Mosquitoes & Diseases

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Canine Heartworm Disease

Eastern Equine Encephalomyelitis (Sleeping Sickness)

West Nile Virus
Heartworm Disease
Causes

- *Dirofilaria immitis*
- 3 main species of Mosquitoes
  - *Aedes vexans*
  - *Anopheles* sp.
  - *Psorophora* sp.
Life Cycle

- **Patency** (6 to 7 months post-infection):
  - Adult: 3 to 4 months
  - L3: 2 to 3 months

- **Transient Patency or Dead End Infection** (7 to 8 months post-infection):
  - Adult: 14 days or longer, 3 to 4 days
  - L4: 3 to 4 days

- MF: Mosquito
Clinical Signs/Symptoms

- Coughing
- Decreased exercise tolerance
- Ascites
- Acute collapse
- Any dog >6 months in Louisiana that is not on preventative
Differential Diagnosis

- Pneumonia
- Kennel cough
- Liver failure
- Pregnancy
Treatment-Old

- **Thiacetarsamide sodium**
  - Thiacetarsamide (Caparsolate®; Merial)
    - intravenous injection
    - Leakage of the drug around the vein
    - systemic toxicity of this drug
    - efficacy is dependent upon a full dosage schedule being administered
    - Male worms are more susceptible to treatment than female worms
Treatment-New

- **Melarsomine dihydrochloride**
  - Melarsomine (Immiticide®; Merial)
    - first new adulticide for canine heartworm to become available in the U.S. in over 25 yrs
    - higher level of efficacy and safety than what has previously been available
    - deep IM injection into the lumbar muscles
    - minimizes post-adulticide complications in dogs with more severe heartworm disease
Prevention

- How prevention works
  - Drugs that are highly effective, administered at the appropriate doses and intervals
  - In Louisiana: all year round!!!
Prevention

Types of prevention

- **Ivermectin** (Heartgard®; Merial): first in this family of drugs to be approved for use in preventing heartworm infection. Infection with larvae as long as 2 months prior to initiation of ivermectin treatment will be blocked from development.

- **Milbemycin** (Interceptor®; Novartis) has benefits which are similar to ivermectin. A key additional feature of milbemycin is its ability to control hookworm, roundworm, and whipworm infections as well.

- **Moxidectin** (ProHeart™; Fort Dodge) is an extremely potent preventive compound that differs from the other macrolides in that it is not microfilaricidal at preventive dose levels.

- **Selamectin** (Revolution®; Pfizer) is the newest preventive approved by the FDA. It is applied topically and includes fleas in its spectrum of activity.
Eastern Encephalomyelitis (Sleeping Sickness)
Causes

- Arbovirus
  - *Culiseta melanura*
    - Rural wooded areas, marshes & swamps
  - *Aedes spp.*
Transmission Cycle of the Virus in the United States

- Wild Birds (Wetlands) → Culiseta melanura → Wild Birds
- Local Birds
- Horse → Aedes spp. → Local Birds
Symptom/Clinical Signs

- Horses
  - Mild to severe fever, poor appetite & stiffness
  - CNS signs: propulsive walking, depression, lethargic to aggressive & excitable, head pressing, blindness, circling, head tilt, twitching
  - Death in 1-7 days
Symptom/Clinical Signs

- **Humans**
  - Most: no symptoms
  - Others: only a mild flu-like illness with fever, headache, and sore throat
    - CNS Disease: a sudden fever and severe headache can be followed quickly by seizures and coma
      - About half of these patients die from the disease.
      - Of those who survive, many suffer permanent brain damage and require lifetime institutional care
  - 4-10 days for symptoms to appear after bite
  - See your doctor

See your doctor
Differential Diagnosis-EEE

- WNV
- Rabies
- Botulism
- EPM
- Poisoning: moldy corn (polio), lead
- Trauma
Laboratory Needs

- Serum
- Brain
Treatment

- Non specific supportive treatments
- Antibiotics for secondary infections
Prevention

- Vaccine - very effective
- Owner compliance - essential
Mosquito

Human (50-75% mortality)

Horse

Horse
West Nile Virus
Causes

- Flaviviruses
  - *Aedes pipans*
Transmission Cycle of the Virus in the United States

Local Birds

Horse

Aedes spp.

Local Birds
Symptoms/Clinical Signs

- Horses
  - Asymptomatic or
  - Non specific signs
    - Afebrile
    - + EPM
    - Stumbling/incoordination, ataxia, down, acute death
Differential Diagnosis-WNV

- EEE
- Rabies
- EPM (Protozoan)
- Poisoning: moldy corn (polio), lead
- Trauma
Symptoms/Clinical Signs

- Humans
  - See your doctor
Laboratory Needs

- Serum
- Brain
Treatment

- Non specific supportive treatments
- Antibiotics for secondary infections
Prevention

- Vaccination from Ft. Dodge
- Only available through your veterinarian
- 2 shots, 3 weeks apart
- 6 month revaccinate in endemic areas, otherwise yearly