# OCCUPATIONAL HEALTH CONSIDERATIONS for WORKING with ANIMALS

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## General Information

This portion of *Introduction to the Canine Patient* will involve reviewing information on allergies, and specific zoonotic diseases associated with working with animals. This general information section will contain information on personal hygiene, the use of sharps, and physical injuries.

## Personal Hygiene

Good personal hygiene practices can greatly reduce the risk of occupational illness. Handwashing is probably the most effective and easiest personal hygiene method of reducing disease transmission. The handling of animals, their wastes, body fluids (including blood), tissue or any equipment or material that may have been in contact with animals should be followed by handwashing. Hands should be washed before leaving an animal facility or owner's home and before eating, drinking, smoking or applying makeup.

Dedicated clothing should be worn when working with animals. This may include scrubs or simply a lab coat over street clothes. Dedicated clothing should be laundered separately and regularly. Clothing that has been contaminated with animal waste should be removed and cleaned immediately.

## Sharps Handling and Disposal

The uses of sharps, such as acupuncture needles, present a risk if handled or disposed of improperly. It is always safest to presume that these needles are a potential hazard. The same biohazard precautions that you would have received instruction in through your acupuncture training should be adhered to with your animal clientele as well.

## Bites, Scratches and Other Injuries

There is a risk of bites, scratches or other injuries when working with any animal species. Proper animal handling techniques are helpful in reducing this risk, but injury is always possible. Wash with soap and water immediately after a bite, scratch or other injury that breaks the skin. Severe injuries should receive medical attention.

Animal bites may be contaminated by bacteria. The mouths of dogs and cats (and other animals) can harbour the bacteria pasturella multocida. Animal bites can also transmit other bacteria such as staph or strep and can also transmit viruses such as rabies, or B virus (from monkeys). Tetanus bacteria is also transmittable through bites, and it is important for the rehab practitioner to be up to date with their tetanus vaccination.

**Allergens**

People can develop allergies to dogs, cats, rabbits, guinea pigs or farm animals. The hair, dander, saliva and urine of animals can contain proteins that trigger allergic reactions, and direct contact with the animal or inhalation of allergens can trigger allergic reactions. (Rodent urine is particularly allergenic.) Reactions can be mild, such as itchy eyes, sneezing or hives. Such reactions can occur immediately or up to 8 hours after exposure. Occassionally symptoms can progress to asthma and rarely, anaphylaxis reactions (shock).

Prevention of allergic reactions can include the following:

- Use of dedicated clothing and/or lab coat when working with animals.
- Separation of animal-dedicated clothing in storage and laundering
- Wash hands well after touching animals and before touching your face or eyes
- Consult with a physician if allergic symptoms develop

**B Virus**

B Virus ( Herpes B virus, Monkey B virus, Cercopithecine Herpesvirus 1) is a virus that infects the macaque species of monkeys and can cause a highly fatal encephalitis in humans. Infected monkeys do not often show signs of infection, therefore, it is prudent to assume that all macaque monkeys are infected with B virus and use proper precautions at all times. Exposure to this virus could include a bite or scratch from a monkey, a scratch from a monkey cage, contamination of a wound with body fluids from a monkey, a needles stick from a needle that was in a monkey, splashing of body fluids from a monkey into the eye mouth or any other mucus membrane. If you suspect exposure of this nature, contact your health care provider.

**Cat Scratch Disease**

Cat scratch disease is thought to be caused by a rickettsial agent called Bartonella henselae. Cats, and particularly kittens, with fleas are associated with this disease. It is perhaps the fleas that transmit this disease to the cat.

Cat scratch disease if fairly rare. It displays as papules or pustules near the original injury, and adjacent lymph node enlargement, sometimes accompanied by a fever. Rarely, the neurological system or the eye can be affected. The disease tends to run its course without treatment. Children can be more susceptible to the disease.

Prevention can include treating cats and kittens for fleas, washing any wounds or scratches with soap and water immediately and/or treat with antibiotics should the disease manifest.

**Gastrointestinal Diseases**

Bacteria or parasites can be common in the guts of many animal species. This can cause diarrhea or other gastrointestinal signs (vomiting, cramping, bloating). Exposure to these organisms may occur with the handling or contact with fecal matter.

Campylobacter bacteria is carried in the feces of many animals, most commonly cattle and poultry. Escherichia coli (E. Coli) is another bacteria that can cause diarrhea in people. Salmonella is another animal-carried bacteria , which could lead to dehydration. Turtles and other reptiles are common carriers of Salmonella.

Parasitic organisms can also affect the gastrointestinal system and be passed from animals to humans. Cryptosporidium and Giardia are two such parasites. These can be carried by animals or infected water sources.

Shigella bacteria can be carried by non-human primates, causing diarrhea in the monkey and bloody diarrhea, dehydration and weight loss in humans. The bacteria can be shed in the feces for long periods of time even after an animal recovers from the effects.

Wash your hands, wash your hands, wash your hands!!!

**Influenza**

The influenza virus occurs in humans, swine, wild and domesticated birds, horses and it has been recently demonstrated that cats can also become infected as well. There are many subtypes (which may vary from year to year) to the influenza virus, which can cause disease epidemics in people and animals. Some subtypes may pass from animal to human. The disease is similar in humans and animals and is characterized by rapid onset of fever, muscle pain and coughing.

**Leptospirosis**

Leptospirosis is a bacteria that may be found in the urine of infected animals, such as wild animals, rodents, agricultural animals, and pets (i.e. horses and dogs). Exposure can occur through contaminated water or other parts of the environment or with direct contact with urine or inhalation of aerosolized urine. Leptospirosis can cause a severe febrile disease, which may progress to affecting the kidneys and liver and may also be passed to the fetus and cause infections or still birth. Prevention includes the use of gloves when handling contaminated animal urine or open sores, avoidance of contaminated water and rigorous hand washing.

**Parasitic Diseases in Dogs and Cats (i.e. "worms")**

Intestinal parasites in cats and dogs can occasionally cause disease in humans. Infected animals may or may not show signs of intestinal problems (such as diarrhea or abdominal pain), and the parasites can be shed in the feces. Parasitic transmission to humans can cause a syndrome called "larval migrans", in which a larval stage of parasite migrates into tissues and organs, causing tissue damage, necrosis and inflammation in the human. Visceral larval migrans refers to migration to the internal organs, neural larval migrans, to the nervous system and ocular larval migrans refers to the eye.

Roundworms (Toxacara canis or cati) can migrate to the viscera or eye but rarely to the nervous system. Blindness, liver or lung damage can be seen. The eggs of the roundworm (microscopic in size) are ingested accidentally and develop in the human ingesting before migrating to toher tissue. The path of the parasite is what determines the exact symptoms of the disease. Children are particularly susceptible to the disease.

Hookworms (Ancyostoma cannium) are most often the cause of cutaneous larval migrans. Contaminated soil or sand, can allow exposure to the larval form via the skin, where it penetrates the skin and migrates through the tissues, causing further damage.

Tapeworms can occasionally ingested by people. Tape worm segments can be shed by human or animal in the feces, and may lead to digestive upset. A rarer tapeworm (echinococcis) can cause internal cysts, sometimes in the lungs or liver.

Prevention can include deworming your own animals, and/or promoting this with your animal clientele as well. Wash your hands well after handing feces and keep sandboxes covered.

**Plague**

The bacterium Yersinia pestis is responsible for the plague. It is associated with wild rodents and sometimes rabbits. It is transmitted by fleas and via this pathways, domestic cats may come into contact with the bacteria, which can in turn cause humans to be exposed as well.

"Bubonic plague" can cause enlarged painful lymph nodes, accompanied by chills, fever, aches and possible toxaemia. "Pneumonic plague" can cause a fatal lung infection and is the forms that caused the "Black death" in the Middle Ages as it passed from person to person.

The disease is transmitted to humans through flea bites, bites or scratches from wild rodents, rabbits or occasionally domestic cats.

**Psittacosis**

Otherwise known as ornithosis or zoonotic chlamydiosis, psittacosis is a bacterium that is passed from birds to people. Susceptible birds include parrots, parakeets or macaws, as well as turkeys. Infection can be asymptomatic or may produce mild respiratory illness (fever, chills and cough), but rarely serious symptoms (i.e. pneumonia) can occur. It is spread by inhalation of the aerosolized dried feces.

Prevention includes the avoidance of handling pet birds if one is immunocompromised, and the use of care if working with turkeys.

**Q-Fever**

Q-Fever is caused by Coxiella burnetii, a rickettsial organism. It causes a feverish flu-like symptoms in people, which may persist for weeks or months. Rarely it can cause a chronic disease affecting the liver or heart or even cause death. The organism is shed in the placenta of sheep or cats. It can be air borne and hence transmitted through inhalation, as well as by contact of placental fluids.

**Rabies**

Rabies is a viral disease that can affect the nervous system and often causes rapid death. Exposure often occurs through a bite from an infected animal, however the disease can also be transmitted is an open sore comes in contact with saliva. In some instances exposure by inhalation is also possible. Skunks, bats and racoons are known carriers of rabies, and can infect dogs, cats, horses, cattle and other ruminants, which can in turn serve as a source of infection for humans.

Prevention is best served by vaccinated for rabies and receiving boosters as needed. It is recommended that titres be checked every two years. If exposure is suspected, retain control of the animal if possible and seek immediate medical attention.

**Ringworm**

Ringworm is actually a fungus (not a worm) by the name of dermatophytosis. The fungus can be transmitted from animal to human by contact with the hair or skin cells of an infected animal. It causes a superficial lesion on the skin that can look red, flakey or crusty and cause hair breakage or loss of hair in the affected area. The spores can remain dormant in the environment for long periods of time. While most animals will display the same skin lesions as described above, cats may carry the fungus and not show any obvious signs.

Prevention includes treatment of the lesions on the animals, and avoiding contact with the lesions (using gloves and/or washing hands after contact).

Salmonella

Salmonellosis is a severe disease caused by the salmonella bacteria, which can manifest with fever, severe diarrhea, dehydration and even systemic infection. Reptiles are common carriers of salmonella. It is carried in the feces of many animals, including cats, dogs, wild animals and birds. Animals infected with salmonella may have diarrhea or may not show any signs at all. Animals may be carriers of salmonella for a long period of time, and meat including beef, pork, milk and milk products and especially chicken and eggs can be contaminated with salmonella.

Prevention includes washing hands well after being in contact with animals, animal products or animal wastes, and use caution with turtles and reptiles, especially around children (as they are highly susceptible). As well, one should cook all meat thoroughly and refrigerate leftovers immediately, use pasteurized milk and pasteurized or irradiated eggs.

**Toxoplasmosis**

Toxoplasma gondii is a protozoan parasite that is found in the feces of infected cats. Contact with the contaminated feces or through contact with soil, water or food contaminated with cat feces can cause an exposure in humans and other mammals. Contamination occurs most commonly by ingesting under cooked meat from an infected food animal or by gardening.

Exposure to Toxoplasma may result in no clinical disease in people, or they may have a mild form of the disease. A cystic form of the parasite can persist in muscle or brain tissue for life, and if the immune system becomes suppressed, the symptoms can become more severe by reactivation of the parasite.

Infection during pregnancy in humans can cause birth defects or abortion of the fetus. Congenital toxoplasmosis can manifest as nervous system defects or blindness or other eye problems. If the mother has been exposed to toxoplasmosis prior to becoming pregnant and she develops antibodies, she will be protected from active infection during pregnancy. If she does not have antibodies, she needs to be especially careful not to become exposed during pregnancy.

Those women who work with cats can get toxoplasmosis titre testing prior to becoming pregnant. Prevention includes hand washing after handling, cats, kittens or their feces, avoidance of emptying cat litter boxes during pregnancy or wearing gloves and/or washing hands after litter changes. Additionally, fully cook all meat to avoid exposure by ingestion.

**Tuberculosis**

Tuberculosis is caused by mycobacterium tuberculosis and causes lung infections. Symptoms include feeling weak or sick, fever, cough and night sweats. It can be active or latent and spread through the air by coughing or by aerosolization of any body fluids, bedding or other infected materials. Primates are particularly sensitive to tuberculosis infection. Persons working with non-human primates can be TB screened every 6 months.

Prevention includes testing, and the use of respiratory protection when working with monkeys or tissues from monkeys.

**Tularemia**

Franciscella tularensis is the bacteria that causes tularaemia. Wild rabbits and hares are sources of infection, as well as beavers, muskrats and voles. However, sheep, dogs and cats can become infected as well. Direct contact with infected animals can provide exposure, as can the bite of an infected tick. Scratches, or bites by infected animals is the most common mode of infection, but the bacteria can also enter through the eye or through contaminated food or water. Inhalation can also transmit the disease. Manifestation of the disease includes infection at the site of entry (wound, tick bite) and swollen lymph nodes. Lung involvement can occur during inhalation and conjunctivitis with eye exposure.

Prevention consists of glove-use when handling wild mammals, cleaning of bites and scratches and seeking medical attention if necessary, avoidance of contact with ticks by wearing protective clothing or repellents (and removing ticks as soon as found), and thoroughly cooking wild game and avoiding contaminated water.

**Zoonotic diseases in general**

A zoonotic disease is a disease that is passed between animals and humans. They can be spread by touching an animal or animal product (i.e. blood, tissue, urine, feces or other bodily fluid). Disease can also be spread through surfaces that have been contaminated by animals or their products. Contaminated scratches, bits or needle stick injuries are a particular danger. Contact with the carcass of an animal or its bedding can spread disease, and spread through the air or contact with other mucus membranes (i.e. splashing something in the eye) is also possible.

Healthy adults are rarely affected by zoonotic disease. Most can be prevented through common sense personal hygiene (i.e. washing hands well after being in contact with any animal, any animal products, waste, bedding or carcasses). Protective personal equipment

(gloves or masks) may be recommended. Smoking, drinking, eating or applying contacts or make up should not be done in areas where there are animals or products. The used of dedicated clothing or a lab coat are additional common sense measures that will help to prevent the spread of zoonotic disease.

Immunocompromisation may make some people more susceptible to zoonotic disease. HIV, diabetes, kidney or liver disease or heart disease can also weaken the immune system. Those who have undergone radiation or chemotherapy or who have received organ transplants are likely immunocompromised. Additionally, some cortisone type drugs may also weaken the immune system.

Pregnancy can affect the immune system. Susceptibility to some zoonotic diseases may be increased and some zoonotic diseases can affect the fetus, causing birth defects or abortions. The very young and the very old may also be less able to resist zoonotic diseases.

**Additional Parasitic Considerations**

**Fleas**

Fleas are a common problem is most all climates. They cause an incessant itch-scratch cycle due to their bites. Some dogs are sensitive to flea saliva and it can manifest into flea allergy dermatitis. They are seen as a small black fleck crawling quickly or jumping on the animal's skin and hair. They can easily jump from animal to animal or human and live in bedding, clothing or furniture where the dog lies. Undisturbed, a flea can live on a dog for more than 100 days.
If a practitioner should find a flea on an animal, the owner should be alerted and advised to see veterinary medical attention. This may consist of a pill or topical medication. Environmental control (for the owner or the treatment space of the practitioner) should begins with washing of all bedding in hot water. Vacuum carpets thoroughly. If carpet is an issue (in a home setting), then professional steam cleaning can kill larval flees and the organic material they feed on.

**Ticks**

Ticks tend to be a seasonal pest: spring and summer is tick season, but any time the dog is outdoors is in a heavily wooded area, an animal could be at risk. They have brown or black tear-shaped bodies with eight legs. An adult tick is about the size of a sesame seed, but they can become much bigger if engorged with blood. Ticks can transmit Lyme disease and Rocky Mountain spotted fever, and with a large infestation, a dog can suffer severe anemia or tick paralysis.

To remove a tick if found, do not touch the tick with your bare hands, instead use gloves and tweezers to grasp the tick at the head. Pull slowly but firmly to dislodge it without leaving any part behind. One can also use a tissue to pinch the head (and often a small part of skin) to remove the parasite.

**Lice**

Lice are host specific animals. They do not move between cats, dog, or humans but are transmitted from animal to animal within the same species with direct contact. Lice spend their whole life on their host, so attention to the environment is not so important. Their life cycle from egg to hatching is 3 weeks, with a further three to four weeks to enter adulthood. Topical treatment is needed, and as the eggs can be resistant to treatment, three or four reapplications may be necessary.