MER BLEUE
Veterinary Hospital

Common intestinal parasites in dogs and cats

Introduction

This informational handout seeks to provide you with a better understanding of the more common intestinal parasites your furry friend is likely to encounter living in Ottawa. In general, kittens and puppies are more likely to have intestinal parasites than adults and are also more likely to show signs of illness. Usually, these parasites will have been passed on by their mother. This means deworming in puppies and kittens is essential, even if they are not showing signs of parasites such as diarrhea, weight loss or poor appetite.

Giardia

This single celled parasite (from a family called Protozoa) is the most common parasite we diagnose in young dogs and cats. Many will know Giardia by its other name, Beaver Fever. It is transmitted either directly through infected feces or through soil, food or water contaminated by infected feces. Outside of the body the parasites are immobile and cannot transfer to other feces on the ground.

The parasite comes in two forms:the trophozoite, its active form which has flagellates (similar to microscopic tentacles) to move around, and the cyst, its inactive form which is surrounded by a resistant cell membrane. The cyst is highly durable and can last in the environment for months. Both the trophozoite and cyst are immediately contagious after they are released from their host's body in the feces.

Most dogs or cats who have Giardia will display no negative health problems. A positive diagnosis is often a surprise to the family. Luckily, animals who have Giardia but no health problems, do not require treatment. Within a few weeks to months, they will eliminate the infection themselves without requiring treatment.

The main sign of Giardia is diarrhea. In most dogs and cats, this diarrhea will not be debilitating. However, in puppies and kittens, if the diarrhea is sufficiently severe, it could cause serious dehydration.

Humans are also at risk of catching Giardia. Within the species, there are several genetic strains (listed A through H). The strains which affect humans are not the same as those affecting dogs and cats. However, as there are reports of dogs or cats carrying the human strains, your Mer

Bleue veterinarian advises proper hand washing and hygiene techniques when dealing with the infected feces of your furry friend.

Coccidiosis

This parasite is another single celled organism from the family Protozoa. Coccidia tend to be very species specific, which means humans are not at risk of catching a dog or cat specific coccidia. In cats and dogs, the organism is called Isospora.

Occasionally our furry friend's stool will test positive for other species-specific types of coccidia such Eimeria. These are specific to small rodents and rabbits, therefore will not cause issues in dogs or cats.

This parasite is infectious after 8 hours of passing through the stool and into the environment. This means ingestion or contact with fresh feces does not pose a risk like it does with the previously discussed Giardia.

Most dogs and cats with coccidia will never develop signs of illness. They will shed the parasite for up to two months before eliminating it on their own.

Dogs and cats are more at risk of a Coccidia infection causing an impact on their health when they are young, already ill, or immunocompromised. The signs are generally diarrhea with the possibility of bloody stools, depression, weight loss, vomiting and loss of appetite. Diarrhea is often the only visible sign.

If a sufficiently small dog or cat has an abundantly high number of Coccidia, there is a risk they may become anemic due to the loss of red blood cells from severe inflammation (causing microscopic leakage of red blood cells) in the intestinal wall.

Luckily most dogs and cats with coccidia never develop health problems. Even without treatment, their immune-system will be successful in eliminating the parasite after a few weeks to months.

Roundworm (Ascariasis)

This parasite resembles a thin white worm and belongs to the family of animals called Nematodes. In Ontario, they are the most common "worms" found in dogs and cats.

If your furry friend throws up or poops out a worm, there is a good chance it is a roundworm. In dogs, the most common roundworm is called Toxocara Canis and in cats it is Toxocara Cati.

Our furry friends become infected by swallowing eggs (usually when consuming something contaminated with infected feces from another animal) or through ingesting an animal containing roundworm larvae. The eggs are immobile and cannot move to other nearby fecal samples.

Compared to previously discussed parasites, roundworms must always be treated as the body's immune system cannot eliminate these on its own.

In puppies and kittens, roundworm larvae can also be transmitted while nursing from their mother. In addition, in dogs, the parasite can be transmitted from the mother to the fetus in the uterus.

Although dogs and cats are the preferred hosts (also called definitive host), the roundworm can live in other species such as rabbits, mice, birds and even humans. These accidental hosts are called paratenic hosts.

Once an egg is released from the host's body through defecation, it is not immediately infectious. The larva within the egg must pass through two maturation stages. The larva must mature from first stage larva (L1) to third stage larva (L3), prior to being able to infect a new host. This process can take 2 to 4 weeks. The warmer the weather, the quicker the larva matures and the faster it becomes infectious.

Once the eggs are swallowed, the small larvae will cross through the wall of their host's intestines, move into the liver and then into the lungs. From the lungs, they will climb up the airways into the throat until they are swallowed back down into the intestines.

As with most parasites, the young, already ill, or immunocompromised are at greater risk of showing signs of infection. The most common signs of roundworms include diarrhea, vomiting, weight loss, failure to thrive, pot belly and a poor hair coat.

Although the larva will die at temperatures below -15 degrees Celsius, the eggs are quite hardy and able to survive through Canadian winters.

The biggest concern with roundworms is the fact they can live in humans. As humans are not the preferred host, the larva will migrate throughout the body rather than return to the intestines.

There are two forms of larvae migration in humans, visceral larval migrans (VLM) and ocular larval migrans (OLM). With VLM the larva will migrate to different parts of the body including the liver, lungs and brain. With OLM the larva will specifically migrate into the eyes.

VLM and OLM can be fatal in children, therefore it is important to ensure children, toddlers and babies do not directly handle dog or cat feces.

There is another species of roundworm called Baylisascaris Procyonis. It is mainly carried by raccoons and can be transmitted to dogs and humans through contact with raccoon feces. Cats are considered very resistant. As with the larva for other species of roundworm, they can migrate into various parts of the body in humans, particularly the brain.

Hookworms (Ancylostomiasis)

Hookworms look similar to the above-mentioned roundworms. The main difference is the 6 sharp teeth the hookworm has on its head. These teeth allow it to attach to the host's intestines and siphon the host's blood.

The most common species of hookworm is called Ancylostoma Caninum in dogs and Ancylostoma Tubaeforme in cats.

This parasite is significantly less common than roundworms in Canada. The more aggressive species of hookworms tend to be found in warmer climates such as the Caribbean and South America.

As with roundworm, infection usually occurs after ingestion of anything contaminated with feces containing eggs or through ingestion of another host (rabbit, rodent, bird) containing the parasite.

Puppies can also be infected while nursing.

Another method of hookworm transmission is through the skin. As the larvae will be found on the ground, the most common point of entry into the skin is through the feet.

The process of maturation of the larva in the egg takes less time than roundworm, usually 2-9 days depending on the environment. The warmer the weather, the less time it takes for hookworm larvae to mature.

As with most parasites, the young, already ill, or immunocompromised are at greater risk of showing signs of infection.

With mild infections we may only see diarrhea. However, with severe infections we may also see digested blood (called melena) or fresh blood (called hematochezia) in the stools, failure to thrive, loss of appetite, a poor hair coat, weight loss and pale gums.

Since the hookworm feeds on blood, dogs or cats with severe infections can quickly see their red blood cell count go down (known as anemia). As red blood cells are essential to carrying oxygen to our organs, severe anemia can become life-threatening if not treated swiftly.

If the larva penetrates into the body via the skin of the feet, the infected dog or cat may develop severely itchy skin as the larva migrate through the skin.

The hookworm eggs are not as hardy as those of the roundworm. They do not survive in freezing temperatures.

Just as with roundworms, humans can become infected with hookworms. The main way humans become infected with hookworms in Canada is via migration of the larva through the skin. This is called Cutaneous larval migrans (CLM). This will generally cause an intense itching of the feet. If there are only a few larvae, the itching will resolve on its own within a few weeks. Otherwise, treatment will be required.

Hookworms in the intestines will always require treatment as the body's immune system will be unable to eliminate them.

Tapeworms

Tapeworms are unrelated to the previously discussed roundworm and hookworm. They belong to a different family of animals called Cestodes.

Their anatomy is quite different from the previously discussed roundworm and hookworm. The main portion of the tapeworm is called a scolex. This structure is analogous to a head and contains hooks and suckers to allow the tapeworm to latch onto the wall of its host's intestines.

Attached to the scolex are proglottids. These are small flat square shaped structures. Each contains a large number of eggs. Some tapeworms have so many proglottid segments that they reach several metres in length. The proglottids segments furthest from the scolex will fall off and be passed out of the host's body with their feces.

Often, cats or dogs with tapeworms will have little white segments resembling rice attached to the fur around their anus. These are the proglottids passing out of the host's body.

The lifecycle of the tapeworm is very different from that of the roundworm or the hookworm. Firstly, the tapeworm requires two hosts to complete its life cycle unlike the one host needed by the roundworm or hookworm. Initially, an intermediate host will eat the tapeworm eggs. The intermediate hosts are smaller animals such as rodents and rabbits. They will eat vegetation on which the eggs have become attached. Once inside this host, the tapeworm eggs

will hatch into larvae. These larvae will migrate through the body and form protective capsules, known as cysts, around themselves.

Once encapsulated, the larvae will remain dormant until the rodent or rabbit is eaten by a predator such as a dog or a cat. These become the definitive hosts in which the larvae can mature into adults.

The above-mentioned cycle is typical of the most common species of tapeworm called Taenia.

There is another species called Dipylidium. The difference between these two species of tapeworms lies in the intermediate host. Instead of being a rodent or rabbit, the intermediate host of the Dipylidium tapeworm is a flea. This means cats and dogs with fleas are at risk of also developing tapeworm. The flea must be swallowed for the cat or dog to develop a tapeworm infection.

As with most parasites, the young, already ill, or immunocompromised are at greater risk of showing signs. The most common sign of tapeworm is diarrhea with possible vomiting, itchiness around the anus and intestinal obstruction. Intestinal obstruction only occurs if there are a significant number of tapeworms.

Since our furry friends need to ingest a smaller animal to become infected, tapeworms are generally more common in outdoor cats.

There is another species of tapeworm which deserves special mention. It is called Echinococcus Multilocularis. Prior to 2009 it had never been diagnosed in North America outside of Alaska and Northern Canada. Since then, a pocket has been found in the southern prairies. Since 2012, this species of tapeworm has also been detected in Ontario. So far these cases are very rare.

As with other tapeworm species, dogs and cats are considered the definitive host of Echinococcus Multilocularis. This means the parasite will be transmitted to them when eating a smaller animal containing the larvae in cysts. When this happens the signs will be similar to that of other tapeworm species.

A major risk to the health of our dogs is when they serve as intermediate hosts to the tapeworm Echinococcus Multilocularis. In other species of tapeworm this has never been observed. However, if a dog swallows eggs of Echinococcus Multilocularis, usually from coming into contact with infected feces of wild canine species such as foxes and coyotes they can serve as intermediate hosts. Once they have swallowed the eggs, these will hatch and the larvae will begin to migrate through the body, just as they would in a rabbit or rodent.

This can lead to large cysts, particularly in the liver. On ultrasound or to the naked eye (such as during surgery) these cysts can be mistaken for large liver tumours. If the cysts are discovered

prior to them irreparably damaging the liver, a surgery to remove the cysts may clear the infection and the patient cured. However, some patients may require daily dewormer for the rest of their lives. If the cysts are not discovered early enough, these will lead to liver failure and death. Only frequent examinations, blood testing and ultrasounds can succeed at detecting these liver cysts in a timely manner to avoid severe disease.

This migration of Echinococcus multilocularis into the liver can also happen to humans if they ingest the eggs. So far only a single human case has been reported in Ontario.

In dogs, a total of 6 cases have occurred, all of them living in southern Ontario. It is estimated that a dog or human would need to swallow a large number of eggs to be at risk.

Although Echinococcus multilocularis is not yet a concern in Ottawa and eastern Ontario, your Mer Bleue veterinarian will continue to monitor and advise you if the situation changes.

Conclusion

Intestinal parasites live all around us and, due to their small size, they often remain undetected.

In most healthy adult dogs and cats, these parasites will rarely cause more than diarrhea, but in the young, ill, or immunocompromised they can become debilitating.

Your Mer Bleue veterinarian advises routine deworming for all patients, but if your furry friend falls into one of the above-mentioned categories, then routine deworming becomes even more important.

As you have also learned, many of the parasites infecting our animal companions can also be passed on to humans. Often, in humans, the effects can be more severe than in cats and dogs. If you have humans in your family who are young, ill, immunocompromised, or pregnant, keeping your furry friend on a routine dewormer is an essential tool to protect every member of the family.

Hygiene is another important tool in preventing human contact with parasites. It is essential to remove and dispose of all feces promptly. Handwashing is essential after you have cleaned up feces, whether it be after a walk, after cleaning the backyard or after emptying the litter box. Even if your hands did not directly touch the feces, handwashing is vital.

If there are toddlers or children in the home, it is important to keep them away from your furry friend's feces. This includes placing the litter box where they cannot reach it and keeping your backyard's sandbox covered when not in use (other neighbourhood cats or wildlife may see the sandbox as a litter box).

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Your Mer Bleue veterinarian strongly advises testing your furry friend's stools at least once per year at the time of their annual early-detection testing. This becomes even more important if you do not keep your friend on a routine dewormer.

The best way to test the stools for the presence of intestinal parasites is to collect three samples over several days. As your animal companion may not pass eggs or parasites every time they have a bowel movement, collecting three samples increases our chances of finding signs of a parasite. The stool samples can all be stored in the same container since they will be mixed together during laboratory testing.

To ensure the feces remains fresh, it must be stored in the refrigerator (not the freezer). Otherwise, it will dry out and harden. This will destroy the parasites and eggs in the feces.

Monitoring and prevention are key tools in ensuring the health of not only your animal companion, but also the rest of your family. If you have any other questions or concerns please contact your Mer Bleue Veterinary Hospital (613-837-6484, contact@merbleuevet.ca).