Heartworm: Why we should care

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All Ages Susceptible to Infection
Dirofilaria immitis: Important Stages
L³ DOG

PENETRATES SKIN PUNCTURE

HEMOLYMPH POOL

MOLTS AFTER 10 DAYS
HEARTWORM LIFE CYCLE

**Patency** (produce offspring)
- 6 to 7 months post-infection
- 3 to 4 months

**Transient Patency**
- 7 to 8 months post-infection
- Heartworm in heart and pulmonary vessels (1-3 worms)

**Adult**
- Heartworm in heart and pulmonary vessels (1-250 worms)
- 2 to 3 months

**Larval Development**
- 3 to 4 days
- L4 (4th stage larva)
- L3
- 14 days or longer infective 3rd stage larva

**Microfilariae**
- L4 (4th stage larva)

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Chronic HWD-Signs

- May be asymptomatic
- Symptomatic
  - **mild to moderate**
    - chronic cough
    - dyspnea
    - decreased exercise tolerance
  - **moderate to severe**
    - syncope
    - hemoptysis
  - **severe**
    - congestive heart failure
Heartworm Treatment Summary

- **Ag + mite test**
- **Doxy**
- **Steroids +/-**
- **Melarsomine**
- **MONTHS**
EXERCISE RESTRICTION

- **Diagnosis**
  - Reduced activity

- **Treatment** - 6-8 weeks post-Tx

- **Recovery**
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- Microfilariae
  - 14 days or longer
  - infective 3rd stage larva

L3
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- larval development

L4 (4th stage larva)
- 2 to 3 months
- larval development

L4 (4th stage larva)
- 6 to 7 months post-infection
- larval development

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Macrocyclic Lactones

**MILBEMYCINS**

- Streptomyces cyaneogriseus
  - NEMADECTIN
  - MOXIDECTIN

- Streptomyces hydroscopicus
  - MILBEMYCIN OXIME

**AVERMECTINS**

- Genetic mutation
  - Streptomyces avermitilis
    - DORAMECTIN
    - ABAMECTIN
    - EMAMECTIN
    - IVERMECTIN
    - EPRINOMECTIN
Heartworm Prophylaxis

Monthly ML treatments kill L₃ and L₄ stages

Timeline of *D. immitis* development, showing periods of susceptibility to macrocyclic lactones and melarsomine

The dotted line represents the “treatment gap”, when *D. immitis* are not considered to be susceptible to either treatment.
Dirofilaria immitis Life Cycle

HEARTWORM LIFE CYCLE

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(6 to 7 months post-infection)
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larval development

L3
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Microfilariae

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L4 (4th stage larva)

larval development

L4 (4th stage larva)

larval development

adult

adult

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Mosquito Vectors

- > 70 species
- 10 - 12 species more important
Mosquito Vectors

- > 70 species
- 10 - 12 species more important

http://cisr.ucr.edu/images/asian_tiger_mosquito/asian_tiger_mosquito_01.jpg
The severity of heartworm incidence as shown in this map is based on the average number of cases per reporting clinic. Some remote regions of the United States lack veterinary clinics, therefore we have no reported cases from these areas.
Weigh the Costs
Heartworm Treatment vs Heartworm Prevention

Heartworm Treatment
$1,200 - $1,800*

medications
veterinary fees
post-treatment preventive
lab tests
x-rays

Heartworm Prevention
$70 - $200*

12 months of heartworm preventive

*Average cost for a 40-lb dog

PROTECT YOUR PET FROM HEARTWORM 12 MONTHS A YEAR. TEST FOR HEARTWORM EVERY 12 MONTHS.
www.heartwormsociety.org
PROTECT YOUR PET

Heartworm disease is prevalent in ALL 50 STATES.

It is estimated that a MILLION dogs in the U.S. have heartworm disease today.

It only takes 1 bite from an infected MOSQUITO to spread heartworm disease to a pet.

Pets should be PROTECTED from heartworm 12 MONTHS A YEAR.

It takes approximately 6 months after being bitten by an infected mosquito for a dog to test positive for heartworms.

DOGS SHOULD BE TESTED FOR HEARTWORM EVERY 12 MONTHS.

Heartworm PREVENTION is much less expensive than treatment. Treatment can COST MORE THAN 15x that of a year’s worth of heartworm preventive.

Once mature, heartworms can live up to 7 YEARS in a dog.

There is only ONE approved treatment for heartworm in dogs.

There are ZERO approved treatments for heartworm in cats.

Visit heartwormsociety.org/thinktw for more information. © 2013 AMERICAN HEARTWORM SOCIETY
What can I take away from today?
HEARTWORM INCIDENCE 2004
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The severity of heartworm incidence as shown in this map is based on the average number of cases per reporting clinic. Some remote regions of the United States lack veterinary clinics, therefore we have no reported cases from these areas.
HEARTWORM INCIDENCE 2007
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HEARTWORM INCIDENCE 2010
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