



Pet Cats & Human Health

As of the year 2000, it was estimated that there were approximately 4.5 million domestic cats in Canadian homes. Many cat owners live in very close contact with their feline companions. It is common for house cats to have access to areas like the kitchen counter where food is prepared, and many cats sleep in the same bed as their owners. Given the high frequency of very close contact between cats and people, cats have the potential to play a significant role in disease transmission and public health. It is important to be aware of the various zoonotic diseases which cats can carry, as well as the simple precautions and management techniques that can be used to help reduce their spread.



Cat Ownership Counseling

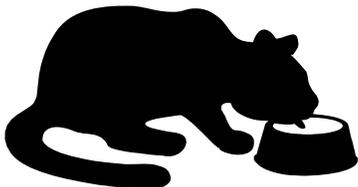
It is important to counsel prospective cat owners about the time and financial commitments involved in cat ownership, and also about what age and breed of cat would be best for them, and from where to obtain their new pet. Cats can be obtained from a wide variety of sources, including breeders, pet stores, animal shelters, cat rescue groups, farms, or any cat owner whose cat has had an unplanned litter of kittens. Kittens and young cats, particularly if they are housed in groups or do not receive regular veterinary care, are more likely to carry certain pathogens such as intestinal parasites and *Toxoplasma*. Farm cats and other cats that are not accustomed to being handled extensively may be less suited to being a family pet as they may be more likely to bite or scratch. Fleas are vectors for some diseases which can infect both cats and humans. In order to decrease the risk of a cat acquiring an infection and/or transmitting infection to a person, it is recommended that the cat should be:

- ▶ **Well socialized and accustomed to handling:** this will make the cat less likely to bite or scratch a person.
- ▶ **Examined regularly by a veterinarian:** in order to assess the overall health of the cat, check for external and internal parasites, and clip the cat's claws. Declawing the cat is NOT necessary.
- ▶ **Spayed/neutered:** this will help to decrease fighting with other cats and the tendency to roam, as well as the tendency for male cats to urine mark, and it eliminates the possibility of pregnancy in female cats.
- ▶ **Kept indoors:** to decrease the chances of the cat acquiring bacterial or parasitic infections, bringing small prey back into the house, or becoming sick or injured due to contact with other cats or wildlife.

If a new cat will be in contact with someone who may be more susceptible to infectious disease (e.g. young children; immunocompromised individuals), it is also recommended that the cat should be:

- ▶ **At least one year old:** this decreases the likelihood of patent parasitic infections, and makes it easier to judge the cat's overall temperament to ensure it is relatively friendly and docile.
- ▶ **Examined thoroughly by a veterinarian PRIOR to being taken home:** The cat can be kept in isolation at a clinic or at another house for a short time if treatment for a particular condition is necessary.
- ▶ **Already litter trained:** to ensure that stool and urine (and the pathogens in them) are not spread in the house.
- ▶ **Not acquired from a shelter:** because such cats usually have an unknown medical history and may be in contact with other sick animals at the shelter facility, even if they do not appear sick themselves.

Management



Feeding

Cats should NOT be fed raw meat or eggs. Uncooked meat is often contaminated with pathogens such as *Escherichia coli*, *Salmonella* sp. or sometimes *Toxoplasma*, which can infect the person preparing the food for the cat. There is also potential for these pathogens to infect the cat, which may result in clinical disease or subclinical infection. Either way, the cat then becomes a vector for spread the pathogens in the household.

Litter Box Cleaning

- ▶ The frequency with which a litter box must be cleaned depends in part on how often the cat uses it. In general, feces and litter clumps (if clumping litter is used) should be scooped out once a day to once a week.
- ▶ Litter boxes in a clinic should be completely emptied, cleaned with scalding water, disinfected and dried between patients. It is important that all visible dust and debris is cleaned out of the box prior to applying a disinfectant such as household bleach. The disinfectant should be left in contact for at least 10 minutes, then the box should be thoroughly rinsed with water, dried, and refilled with clean litter. Never clean a litter box in the kitchen sink.



It is important to thoroughly wash one's hands with soap and running water after scooping out or cleaning a cat's litter box, in order to reduce the risk of disease transmission. The risk of becoming sick from a fecally-transmitted pathogen from a cat is minimal in most people, but it is higher for young children, immunocompromised individuals (e.g. HIV/AIDS, transplant and cancer patients) and pregnant women. If possible, these higher-risk individuals should not handle used cat litter, and should avoid contact with cat feces in general.



Bite and Scratch Avoidance

- ▶ To decrease the risk of being bitten or scratched, individuals should anticipate a cat's behaviour in situations where it might become scared or feel uncomfortable.
- ▶ Do not allow high-risk individuals (e.g. children, immunocompromised individuals) to hold a cat during any procedure with which the cat is unfamiliar.
- ▶ The use of a cat muzzle, if necessary, often allows the handler to restrain the cat more securely, which is ultimately safer for the animal and personnel involved.
- ▶ Injectable sedation in fractious cats is often very difficult to administer, in which case the use of an anesthetic chamber may be necessary in order to induce general anesthesia prior to performing the necessary procedure.
- ▶ Beware of cats that may have petting-induced aggression.

Vaccines

The American Association of Feline Practitioners Vaccine Advisory Panel recommends all cats to be vaccinated against rabies virus, feline panleukopenia virus (FPV), feline herpesvirus 1 (FHV-1, also known as feline viral rhinotracheitis (FVR)) and feline calicivirus (FCV). Vaccines for feline leukemia virus (FeLV), feline immunodeficiency virus (FIV), *Chlamydomphila felis* and *Bordatella bronchiseptica* are considered non-core, and should be reserved for cats at specific risk for infection with these pathogens. Vaccination for giardiasis and feline infectious peritonitis/feline coronavirus (FIP/FCoV) are generally not recommended due to lack of sufficient evidence that the vaccines induce effective immunity or because the adverse effects of vaccination are disproportionate to the benefits.

Of the diseases against which the core and non-core vaccines are targeted, only rabies and *B. bronchiseptica* are potentially transmissible to humans. Although *B. bronchiseptica* is a recognized cause of disease in humans, evidence of direct transmission from animals to people is largely circumstantial, and the risk is likely very small. The evidence of transmission of *C. felis* from cats to people is very poor, and it is not considered a significant zoonotic risk. Appropriate vaccination helps to keep cats healthy overall, and decreases the likelihood that an animal will become ill with a disease that is transmissible to humans. Care must also be taken to avoid exposure of higher-risk individuals to intranasal veterinary vaccines, such as that for *B. bronchiseptica*, ideally by administering them in a different room.



Parasite Control

In general, a fecal floatation using the zinc sulfate concentration technique (ZSCT) should be performed yearly for cats to look for evidence of nematode eggs. In Canada, the intestinal parasite of most concern in cats in terms of its zoonotic potential is the roundworm, *Toxocara cati*, the larvae of which can cause visceral, ocular or neurological larval migrans, particularly in children. The larvae of feline hookworms (i.e. *Anchylostoma braziliense* and *Uncinaria stenocephala*) have the potential to cause cutaneous larval migrans. These conditions are very uncommon in Canada. The tapeworm, *Dipylidium caninum*, which is transmitted by fleas, can infect dogs, cats and humans who ingest an infected flea, but human infection is very rare.

Recognizing Illness in Cats

When trying to identify the source of illness in a cat or of an infectious disease, particularly in a cat with which you are unfamiliar, in addition to standard history questions, one should address the following topics with the cat owner:

- What measures are being taken for tick and flea control for the cat
- Whether the cat visits a veterinarian regularly and has up-to-date vaccines
- Whether the cat is indoor or outdoor and whether it has contact with stray cats or wild animals
- If there are rodents in or around the residence

However, it is also important to remember that many of the potentially zoonotic diseases of cats can be carried by these animals in a subclinical form, or as part of their commensal bacterial flora, with no obvious signs of illness.



Zoonotic Diseases of Cats

The following is not an exhaustive list of zoonotic pathogens carried by cats, but includes those of primary concern. It is important to be aware of the zoonotic potential of these conditions and the associated human and public health concerns. Please refer to individual disease information sheets for additional details.

Campylobacteriosis:*

- ▶ An infection caused by *Campylobacter jejuni*, a bacterial species that is sometimes carried in the intestinal tract of pets such as cats, dogs and birds. In animals and people, *C. jejuni* causes diarrhea, which often contains blood, and sometimes vomiting as well. The bacteria are transmitted by the fecal-oral route.

Cat scratch disease (bartonellosis, benign lymphoreticulosis, bacillary angiomatosis):

- ▶ An infection caused by the proteobacterial organism, *Bartonella henselae*, which is carried in a subclinical form by up to 40% of cats. It is believed to be transmitted to humans by contamination of bite or scratch wounds with blood or flea excrement from an infected cat. It most often causes a regional lymphadenopathy which may lead to lymph node abscessation in some cases. However the infection can have much more serious consequences, and can be fatal in immunocompromised individuals.

Cat bite wound infections:

- ▶ It is estimated that 20-50% of cat bite wounds become clinically infected. Infection typically involves *Pasteurella multocida*, *Streptococcus* spp., and *Staphylococcus* spp., and most infections are polymicrobial, including anaerobic bacteria. Cat bites can create deep puncture wounds which may also result in infection of underlying tissues such as bones and joints.

Cryptosporidiosis:*

- ▶ An infection caused by the protozoal organisms, *Cryptosporidium parvum*, *C. felis*, or *C. hominis*. Only the first two species are found in cats, in which infection is typically subclinical. In people, infection causes diarrhea, and is an increasingly common cause of death in AIDS patients. The infection is transmitted by the fecal-oral route, but infective oocysts can also survive for a long time in the environment.

Dermatophytosis (ringworm, dermatomycosis):

- ▶ A fungal skin infection caused by one of several species of *Microsporum* or *Trichophyton*. It is most commonly subclinical in cats, but can mimic almost any feline skin disease. In humans it can cause well-delineated areas of red, raised, itchy skin with central pallor, which therefore appear as a "ring." The fungus is transmitted by contact with the skin, fur or dander of an infected cat, particularly if the person's skin is damaged or moist.

Giardiasis:*

- ▶ An infection caused by the protozoal parasite, *Giardia intestinalis*. Infection is most often subclinical, but when they occur signs of infection are related to diarrhea without vomiting. Only some strains carried by pets are potentially transmitted to humans. People are more likely to acquire giardiasis from drinking or swimming in inadequately treated water.

Larval migrans caused by hookworm and roundworm larvae:

- ▶ This condition can be caused by various members of *Ancylostoma* spp., *Uncinaria* spp. and *Toxocara* spp., some of which infect cats. Eggs of the parasites are passed in the feces of infected animals, and release larvae which can penetrate a person's skin or be accidentally ingested. The larvae then migrate under the skin (cutaneous), through various internal organs (visceral) and occasionally the eye or brain (ocular or neurological), causing irritation and inflammation (larval migrans). The ocular form can result in blindness. Infection is most likely to occur in young animals and children.

Rabies:*

- ▶ A viral infection of the nervous system which is almost always fatal once clinical signs appear. Cats are usually infected by direct contact with a rabid animal, most often a skunk, fox, raccoon or bat. Transmission occurs when the saliva of an infected animal comes in contact with a wound (such as a bite or scratch) or mucous membrane.

Salmonellosis:*

- ▶ An infection caused by many serovars of *Salmonella enterica* subsp. *enterica*. It typically causes diarrhea, but in some cases it can cause much more serious disease. The bacteria are passed in the feces of an infected animal, which may or may not also show signs of diarrhea. Transmission is by the fecal-oral route.

Toxoplasmosis:

- ▶ An infection caused by the protozoal parasite *Toxoplasma gondii*. Exposure to *T. gondii* is common in people and in cats, but clinical disease is uncommon in immunocompetent individuals. Infection in pregnant women, however, can cause abortion, premature delivery or still birth. Cats are the definitive host of the parasite, and therefore may shed oocysts in their feces. In humans, *exposure to the parasite is more commonly through oocysts found in soil or undercooked meat that are then ingested*. Transmission from cats is actually comparatively uncommon.

* Notifiable disease in people in Canada.



Infection Control



Bite and Scratch Care: Bites and scratches from cats usually become infected with the same organisms and therefore should be treated and managed similarly. Any wound from a cat, in a human or an animal, should be washed immediately and thoroughly with soap and water. All bite wounds should be reported to the local public health unit. Medical attention should be sought, and antimicrobials considered, for any bite wound associated with:

- ▶ the hand or any joint or bone.
- ▶ an immunocompromised individual.
- ▶ any kind of crushing injury.
- ▶ excess redness, pain, swelling, discharge or fever.

Any cat that bites a person, especially if its rabies vaccination status is out of date or unknown (e.g. a stray), must be isolated for ten days and observed for signs of rabies. If signs of the disease develop the cat will be euthanized and tested for rabies.

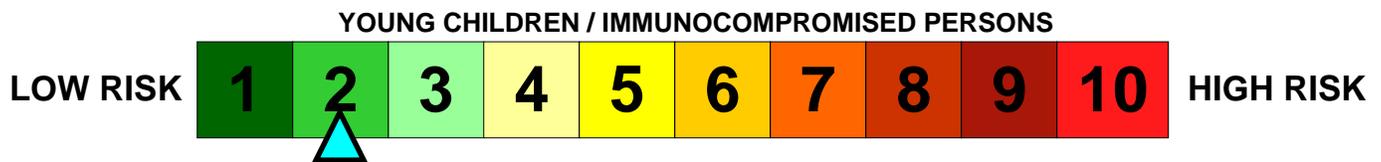
Hand Hygiene: Hands should be washed with soap and water after handling any pet, including cats. This is especially important after cleaning a litter box or coming in contact with urine, feces or bodily discharge from a cat. This simple precaution can reduce the transmission and spread of several of the zoonotic pathogens which are carried by cats .

Zoonotic Disease Risk

The zoonotic risk to the general population posed by most domestic cats is:



Groups at higher risk of acquiring a zoonotic disease from a cat include immunocompromised individuals (e.g. HIV/AIDS, transplant and cancer patients), infants and young children less than five years of age, and the elderly. There are also precautions that should be taken by pregnant women around cats in order to protect the fetus. For these groups, the zoonotic risk posed by most domestic cats is likely:



Precautions for Immunocompromised Cat Owners & Young Children

- Keep the animal's claws well trimmed. Plastic nail caps can also be applied to help prevent scratching. Declawing a cat is unnecessarily invasive.
- Have someone else clean the cat's litter box. Otherwise wear thick rubber gloves and be very diligent about hand washing afterwards. The litter box should also be kept away from food preparation and sleeping areas.
- Keep the cat in good health by having regular examinations by a veterinarian, as well as up-to-date vaccinations and regular fecal exams to check for parasites. Ensure that the cat is free of fleas. Keep the cat indoors.
- Feed a high-quality commercial cat food that does not contain any raw ingredients.
- Do not let the cat lick the person in question, particularly on the face, nor should they handle the cat if it seems ill.
- Always supervise young children when they play with a pet. Teach them to be gentle and quiet so the animal is not frightened. Also teach them never to approach an animal they do not know.
- Hand washing with soap and water after handling a cat or contacting any urine, feces or other bodily secretions is one of the simplest and most important means of infectious disease control.

Pregnant Women

The risk of exposure to *Toxoplasma* from a mature house cat is very small. Nonetheless, pregnant women should avoid contact with cat feces that are more than 24 hours old. Preferably someone else should clean the cat's litter box. Otherwise she should wear thick rubber gloves and ensure that she washes her hands thoroughly afterwards, particularly before handling food of any kind.

Additional Information:

Hemsworth S, Pizer B. Pet ownership in immunocompromised children – a review of the literature and survey of existing guidelines. Eur J Oncol Nurs 2006;10:117-127.