



Ringworm

Advice for vets



This guidance is intended for the approach to dermatophytosis for cats in the care of Cats Protection.

Support

Cats Protection Veterinary team, including your Regional Vet can be contacted by emailing veterinary@cats.org.uk

Dermatophytosis in cats

Dermatophytosis is a superficial fungal infection of the keratinised structures of the skin. *Microsporum canis* is the most common cause of dermatophytosis in cats. *Trichophyton* may be more rarely isolated.

The infective form of the disease is an arthrospore, which can survive up to two years in the environment, and is resistant to many disinfectants. Most commonly, transmission occurs due to contact with another infected cat or animal. Spores can also be transmitted via fomites or from a contaminated environment. Skin damage from self-trauma, humidity and ectoparasites can optimise conditions for infection¹.

Dermatophytosis is zoonotic, and can be spread from cat to human, or human to cat. Dermatophytosis is a self-limiting disease in immunocompetent cats and people.

Prevalence

The prevalence in cats varies widely in studies, and is dependent on the geographical location, cat factors and may also be impacted by the non-clinical carriage of spores. One study from a Northwestern US cat shelter found a prevalence of 1.8% for *Microsporum canis*². Certain populations of cats may be more at risk, one study showed a 13% prevalence in cats rescued from hoarding environments³.

Significance in the shelter setting

Dermatophytosis is a challenging disease within the shelter setting owing to:

- cat factors. Cats within the shelter setting are more likely to be stressed and therefore immunocompromised. Cats may also be entering Cats Protection care from multi-cat households, and may be suffering from other skin conditions which increase the chance of dermatophytosis
- zoonotic potential. Risks to both cat caring staff and volunteers, and to potential adopters must be considered
- diagnosis. Due to non-clinical carriage of dermatophyte spores, the correct diagnostic tests, in the correct cats need to be selected in order to prevent false positives or negatives
- treatment. Long duration of treatment can affect the welfare of infected cats
- environmental persistence of spores. Cats suspected of dermatophytosis ideally will be housed in an isolation facility to limit spread of the disease. Higher dilutions of disinfectant are required, with increased frequency of environmental cleaning and disinfecting

Signalment

Cats most at risk of dermatophytosis include:

- kittens
- immunosuppressed cats
- persian cats
- longhaired cats
- cats from multi-cat households, or free roaming cats

Clinical signs

Lesions usually first appear as small areas of hair loss on the face, ears and muzzle of the cat and can spread to the paws and other body areas. Scaling, crusting and erythema can be present. There can be changes to the appearance of the nails, and dermatophytosis is a differential for pododermatitis. Lesions are more rarely widespread and generalised, although dermatophytosis is a differential diagnosis for exfoliative dermatitis. Lesions are not normally pruritic but occasionally will be. Dermatophytosis can resemble other skin disease, where further diagnostics will be required for diagnosis. More rarely, nodular skin disease may occur.

All cats should be checked carefully for any skin lesions at each veterinary examination. Cat carers are also asked to monitor cats closely, especially upon entry into care, and to contact their veterinary provider if concerned.

If you are suspicious that a cat may have dermatophytosis, please wear full PPE and ensure the cat carer is aware of the advice in Ringworm: guidance for cat carers. Fosterers should contact their Regional Vet, Cat Welfare Advisor and Branch Development Manager for further support.

Diagnosis

Dermatophyte culture

All cats with lesions suspicious of dermatophytosis should have a dermatophyte culture performed. Samples should be sent to an external laboratory rather than using in house testing kits. Finn is the preferred laboratory for Cats Protection and using this lab secures us significant savings.

We advise the toothbrush sampling method, as described below:

Equipment required

- toothbrush in original packaging (sterile)
- forceps
- universal sterile container, or sterile plastic bag, for sending to an external lab

Sampling technique

- label the container with the cat's name, ID number, date of sampling, and practice details
- remove the toothbrush from its packaging, and brush the cat all over
- collect any loose fur or skin scale into the sterile container or bag
- once the cat has been brushed all over, place the toothbrush into the plastic bag, or, if using a container, use sharp scissors to cut off the tip of the toothbrush and place this into the container with any fur collected
- hair can also be plucked from the edge of any skin lesions, and placed into the same or a separate container

Samples are checked each working day at the laboratory. You will be informed of a positive result if seen or receive a negative result after around 14 days.

Other testing

Wood's Lamp examination and PCR testing is available. PCR is not advised for general use for cats in Cats Protection care. We no longer advise using Wood's Lamps to screen healthy cats with no skin lesions due to the risk of false positive results.

Wood's Lamp examination:

- is open to interpretation based on the confidence of the user and the suitability of the environment
- can result in both false positive and false negative results
- all cats with suspicious lesions should have a culture performed regardless of lesion fluorescence
- with limited isolation spaces we need to reserve pens for lesional cats, either confirmed positive or highly suspicious of ringworm

PCR:

- a study has shown that false positives are relatively common when compared to culture⁴
- culture also provides information on the species of the dermatophyte, allowing for appropriate environmental control

There may be a place for these tests in certain scenarios, including an outbreak situation. Using a Wood's Lamp can be helpful as part of your health check in a cat with suspicious skin lesions, although we would still want a culture performed regardless of lesion fluorescence.

Please contact your Regional Vet for advice about specific circumstances.

Results

The lab checks the fungal culture on each working day and you should be informed of a positive result as soon as it is seen. It can take up to 14 days for a positive result to appear, or you will then receive a negative result.

FIV/FelV testing

Cats who are confirmed positive for dermatophytosis should be tested for FIV/FelV prior to commencing treatment.

[Please follow our guidelines.](#)

If confirmed positive for either retrovirus, please contact veterinary@cats.org.uk

Sick cats

A cat who is diagnosed with ringworm and also has significant other health problems is more likely to develop a severe infection, and less likely to respond to treatment⁴. In some cats, ringworm infection is the first sign of serious underlying health problems. Consideration of each cat, their overall health, and any behavioural concerns is important prior to undertaking treatment for ringworm. Please contact your Regional Vet for further support with these cases.

Treatment

Please find below our suggested treatment protocol for confirmed positive cats. If you have questions or concerns, please contact our Regional Veterinary team at veterinary@cats.org.uk.

Our recommended treatment protocol is:

- twice weekly bathing with Imaverol, starting from taking the first culture sample
- oral treatment with Itrafungol. This is given once a day, on a one week on, one week off programme, for five weeks. Oral treatment should start as soon as possible after a positive result is confirmed. If you strongly suspect ringworm, Itrafungol may be started while awaiting a culture result, prescribed on a risk/benefit basis

Week	Itrafungol (by mouth)	Imaverol (wash)	Testing
1	Once daily	Twice weekly	
2	Week off	Twice weekly	
3	Once daily	Twice weekly	
4	Week off	Twice weekly	
5	Once daily	Twice weekly	Test at the end of week 5/beginning of week 6 after bathing. Submit fungal culture to Finn
6	Treatment stopped	Treatment stopped	
7-8	Treatment stopped	Treatment stopped	If result negative: can be FTH if otherwise well. If result positive: contact Regional Vet

Imaverol (enilconazole)

- This product is not currently licensed for use in cats. However, it can be used 'off licence', following the cascade. It should not be used as the sole treatment for cats with a positive culture, but it is an important part of approach to therapy as it reduces spread within the environment and improves the response to overall treatment⁵
- It can be used in pregnant and lactating animals. Unweaned kittens should not be treated with Imaverol
- Imaverol has increased efficacy over Malaseb and is the recommended topical treatment for dermatophytosis at Cats Protection. Chlorhexidine solutions should not be used as they are ineffective^{6, 7}

How to use Imaverol

- Wear suitable protective clothing including gloves and goggles
- Prepare in an adequately ventilated area
- Dilute one part Imaverol with 50 parts warm water (to make a 2mg/ml emulsion). For example, mix 4ml of Imaverol with 200ml of warm water. The diluted solution can be made up directly into a spray bottle. Once made up the solution will last six weeks.

Itrafungol

Dosing

- licensed for the treatment of dermatophytosis in cats
- administered orally on an empty stomach
- treatment course of five weeks with dosing on alternate weeks. Itrafungol continues to work for two weeks after the last day of treatment
- the shelf life of the product after opening is five weeks

Special considerations

- Itrafungol cannot be given to pregnant or lactating cats
- Itrafungol can be used in kittens from 10 days old. Kittens will need to be weighed regularly as the dose will need to be adjusted for their changing weight (under veterinary guidance). Kittens under 500g should have dosing with a 1ml syringe to allow for accurate dosing

Adverse reactions and contraindications

- Itrafungol may cause short-term inappetence, vomiting, diarrhoea, or lethargy. It rarely can cause liver dysfunction. Adverse effects are more likely in cats of poor general condition or with other diseases. Screening or monitoring blood tests are not recommended for cats being treated within Cats Protection care if otherwise well
- Itrafungol should not be given at the same time as Convenia

Clipping

Clipping is not routinely recommended for Cats Protection cats. Occasionally, for cats with widespread disease and a long hair coat it can improve response to treatment. However, this must be balanced with the chance of damaging the skin during the clipping procedure, and the stress caused to the cat both during clipping, and then in having a changed haircoat. If you recommend clipping, please ensure it is done by a veterinary professional within the practice.

Pregnant or lactating cats and kittens

A pregnant spay should be carried out for all pregnant cats diagnosed, or suspicious of ringworm. It is not necessary to wait for a confirmatory test before carrying out the spay, as this would allow the pregnancy to progress further. There are severe welfare compromises when treating pregnant cats and then lactating cats with young kittens when in care. Therefore, a pregnant spay is advised and this can be carried out up to full term.

Pregnant cats

- should be spayed
- cannot be treated with Itrafungol, as it can harm the unborn kittens
- if severely affected and a pregnant spay is not possible, she can be bathed with Imaverol

Entire female cats

- palpate to assess for pregnancy during the clinical examination
- cat carers are advised to monitor cats for any obvious signs of pregnancy throughout the treatment course and arrange a spay if pregnant

Lactating cats

- cannot be treated with Itrafungol because it is secreted in the milk and so there is a risk of overdosing the kittens
- can be bathed with Imaverol if severely affected. If mildly affected, consider withholding treatment until the kittens are weaned to avoid the stress of bathing

Kittens

- should be weaned as early as possible (at around six weeks) and separated from the queen
- should be moved to an Isolation facility and housed in pairs or small groups
- can be treated with Itrafungol if they are confirmed positive and over 10 days old, but may take longer to cure because the queen cannot have oral medication and they are in contact with her
- cannot be bathed with Imaverol until they are weaned

For support with any cases, please contact your Regional Vet.

Management

Please refer to Ringworm: guidance for cat carers or contact veterinary@cats.org.uk for comprehensive advice about the management of dermatophytosis within the shelter setting.

General advice is as follows:

- cats should be moved to an isolation facility within a Cats Protection Cat Centre. This helps prevent spread to other cats, allows the correct treatment (of both the cat and the environment) and protects our people
- fosterers who are caring for a cat who is suspicious for dermatophytosis, should contact their Cat Welfare Advisor, Branch Development Manager and Regional Vet
- full PPE (overalls, aprons, gloves, over-sleeves, caps and over-shoes) should be worn when handling a cat with suspected or confirmed dermatophytosis
- Cats Protection uses the disinfectant Anigene. For ringworm, a 10% dilution needs to be applied to clean surfaces for a contact time of 15 minutes. All equipment will need to be disinfected where possible after use. Disposable food bowls and litter trays should be used where possible

Cats Protection has a team of accredited Behaviourists who are available to provide individual support for cats undergoing treatment for dermatophytosis. Cat carers are encouraged to contact their Regional Behaviourist for advice.

Testing after treatment

Following the treatment course, many cats will have a good response and show clinical improvement, especially if otherwise well. In these cats:

- a repeat fungal culture should be taken at the end of week five or beginning of week six (where treatment is initiated at the start of week one)
- ideally the sample will be taken within 24 hours of the cat having been bathed with Imaverol (this will reduce the chance of a false positive result)

If the fungal culture is negative, the cat can be declared fit to home. The use of one negative culture has been shown to effectively predict mycological cure in 90% of otherwise healthy shelter cats⁴. Please record the disease as 'resolved' and recurrence as 'possible' on the Medical Summary form. We have created an 'Advice for adopters, ringworm handout' which a Cats Protection representative will provide to the new owners when the cat is homed.

If the fungal culture is positive, please contact the Regional Vet who can assess the case, and support in deciding how best to treat the cat moving forwards.

If a cat is not responding to treatment and still has lesions, or worsening with treatment and developing more severe lesions, we ask that our cat carers approach their vet to reevaluate the case. Please do not take a sample for fungal culture unless there is clear clinical reason to do so, as it is very likely to be positive. Considerations could include:

- ensuring the treatment is being given as directed. For example:
 - Itrafungol is most effective when given on an empty stomach
 - rechecking the dosage especially in growing kittens
- an alternative treatment protocol, such as a day on/day off protocol (this is off licence)
- other health concerns not yet identified
- considering environmental factors which could be continuing the course of the disease

Our Regional Vets are available for further support.

Non-lesional ‘in-contact’ cats

Healthy cats who are, or have been, in contact with a cat with ringworm may not go on to develop disease. Testing of non-lesional cats who have been in contact with an infected cat may only be positive due to carriage of spores on their coat, rather than because of infection. This could lead to many weeks of unnecessary treatment.

However, cats in care are under additional stress, so may be more susceptible to ringworm. Generally, if cats are going to develop disease after being in contact with an infected cat, it will appear within three weeks. During this time, cats will need to be closely monitored, and additional PPE worn by cat carers.

If cats are currently housed in a pair but are not showing signs of being bonded, we recommend separation into lesional cats and non-lesional cats.

Lesional cats

- go to isolation, have a sample taken for fungal culture and Imaverol bathing starts while waiting for results
- if positive, follow the guidance for treatment and management above

Management of non-lesional in-contact cats

Cats:

- stay in their current accommodation and are barrier nursed (fed/cleaned last using full disposable PPE including aprons, gloves, over-sleeves and over-shoes)
- need to be checked daily for any signs of skin disease
- if skin lesions develop, the cat should be moved to an isolation facility. A sample taken for culture, and the advice followed for suspected cats
- if no skin disease appears, cats should be monitored for three weeks
- if no disease becomes apparent in this three-week period, the cat can be declared fit to home
- the cat will be rehomed with a Ringworm: advice for adopters handout

Kittens up to six months old:

- all in-contact kittens should be moved to Isolation and have samples taken for culture (due to their increased risk of infection)
- kittens under six weeks stay with the queen, kittens over six weeks old should be separated from the queen
- if a litter has some kittens with lesions, and some without, please contact veterinary@cats.org.uk for further advice
- if separating kittens from the queen or from littermates would result in a kitten under 16 weeks old being housed singly, please contact veterinary@cats.org.uk

Bonded pairs of cats

Please contact veterinary@cats.org.uk and the Regional Vet and Behaviourist can assess the situation and provide further support.

Guidance for adopters

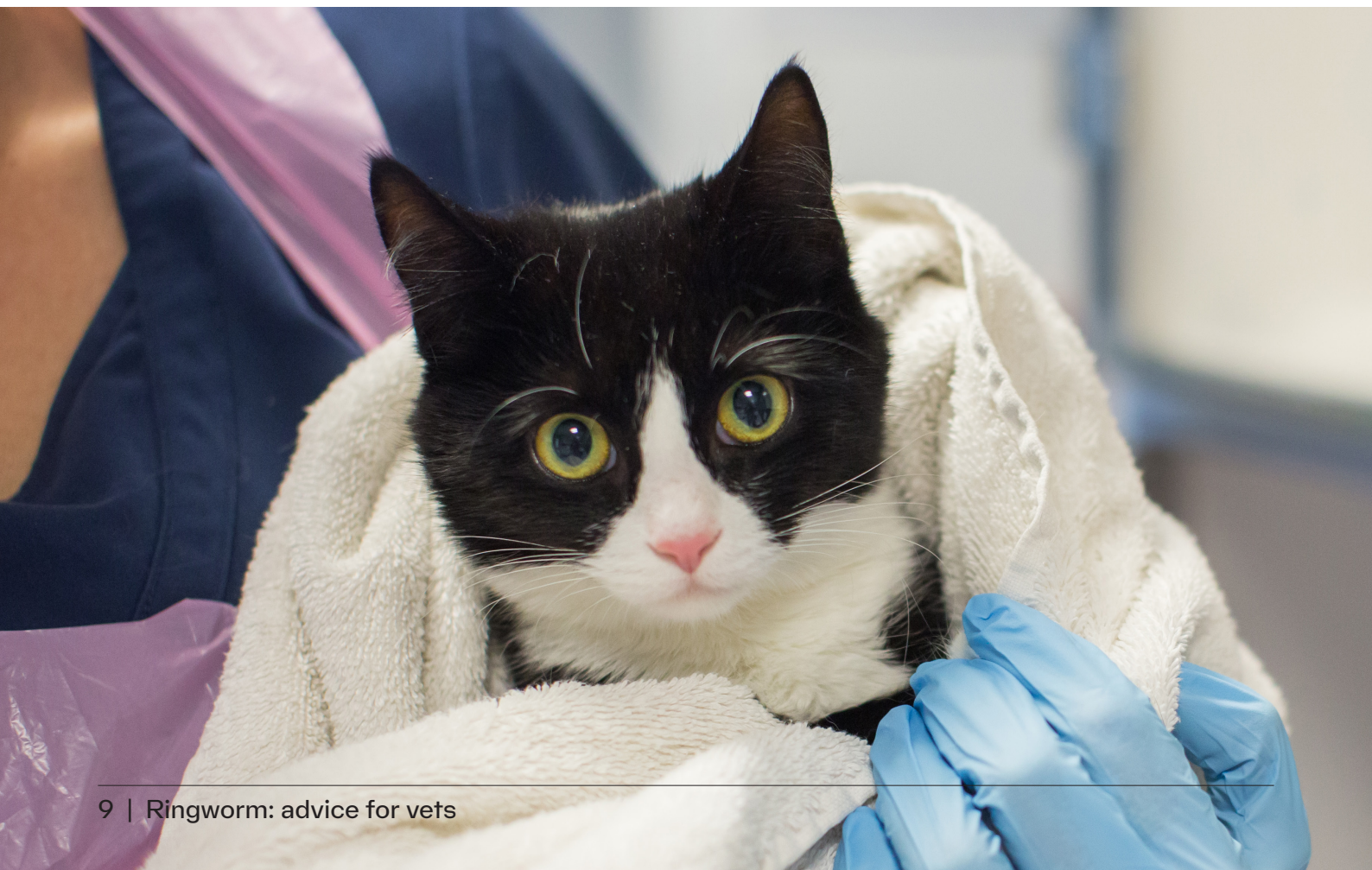
A document has been produced for adopter information about ringworm, which can be found [here](#).

References

1. Ogawa H, Summerbell R, Clemons K et al. Dermatophytes and host defence in cutaneous mycoses. *Medical Mycology* 1997;36:166–173
2. DeTar LG, Dubrovsky V, Scarlett JM. Descriptive epidemiology and test characteristics of cats diagnosed with *Microsporum canis* dermatophytosis in a Northwestern US animal shelter. *Journal of Feline Medicine and Surgery*. 2019;21(12):1198-1205
3. Jacobson LS, Giacinti JA, Robertson J. Medical conditions and outcomes in 371 hoarded cats from 14 sources: a retrospective study (2011–2014). *Journal of Feline Medicine and Surgery*. 2020;22(6):484-491
4. Stuntebeck RL, Moriello KA. One vs two negative fungal cultures to confirm mycological cure in shelter cats treated for *Microsporum canis* dermatophytosis: a retrospective study. *Journal of Feline Medicine and Surgery*. 2019;22(6):598-601
5. Paterson S. Miconazole/chlorhexidine shampoo as an adjunct to systemic therapy in controlling dermatophytosis in cats. *Journal of Small Animal Practice* 1999;40:163–166
6. Newbury S, Moriello KA, Kwochka KW et al. Use of itraconazole and either lime sulphur or Malaseb Concentrate Rinse (R) to treat shelter cats naturally infected with *Microsporum canis*: an open field trial. *Veterinary Dermatology* 2011;22:75–79
7. Moriello KA. Kennel Disinfectants for *Microsporum canis* and *Trichophyton* sp. *Veterinary Medicine International* 2015(1):853937

The consensus guidelines of the World Association for Veterinary Dermatology have also been invaluable:

Moriello, Karen A., et al. "Diagnosis and treatment of dermatophytosis in dogs and cats. Clinical Consensus Guidelines of the World Association for Veterinary Dermatology." *Veterinary dermatology* 28.3 (2017): 266-e68.





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