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Fleas and Flea Control

(*adapted from Little, S. Conquering Fleas, Today's Veterinary Practice, Nov/Dec 2012 pg 33-39)*

Ctenocephalides felis is the cat flea that feeds on cats, dogs, humans, other animals, causing severe local itching, allergic reactions, and with severe infestation, anemia.

Flea populations can become established in homes and kennels where constant sources of nutrition i.e. pets, are readily available. Eggs, larvae or pupae comprise the majority of fleas in an infestation. Once immature stages are present, they may continue to emerge for weeks to months, despite control of the adult flea. Flea populations then can persist indefinitely when untreated pets or other animals are present. This creates a constant source of infestation.

Disease Transmission

Fleas are a major source of disease. Pets infested with cat fleas have been associated with an increasing number of infections, including those that cause zoonotic disease (animals to people). Problems associated with fleas include: flea bites, flea frass (feces, often described as "flea dirt" which appears as small, blackish "dandruff" but turns red when a drop of water is put on it.), fleas ingested during grooming.

Infectious agents that can be transmitted by the cat flea include tapeworms (*Dipylidium caninum*), Bartonellosis (*Bartonella henselae, Bartonella* sp.), Hemotropic mycoplasmosis (*Mycoplasma haemofelis* and *Candidatus* M *haemoninum*), Murine typhus and other rickettsial infections (*Rickettsia typhi* and *R. felis*)

Bartenollosis is commonly called "Cat Scratch Fever or Disease". Infected individuals, usually children, develop fever and regional lymph node enlargement after a cat bite or scratch. Joint pain and inflammation, muscle pain, and hepatitis have also been implicated. The role of fleas in transmitting this is well established. Hosts for the disease are cats, dogs, and some wildlife. Fleas feeding on animals with B.henselae in their blood shed the organism in their feces. The bacteria-laden frass is transferred to claws and teeth during grooming, resulting in the infection passed to the human if bitten or scratched.

Rickettsial infections are most often associated with tick-borne disease, fleas have also been documented as transmitted by fleas. R.typhi has been seen in humans in Texas, California, and Hawaii. Both flea bites and inhalation of flea frass are considered likely sources of human infection. Humans may develop rash, fever, headache, and muscle pain. The opossum and the cat flea can serve as reservoir hosts. R.felis is more recently identified and found worldwide. It is associated with murine typhus-like illnesses in humans.

Mycoplasma haemofelis can cause feline infectious anemia in cats. *Candidatus* Mycoplasma *haemominutum* is less pathogenic in cats, but can contribute to anemia. It may cause more of a problem in immunosuppressed cats, and in particular is found more often in male cats and ones with concurrent feline immunodeficiency virus (FIV) or feline leukemia virus (FeLV).

Tapeworms (Dipylidium caninum) is the most commonly transmitted disease from fleas. The flea is the vector, and cats and dogs are readily infected upon ingestion of fleas containing the infectious form of the worm while grooming. While D.caninum is not considered pathogenic (causing illness), it is aesthetically unpleasant to see the proglottids (segments) in the fur around the anus or dropped into the environment. Effective treatment of D.caninum infestation include cestode treatment as well as diligent flea eradication. Humans can become infected due to ingestion of the fleas containing tapeworm infectious stage (cysticercoids), with infection most often reported in children and may be confused with pinworm infection.

Flea Control

All dogs and cats must be treated. If there are visiting dogs or cats, they too must be treated. Untreated pets seed the environment with eggs, creating a constant source of newly-emerged fleas that leads to failure of flea control.

Flea-infested wildlife, strays, and roaming pets may contribute to flea burdens around homes. These may include opossums, raccoons, foxes, stray or feral cats, and dogs that visit lawn areas. Areas where many animals mingle, include neighbor's homes, dog parks, boarding kennels, and camp sites.

In conclusion: fleas are ubiquitous. However, you can take control and protect pets from fleas.

Persistent Flea Control
The majority of a home's fleas: eggs, larvae and pupae, reside in carpets, pet beds, and furniture. Adult fleas on the pet account for only about 5% of the overall flea population. Eggs and larvae are usually concentrated in areas where pets spend the most time. These stages can be killed, but may be difficult to reach in furniture, cracks and crevices such as grooves in a hardwood floor. Pupal stages are very difficult to destroy with current insecticides. These can last for months in the environment waiting for an opportunity to start an infestation. Newly emerged adult fleas feed on pets and people and create more offspring, thereby creating or maintaining the infestation.

Flea Control Products are grouped into Adulticides and Insect growth regulators/developmental inhibitors. Many products combine these. Straight adulticides include: deltamethrin, dinotefuran, fipronil (Frontline), imidacloprid (Advantage), indoxacarb, nitenpyram, permethrin, pyrethrins, selamectin (Revolution), and spinosad. Growth regulators/development inhibitors include

lufenuron, methoprene, and pyriproxyfen. Combining these in a single product ensures re-infestation of the environment does not happen.

The most important aspect of flea control is CONSISTENT USE of control products. This should be combined with mechanical removal (vacuuming is excellent) of eggs, larvae and pupae. Year round control is necessary here as we rarely get more than 5 days in a row below freezing (entire 24 hr period).

Remember that once a flea infestation has occurred, regular treatment of the pets is necessary along with the environmental control. In severe infestations, treatment of the environment with insecticides/growth regulators-development inhibitors may also be necessary. These include premise sprays and flea "bombs". Follow label instructions on all of these chemicals. These premise chemicals must always be used in conjunction with the on-the-pet products.

In summary, dogs and cats have ample opportunities to become infested with limitless supplies of fleas. When they feed on pets, they breed, contaminating the environment with eggs, which will establish a home infestation that can take several weeks to months to eliminate. Be consistent in treating all pets in the household with quality flea adulticides that limit the feeding of adult fleas, reducing their overall reproductive capacity, incorporating a product that prevents the maturation of immature stages further hinders establishment of infestations. Flea control prevents transmission of disease to pets and people. Consistent use of products (every pet, environment) year round is necessary.

How to Prevent Flea Infestations

1. Administer insecticides to all pets in the household (indoors and outdoor pets).
2. Use compounds effective against immature stages of fleas, all pets in the home and to the environment.
3. Apply preventive products to pets consistently and year round.
4. Limit encounters, if possible, with potentially infested animals such as visitations in the home or yard of other animals, wildlife and feral animals, and areas where pets congregate such as dog parks.
5. Protect the home environment, both indoors and outdoors by using premise sprays, washing pet bedding and accessories, thorough vacuuming of floors, carpets, and furniture with disposal of vacuum bags immediately following to prevent hatching of eggs and development of larvae which can re-infest the home.