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Transmittable Diseases of Dogs

Our topics for this week are:

- Diseases that can be transmitted from healthy-appearing dogs to humans
- Preventing zoonotic diseases from dogs
- Preventing the spread of disease among dogs

Key Zoonoses

(**Note:** Apparently ill animals should be handled by veterinary professionals or under their supervision. Precautionary measures against zoonoses from sick animals are more involved than those required when handling apparently healthy animals and vary widely. The discussion here is directed primarily at handling apparently healthy animals.)

Apparently healthy domestic dogs pose little risk of transmitting disease to healthy adult handlers who practice conventional personal hygiene. The risks of physical injury are greater than the risks of acquiring an infectious disease. The most suitable pets for young children are dogs and cats because the risks of injury and infection are better known and more easily controlled than other animals.

Directly transmitted zoonotic diseases from dogs can result in signs of disease systemically or primarily in the respiratory, digestive, or integumentary system of humans. In some cases healthy-appearing dogs can transmit zoonotic diseases.

Directly Transmitted

Systemic Disease

Many zoonoses from dogs that can cause generalized (systemic) illness. Nearly all are described as flu-like symptoms. None are common in adult handlers of healthy appearing dogs.

There can be serious damage in humans, primarily the liver or eyes of children, who acquire dog roundworm (visceral or ocular larvae migrans) by carrying the infective larvae in the soil to their mouth. Fecal material must be ingested to develop larvae migrans infections. Development of the larvae for at least two weeks after being passed in the feces is required for transmission. Fresh feces is not a risk for larvae migrans. Young children should be kept from playgrounds and beaches where dogs are allowed to defecate.

Echinococcosis (*Echinococcus granulosus or E. multilocularis)*, are tapeworms of dogs in contact with sheep or wildlife. They are acquired by ingesting fecal contaminated materials. The eggs are sticky and exposure can occur by petting an infected dog's hair coat. Echinococcosis typically causes cysts in the liver or lungs in humans. It occurs wherever dogs are allowed to eat raw sheep parts (*E. granulosus*) or rodents (*E. multilocularis*) but is rare in the U.S.

Capnocytophaga canimorsus, a potentially fatal bacteria in dogs' oral cavity, is a risk for humans with impaired immune systems, such as from chemotherapy, cancer, AIDS, or

splenectomy.

Brucellosis is a systemic disease of humans that can be transmitted by dogs ill with the disease, particularly after a dog experiences an abortion.

Listeriosis can cause generalized disease in immunosuppressed humans that includes an atypical pneumonia.

Urogenital secretions from dogs may transmit canine brucellosis (*B. canis*), Q Fever, or leptospirosis. Dogs with brucellosis generally have clinical signs of disease although they may be subtle. Coxiellosis (Q Fever) is a bacterial disease that is transmitted by inhalation of dust contaminated by the body secretions of animals (urine, milk, feces, etc.) infected with *Coxiella burnettii*. Dogs from farms with livestock may transmit Q Fever in placental fluids, although the risk from cats is better established. Dogs with leptospirosis can have subclinical infections, especially if previously vaccinated against leptospirosis, or be in a recovery phase while transmitting the infective organism in the urine. Leptospirosis causes systemic disease and tends to localize in the kidneys. In humans, symptoms vary, ranging from flu-like to meningitis, hepatitis, and renal failure.

Rabies is a fatal viral infection that is transmitted by bites or saliva contaminated wounds.

Respiratory Disease

Dog respiratory or oral secretions can be a source of infection with *Bordetella bronchiseptica*, *Capnocytophaga canimorus*, *Pasteurella multocida*, plague (*Yersinia pestis*), and tularemia (*Francisella tularensis*) in immunosuppressed humans. Young children should not be permitted to kiss dogs and expose themselves to dog respiratory or oral secretions. It should be noted that Strep throat, caused by Group A *Streptococcus*, does not originate in dogs.

Digestive Tract Disease

Ingesting fecal contaminated materials is required to acquire some of the bacteria diseases that cause diarrhea, such as campylobacteriosis or salmonellosis, from dogs. Of these, Campylobacteriosis (previously known as Vibriosis) is the most common, although the source (*C. upsaliensis*) is generally from puppies with diarrhea. However, campylobacteriosis can be transmitted to humans from healthy-appearing dogs.

Salmonellosis (*Salmonella enteritidis)* is uncommon in dogs, but the incidence has increased with the popularity of feeding raw meat or bones to dogs. Handlers become at risk from infected feces or handling raw meat or bones and accidently ingesting the bacteria.

Both cryptosporidiosis and giardiasis have been listed as potential zoonoses from infected dogs, but the risk of transmission has been poorly characterized.

Zoonoses that are passed in the feces in the infective form and could be acquired from exposure to the rectum during handling a dog are salmonellosis, campylobacteriosis, cryptosporidiosis (C. *parvum*), yersiniosis (*Yersinia enterocolitica*), and perhaps, giardiasis. Among these, salmonellosis or campylobacteriosis is the greatest risk, although the risks are still small if no clinical signs (diarrhea) are present and hands are washed after handling dogs.

Skin Disease

The zoophilic skin fungus, *Microsporum canis,* is a common cause for ringworm, particularly *tinea capitus*, in young children. It is often carried on hair coats without clinical signs, especially in cats, and transferred to the scalp of children by contamination of their hands and fingernails.

Young children should have their hands washed and fingernails cleaned after handling dogs and particularly cats to reduce the risk of acquiring ringworm. Ringworm is the most common reported zoonosis other than bites and scratches in small animal veterinarians. Dog handlers may develop transient infections by contact, often by infected hair being caught under a sleeve or collar and rubbed against the skin or caught under the fingernails and scratched into the scalp.

Mange mites (*Sarcoptes scabiei, Cheyletiella yasguri*) can be transmitted transiently to handlers, but transmission by animals without clinical signs of skin disease is highly unlikely. Staphylococcus (*S. pseudintermedius*) is a common bacterial disease of dogs, but the species of bacteria is usually not the type that is found in people (*S. aureus*).

Exposing bare skin to fecal contaminated soil can result in hookworm larvae (*Ancylostoma brazilense* and less commonly *A. caninum* or *Uncinaria stenocephala*) penetrating the skin and causing inflamed, itchy tracts in the skin (cutaneous larvae migrans, "creeping eruption", "plumber's itch"). Larvae migrans diseases are not acquired from fresh feces. One to 3 weeks after elimination in the feces is required for the larvae to become infective.

Vector-Borne

Some zoonotic diseases are not acquired directly from dogs, but dogs may have a role in delivering the disease to humans.

Ehrlichiosis (*E. chaffeenis*, *E. ewingii*, and *Anaplasma phagocytophilum*) and Rocky Mountain Spotted Fever (*Rickettsia rickettsii*) are white blood cell diseases or blood platelet diseases transmitted from ticks which dogs could carry into a human's environment.

Tularemia (*Francisella tularensis*) is a bacterial infection of wild rabbits and rodents that can be transmitted by infected animal body secretions or biting insects and arachnids, especially deerflies and ticks.

Lyme disease *(Borrelia burgdorferi)* is another tick-transmitted disease that causes infectious arthritis and other symptoms in humans. Dogs might carry infected ticks to humans.

Plague can be transmitted directly by respiratory secretions or other body fluids, but the usual means of transmission is via rodent flea bites. Plague in the U.S. is most often associated with exposure to wild rodents or their burrows (and fleas) or the dogs or cats that become infected by eating wild rodents that carry plague.

Leishmaniasis is a protozoan disease that requires sandflies for transmission and causes skin sores that do not heal and can affect internal organs. Infected dogs can be reservoirs for sandflies to acquire the organism.

The most common tapeworm (*Dipylidium caninum*) of dogs can be acquired by humans, if they swallow the intermediate host, a flea or less commonly, a louse.

Sanitary Practices

Zoonosis Prevention

A handler of dogs should wear appropriate dress to protect against skin contamination with hair and skin scales or saliva, urine, and other body secretions. Handlers should not allow dogs to lick their face, wounds, or scratches. Fleas, ticks, deerflies, and other biting flies, should be controlled. Vaccinations in dogs should be kept current against rabies and leptospirosis. Dogs should be dewormed on a routine conventional schedule. Dog handlers should be vaccinated against tetanus at least every 10 years.

Basic sanitary practices should be practiced, such as keeping hands away from eyes, nose, and mouth when handling dogs and washing hands after handling them. Feces should be removed from yards and properly disposed of at least weekly. Dogs should not be allowed around rabbit or rodent burrows or given the chance to kill or eat dead wild rabbits or rodents.

Handlers should wash their hands each time they handle pet foods and treats. Dog food bowls and food scoops should be washed after each use. The Federal Drug Administration and Centers for Disease Control discourages the feeding of raw meat or bones to dogs due to the risks of transmitting salmonellosis, listeriosis, and colibacillosis. Dogs should be prevented from eating out of cat litter boxes.

Children should not handle dogs with fleas or ticks. Dogs should be routinely examined and treated for external parasites. Avoiding ticks requires avoiding tall grass, brush, and bushes during warm weather and keeping grass maintained short in dog pens and yards. Wearing light colored clothing facilitates seeing and removing ticks. Long sleeves and long pants that are tucked into socks, plus tall boots and a hat reduce the possible tick attachment sites. Ticks are picked up by brushing against vegetation that the tick has crawled out on to quest, i.e., prepare to grab onto a victim. Skin and clothing can be treated with N, N-diethyl-m-toluamide (DEET) or just clothing can be treated with permethrin to deter or kill ticks. Daily inspection of the skin, particularly under long hair of children, and prompt removal of attached ticks will minimize or eliminate the risk of transmission of zoonotic diseases. Most tick diseases take 24 to 48 hours of attachment for disease transmission to occur.

Preventing Spread of Disease Among Dogs

When handling more than one dog from different households or kennels, proper sanitation is required to prevent the spread of disease from carriers without clinical signs to dogs immunologically naive to the disease. Dogs from different origins should not be confined in the same cage or run. A separation of at least three feet is desirable to reduce the risk of the spread of airborne disease agents. Handlers should wash their hands before and after handling animals and clean and disinfect table tops and cages used in handling. Runs should be sanitized with chlorine (3 cups of bleach/gallon of water) before being used by a dog that has not previously mingled with other dogs that have used the run. Restraint equipment such as blankets, muzzles, capture poles, grooming equipment, collars, harness, and slip leashes should be disposable or cleaned and disinfected. Leather gloves should be kept as clean as possible and used infrequently.

Special precautions are needed if sick dogs are handled, and sick dogs should be isolated from apparently normal dogs. New household dogs should be quarantined for at least 2 weeks to reduce the risk of transmitting a disease to others dogs in the house.

Now, let's recap the key points to remember from today's episode:

- The risk of acquiring infections from healthy-appearing dogs exists but is very low if the handler has a healthy immune system and practices good personal hygiene.
- Preventing disease transmission among dogs requires good sanitary practices, and in some cases, isolation of sick dogs.

More information on animal handling is available in my book, *Animal Handling and Physical*

Restraint published by CRC Press. It is also available on Amazon and from many other fine book supply sources.

Additional information is available at www.betteranimalhandling.com

Don't forget serious injury or death can result from handling and restraining some animals. Safe and effective handling and restraint requires experience and continual practice. Acquisition of the needed skills should be under the supervision of an experienced animal handler.