Yes!

**Dermatophytosis**

Dermatophytosis is more common in cats than in dogs. The different species of dermatophytes that affect animals can be zoophilic (i.e. *Microsporum canis* from an animal), geophilic (i.e. *Microsporum gypseum* from the soil), or less often, anthropophilic (i.e. *Microsporum audouinii* from people). Knowing the species causing the infection is useful for determining where the patient may have contracted it.

In dogs, dermatophytes cause focal alopecia with scaling, crusts and papules. These lesions can expand into larger patches and coalesce with other lesions. Other less common clinical signs include folliculitis and furunculosis with crusting on the bridge of the nose, or a generalized seborrheic dermatitis. In cats, dermatophytes cause focal circular areas of alopecia with scaling, or more generalized alopecia with scale and variable erythema and crusts. Ringworm is variably pruritic.

The gold standard for diagnosis of ringworm is the DTM – fungal culture of hair from the patient. A Woods lamp can be useful, but fluorescence only occurs with some species of ringworm (i.e. *M. canis*, *M. audouinii*, *M. disortum*, *Trichophyton schoenleinii*), so a false-negative result is possible. Examination of the hair under the microscope can reveal hyphae or arthrospores, but these are not present in all cases. Biopsy for histopathology is useful but may not identify fungal organisms if they are present in small amounts – a DTM culture is more sensitive than a tissue biopsy for the diagnosis of ringworm.

Humans in contact with animals that have dermatophytosis can develop ringworm; lesions are often located on the arms and trunk. Dermatophytosis may be more likely to occur in people with immune-compromise, children or senior citizens. It is important to recommend that clients with skin lesions seek consultation with their physician or dermatologist; providing them with documentation of the suspected/diagnosed fungal infection can help them discuss the issue with their health care provider. Patients with dermatophytosis should have limited contact with people, other than care providers, to limit human risk of acquiring ringworm.

*M. canis* spores can persist in the environment for over 12 months, so environmental control is very important. When feasible, confining the pet to a smaller area of the house can be beneficial for limiting the spread of dermatophyte spores and may make cleaning easier! Hard surfaces should be vacuumed and disinfected (bleach 0.5% where possible). Vacuum air ducts, carpets and rugs frequently (daily). To monitor household contamination, pieces of a Swiffer pad can be used to wipe areas to be tested. The pad is then gently applied to the DTM surface.
Spontaneous remission of ringworm can occur in animals, but due to the zoonotic nature of the disease, topical treatment is always warranted to help reduce contagion and speed time to resolution. For dogs and kittens with localized forms of ringworm, antifungal creams/ointments can be applied to the lesion, including several centimeters around the lesion. Clipping can be performed to remove infected hairs (prevents shedding these into the environment) and ease topical treatment, but it may temporarily make the area worse. If clipping is performed in a grooming facility or veterinary clinic, it is very important to take precautions to limit contamination to the facility, and to sterilize the clippers after use.

Topical and systemic therapy should be used for all cats, and for dogs with multiple or generalized lesions. For these patients, antifungal dips (lime sulfur) are preferred over shampoos and creams because of the ability to treat the entire body and for their residual antifungal activity. Systemic antifungals can include griseofulvin, itraconazole, or terbinafine. Therapy should be continued until 2-3 negative fungal cultures are achieved.

Patients with dermatophytosis should be restricted from contact with other animals until the infection resolves. In-contact animals should have a physical examination, and all in-contact cats should be tested by DTM culture (even if asymptomatic). Contact animals that are ringworm positive should be treated systemically and topically; consider a topical antifungal shampoo or dip for in-contact animals that are culture-negative.

MAYBE!!

**Methicillin-resistant *Staphylococcus sp.***

Methicillin-resistant Staphylococcal (MRS) skin infections are more common in dogs than in cats (rare in cats). The species of staphylococcus that affect dogs are primarily *S. pseudintermedius* and *S. schleiferi*. Rarely, *S. aureus* is a cause of superficial skin infection in dogs and cats.

Staphylococcal organisms are considered normal flora – infections of the skin are often due to an underlying cause such as trauma, parasitic infection, hormonal and allergic disorders. Skin infections are characterized by variable pruritus, pustules, papules, erythema, epidermal collarettes, scale, crusts, hyperpigmentation and alopecia. Clinically, a skin infection with MRS organisms is indistinguishable from an infection with antibiotic-sensitive organisms.

Suspicion of a MRS skin infection can be based on historical findings, such as a lack of response to empiric cephalosporin therapy, but confirmation requires a culture and sensitivity. First, skin cytology should be performed to assess the presence of bacteria. A sterile swab (or tissue biopsy sample) of the affected areas that are cytologically positive for the presence of bacteria should be submitted to a laboratory for culture and antibiotic susceptibility.

Humans in contact with patients that have a MRS infection are at low risk for acquiring the infection, particularly if the bacteria isolated is *S. pseudintermedius* or *S. schleiferi*. These bacteria prefer canine
skin, and only very rarely cause human infections. If the culture reveals an infection with *S. aureus*,
there is still a low risk for transmission of the infection to people, but *S. aureus* prefers human skin, so
the risk is greater than with the other staphylococcal species. It is important to recommend that clients
with skin lesions seek consultation with their physician or dermatologist; providing them with the
patient’s culture results can help them discuss the issue with their health care provider.

Good hand hygiene is the mainstay for preventing spread of MRS. The client and people in contact with
the patient should wash their hands after handling the pet or its belongings (bedding, food or water
dishes). Dogs should not be allowed to give kisses, particularly on people’s faces. It is optimal to restrict
contact with other animals until the infection is resolved – for example forgo doggy daycare, kennels,
and grooming. MRS can remain in the environment for several months, so the owner should be
encouraged to clean the home on a regular basis – regular household cleaners are effective against
staphylococcal bacteria.

MRS infections are treated with topical antibacterial shampoos, conditioners or sprays to help decrease
the amount of bacteria on the skin and potentially speed resolution of the infection. Additionally, a
systemic antibiotic is given based on the culture and sensitivity results. Treatment is continued at least
1 week past clinical resolution of skin lesions.

Yes!

*Sarcoptes scabiei*

*Sarcoptes scabiei* primarily affects dogs, and very rarely cats. Cats are more likely to be affected with a
different form of sarcoptic mite, *Notoedres cati*, which is generally rare but can be found in some areas
of the United States.

Canine scabies can be acquired from contact with other dogs (dog parks, doggie day care, kennels,
groomers, veterinary offices), or the environment (foxes can be a source). The parasite lives in the
superficial layers of the skin and burrows into the epidermis. *Sarcoptes* causes an intensely pruritic
dermatitis that may initially involve the ear pinnae, elbows, hocks and ventrum – but can be generalized
on the body. Lesions often consist of erythematous papules, yellow scale and crust and alopecia.

Diagnosis is confirmed with a positive skin scraping for *Sarcoptes scabiei* – just one mite or egg is
diagnostic. The mite can be difficult to find with skin scrapings, and a negative scrape does not rule out
the potential that the patient has this infection. When scabies is suspected, and mites are not found, a
parasite treatment trial should be pursued.

Humans in contact with patients that have scabies can develop itchy, papular lesions on their trunk and
arms. For most people, lesions associated with *Sarcoptes scabiei* will resolve without therapy once their
pet has been treated. The mites usually survive on humans for a short time (less than 1 week), and
lesions typically resolve within 2 weeks after discontinuation of exposure. With continued exposure to
the affected pet, people will continue to have the red, itchy rash. It is important to recommend that
clients with skin lesions seek consultation with their physician or dermatologist; providing them with documentation of the suspected/diagnosed parasitic infection can help them discuss the issue with their health care provider.

*Sarcoptes scabiei* can persist in the environment for up to 21 days depending on environmental conditions. For most patients, treatment of the pet and in-contact animals (primarily dogs) will eliminate *Sarcoptes*. In some instances, for example a high mite load or multiple affected pets, clients may need to use a household or environmental pesticide to eradicate mites in the environment, in addition to treatment of the animals.

Dog with *Sarcoptes scabiei* should be restricted from contact with other dogs until the infection has resolved (usually 6 weeks). All in-contact dogs should be treated even if they are not exhibiting symptoms of scabies. Treatment should be continued for a total of 6 weeks; options include lime sulfur dips q. 7 days, topical selamectin q. 14 days, topical imidacloprid/moxidectin q. 14 days, and ivermectin PO q. 7 days.

NO!

*Demodex sp.*

*Demodex sp.* can affect dogs (*D. canis, D. injai, D. cornei*) and cats (*D. cati, D. gatoi*). *D. canis, D. injai* and *D. cati* have the typical cigar shape of *Demodex sp.* mites, whereas *D. cornei* and *D. gatoi* have blunted abdomens.

*Demodex sp.* mites are considered normal flora of the hair follicles, and are not contagious to other species or humans. Generally, *Demodex sp.* mites are also not contagious to other animals of the same species. Canine demodicosis results from a hereditary defect of lymphocytes (puppies), or with immune-compromise (generally older dogs). Potentially, contagion from one dog to another could occur if (a) the patient has generalized demodicosis with a very high mite load (b) the other dog is in very close contact with the patient (c) the other dog is immune-compromised – this has rarely been reported anecdotally. The major exception to the rule “*Demodex are not contagious*”, are *D. gatoi* mites, which are contagious to other cats.

*D. gatoi*

*D. gatoi* are different from the other species of *Demodex* mites, because they are not typically associated with concurrent immune-compromise. These mites cause a pruritic dermatosis, and often self-induced alopecia (fur mowing) of the ventral abdomen and legs is the only clinical sign.

Diagnosis is confirmed with a positive skin scraping for *D. gatoi*. This *Demodex* mite can be difficult to find with skin scrapings, and a negative scrape does not rule out the potential that the patient has this infection. When *D. gatoi* is suspected, and mites are not found, a treatment trial should be pursued.
All in-contact cats should be treated, even if they are not exhibiting symptoms of demodicosis. Most cats with *D. gatoi* will start to respond to therapy within the first 3-4 treatments, but usually require a longer duration of treatment for resolution. The mainstay of treatment is weekly lime sulfur dips, but ivermectin PO weekly or topical imidacloprid/moxidectin q. 14 days has been effective in some patients.

*D. cati*

*D. cati* is rare in cats. Alopecia, erythema, scaling and crusting occur, and can be localized (usually face, head or neck) or generalized. Cats with *D. cati* usually have an underlying systemic disease such as FeLV, FIV, diabetes mellitus, or hyperadrenocorticism.

Diagnosis is confirmed with positive skin scrapings for *D. cati*. This mite should be found on skin scraping if they are the cause of the skin lesions – if it is not found, a skin biopsy should be performed for further evaluation. Parasite treatment should not be performed unless presence of this mite has been documented.

Labwork should be done to investigate a possible underlying systemic disorder (other diagnostics could include thoracic radiographs and abdominal ultrasound). Treatment options include weekly lime sulfur or amitraz (125-250ppm) dips, or ivermectin PO daily.

*D. canis, D. injai, D. cornei*

Demodicosis can cause localized or generalized disease in dogs, and is usually not pruritic. The localized form presents with one or more focal areas of alopecia, erythema and scale on the face and front legs. Generalized demodicosis often starts on the head and legs, but can progress to involve most of the body. Alopecia, erythema, scaling and comedones are common initially – as the disease progresses, it is often complicated by bacteria which can lead to crusts, papules and hemorrhagic furunculosis and edema.

Diagnosis is confirmed with positive skin scrapings for *Demodex sp.* mites – often more than one species can be found on a patient. *Demodex* should be found on skin scraping if they are the cause of the skin lesions – if they are not found, a skin biopsy should be performed for further evaluation. Parasite treatment should not be performed unless presence of this mite has been documented.

Localized demodicosis will usually spontaneously resolve, so patients do not require miticidal therapy, but they may benefit from topical benzoyl peroxide or antibiotic creams/ointments. If the patient’s symptoms worsen, they may require treatment as for generalized demodicosis. Dogs with generalized demodicosis should be neutered because of the hereditary nature of the disease. In older patients with generalized demodicosis, labwork should be done to investigate a possible underlying systemic disorder (other diagnostics could include thoracic radiographs and abdominal ultrasound). Treatment options for generalized demodicosis include amitraz (250ppm) dips q. 14 days, ivermectin PO daily, and possibly topical imidacloprid/moxidectin q. 7-14 days. Most patients with generalized demodicosis have a concurrent secondary bacterial skin infection and benefit greatly from antibiotic therapy. Miticidal
treatment is continued until at least two consecutive negative skin scrapings are achieved. Older patients, and those with concurrent immune-compromise, may require long-term therapy.

Yes!

*Cheyletiella sp.*

*Cheyletiella sp.* can affect dogs (*C. yasguri*), cats (*C. blakei*) and rabbits (*C. parsitovorax*). The species of *Cheyletiella* are not very host-specific.

Cheyletiellosis can be acquired from contact with other animals or from the environment. The parasites live in the stratum corneum of the skin and attach their eggs to the hair by fine strands (compared to louse eggs which are more firmly attached to the hair). Clinical signs in dogs and cats are variable. In dogs the symptoms can range from pruritus with dorsal scaling to widespread erythema, papules and alopecia. Cats can have dorsal scale, military dermatitis, or self-induced alopecia (fur mowing) with no other lesions.

Diagnosis is confirmed with a positive skin scraping for *Cheyletiella sp.* mites – just one mite or egg is diagnostic. The mite can be difficult to find with skin scrapings, and a negative scrape does not rule out the potential that the patient has this infection. When cheyletiellosis is suspected, and mites are not found, a parasite treatment trial should be pursued.

Humans in contact with patients that have *Cheyletiella* can develop itchy, maculopapular lesions that may progress to pustules and crusts. The lesions are often located on the arms and trunk. The lesions associated with *Cheyletiella* will typically resolve within 2-3 weeks, once contact with the affected pet is discontinued, or the pet is effectively treated. With continued exposure to the affected pet, people will continue to have the pruritic dermatitis. It is important to recommend that clients with skin lesions seek consultation with their physician or dermatologist; providing them with documentation of the suspected/diagnosed parasitic infection can help them discuss the issue with their health care provider.

*Cheyletiella* can persist in the environment for at least 10 days depending on environmental conditions. For most patients, treatment of the pet and in-contact animals (dogs, cats, rabbits) will eliminate *Cheyletiella*. Rarely, environmental pesticide treatment is required.

Patients with *Cheyletiella sp.* should be restricted from contact with other animals until the infection has resolved (usually 6 weeks). All in-contact pets should be treated even if they are not exhibiting symptoms of cheyletiellosis. Treatment should be continued for a total of 6 weeks; options include lime sulfur dips q. 7 days, topical selamectin q. 14 days, topical imidacloprid/moxidectin q. 14 days, and ivermectin PO q. 7 days. Many flea control products are effective for cheyletiellosis, but variable effects have been reported.