



Ringworm Diagnosis and Treatment Guidelines

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Ringworm Program Introduction

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 ringworm-manager@austinpetsalive.org.

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. Fungal cultures can be more conclusive, but also provide false positives and negatives, 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 followed.

I.A Visual Light Recognition

1. Multiple sets of eyes, at different times → don't assume free of ringworm last week means free of ringworm today
2. Consider history → Ringworm exposed? Found outside? Hoarder case?
3. Pay special attention to very young, very old, very sick, and very stressed animals → their immune systems are weaker
4. Tactile as well as visual exam
5. Know the signs:
 - a. Areas of hair loss (frequently but not always circular)
 - i. Well-defined edges
 - b. Crusty skin, sometimes inflamed/moist
 - c. Pay special attention to face, ears, feet, and tails
6. Err on the side of caution- treat suspicious crusty, flakey spots as ringworm

I. B Using a Wood's Lamp

- Find/create a completely dark room
- Give the lamp 2-5 minutes to warm up → light must be in 340-450 nm wavelength range
- Hold lamp ≤ 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- skin that lights up may not be ringworm
 - 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 hiding underneath
- Look for apple-green glow
- Be wary of false negatives
 - Take your time
 - Remember not all ringworm is Wood's Lamp positive
- 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
 - Urine → diffuse glow, yellow, can be wiped off with a baby wipe
 - Dust → blueish, 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. C Record-Keeping

- Record all Wood's Lamp tests in Shelter Luv, even negative ones!
- Record notes about urine scald, chin acne, scabs, etc.
- If cat is diagnosed as ringworm positive or exposed, add the attribute and diagnosis in Shelter Luv immediately!

II. Cattery Outbreak Protocols

No diagnosis protocol can prevent 100% of ringworm outbreaks in the general population, 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. A 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 treatment 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, move asymptomatic exposed cats to isolation boxes in their normal cattery.
 - 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" be explained to and signed by adopter

II. B Deep-Cleaning Exposed Areas

- Deep-clean exposed enclosures after infected and exposed cats have been relocated
 - Remove everything
 - Scrub all surfaces with detergent → All surfaces must be free of organic material, or disinfectant will not be effective
 - Spray all hard surfaces with 1:10 bleach, let sit for 10 minutes or allow to air-dry
 - Trifectant is not a proven effective substitute
 - Accelerated hydrogen peroxide products are, but are expensive → Use sparingly, and only if ventilation or allergies make bleach use a health hazard
 - Repeat detergent scrub and bleaching twice more
 - Dry enclosure and set up using clean bedding, bowls, etc.
- Laundry must be washed with bleach
 - Soft toys and beds must either be designated ringworm-only or must be disposed of
- Areas outside enclosures that could have indirect exposure, including door handles, floors, tables, etc. should also be cleaned and disinfected
- Carpeted flooring is advised against in ringworm quarantine rooms, but in case of accidental exposure may be effectively disinfected after two to three passes of a carpet steamer or shampooer

III. Disinfection/Quarantine

Quarantining 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. A Quarantine

- Ringworm cats onsite at APA! should be housed in the Ringworm Adoption Center
- 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

III.B 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

III.C Deep-Cleaning/"Hard Scrubs"

- Hard scrubs are recommended after cats have had lime-sulfur baths, in order to ensure they are going back into a clean environment
- "Hard scrub" enclosures while cats are in separate kennels
 - Remove everything
 - Scrub with detergent → All surfaces must be free of organic material, or disinfectant will not be effective
 - Spray all hard surfaces with 1:10 bleach, let sit for 10 minutes
 - Trifectant is not a proven effective substitute
 - Accelerated hydrogen peroxide products are, but are expensive → Use sparingly, and only if ventilation or allergies make bleach use a health hazard
 - Dry and set up enclosure
- Laundry must be washed with bleach
 - Soft toys and beds must either be designated ringworm-only or must be disposed of

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. A Terbinafine Treatment

- 30 mg/kg PO SID x 21 days, then recheck.
- If still positive, wait 7 days, then alternate 7 days on/off terbinafine until ringworm resolves.
 - Recheck after each "pulse" round.
- Make sure fosters/adopters are aware of pulse-dose schedule.
- Monitor for side effects
 - Diarrhea, GI upset most common
 - If cat starts displaying inappetance, immediately discontinue terbinafine and follow up with vet to check 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
 - Antifungal drugs are processed by the liver
 - Poor reaction to terbinafine previously
 - Consider other health issues on a case-by-case basis

IV.B Lime-Sulfur Dip Information

- 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
 - Do not use stainless steel sinks or cages → will stain black
- 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. C Lime-Sulfur Dip Treatment 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 ½ of a cup of lime dip into 1 gallon of warm water, then pour mixture into a plastic dipping tub.
5. Scruff or gently hold cat and lower them into the warm lime dip solution. Pour solution over cat or wipe against the grain of the fur with a rag or sponge, making sure to get them completely wet down to the skin.
 - a. If the cat is highly resistant to being given a full bath, they may be placed on a towel next to the tub and given a "sponge bath" with the solution instead.
6. Squeeze feet gently to extend claws and dip feet.
7. Use a cotton ball 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 fresh water. Repeat these steps every three 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.A 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 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.B 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.C Record-Keeping

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