**HOW CAN YOU PROTECT YOUR PET?**

First and foremost, you should contact your veterinarian for advice on heartworm prevention. There is medication for both dogs and cats to prevent the parasites. Should your animal have heartworm, currently there is medication to treat dogs. There is no medication to treat cats.

According to the American Heartworm Society, “Heartworm disease is a serious, progressive disease. The earlier it is detected, the better the chances the pet will recover. There are few, if any, early signs of disease when a dog or cat is infected with heartworms, so detecting their presence with a heartworm test administered by a veterinarian is important. The test requires just a small blood sample from your pet, and it works by detecting the presence of heartworm proteins. Some veterinarians process heartworm tests right in their hospitals while others send the samples to a diagnostic laboratory. In either case, results are obtained quickly. If your pet tests positive, further tests may be ordered.”

For more information on canine heartworm, visit [www.heartwormsociety.org](http://www.heartwormsociety.org)

---

**HOW CAN YOU HELP TO CONTROL WESTERN TREEHOLE MOSQUITOES ON YOUR OWN PROPERTY?**

- Inspect trees for holes as small as ½”, they lead to cavities that can hold water. You may need to consult with an arborist.
- Fill holes with water-absorbing polymer or sand to prevent mosquito development in standing water.
- Remove buckets, toys, tarps or other items holding water.
- Check your gutters for clogs and standing water.
- Contact the District for help inspecting your property and identifying problem areas.

---

**San Joaquin County Mosquito & Vector Control District**

**Protection Through Prevention since 1945**

San Joaquin County Mosquito and Vector Control District is an independent special district governed by a board of trustees.

The District covers over 1,400 square miles including seven cities and all unincorporated areas. District operations are based on a concept that utilizes several different approaches to vector control. The District uses state-of-the-art, environmentally sound techniques as a sustainable approach to managing public health pests and vectors, by combining biological, chemical, legal, natural and physical control tactics in a way that minimizes economic, health and environmental risks.

San Joaquin County Mosquito and Vector Control District continues to protect public health through preventive techniques, as well as providing surveillance for potentially new invasive mosquitoes and exotic diseases they may carry.

---

**SERVICES PROVIDED**

for San Joaquin County Residents (cities and rural areas)

- Mosquitoes
  - Inspection & Control
- Mosquitofish
  - For Residential & Agricultural Sites
- Ticks
  - Inspection, Identification & Education
- Public Education
  - Literature, Presentations, Website, News & Spray Alerts

---

**Contact Information**

- **Phone**: 209.982.4675, 1.800.300.4675
- **Address**: 7759 S. Airport Way, Stockton, CA 95206
- **District Hours**: Monday-Friday 7a.m. to 3:30p.m.
- **Website**: [www.sjmosquito.org](http://www.sjmosquito.org)
YES, MOSQUITOES ARE INVOLVED

For many years the Western treehole mosquito, Aedes sierrensis, has been known to be the primary vector or carrier of heartworm. This mosquito’s life cycle is centered on standing water that accumulates in holes in the trunks and branches of trees or even artificial containers and tires. A wide variety of trees are commonly used by Western treehole mosquitoes, with oaks, sycamores, and walnut trees being the most common in San Joaquin County.

Female mosquitoes can lay 200 to 300 eggs on the damp surface of the treehole or container just above the water line. The eggs remain dormant until the treehole or container is refilled with water. The eggs hatch shortly after submersion, producing larvae which develop into pupae as temperatures are warm enough to support adult mosquito activity. A few days later, adult mosquitoes emerge. Adult female mosquitoes will then seek a blood meal, mate, and return to a suitable water-filled treehole or container to continue the cycle.

Research conducted by San Joaquin County Mosquito and Vector Control District suggests that several other mosquito species may be involved in heartworm transmission (Huang et al., 2013). The research strongly suggests that a local abundant mosquito, Culex pipiens, the Northern House mosquito, and Culiseta incidens may be involved in the parasitic transmission as well.

WHAT DO WE DO TO MANAGE THESE MOSQUITOES?

San Joaquin County Mosquito and Vector Control District is aware of problem areas within the county. Our efforts to manage Western treehole mosquito populations include:

- Identify treeholes that hold water and eliminate or treat the water to prevent adult mosquitoes from emerging.
- Support and conduct research that is designed to identify more efficient control methods.
- Conduct adult mosquito surveillance to monitor adult mosquito population levels and help direct control operations.
- Work with local veterinarians to determine the extent of the heartworm infections in San Joaquin County.
- Engage in community-wide efforts to reduce adult mosquito abundance.
- Conduct outreach to educate the public about mosquitoes and mosquito-borne disease.

HEARTWORM BIOLOGY

Adult heartworms are 6 - 12 inches long and can reduce blood flow to the point that the heart, lungs, liver, and kidneys of canines are damaged. Symptoms are usually not apparent until after damage has been done. Advanced symptoms of heartworm include: rapid tiring, panting, chronic soft dry cough, listlessness, and weight loss.

Heartworm Life Cycle

1. A mosquito bites an animal infected with heartworm.
2. Microfilariae (immature heartworm) mature inside the mosquito in 10 - 14 days.
3. Infected mosquito bites a dog and the heartworm larvae migrates from the mosquito’s mouth parts and enter through the wound.
4. Heartworm larvae enters the bloodstream and migrates to the heart. They become sexually mature in six to seven months.
5. Adult heartworm live within the heart for 5 - 7 years.

Visit our website for more information about Heartworm.

Heartworm (Dirofilaria immitis) is a roundworm endemic to the Central Valley and adjacent Sierra Nevada where it is transmitted primarily by Aedes sierrensis, commonly known as the Western treehole mosquito. Although the parasite is often referred to as canine or dog heartworm, a variety of other animals are susceptible.

This roundworm, capable of growing up to a foot long, causes severe circulatory disease in dogs, coyotes, foxes, ferrets, sea lions, and occasionally cats. Humans rarely get the parasite which is often associated with the lungs and respiratory system.

Visit our website for more information about Heartworm.