Canine zoonoses

Institutional Animal Care and Use Committee

3/11
Rabies

- Clinically ill dogs are a source of infection for humans
- Transmitted by a bite wound/contact with virus-laden saliva
- Dogs are infected by exposure to a wild reservoir
  - Striped skunk
  - Various species of bats
- Prevention through
  - Vaccination of dog population
  - Judicious handling of dogs showing central nervous system disease
Rabies

- Any type of behavioral abnormality, in particular, aggression, should be considered a potential clinical sign of rabies. Do not attempt to handle an animal like this without appropriately trained personnel.
- Contact the University Attending Veterinarian immediately.
Skunks active in the daytime are always suspect for rabies. North Dakota has a high incidence of rabies in the skunk population. Avoid any contact.

Bats should not be handled without gloves. In fact, it is advisable to place them in container and submit them to the laboratory for testing.
Brucellosis

- Various species of *Brucella* bacteria affect animals and humans
- *Brucella canis* is the organism in dogs
- This is typically an infection of the female or male reproductive tract in dogs
- Signs of clinical disease in humans includes fever, sweats, headaches, back pains and physical weakness
- More severe infections are possible
Brucellosis

- Humans are infected by eating or drinking contaminated material, inhaling the bacteria, or having the bacteria enter a skin wound
- Humans do not transmit the bacteria to one another
- Avoid contact with blood, semen or placenta from dogs with signs of reproductive disease
- Immune suppressed individuals should not handle suspect dogs
Brucellosis

- Diagnosis can be done with serology, culture or PCR
- Treatment is available, however, chronic infections can develop
- Contact the Attending Veterinarian if you suspect brucellosis
Campylobacteriosis

- Infectious disease caused by the bacteria, *Campylobacter* spp.
  - *C. jejuni, C. fetus*
- Sick humans see diarrhea, cramping, abdominal pain, fever, nausea, vomiting
  - May see diarrhea in the blood
- 2 to 5 day incubation period followed by a week of illness
- Lasts longer in immunocompromised patients
- In rare cases can develop into a widespread, blood borne infection
Campylobacteriosis

- Common diarrheal illness in the United States
- More common in the summer
- More commonly isolated from young patients
- Most cases recover within a week
- Rare serious disease such as arthritis or Guillain-Barre syndrome (a patient's own immune system attacks nerves and leads to paralysis)
- Diagnosis through isolation and identification of the bacteria
Campylobacteriosis

- Human exposure:
  - Poultry or poultry products
  - Unpasteurized milk, contaminated water
  - Contact with aborting cattle, goats or sheep
    - *C. fetus*
  - Contact with stool of ill animals
    - Dog
    - Cat
    - Sheep, goat, cow
Campylobacteriosis

• Prevention
  ▫ Cook all foods thoroughly
  ▫ Wash hands with soap and water
  ▫ Avoid consuming unpasteurized milk or untreated water
  ▫ When working with animals, particularly animals with diarrheal or reproductive illness, wear gloves and wash hands frequently
Salmonellosis

- Caused by bacteria, *Salmonella* spp.
- Diarrhea, fever, abdominal cramps roughly 12 to 72 hours after infection
- Illness last about a week after which most people recover
- In uncommon situations, severe bloody diarrhea may develop as well as bloodstream infections
- More serious in elderly, infants and immunocompromised individuals
Salmonellosis

- Diagnosis by growing the organism in a lab
- Most cases resolve without treatment, but antibiotics and fluids may be indicated
- *Salmonella* is common in many species of animals. Humans are exposed by consumption of food from these animals or contact with fecal matter from ill animals or carrier animals.
- Found in reptiles, birds, sick calves, lambs,
Leptospirosis

- *Leptospira interrogans*, worldwide distribution in domestic and wild animals
  - *l. icterohaemorrhagicae* (rats, dogs), *l. pomona, bratislava* (swine), *l. hardjo* (cattle), *l. canicola* (dogs), *l. ballum* (rats and mice)
- Shed in urine
- Dog can be infected for years
- In humans flu-like symptoms, rash, orchitis (inflammation of testicle), cutaneous hemorrhage, anemia, hepatorenal failure, jaundice, encephalitis (inflammation of brain), pulmonary disease
- Diagnosis by serology and culture
Leptospirosis

- Dogs that shed the *Leptospira* organism do not always show clinical disease
- The *Leptospira* organism can penetrate mucous membranes
- Wear gloves when working around dog urine and feces
- Animal vaccines are available
- Antibiotics will help reduce shedding of bacteria, but not eliminate it from the dog kidney
- Consult with the Attending Veterinarian about any dogs that test positive for *Leptospira*
Bordetellosis

• Caused by a bacteria, *Bordetella bronchiseptica*
• Caused of upper respiratory disease in dogs
• Rarely transmitted to humans by aerosol contact with infected dogs
• Diagnosis through culture
• Treatment with antibiotics
• Prevention through careful handling of infected small animals
Ringworm

• Actually a fungal infection of the epithelium
• Not invasive
• Can grow on scalp, skin or nails
• Contagious by direct contact
• Thrive in warm, moist areas
• In humans see itchy, red, raised patches that blister and ooze
• Ring appearance; bald patches
Ringworm

- Diagnosed by various methods with the help of your physician
- Condition may be self-limiting, but may need the help of topical antifungals
- Gloves, hand-washing
- Dogs develop scaly, hairless patches anywhere on the body
- Tends to be a self-limiting or easily treated condition in dogs as well.
Giardiasis

- Caused by a parasite, *Giardia lamblia*
- Humans infected through inadvertent ingestion of parasite cyst from infected animals
- Common cause of diarrhea in dogs and cats
- Diagnosis through identification in fecal matter
- Treated with antiparasiticides
- Prevention through hand-washing and judicious use of gloves when handling suspects for infection
- Typically resolves in 2 to 3 weeks in healthy individuals, but can be more severe in immunocompromised individuals
**Dirofilaria spp.**

- Dog heartworm (*D. immitis*)
- Pulmonary infections in humans
- Life cycle
  - Worms do not reach maturity in humans
- Clinical disease/diagnosis
  - Chest lesion seen with imaging technology
- Epidemiology
  - 15 species of mosquitoes carry organism
  - Found in a variety of wildlife
Roundworms

- Caused by a parasite, the dog roundworm
- Humans can become infected with canine roundworms by ingesting roundworm eggs
  - Fecal/oral transmission
- Condition called “visceral larval migrans”
  - Canine roundworm cannot complete development in human, but migrates through various tissues causing inflammation and scarring
    - Can target the eye on occasion
    - “Ocular larval migrans”
Roundworms

- Diagnosis requires examination by a physician
- Treatment depends upon the stage of the infection
- Prevention through hand-washing and careful handling of dogs and cats
- Worm dogs to prevent the shedding of worm eggs into the environment
- Clean up dog fecal matter immediately to eliminate source
Hookworms

• Caused by a parasite, the dog hookworm
• Dog hookworm larva in the environment penetrate human skin and cause a condition called “cutaneous larval migrans”
• The dog hookworm larva cannot complete their life cycle in humans but do migrate through the skin and subcutis and cause dermatitis
Hookworms

- Diagnosis by physical exam, biopsy
- Treatment with antiparasitic drugs
- Prevention by worming dogs
- Clean up dog fecal matter immediately
- Be aware of the environment – exposure of skin to hookworm larva
  - Avoid bare feet in the summertime in certain locations
1. Eggs in feces
2. Rhabditiform larva hatches
3. Rhabditiform larva develops into filariform larva in the environment
4. Adults in small intestine
5. Infective Stage
6. Diagnostic Stage

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Scabies

- Parasitic infection of skin caused by a mite, *Sarcoptes scabei*
- Any area on the skin is susceptible
- Intense itching
- Secondary infections and complications due to scratching
- See scaling, crusting, erosions
- Diagnose by microscopic identification of the mite or mite eggs
Scabies

- Widespread
- Animal strains can live on humans, but do not reproduce on humans
- Transfer by direct contact
- Careful handle of suspect animals
- Affected animals, particularly wild animals such as coyotes and foxes, show thickening of the skin, crusting, oozing, scabs, erosions and ulcers (secondary infection)
Dog and cat tapeworm; *Dipylidium caninum*

- Common in dogs
- Most reported infections in children
- Life cycle and morphology
  - Arthropod intermediate host (flea, louse)
  - Adult worm in dog
  - Ingestion of tapeworm proglottid or egg basket by intermediate host (flea)
  - Intermediate host then accidentally ingested by human or animal
  - Develops into an adult in 3 or 4 weeks
Dog and cat tapeworm; *D. caninum*

- **Clinical disease**
  - Indigestion, appetite loss, abdominal pain, diarrhea, rash, itching around anus
  - Diagnose by identification of egg basket or proglottid

- **Epidemiology**
  - Worming of dogs
  - Careful grooming of pets
1. Gravid proglottids are passed intact in the feces or emerge from perianal region of either animal or human hosts.

2. Each proglottid contains egg packets that are held together by an outer embryonic membrane. The proglottids disintegrate and release the egg packets.

3. Egg packets containing embryonated eggs are ingested by larval stage of flea.

4. Adult flea harbours the infective cysticercoid.

5. Host is infected by ingesting fleas containing cysticercoid.

6. Animals can transmit the infected fleas to humans.

7. Humans, normally children, acquire the infection by ingesting the infected flea.

8. Adult in small intestine

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\( \Delta \) = Infective Stage
\( \Delta \) = Diagnostic Stage