



Zoonoses – Shared Disease Agents of People and Pets

Pet Diseases Transmissible to Humans

People can share certain diseases with their pets. Have you heard of ringworm, toxoplasmosis or roundworms? All of these are “zoonoses”, a term describing agents of disease that can be transferred between animals and humans.

Rabies

Rabies is the best-known virus zoonosis in Canada, and the most deadly. Rabies infects warm-blooded mammals via bite wounds, saliva contamination of wounds or entrance into damaged skin. Common wildlife species of concern are skunks, raccoons and bats. Roaming unvaccinated feral (roaming wild) cats and dogs are a concern in remote areas of Canada. Vaccination is very effective against rabies and is mandatory for pets in many areas.

Keep your pet on a leash when outdoors to help to prevent contact with roaming potentially rabid animals. An animal with rabies may have the traditional "furious" aggressive form, but the disease may present as an overly friendly animal, a dazed animal (the so-called "dumb" rabies) or even a pet with an apparently injured tongue.



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Bacterial enteritis: Salmonella, E. Coli and Campylobacter

These disease-causing bacteria can cause serious human and animal disease when shed in feces. Pets and livestock may shed some of these agents in their stool or diarrhea during clinical disease, or in some cases, unaffected carriers may shed these organisms in normal-appearing stools. The bacteria may contaminate the environment, and transfer may be indirect via contaminated food, water or soil, or direct when accidental oral intake of contaminated feces occurs. These bacteria can cause serious illness, or death in some cases.

- **Salmonellosis** is a significant foodborne illness (food poisoning). Contact with diarrhea from pets or general contact with pet reptiles or amphibians may also provide a source of infection in people. Bacteria survive long periods in the environment and may be found in water sources.
- **Campylobacteriosis** is the most common significant zoonosis; it is a very common cause of foodborne illness. Backyard poultry and contaminated poultry products are the common sources. Puppies and kittens may shed significant numbers of bacteria in their diarrhea leading to human exposure, though this is less common. The bacteria can cause a severe diarrhea in people with fever and abdominal pain.

Colibacillosis

Colibacillosis is another illness that can be foodborne (unpasteurized dairy or undercooked meat), or contracted via contamination of the environment (water source contamination, livestock feces). The disease is caused by harmful strains of *Escherichia coli* (*E. coli*).



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Ringworm

Ringworm is a skin disease that frequently plagues cats. Although called ringworm, this condition is not a worm, but actually is caused by a fungus that can spread to people. Humans with ringworm have red, scaly areas on their skin that are sometimes itchy and sores that may have a traditional "bull's-eye" appearance. Though not a serious problem in cats (many show no signs), ringworm needs to be treated. Clearing ringworm from catteries or households can be very difficult since cats can be asymptomatic (no signs), or "carriers". The fungus spore can get into heating ducts, carpeting and furniture of the home and the spore form is quite resistant (lasts years). Many cats only display scurfy or scaly dandruff, with small patches of hair thinning or loss, if they show any signs at all.

Toxoplasmosis

Toxoplasmosis is a disease caused by the minute parasite *Toxoplasma gondii*. Exposure can occur via food/water or general environment contamination with excrement containing the parasite precursors. Exposure occurs when the contaminated material is accidentally ingested by mouth.

"Toxo" is a concern for pregnant women because it can cause serious birth defects or spontaneous abortion. Most people get infected with toxoplasma by handling raw meat. Gardening in soil or playing in sandboxes contaminated with cat feces, or eating undercooked meat are other important sources.

Contact with the stool of infected cats is not a common source of infection but, as a precaution, pregnant women should not clean litter boxes during pregnancy, if possible. Use of gloves when gardening, preparing raw meat, or cleaning litter boxes is an important precaution that can help reduce the opportunity for exposure. Cats normally shed the organisms for a short period (a few weeks) following the initial infection and rarely shed again during the rest of their lives. Cat exposure to the toxoplasma organisms most commonly occurs in young, actively hunting, outdoor cats. Toxoplasma in fresh feces cannot infect people. They must live in the environment for days to be a risk, so regular litterbox cleaning and prompt cleaning of any fecal accidents is important.



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Roundworms

Roundworms (*Toxascaris*, *Toxacara*) are very common parasites in puppies and kittens that look like spaghetti on visual examination. Most puppies and kittens have them so all young pets should receive repeated dewormer treatments as per your veterinarian's recommendation. People who inadvertently consume roundworm eggs can become infected. Once the eggs reach the person's intestine, they hatch and develop. The larvae (immature worms) produced by these eggs burrow into, and sometimes through the intestinal wall and migrate through the body. The migrating larvae cause disease if they migrate through the abdomen (termed visceral larval migrans). Blindness may result if the immature worms reach the eyes (termed ocular larval migrans). Children are more susceptible to worms than adults because children play on back lawns and in sand boxes where contaminated "poop" is likely to be found, and may eat dirt or not practice hand washing hygiene fastidiously. Use gloves when gardening and encourage both children and adults to practise regular handwashing.

Hookworms

Hookworms (*Ancylostoma*, *Uncinaria*), another class of intestinal worms, can cause skin damage (termed cutaneous larval migrans). This occurs when the larva (immature) stage of the parasites track under people's skin. Commonly, transmission occurs when children play barefoot in moist, contaminated soils such as sandboxes and playgrounds. Severe infestations can lead to blood loss anemia. Digestive system hookworm disease is possible, but extremely rare.

Tapeworms

- Common **tapeworms** (*Dipylidium*, *Taenia*) are not considered significant zoonoses, because the risk is low for transmission to people. One would have to eat a flea carrying the tapeworm egg to get *Dipylidium* (flea) tapeworm, for example. The *Taenia* (hunting) tapeworm species is usually picked up by cats during hunting. Control fleas on your pets, poop and scoop and dispose of feces, and prevent cat hunting behaviour to reduce risk of infestation.



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- ***Echinococcus granulosus canadensis (EG)*** is an uncommon **tapeworm** of the Northern Canada regions that is dangerous to people, and is transferred via a wildlife cycle that has two parts. Deer, sheep, moose, and dogs are affected, and the parasite makes cysts in internal tissues such as liver or lungs. Reduce the risk for people by not allowing dogs to eat dead game or sheep viscera. People should not contact these tissues and use careful hygiene when dressing a carcass.
- ***Echinococcus multilocularis***, another small uncommon tapeworm species, causes digestive system infestation in foxes, dogs, and coyotes. Rodents and people become infested if they pick up eggs from feces and the eggs are ingested. It causes hydatid cyst disease, with cysts in the heart, lungs, liver, and brain in people and rodents.
- **General preventive measures** for *Echinococcus* type tapeworms include:
 - Routine deworming: If a dog is allowed to run free in the countryside, talk to your veterinarian, as they may recommend routine deworming for tapeworms a few times a year to protect the dog.
 - Proper hygiene: Wearing gloves or washing hands carefully after handling “poop” or game is essential as people may inadvertently eat the parasite eggs if there are contaminated dog feces or tissue cysts. Eggs of *E. multilocularis* may be on dogs’ fur and accidentally ingested after petting if hands are not washed. Contaminated food, water and soil are other sources of contamination.

Raccoon roundworm

Raccoon roundworm, *Baylisascaris procyonis*, is a digestive system parasite of raccoons. Eggs are shed in the feces. This parasite produces *neural larval migrans* in people when immature worms get into the nervous system, and also can produce disease of eyes and heart if they migrate into those tissues. Avoid contact with raccoon “latrines” (areas where raccoons defecate), keep pets from roaming, discourage raccoons from living around houses, and wash hands after being in areas where raccoons may have defecated. These are all important preventive measures.



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Bartonellosis

Bartonellosis is caused by a bacterium called *Bartonella*. This agent causing “cat scratch disease” has only been identified fairly recently. In humans, it causes lymph node changes, ulcers at the site of entry, and can affect the heart. As the name implies, the most common route of transfer is by a scratch, but other contact with cats, or bite wounds by carrier cats or dogs are also considered effective paths of transmission, as are bites from infected fleas. Strays, outdoor, and shelter cats are more likely to have this infection because they are more likely to harbour fleas. Cats may not show any signs of illness. The Centers for Disease Control and Prevention estimates up to 40 per cent of apparently healthy cats carry this bacterium and, in cats, the most common sign of illness is a fever lasting a few days.

Giardia

Giardia, a single-celled parasite, is rarely transferred between people and pets. The condition in people is called “beaver fever”, reflecting more common sources of infection in pond, river and lake waters (the parasite is shed by beavers and other wildlife). Swallowing water while swimming, contacting surfaces that have feces from infected pets or wildlife, petting fur of diarrheic dogs, and not washing hands before contacting the mouth may allow disease transmission. In pets and people, bloating, weight loss, tiredness, and diarrhea may result. Sometimes animals and people will carry the parasite without showing signs.

Leptospirosis

Leptospirosis is caused by a bacteria (*Leptospira*) that is shed in urine and contaminates rivers, ponds and streams. Direct contact with the urine of an ill animal or contaminated food may also serve as a source of infection for people. Bacteria can also enter mucus membranes (eyes, nose, inside mouth) or damaged skin surfaces. Leptospirosis can affect liver, kidneys, brain, respiratory and reproductive system, and sometimes the disease is fatal. It often starts with flu-like symptoms in people. Dogs are the most commonly affected pet species; cats can be infected but rarely develop signs of disease. Prevention includes avoiding contact with urine of infected pets or contaminated food or water, and good hygiene. A dog vaccine is available.



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Chlamydophila psittaci

Chlamydophila psittaci is a bacterium producing “parrot fever”. Pet psittacine birds are the most common source of infection. The disease in people may include respiratory, nervous and digestive system signs, and can rarely be fatal. Pigeons also carry this infection.

Bordetella bronchiseptica

Bordetella bronchiseptica is a bacterium causing a kennel cough in dogs (kennel cough can be due to more than just one infectious agent; parainfluenza virus is another). The infection produces respiratory signs in cats and people. It is transferred via cough droplets. There is a vaccine for dogs; a cat vaccine is available, but not commonly used.

Bites and Scratches

- Rabies and bartonellosis as described above, (and many other bacteria) can be transferred via bites and scratches or enter via broken skin. Some organisms can enter mucus membranes too. Serious infections may result from either route of germ entry. For example, *Capnocytophaga* (formerly dysgonic fermenter) is a bacteria that can produce very serious complications of bite wounds, scratches or licks, though it is very uncommon.
- There are many other zoonoses, but those listed above are the most commonly seen in Canada.
- In other parts of the world other zoonoses such as plague, and viral agents such as zika, Nipah, Ebola and many others are emerging concerns.
- Routine veterinary care and hygiene will help prevent many of these diseases. Have your pet checked by your veterinarian if s/he is ill. See your physician if you have contact with an animal that is sick and then you become sick.

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Reviewers:

Dr. Kathleen Cavanagh, Online Editor, CVMA

Dr. J Scott Weese, Canada Research Chair in Zoonotic Diseases



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