

ECTOPARASITES



EAR MITE



EAR MITE DESCRIPTION:

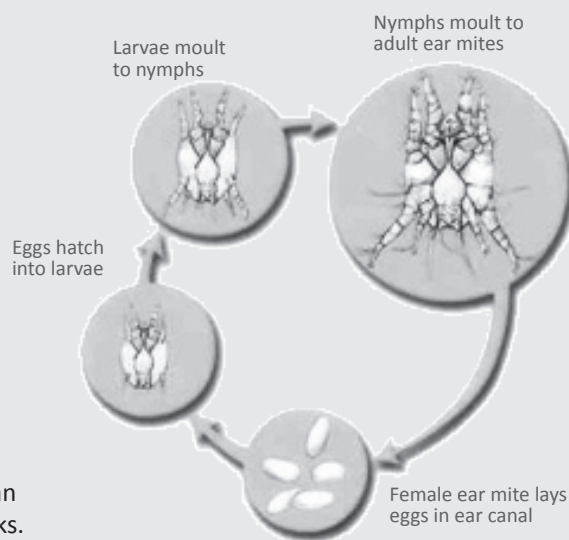
The ear mite is the most common cause of ear infections in cats, quickly spreading from one cat to another through direct contact. Ear mites cause inflammatory symptoms, similar to bacterial and yeast infections. Symptoms include itching and redness of the ears. Other, more serious problems can result from untreated infections, such as skin disease in areas other than the ear like the neck and tail, and deafness.

NOTE: Pets which have a fetid odor associated with the ears or which shake or scratch their ears excessively should be examined for signs of ear mites by a veterinarian.

Ear Mite Life Cycle (21 days)

The mite lives on the surface of the ear canal skin, though sometimes migrates out onto the face and head of its host. Eggs are laid and hatch after 4 days of incubation. The larva hatches from the egg, feeds on ear wax and skin oils for about a week and then molts into a "protonymph," which in turn molts into a "deutonymph." The deutonymph mates with the adult male. What seems especially bizarre to us mammals, is the fact that the deutonymph has not yet developed a gender at the time it mates with the adult male.

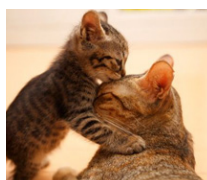
After mating, the deutonymph molts into either an adult male or an adult female. If she becomes a female, she will be gravid with eggs as a result of the mating. If he develops into a male, there are no consequences to the mating and he is ready to mate with deutonymphs of his own choosing. The adult mite lives approximately two months happily eating ear wax and skin oils. The life cycle (the time it takes for an egg to develop into an adult mite ready for parenthood) requires 3 weeks.



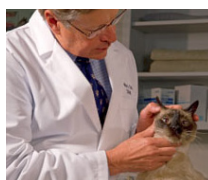
Excessive Scratching



Black or Brown Waxy Secretion



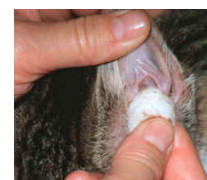
Physical Contact



Dermatologic Exam



Thorough Cleansing



SIGNS	SYMPTOMS	METHOD OF TRANSMISSION	DIAGNOSIS	TREATMENTS	PREVENTATIVE MEASURES
- Excessive scratching and ear rubbing - Head shaking - Lopsided appearance - Dizziness and loss of balance - Flattened ears	- Hair loss and dermatitis - Black or brown waxy secretion - Strong odor - Inflammation of the ear - Obstruction of the ear canal with debris - Scratches or scabs near ear	Physical contact with other animals	- Ear exam with Otoscope - Dermatologic exam - Ear swab and Cytology - Ear Swabs - Complete physical exam by Vet - Lab tests	- Thorough cleansing of the ear and tail (cats sleep with tail close to head) - Topical Treatments	Routine cleaning of ears

EAR MITE FACTS. DID YOU KNOW...

Ear Mites are more common in Cats than in Dogs

 Although ear mites can infect cats of all ages, they are most common in kittens and outdoor cats.

 There are many different types of mites, but the most common is Otodectes Cynotis, which is found in approximately 90 percent of all feline ear mite infestations.

 Other animals can catch ear mites from a cat, but humans cannot.

EAR MITE PREVENTION TIP

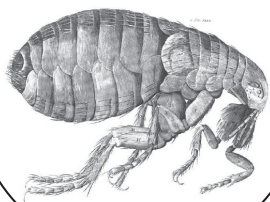
Ear mites can be prevented with the use of a monthly heartworm preventive that includes an ear mite preventive. Keeping your pet from being exposed to other pets that have ear mites is the obvious prevention method.

As mentioned, ear mites are very contagious among household pets, therefore all animals in the home should be treated to prevent re-infestation. If secondary infections, hematomas or chronic re-infestations occur see your veterinarian as soon as possible.

REFERENCES:

<http://www.asPCA.org/pet-care/cat-care/ear-mites.aspx>
<http://www.petmd.com/>
http://en.wikipedia.org/wiki/Ear_mite
<http://www.cat-world.com.au/ear-mites-otodectes-cynotis-in-cats>

FLEA



FLEA DESCRIPTION:

Fleas are insects that are parasites of mammals and birds. The most commonly found flea pest in homes is the cat flea. Dog fleas can also be a problem, but most often it is the cat flea (*Ctenocephalides felis*) that is found to be infesting both dogs and cats in North America. They are small (about 1/12 inch), wingless, dark brown or black, six-legged insects that look flat from side to side. Fleas have been known to jump as far as 13 inches, about 200 times their own body length.

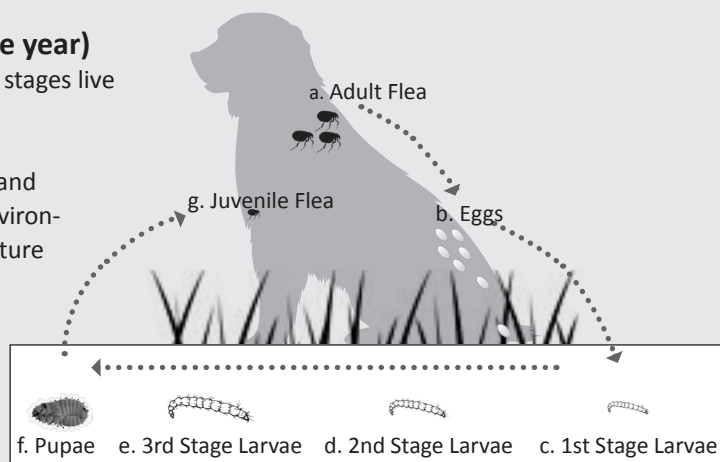
NOTE: If you have a flea problem, you must treat your pets. Consult your veterinarian for the best methods to control fleas. Some pet products are not as safe as others. Be very careful about which pesticide product you choose. Pets may ingest pesticides that have been sprayed or dusted on when they groom themselves, and some pets are more sensitive to pesticides than others.

Flea Life Cycle (as short as 20 days, or as long as one year)

Adult fleas live both on and off the host; Larvae and Pupae life stages live only in the environment.

Adult fleas (a, live approx 4 - 25 days) feed on the canine host and produce eggs (b, hatch within 2 days) which fall off into the environment. Eggs mature into larvae (c-e, lasts 5 - 15 days) which mature into pupae (f, 2 weeks to 12 months depending on conditions) and juveniles (g). The cycle begins again when juveniles and adults feed on the host.

In ideal environments, a flea egg can mature into an adult flea within 12 days, though the typical time period is longer.



Flea Feces



FSmall Red Sores



Dog Park



Flea Allergy



Bathing



Consistent Grooming

SIGNS	SYMPTOMS	METHOD OF TRANSMISSION	DIAGNOSIS	TREATMENTS	PREVENTATIVE MEASURES
- Frequent scratching, biting or licking - Presence of fleas and flea feces - Hair loss	- Small red sores - Open Sores - Inflammation - Secondary skin infection - Allergic reaction - In severe cases - - Listless - Lethargic - Confusion - Difficulty walking - Difficulty standing - Anemia	- Other animals - Local wildlife may harbor flea populations - Clothing - Yard - Car upholstery - Pet bedding - Home carpeting - Doggy daycare - Dog Park	- Inspect hair with a flea comb - Skin tests by Vet	- Flea Shampoo - Apply flea control with Vet supervision - Clean or replace bedding - House flea treatment - Allergies - - Steroids or antihistamines - Flea saliva extract (flea antigen)	- Keep your pet healthy - Use a flea comb - Consistent grooming with a flea comb - Vacuum the house regularly, disposing of the vacuum bag promptly each time

FLEA FACTS. DID YOU KNOW...

There are 5 types of fleas.

1. Oriental rat flea (*Xenopsylla cheopis*)
2. Hen flea (*Echidnophaga gallinacea*)
3. Dog flea (*Ctenocephalides canis*)
4. Cat flea (*Ctenocephalides felis*)
5. Human flea (*Pulex irritans*)

For every one flea on your pet there might be 100 eggs or developing immature fleas, living out of sight in your home.

A female flea will lay eggs every day of her adult life. She can lay 2,000 eggs in her lifetime.

THE DANGERS OF FLEAS

Some dogs are allergic to the flea's saliva. Rather than developing little "bug bites" like most dogs and people, they break out in large welts and present with severe skin irritation and excessive shedding--the irritation results in your dog licking and biting at the site, which often leads to infection.

This is called flea allergy dermatitis. It is a self-perpetuating cycle because the more your dog licks and bites at the affected area, the worse the irritation gets and the more he will want to lick and bite. This cycle can be halted by getting rid of the fleas, and putting an Elizabethan collar on your dog so he cannot worsen the problem while it heals.

REFERENCES:

www.4petsusa.com

<http://www.flea-i.com/>

<http://www.stopthefleas.com/>

<http://www.pested.msu.edu/Resources/pdf/Fleas.pdf>

http://controlsfleas.com/controlfleas/flea_control_life_cycle.html

TICK



TICK DESCRIPTION:

Adult insects have three pairs of legs and one pair of antennae. Ticks are among the most efficient carriers of disease because they attach firmly when sucking blood, feed slowly and may go unnoticed for a considerable time while feeding. Ticks take several days to complete feeding.

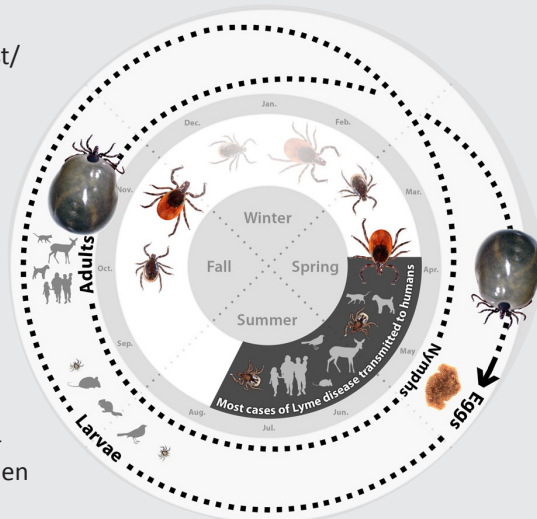
Ticks wait for host animals from the tips of grasses and shrubs (not from trees). When brushed by a moving animal or person, they quickly let go of the vegetation and climb onto the host. Ticks can only crawl; they cannot fly or jump. Ticks found on the scalp have usually crawled there from lower parts of the body. Some species of ticks will crawl several feet toward a host. Ticks can be active on winter days when the ground temperatures are about 45o Fahrenheit

Ear Mite Life Cycle (2 year life span)

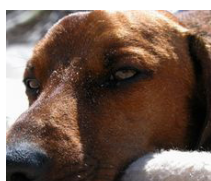
Life-cycle of *Ixodes scapularis* (a.k.a. blacklegged or deer tick) in the northeast/ mid-Atlantic/upper mid-western United States. Larval deer ticks are active in August and September but these ticks are pathogen-free.

Ticks become infected with pathogens when larvae (or nymphs) take a blood meal from infectious animal hosts. Engorged larvae molt over winter and emerge in May as poppy-seed sized nymphal deer ticks.

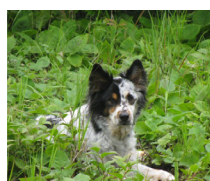
Please note that most cases of Lyme disease are transmitted from May through July, when nymphal-stage ticks are active. Adult-stage deer ticks become active in October and remain active throughout the winter whenever the ground is not frozen. Blood-engorged females survive the winter in the forest leaf litter and begin laying their 1,500 or more eggs around Memorial Day (late May). These eggs hatch in July, and the life-cycle starts again when larvae become active in August.



Severe Tick Infestation



Lethargy



Environment



Examination





Signs	Symptoms	Method of Transmission	Diagnosis	Treatments	Preventative Measures
Visible to naked eye	- Fever - Lameness - Loss of appetite - Sudden pain - Lethargy - Depression - Arthritis - Tick paralysis	Ticks are most active in from spring through fall and live in tall brush or grass, where they may attach to dogs playing on their turf. These parasites prefer to stay close to the head, neck, feet and ear area. In severe infestations, however, they can be found anywhere on a dog's body.	Veterinarians can conduct a careful examination of the entire body looking for ticks still attached, rashes, or signs of a tick-caused disease.	- Tick Removal - Broad spectrum antibiotics for treatment of Lyme disease	- Treat each pet with a topical spot-on treatment - Vacuum carpets, baseboards and furniture. Wash or vacuum pet bedding. - Treat your outside environment to prevent re-infestation when your pet leaves the home.

TICK FACTS. DID YOU KNOW...

There are about 200 species in the United States.

Blacklegged ticks can carry the bacteria which causes Lyme Disease and Rocky Mountain Spotted Fever

Ticks are more closely related to spiders and scorpions than insects

There are two main types of ticks: hard and soft.

- Hard ticks are found in the woods.
- Soft ticks have tough, leathery skin found in caves, cabins and on birds.

THE DANGERS OF TICKS

Though they are known vectors of disease, not all ticks transmit disease – in fact, many ticks do not even carry diseases. However, the threat of disease is always present where ticks are concerned, and these risks should always be taken seriously. Most tick-borne diseases will take several hours to transmit to a host, so the sooner a tick is located and removed, the lower the risk of disease.

The symptoms of most tick-borne diseases include fever and lethargy, though some can also cause weakness, lameness, joint swelling and/or anemia. Signs may take days, weeks or months to appear. These signs typically begin to resolve after tick is removed. If you notice these or any other signs of illness in your dog, contact your veterinarian as soon as possible so that proper testing and necessary treatments can begin.

REFERENCES:

http://www.tickcounter.org/education/deer_tick_life_cycle

<http://www.puppy-training-solutions.com/tick-bite-symptoms.html>

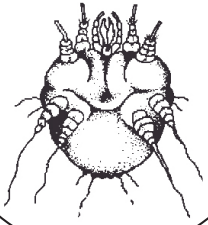
<http://www.aspc.org/pet-care/cat-care/ticks.aspx>

<http://en.wikipedia.org/wiki/Tick>

<http://www.cdc.gov/features/stopticks/>

<http://www.placervillevet.com/ticktools.htm>

MANGE



MANGE DESCRIPTION:

Mites in dogs is known generally as Mange and cause severe irritation in dogs with symptoms of inflammation, itching and hair loss. Mites cause their damage by tunneling into the skin via the hair follicles and oil glands of the epidermal layer. Once the dog begins scratching the pruritus, soreness and redness begin to develop leading to crusty skin and scabs.

Mites normally live freely in dogs and cats, even humans without ever bothering their host; it is only when the immune system of the host suffers because of any number of circumstances do the mite begin their process of infestation – sometimes causing life-threatening conditions.



Demodectic Mange

Demodectic mange, sometimes just called “demodex” or “red mange”, is the most common form of mange in dogs. It is caused by the *Demodex canis*, a parasite that lives in the hair follicles of dogs. Under the mi-

croscope, this mite is shaped like a cigar with eight legs.

All normal dogs (and many humans) have a few of these mites on their skin. As long as the body’s immune system is functioning properly, these mites cause no harm.

Demodectic mange most often occurs when a dog has an immature immune system, allowing the number of skin mites to increase rapidly. As a result, this disease occurs primarily in dogs less than twelve to eighteen months of age. As the dog matures, its immune system also matures.

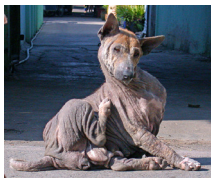


Cheyletiella Mange

Cheyletiella mites affect dogs, cats, rabbits and, people. In people, the condition manifests as very itchy lesions on arms, trunk and buttocks. These lesions develop a central area of

necrosis that is considered highly diagnostic.

These mites are not associated with hair follicles (like demodex mites) and do not burrow (like sarcoptic and notoedric mites). They move rapidly on the surface of the skin in pseudo-tunnels of epidermal debris. They spend their entire life cycle on the host. Mites usually die within 48 hours off the host but, adult females have been maintained off the host for up to 10 days. Eggs are small and loosely attached to hairs. (Louse nits are much larger and are firmly cemented to hairs).



Excessive Scratching



Hair Loss



Contact



Skin Inspection



Medicated Shampoo



Cleanliness

Signs	Symptoms	Method of Transmission	Diagnosis	Treatments	Preventative Measures
- Excessive scratching or biting - Eating less - Not sleeping - Bad odor from infection site	- Red and inflamed skin - Small swellings - Hair loss - Scruff or dandruff - Crusts on the skin	- Contact with an infected animal - Local wildlife may harbor mange - Possible hereditary problem	- Close inspection of the skin - Examining skin scrapings under microscope	- Isolation to prevent spreading - Oral medication - Topical medication - Medicated shampoo - Physiologic stress management	- Clean or replace bedding and collar - Keep pets away from infected animals - Bath and clean your pet regularly - Check in with Vet regularly

MANGE FACTS. DID YOU KNOW...

Common types of mange are:

- Notoedric mange, aka “feline mange”, not transferable to humans
- Demodectic mange, found often in dogs, mainly puppies. Not transferable to humans
- Sarcoptic mange, or “canine scabies”, transferable to humans from an infected dog
- Cheyletiellosis mange is highly contagious and transferable to humans and cats

IS THERE A CURE FOR MANGE?

Younger dogs often recover fully from mange, but adult dogs often require long-term therapy to control the disease. Dogs with demodectic mange should not be bred, as this condition is thought to be hereditary.

Treatment, no matter which option is chosen, should be accompanied by skin scrapes every two weeks. After two consecutive scrapes are negative, medication is discontinued, but a final scrape should be performed one month after treatment to ensure there isn't a recurrence.

Many skin treatments can be toxic to dogs and should not be repeated frequently, so check with your vet before beginning any treatment program for mange.

REFERENCES:

- <http://www.wormsandgermsblog.com/2008/12/articles/animals/dogs/cheyletiella-the-walking-dandruff/>
- <http://www.aspcare.org/pet-care/dog-care/dog-care-mange.aspx>
- <http://megankouz.hubpages.com/hub/All-About-Dog-Mange>
- <http://www.superpages.com/supertips/mange-facts.html>

WARBLE



WARBLE DESCRIPTION:

Warbles are the larval stage of the botfly. Botflies proliferate by laying eggs on blades of grass, or in nests, where they hatch, releasing maggots that crawl onto the skin of the passing host. The small maggots enter a body orifice, migrate through various internal tissues, and ultimately make their way to the skin, where they establish themselves within a warble (a small lump in the skin). The mature maggots, which may be an inch long, then drop out of the rodent or rabbit host and pupate in the soil.

Dogs become infected with a botfly larva when they come into contact with a blade of grass that has a maggot on it. The dog's movement against the blade of grass stimulates the maggot to crawl onto the dog. The maggot then crawls around on the dog until it finds an orifice in which to enter.

MORE INFORMATION:

Botfly, common name for several families of hairy flies whose larvae live as parasites within the bodies of mammals.

The horse botfly secretes an irritating substance that is used to attach its eggs to the body hairs of a horse, mule, or donkey. When the animal licks off the irritant, the larvae are carried into the host's mouth and later migrate to the stomach. They attach themselves to the lining, where they feed until ready to pupate, and then drop to the ground with the feces.

The larvae, which may cause serious damage to the digestive tract and weaken the animal, can be eliminated by a veterinarian.



Signs	Symptoms	Method of Transmission	Diagnosis	Treatments	Preventative Measures
Skin signs: - Lump in the skin containing warble; there will be a raised opening in the lump so that the warble may breathe Neurological signs: - Dizziness - Circling - Paralysis - Blindness - Lying down	Respiratory symptoms: - Cough - Fever - Shortness of breath Ophthalmic symptoms: - Lesions (caused by the larvae in the eyeball)	- Contact with an infected animal - Environment where Bot Fly flourishes such as grassy areas	- Exam by Vet to rule out other parasites or conditions - Visible Warble under the skin	- Warble extraction by a Vet - Anti-parasite medication	- Monthly heartworm preventatives - Flea control products

WARBLE FACTS. DID YOU KNOW...

In cold climates supporting reindeer or caribou-reliant populations, large quantities of warble fly maggots are available to human populations during the butchery of animals. These are relished in modern times by some as important seasonal luxuries containing high levels of protein, fats and salt.

WARBLE FLY OR HUMAN BOTFLY

The human botfly is one of several species of fly the larvae of which parasitize humans (in addition to a wide range of other animals, including other primates). It is also known as the torsalo or American warble fly, even though the warble fly is a parasite on cattle and deer instead of humans.

This species is native to the Americas from Mexico to northern Argentina and Chile, though it is not abundant enough (nor harmful enough) ever to attain true pest status. Since the fly larvae can survive the entire eight-week development only if the wound does not become infected, it is rare for patients to experience infections unless they kill the larva without removing it completely.



REFERENCES:

http://www.michigan.gov/dnr/1,1607,7-153-10370_12150_12220-26354--,00.html

http://www.petmd.com/dog/conditions/infectious-parasitic/c_multi_cuterebrosis

<http://en.wikipedia.org/wiki/Botfly>

MYIASIS



MYIASIS DESCRIPTION:

A condition that is characterised by the invasion of the body by the larvae of flies. Of all the arthropods, only the larvae of certain flies (Diptera) are adapted to invade and consume the tissues of a vertebrate host. An infestation by any of these flies is known as myiasis.

In North America, this type of parasitism is most common among domestic animals (particularly sheep, cattle, and horses), but it can also be a problem among the poor and elderly of the human population where it is usually associated with neglect and unsanitary conditions.

Myiasis is the infection of a fly larva (maggot) in tissue.



Image: L to R: Close-up of the anterior end of a larva, showing the mandibles and one of the anterior spiracles. Adult of *Dermatobia hominis*, the human bot fly. Four larvae of *Dermatobia hominis*.



Worms



Open Sores



Prolonged Wet Skin



Skin Examination



Removing Maggots



Shaving

Signs	Symptoms	Method of Transmission	Diagnosis	Treatments	Preventative Measures
• Wriggling white worms • Maggots	• Open sores with worms • Prolonged wet skin from urine or feces • Fleece rot (in sheep) • Shock (in severe case)	• Pets that are confined outdoors with sustained skin moisture and open sores	• Close inspection of the skin • Identifying the affected area	• Shaving hair from the affected area • Remove the maggots physically • Apply mild insecticide • Rinse area with water • Possible skin grafts in severe cases	• Shave prone animals • Prevent skin disease that attract blowflies • Examine your pet daily • Spray insecticide where livestock sleep

BLOW FLIES

Blow flies belong to the Family Calliphoridae of flies under Order Diptera. To date, there are approximately 1,100 species of blowflies worldwide. Blow flies are often metallic in appearance, with feathery hairs on the terminal antennal segments. Adult blow flies have sponge-like mouth parts, while maggots have hook-like mouth parts.



MYIASIS IN HUMANS

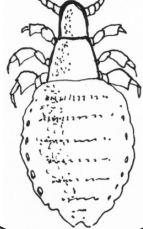
In humans, myiasis is often the result of neglect and is most commonly found in the very old, the very young, or others who are unable or unwilling to ensure basic hygiene and wound cleanliness. In most cases, the insects are colonizing a living person and feeding on dead, rather than living, tissue.

The ability of such insects to remove dead tissue and clean wounds, while leaving the living tissue intact, has been used in medicine for centuries. The popularity of maggot debridement therapy declined with the discovery of antibiotics, but in the last 20 y, its use has been revived and it is now considered to be a viable alternative to surgery in certain cases.

REFERENCES:

- http://www.wiki-pet.com/health/dog/condition/index.php?condition_id=62&name=maggots
- <http://www.cdc.gov/parasites/myiasis/>
- <http://www.petplace.com/dogs/myiasis-maggots-in-dogs/page1.aspx>
- <http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/71719.htm>

LICE



LICE DESCRIPTION:

Two varieties of lice are very common in the dog. One lives by sucking the dog's blood, and the other gets its nourishment by feeding on the scales on the superficial layers of the skin as well as on hair. The blood-sucking variety is more troublesome, but for the most part all louse infestations are highly amenable to treatment and are responsible for serious complications only in cases of very extreme neglect.



Biting (Mallophaga): trichodectes canis & Heterodoxus spiniger. (feed on skin flakes and skin)

With a life cycle that takes about three to four weeks, and includes

incomplete metamorphosis (hemimetabolous), canine biting lice can be found anywhere on the dog's body.

While rare on healthy animals, poorly nourished dogs may have heavy infestations, adding to their troubles. In addition to causing severe itching and loss of sleep, *Trichodectes canis* can act as the intermediate host for the dog tapeworm, *Dipylidium caninum*. In the case of Alaskan wolf packs infected by human pets, extensive hair loss in sub-zero temperatures creates metabolic demands that reduce survival rates.



Sucking linognathus piliferus setosus (feed on dogs blood and are more irritating)

The anopluran louse, *Linognathus setosus*, is a capillary blood feeder. These lice suck blood

frequently – about every couple of hours.

In heavy infestations, lesions of the skin with excoriation, urticaria-like lesions with alopecia, and even necrotic skin lesions are all typical clinical signs of infestation with the sucking louse.

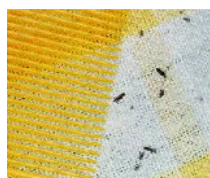
Infested dogs are restless and display constant pruritus, with risk of secondary dermal infections.



Visual Confirmation



Hair Loss



Lice on Bedding



Visual Confirmation



Pyrethrin Shampoo



Preventative Treatments

Signs	Symptoms	Method of Transmission	Diagnosis	Treatments	Preventative Measures
- Restlessness - Scruffy dry hair and coat - Pruritus (itching)	- Hair Loss - Anemia (severe case)	Lice are transmitted mainly by host to host interaction, either directly or from contact with shared materials, e.g. bedding or lice comb. Off the host, lice survive only for a limited period of time.	- Visual Confirmation - Examination of the fur and skin	- Pyrethrin Shampoo - Pyrethrin Spray or Powder Note: Pyrethrin is not safe for cats	Preventive topical treatment

DOG LICE - PREVENTION & CONTROL

Prevention of dog lice is much better than looking for treatment. If you know other dogs have lice then keep your dog away from them until they are treated.

.....
Regular grooming will help prevent dog lice and also help you spot the signs early on, should they occur.

.....
Steer clear of sharing grooming tools with other dogs and keep strays at a good distance. Prevention of re-infestation can be helped by thoroughly following treatment instructions.

DEALING WITH HEAD LICE

Dealing with head lice is something most school officials and some parents are familiar with. Is the family dog at risk if the kids have lice? Did the kids catch lice from the cat? A lice parasite infection is termed pediculosis, no matter what species of animal is affected by lice.

Lice are species-specific, meaning that there is a different species of lice for each animal species that they depend on. Human lice need human blood to survive, dog lice need dog blood, and so on. Therefore, if your child comes home from school with a diagnosis of head lice, your dog, cat, or other pets in the household are not at risk from catching the lice or hatching eggs.

REFERENCES:

<http://micro.magnet.fsu.edu/optics/olympus-micd/galleries/brightfield/trichodectescanis.html>

<http://www.animalhealth.bayerhealthcare.com/4903.0.html>

<http://www.yourpetshealth.co.uk/page10.htm>

<http://www.eradicatebedbugs.com/more-services/lice-sheets-1.12>