Knowledge of zoonotic diseases and being able to communicate zoonotic potential effectively to pet owners is essential to practicing the Veterinary Technician Oath. You promise, “to provide excellent care and services for animal, by alleviating animal suffering and promoting public health.” Given how busy many clinics are and the short amount of time allowed per appointment, it can be easy to forget or gloss over educating pet owners on any zoonotic diseases their pets may be suffering from. You cannot emphasize the zoonotic risks enough with owners. While some zoonotic diseases cause minimal disease in people, there are some of these diseases that can cause life threatening or life alternating complications. Immune compromised individuals are especially at risk such as those with AIDS, undergoing cancer treatment and young children. Be aware of which pet owners are in this category and adjust your client education and monitoring for disease accordingly.

It is important to remember that we as veterinarians and veterinary technicians are on the front line in educating pet owners because human doctors do not spend much time in their education discussing zoonotic diseases and some doctors will give out incorrect information. There are many OB-GYNS that tell pregnant women to get rid of their cats instead of educating them on decreasing their chance of exposure. Limiting your exposure to zoonotic disease is based on good hygiene and awareness. Frequent hand washing, wearing gloves, and not eating near the lab and animal samples help in prevention. Be aware of pets that may have a zoonotic disease, handle the pet appropriately and communicate these risks to co-workers to prevent further spread of the disease.

**Flea and Tick Borne Disease**

*Borrelia burgdorferi* (Lyme Disease)

Lyme Disease is classified as a zoonosis however dogs and cats are not reservoir hosts for humans. Cases of Lyme Disease in dogs and cats are considered sentinel hosts meaning the potential for human infection exists in the area. We discuss Lyme Disease as a parasitic disease because the tick is an essential part of the transmission of the disease even though it is a bacteria that causes the disease. Detection in dogs is through serology tests, titers, and Western blots.
Treatment for Lyme Disease in pets is usually doxycycline, azithromycin, and amoxicillin. Client education to prevent Lyme Disease consists of discussing individual pet’s risk of exposure. Hunting dogs, dogs that are frequently in the Upper Peninsula or west side of Michigan and who spend time camping should have the Lyme vaccine and good flea and tick prevention. Owners should be educated on the importance to checking for ticks on their pets daily and the proper way to remove a tick. In Michigan, the west side of the Upper Peninsula and the west side of the Lower Peninsula are considered endemic areas. Endemic means that there have been ticks confirmed to carry *Borrelia burgdorferi* and there have been 2 or more confirmed human cases.

**Bartonella henselae**

Cat scratch fever typically does not cause disease in cats and is a classic example of zoonotic disease because direct contact with the cat causes the disease in humans. Not every bite or scratch will cause cat scratch fever but it can be deadly if left untreated. Immune compromised individuals are at greatest risk. Typically *Bartonella henselae* is detected via serology testing and/or Western Blot in cats. There is not a treatment that causes complete clearance in the cat. Client education is essential in limiting and preventing transmission. Good flea control is important because the flea transmits the disease to cats. Other preventive measures include thorough cleaning of bites and scratches and seeing a doctor after such injuries. If a cat scratches or bites its owner while the pet is in the clinic, make sure to tell the owner to clean the wound and to see their physician. If the owner is immune compromised consider testing the cat for *Bartonella* during the visit.

**Yersinia pestis** (Plague)

Fleas transmit *Yersinia pestis*. The plague has three forms including respiratory disease, systemic disease and the bubonic form. The bubonic form causes the lymph nodes to enlarge and then abscess. The main reservoir host is rodents however the fleas will bite humans, dogs and cats if the rodents are not available. This disease occurs in Western United States and the reservoir hosts are prairie dogs and squirrels. It is important to handle suspected animals carefully using gloves because transmission is through inhaling droplets, broken skin exposure, and from flea bites. Detection in pets is through paired serology tests, cultures, and direct fluorescent antibody testing of smears. Treatment involves antibiotics. Anything that has infected material on it needs to be double-bagged and incinerated. You should wear gloves, gowns, eye protection and high-density surgical masks when handling a pet with suspected or diagnosed plague. Client education involves discussing appropriate flea control especially if their pet visits the Western States flea control and discussing proper handling of the pet if a diagnosis is made.

**Rickettsia rickettsii** (Rocky Mountain Spotted Fever)

Rocky Mountain Spotted Fever (RMSF) can occur in every state in United States except Maine. It is transmitted via the American dog tick. Detection in dogs is usually through clinical signs,
serology testing and PCR. Treatment in dogs is usually doxycycline, enrofloxacin or tetracycline. This disease can be fatal in humans. It is believed to be similar to Lyme Disease in that the disease likely does not pass directly from the dog to the human, however knowing that there are canine cases in an area increases human exposure. Client education again involves good tick control and reminding owners to never crush a tick with their bare hands.

**Intestinal Parasite Diseases**

*Toxocara canis and Baylisascaris procyonis*

Roundworms from dogs (*T. canis*) and raccoons (*B. procyonis*) can cause visceral larval migrans (VLM) and ocular larval migrans (OLM) in people. *Baylisascaris procyonis* can migrate to the central nervous system and be fatal. Infection with *Baylisascaris procyonis* is rare. The main source of human infection is from ingesting the eggs from the environment. These eggs are very resistant to breakdown and can last in the soil for years. Children are most commonly affected due to their hygiene habits and the risk of them putting soil in their mouth. Detecting this parasite in dogs is through fecal examination. Treatment include medications such as pyrantel, fenbendazole, and monthly heartworm preventatives. Client education has several prongs. Emphasis on proper puppy deworming, fecal monitoring, and the importance of heartworm preventative that covers intestinal parasites helps prevent environmental contamination. Educate owners on the importance of cleaning up their pet’s feces in the yard and in public places to further prevent environmental contamination. Cleaning the yard every few days helps prevent human infection because eggs require 9-15 days to become infective. Recommend that owners do not allow their puppies and dogs to lick children on the mouth and face because some dogs do eat their own feces and could cause infection in children via that route. Finally remind the public that raccoons should not be kept as pets or encouraged to frequent the owner’s yard.

*Toxoplasma gondii*

Toxoplasma is an important zoonotic disease because the host is cats and it typically affects pregnant women and their babies and unborn children. Transmission to humans is from exposure to cat feces, eating undercooked meat, and gardening. *Toxoplasma gondii* infection is a common and serious disease in immune compromised individuals and is considered an AIDS defining disease. It is estimated that approximately 50% of infection in humans in the United States are associated with ingestion of meat 6. Human physicians tend to inform pregnant women that it is their cat that causes the risk and some will even recommend getting rid of the cat! Detection of the disease in cats can be difficult and includes fecal flotation and serology testing. Treatment is usually with clindamycin for several weeks. Client education is important to help preserve the human-animal bond. Owners should be told to wash their hands thoroughly after cleaning the litter box even when they are not pregnant and not adding a stray cat to the household during pregnancy. If a pregnant woman must change the litter box she should do it daily and wear
gloves. Discourage feeding strays in the yard near gardens to limit spread to humans as well. Also cleaning the litterbox daily will prevent contact with the infective oocysts because it requires at least 24 hours for the oocysts to become infective.

**Cryptosporidium spp**
This disease typically comes from a bovine source and usually involves water contamination or unsanitary public areas. Rarely does the dog and cat species of Cryptosporidium cause zoonotic spread, however dogs can develop the disease from the bovine species and spread it to their owners. It is spread via the fecal oral route. Detection in animals is through fecal exam, which may require special staining as well as serology testing. There is no medicine that will treat Cryptosporidium so supportive care is the treatment including keeping up with hydration. In humans that are immune compromised, this infection can be fatal. Client education should include good hygiene especially when visiting farms and petting calves.

**Giardia spp**
Humans usually develop *Giardia* infections from contaminated water sources. Genetic tests have shown that isolates from dogs and cats have been found in humans. Fecal examination detection in dogs can be difficult and fecal assay tests have gained popularity in recent years. Treatment is either metronidazole or fenbendazole in dogs and cats. Client education is important when a pet has a positive Giardia test. Owners should be told to clean up all diarrhea as soon as possible and to use bleach and gloves when is it possible.

**Sarcoptes scabiei** (Scabies)
Human doctors love to blame dogs for human cases of scabies and that is not necessarily true. It has been shown that there is a significant amount of species specificity so when the a dog has scabies, the mite will readily and easily pass to another dog but is much less likely to pass to humans. If the dog scabies does infect a human the disease is transient and will resolve without treatment.

**Sources for Client Education Materials and Helpful Websites**

1. www.cfsph.iastate.edu/Zoonoses
2. www.capcvet.org
3. www.cdc.gov/healthypets
4. www.cdc.gov/healthypets/resources
5. King County PH dept www.kingcounty.gov/healthservices/health/ehs/zoonotics
6. www.wormsandgermsblog.com
7. www.veterinarypartner.com
8. www.vspn.org
9. www.vin.com - ask your veterinarian to help collect handouts
10. Search for zoonotic diseases and use any sites that are associated with a vet school or medical school
11. Ask your drug representatives about handouts
12. Veterinary schools
13. www.avma.org and your local and state associations
14. State veterinarian and Health department websites

References/Suggested Reading