ZOONOTIC DISEASES – WHAT EVERY PET OWNER SHOULD KNOW

Everyone with pets should be aware that some infectious diseases can be transmitted from animals to people. Approximately 50% of infections that affect humans also affect animals. The World Health Organization (WHO) tracks 156 different diseases that are considered "emerging diseases," ones that are becoming more prevalent or spreading outside of their original range. 73% of these are zoonotic (transmissible to both animals and humans), including Ebola virus, influenza and West Nile virus.

Closer to home, there are many parasites and infectious diseases that we deal with on a regular basis that can affect humans. We especially worry about people who are immunocompromised – in other words, their immune systems are not as strong and they are more susceptible to diseases acquired from pets. This includes people with chronic or infectious diseases, organ transplant, radiation or chemotherapy and persons with HIV/AIDS. It also includes pregnant women, infants and children under age 5, and adults over age 70. **Most pets routinely come into contact with humans in at least one of these categories.**

We want to make sure you know what risks to take into account with your family pets. If you are immunocompromised, or someone in your household is, it is very unlikely that your physician will think to discuss the subject with you. 58% of veterinarians have readily available information about zoonotic diseases in their offices but only 3.5% of human physicians do and 71% of MDs who are treating HIV patients do not ask about exposure to animals. Veterinarians have a lot more training in this area than physicians do, so please ask us about any concerns you might have.

We try to discuss the risk from intestinal parasites with every client, especially owners of puppies and kittens. Young animals shed far more parasites in their stools than adult pets generally do. We also talk about Rabies vaccination with all our dog and cat owners. Many of the other risks, however, are probably things you have never thought about before – and likely your doctor hasn't mentioned them either, even if you or a family member is at risk.

Zoonotic intestinal parasites:

- Roundworms – 1-3 million human cases per year in the U.S., mostly children under age 5
- Hookworms – larvae hatched from infected feces burrow into the skin
- Giardia – 1/3 of puppies and kittens are carriers

1) **Infections diarrhea:** Two of the biggest problem diseases that can be spread from animals to people are **Salmonella** and **Campylobacter.** A normal adult human with a healthy immune system will likely only suffer from mild diarrhea from these infections but they can be fatal for a small child or elderly person. From 2011 to 2013 there were 8 multistate outbreaks of Salmonella in the U.S. **About 1/3 of the reported cases were in children under one year of age.**

   Once infected, pets and people can shed Salmonella bacteria in their feces for months, even if they never became seriously ill. Your dog or cat could have a Salmonella infection without symptoms and could be continuously shedding the bacteria in their stools. Even more frightening is that a child in diapers can shed Salmonella for months as

well, putting any caretaker at risk of getting infected or transmitting the infection to other children.

To avoid Salmonella infection, first prevent yourself from getting it and then protect your pets as well, so they cannot transmit the disease to susceptible humans and other pets. Everyone should wash their hands after contact with animal feces but immunocompromised people should ideally not be the ones to pick up dog poop in the yard or scoop the litter box, nor should they be handling raw milk, eggs or meat. They should wash their hands after handling pet food or touching the pet.

Precautions for Therapy Animals:

Dogs and cats are increasingly seen in nursing homes, hospitals and other facilities, either as visitors or residents. These animals have extensive contact with frail and immune-deficient people. The biggest concern for them is **MRSA,** antibiotic resistant Staph infections that are readily spread in these environments. To prevent pets from spreading disease from patient to patient:

- Therapy pets should never be fed any raw food, especially milk, eggs or meat. Animals who get human food scraps, drink out of toilets, scavenge outside or hunt for smaller animals are more likely to transmit infection.
- Insist on hand washing or sanitizing both before and after each patient or resident encounter. You don't want MRSA getting on the pet from the patient nor do you want it going from the pet to the patient.
- Do not allow pets to lick the face, hands or any area of broken skin.
- Do not let patients kiss the animal or feed it any treats.
- If the pet needs to be placed on the bed or the patient's lap, place the animal on a clean towel or sheet, not directly on the hospital gown or bed sheets.
- Do not visit if the pet has any sort of infection or parasite, and wait a full week after any infection has resolved. This includes any type of vomiting or diarrhea, respiratory disease, skin or ear infection.
- Keep immunizations current, especially Rabies vaccination.
- Have stool samples checked regularly for intestinal parasites and keep pets on a year round parasite prevention program.

Pets living in a household or with contact with immunocompromised people should never be fed any raw food, especially milk, eggs or meat. This includes smoked or freeze dried animal products such as pig ears, cow hooves, pizzle sticks or turkey parts. Animals who get human food scraps, drink out of toilets, scavenge outside or hunt for smaller animals are more likely to transmit infection to their humans.

Chicken manure is a common source of Salmonella, as are reptiles. 74,000 humans are infected with Salmonella acquired from pet reptiles each year.

We do not recommend keeping reptiles as pets at all if there is a pregnant woman or young child in the household. It's very common for an owner to clean reptile tanks or equipment in a sink or bathtub that is later used by children and then for the children to become infected. Salmonella can live for months in the environment so reptiles that can roam in a house outside of a cage or tank can leave it everywhere.

Livestock manure and young animals with diarrhea, such as calves, are very likely to be shedding Salmonella or Campylobacter. We also see Campylobacter as an occasional cause of diarrhea in dogs, and thus an occasional source of infection for pet owners.

2) **Brucellosis** is an infection that can be carried by dogs as well as other species such as cattle, elk and buffalo. The dog version is called Brucella canis. This disease causes abortion, miscarriage and still births in dogs. Brucella bacteria are shed most prolifically in semen, placenta and birth fluids, vaginal discharge and within the infected fetus. Milk, urine, feces, blood, saliva and nasal secretions also can contain the infection. Obviously **this disease is of big concern to dog breeders.** New dogs entering a breeding facility should be quarantined until they have had two negative tests for Brucella. All breeding dogs should also be tested annually.

   Brucellosis infection is a very serious disease in immunocompromised humans. It causes flu-like symptoms such as fever, lethargy, headache, chills and coughing but in severe cases can cause vomiting and diarrhea or sepsis, with infection spreading to many organs including the spleen, bones, joints, lymph nodes and heart.

3) **Roundworms** are also a very big concern to breeders, especially for **children living in a household that breeds dogs.** Puppies shed about 3 million roundworm eggs per bowel movement (yes, you read that right!) No matter how carefully you clean up stools, millions of eggs end up on the grass and soil and they remain infective for years. Toddlers who acquire roundworms usually just have several days of flu-like illness with vomiting and diarrhea but occasionally roundworm larvae end up in the brain or eyes, where they can cause neurologic disease or blindness.

4) In households with cats, we worry about **Bartonella** infection – cat scratch fever. The bacteria that cause it are shed in saliva. Since cats lick their feet and groom themselves humans are usually infected from a bite or scratch. Human cases of Bartonella are estimated to be 23,000 per year with about 2000 of them requiring hospitalization. In most cases, the infective cat is less than a year old and was a stray or shelter cat.

   Pustules usually appear at the site of the bite or scratch 1-2 weeks later and usually spread quickly to the lymph nodes, which may swell and burst open. Blood vessel lesions can appear almost anywhere in the body, especially the skin, spleen, liver, heart, bone and gastrointestinal tract. **The disease is especially a problem for people who have had heart valve replacements or vascular grafts.**

   To prevent Bartonella, avoid rough play with cats and especially kittens. Wash cat bites and scratches promptly. Do not allow cats to lick any wounds or open areas of skin on a human. Fleas are required to pass the disease from cat to cat, so use flea preventatives on your pets. Consider nail caps or declawing if someone immunocompromised lives in your home. Consult a physician immediately if pustules develop at the site of a cat scratch or bite.

5) **Ringworm:** Cats, especially outdoor cats and kittens, also can suffer from ringworm (Dermatophytosis) and pass it along to people, especially children. Ringworm is not a worm at all. It is a fungal infection that grows in the hair follicles and hair shafts, causing ring-shaped, red, itchy patches of skin. The fungal spores survive for long periods of time in the environment but the biggest risk comes from handling and petting an infected cat.

6) **MRSA:** Methicillin resistant *Staphylococcus aureus* (MRSA) is a huge problem in human hospitals and nursing homes, infecting thousands of patients every year with a serious bacterial infection that is difficult to treat. Dogs occasionally can be carriers of MRSA, though most dog and cat infections are caused by a different but related type of Staph, *Staph. Intermedius.* It is rare that dogs are growing the human type of Staph.

on their skin but they can easily transport it from one patient to another in a nursing home or hospital setting. (See text box earlier in this handout for information on preventing MRSA spread via therapy animals.) Severe or chronic skin infections in humans and their pets should be cultured and efforts made to identify carriers, either people or animals, in order to prevent recurrent infections and spread of the disease to other family members.

Diseases that are *not* shared between pets and humans include pinworms, lice and most species of mites. Sarcoptic mites (scabies) are the exception.

Another scourge of hospitals is *Clostridium difficile,* commonly called C. diff. This infection is not generally shared by pets. Clostridium infections in dogs are almost always caused by a different species called *Clostridium perfringens.*

7) LCMV: The last disease of concern that most of you will never have heard of is Lymphocytic Choriomeningitis virus, LCMV, a disease of rodents. The primary host for this disease is the house mouse but it has been found in many rodent species. Naturally infected rodents often show no symptoms but if they become ill they can have neurologic problems, conjunctivitis or kidney disease. The virus is shed in the rodent's urine, feces, nasal secretions and milk.

In humans, about 1/3rd of those infected will have no symptoms. Others will develop a flu-like illness 1-2 weeks after handling or being bitten by a rodent. Meningitis or infection of the joints, heart, bone marrow and other organs may develop. **The infection is passed from mother to fetus in pregnant women and can cause miscarriage and severe congenital defects. The virus is most likely to infect people who have had an organ transplant.** Pregnant women or anyone having an organ transplant should have no contact with rodents.