery pending recheck
  - Staff, volunteers, and visitors in the Main Cattery should handle these cats **after** they are completely finished handling non-exposed cats
- Fosters with ringworm cats are advised to keep them in a room with tile or linoleum flooring
  - Strictly following handwashing procedures and keeping ringworm-specific clothing and shoes will help to prevent spread of spores throughout home
  - Quarantining cats in open areas using baby gates or dog kennels is non-ideal due to possibility of infected hairs becoming airborne and travelling short distances
  - Provide fosters with verbal explanation of risks and protocols, as well as written FAQ document with ringworm team contact information [see Appendix B, “Fostering Cats with Ringworm Handout”]

### III.ii Personnel Concerns

- Whenever possible, there should be a designated ringworm-only caretaker each day
- If staff and volunteers must switch between positive and negative cats, should take care not to transfer spores on their clothes or skin
  - Tie long hair back, and change clothes or wear scrubs
  - Wash hands up to elbow in hot water and soap for at least 30 seconds after contact
  - Preferably, ringworm cats should be last animals contacted
- Visitors to the Ringworm Adoption Center are asked to sign a waiver confirming their understanding of the contagion risk before entering [Appendix C, “Ringworm Center Door Waiver”]

### III.iii Deep-Cleaning/“Hard Scrubs”

- Hard scrubs are recommended once weekly in foster homes as well as in the Ringworm Adoption Center, after one of the twice weekly lime sulfur dips
- “Hard scrub” enclosures while cats are in separate kennels
  - Remove everything
  - Remove excess fur, dirt, organic material
  - Scrub all surfaces with a detergent such as diluted dish soap or Simple Green
  - Spray all hard surfaces with Accel/Rescue diluted 1 part in 16 parts water, let sit for 5

- minutes, then dry enclosure and rinse any remaining cleaner residue
  - Dry enclosure and set up using clean bedding, bowls, etc.
- Laundry must be washed in lightly-packed load on longest cycle available

## IV. Treatment

At Austin Pets Alive! we use terbinafine and lime-sulfur dip concurrently to treat ringworm, with attention paid to the cats' individual concerns and health issues.

### IV.i Terbinafine:

- 30 mg/kg PO SID x 21 days, then recheck.
- For kittens <6mos, if still positive, wait 7 days, then alternate 7 days on/off terbinafine until 8 weeks of medication protocol/treatment have passed.
  - Recheck after each "pulse" round
  - After 8 weeks, reevaluate treatment plan to determine cause of delayed treatment
- Cats >6mos do not receive pulse therapy unless they experience significant weight gain, or have a widespread or non-resolving infection
  - Consult with veterinarian or Ringworm Manager
- Monitor for side effects
  - Diarrhea, GI upset most common
  - If cat starts displaying inappetance, immediately discontinue terbinafine and follow up with vet to consider liver function
- Contraindications:
  - Age and weight
    - Must be at least 8 weeks old and 2 lbs in weight
  - Nursing- no pregnant or nursing moms due to danger to kittens
  - Chronic GI issues/history of hunger striking
  - Liver issues or concurrent medications also processed by liver (steroids, etc.)
  - Poor reaction to terbinafine previously
  - Consider other health issues on a case-by-case basis
  - FeLV cats do not receive terbinafine due to stress concerns

### IV.ii Lime-Sulfur Dip:

- Ratio is always 1:32 lime dip:water for fosters/adopters.
  - ½ of a cup of lime dip in 1 gallon of warm water
  - 3.5ml of lime dip in ¼ cup of water
  - 0.5 mL lime dip in 8 mL water
- Warnings:
  - Sulfur compound
    - Smells like rotten eggs
    - Stains clothing, skin, nails, and upholstery yellow
    - Wear gloves
  - Slightly caustic to metal
    - Remove jewelry beforehand



- Contraindications:
  - Age and weight
    - Must be at least 8 weeks old and 1.5 lbs in weight to get full bath
    - Younger kittens may be spot treated instead
  - Open wounds
  - Recent surgery
    - 1 week post-neuter
    - 2 weeks post-spay or other major surgery

#### IV.ii.a Lime-Sulfur Dip Procedure:

1. Have a carrier ready with a small towel in the bottom to place the cat in after dipping, so that they may drip dry.
2. Find a warm, well-ventilated room to dip in.
3. Put on rubber gloves to protect your hands.
4. Pour 160 mL lime sulfur per 1 L warm water into plastic continuous-mist spray bottle.
5. Gently hold cat and use sprayer to thoroughly wet fur, massaging solution into skin
  - a. Squeeze feet gently to extend claws and spray feet.
6. Use a cotton ball, clean sponge, or toothbrush to treat the face, paying extra attention to the ears, nose, whiskers, and chin.
  - a. The solution burns delicate mucus membranes, so be as careful as possible on the facial area, especially around nose and eyes. If you do happen to get dip in the cat's eye, be sure to flush the eye well with eyewash.
7. Repeat these steps twice weekly on non-consecutive days.

APA fosters can come to the Ringworm Adoption Center on Tuesdays and Fridays between 11:30am and 6pm to have their fosters dipped by the Ringworm Team; foster cats coming to dip day must be six weeks of age and must have received at least 2 FVRCP boosters.

## V. Clearance Exams

Visual and Wood's Lamp clearance examinations are done when the cat finishes a round of terbinafine, or when it is suspected that they have completed treatment and are free of ringworm. Because we rely on these examinations instead of resource- and labor-intensive fungal cultures, protocols must be adhered to extremely strictly.

### V.i Technique

- Same technique as used for initial exams, but even more strict
  - If there are ANY crusty or flakey lesions present, even if suspected to not be ringworm, cat cannot be cleared
  - Cats cannot be cleared for two weeks after spay/neuter/other major surgery due to risk of relapse
  - Blacklight Woods Lamp must be negative- even one positive hair is a failure to clear
  - Should take you at least 5-10 min per cat.
- When in doubt ask a vet or manager!

### V.ii Clearance Protocols

- If cat fails exam, send foster home with instructions for continued treatment, next round of medication, etc.
- If cat passes exam, ask a vet, clinic manager, or the Ringworm Manager to provide a second opinion and give official clearance.
  - If cat is clear, they must be dipped one final time to kill any spores on hair coat.
  - In a litter of kittens, cleared kittens must either be separated from siblings, or cannot get final clearance.
    - Can be downgraded to "exposed" status for adoption purposes/in SL.

### V.iii Record-Keeping

- Record all Wood's Lamp tests in cat's records, especially clearances
- If cat is cleared or downgraded to exposed status, remember to resolve diagnosis and fix attributes in ShelterLuv **immediately!**

## VI. Ringworm Adoptions

Though fewer visitors and adoptions can be expected, cats with active ringworm infections are still available for adoption. More attention should be devoted to marketing ringworm cats, addressing fears and myths about ringworm, and educating potential adopters about the rewards of adopting one of these cats.

### VI.i Onsite adoptions

The proceeding steps should be followed when adopting out a cat that is currently undergoing treatment for ringworm. This procedure should be followed in addition to the standard adoption procedures.

1. Potential adopters should be immediately notified that the cats they are interested in adopting are undergoing treatment for ringworm. Be sure they are aware that it is contagious to both animals and humans, and welcome to interact with the cats, but remind visitors they should not visit non-ringworm animals after doing so. A sign-in waiver [Appendix C, “Ringworm Center Door Waiver”] is located outside the door of the ringworm building to ensure that all visitors are aware of and acknowledge the risks of interacting with the ringworm cats; all visitors must sign this form in order to enter the ringworm ward.
2. The Ringworm Adoption Handout [Appendix D, “Ringworm Adoption Handout”] should be given to any potential adopters of ringworm cats prior to the adoption.
3. Potential adopters should be made aware of what is involved in treating ringworm in their home prior to signing the adoption contract. They should be made aware that:
  1. Ringworm treatment can last anywhere from 4-10 weeks (some cats can clear up faster in the low stress environment of a home, but others may last longer than 10 weeks if the infection is severe or other medical complications slow the progress of treatment).
  2. APA! will provide enough medication to last the adopter 3 weeks of treatment. After this course of treatment, adopters are advised to continue treatment and rechecks with their private veterinarian.
  3. Should the animal have a negative reaction to any treatments, the adopter should take the cat to their own veterinarian.
2. Once the adopters have undergone the standard adoption interview and counseling, information specific to ringworm should be discussed making sure to cover important topics found in the FAQ sheet including quarantine in the household (especially if adopter has other pets in the home), lime dipping, and how to give oral medication, as well as post-clearance clean up.
3. Adopter then needs to sign the Ringworm Waiver, which should be kept on file in the ward (adopters should be sent home with a copy of the signed waiver).
4. Adopters should be sent home with the amount of Terbinafine needed until the cat’s next scheduled recheck (if the animal is eligible to receive oral antifungals), as well as enough concentrated lime sulfur dip for three weeks. Adopted animals are not allowed to be brought into the ward to receive lime dips.

- a. The clinic may need to refill Terbinafine prescriptions in short time frames. If a refill needs to be rushed, the adoption counselor will verbally notify the clinic manager/TLAC tech when turning in the request.
- b. Should an adoption counselor have questions regarding an animal's eligibility to receive terbinafine, the Ringworm Manager and/or TLAC tech will assist.

Adoption counselors should instruct the adopters to email the Ringworm Manager should they have any questions about the progress of their adopted cat's ringworm treatment. If an adopter's question is outside the scope of knowledge of the ringworm team, the staff can forward the email to the med techs.

## **II. Pre-adoptions**

When a pre-adopted animal is discovered to have ringworm at surgery, the clinic staff will fill the appropriate medications and attempt to briefly disclose what ringworm is and how to treat. Should the adopter have concerns, extensive questions, etc., they should be directed to the Ringworm Adoption Center for further clarification. Additionally, if the pre-adopters decide they no longer wish to keep the adopted animal they must be directed to the cattery to formally surrender the animal back to APA!

## **III. Offsite adoptions**

When spayed/neutered ringworm cats are adopted from foster at the Tarrytown location, in addition to informing adopters of the risks and procedures involved in ringworm adoption, an email requesting medication should be sent to the ringworm manager, clinic managers, and med techs. The adopter should then be instructed to pick the medication up from the clinic during normal operating hours.