

The American Heartworm Society: Guidance for Heartworm Disease Management During the Adulticide Unavailability

Background

August 9, 2011: The American Heartworm Society became aware of a pending product unavailability of the only available heartworm adulticide product, IMMITICIDE®, for an undetermined duration.

Because there are no other approved products available for killing adult heartworms, the American Heartworm Society Board and Scientific Committee has developed and approved the following management plan for heartworm positive dogs during this period of adulticide unavailability. While the unavailability persists, heartworm-positive dogs should be managed to achieve three primary goals:

- Reduce potential pathology from the infection.
- Maintain the health of the dog until it can be appropriately treated.
- Prevent additional heartworm infection of the dog.

These goals may be achieved by strict adherence to the following:

- Limit the activity level of the dog to reduce pathology.^{1,2}
- Carefully place the non-protected dog on heartworm prevention.^{3,4,5,6,7}
- Administer doxycycline to reduce pathology and infective potential of heartworms.⁸

The Management Plan: Heartworm-Positive Dogs and Dogs Not Completing a Full Course of Adulticidal Therapy

1. Verify any positive antigen test by performing a second antigen test, sourced from a different manufacturer. If a dog is confirmed antigen positive or for dogs already initiated on, but not completed adulticidal therapy (due to product unavailability), a microfilariae test should be performed. In rare cases, the administration of heartworm preventives to microfilaremic dogs can result in shock-type reaction. For this reason professional observation is **highly** recommended.

- **If microfilariae are detected, the dog should be pretreated with corticosteroids with or without antihistamines⁹ and then administered a dose of heartworm preventive (macrocytic lactone).¹⁰**
 - While all heartworm preventives affect microfilariae, the resulting immunologic reaction of the dog to the microfilariae can vary dramatically.^{3,4,5,6,7} Therefore dogs should be kept under clinical observation for at least 8 hours following the initial dose of heartworm preventive to allow rapid, appropriate medical treatment should a shock reaction occur.
 - **Anti-inflammatory pretreatment:** Dexamethasone at 0.25 mg/kg intravenously and diphenhydramine at 2.2 mg/kg intramuscularly, **or** 1 mg/kg of prednisolone orally 1 hour before and 6 hours after administration of the first dose of preventive.⁹
 - Elimination of every single microfilaria is not the goal; the health, safety, and maintenance of the patient is the goal.

- Microfilariae will **likely** persist following preventive dosing.
 - If the positive dog is already on prevention, continue regular monthly oral or topical dosing or twice yearly injections of preventives.
- **If the dog is negative for microfilariae, a heartworm preventive should be administered.**
- 2. Dogs should then be *maintained* continuously on heartworm preventive to limit further infection of the dog until the adulticide product is again available.**
- 3. Dogs should also receive doxycycline at 10 mg/kg BID for 4 weeks.** This dosing should be repeated quarterly until adulticide is available. (*Dose may be reduced to 5 mg/kg BID if tolerance issues exist.*)
- Doxycycline has been demonstrated to affect the viability of subsequent heartworm stages.
 - Microfilariae will still be able to infect mosquitoes, but the infective larvae from these mosquitoes will be less capable of infecting another dog.
 - The doxycycline protocol would be 1 month on, 2 months off, 1 month on, 2 months off, etc.
 - The combination of macrocyclic lactone and doxycycline is proven to be more effective than macrocyclic lactones alone. Research studies have demonstrated macrocyclic lactone/doxycycline combinations will:
 - Shorten the life span, but not eliminate the adult worm infection.
 - Lessen the pathology associated with worm death.
 - Disrupt heartworm transmission.
- 4. Restrict ALL activity of the dog! Limit ALL exercise!**
- The severity of heartworm disease is directly related to the activity level of the dog.
 - As physical activity increases, pathology associated with adult heartworms increases.
- 5. Any dogs that are symptomatic for heartworm infection should be treated medically to relieve signs of respiratory distress.** Surgical options should be weighed for dogs exhibiting cardiovascular compromise.
- 6. When adulticide product is again available:**
- Adult heartworms will **likely** persist in the dogs managed under this protocol.
 - Nevertheless, dogs should be retested to revalidate the presence of an adult heartworm infection.
 - If positive, the dog should be appropriately treated for adult heartworms with the approved adulticidal product.

REMEMBER THE GOALS:

- Reduce potential pathology from the infection.
- Maintain the health of the dog until it can be appropriately treated.
- Prevent additional heartworm infection of the dog.

For further background information considered in development of this management protocol, refer to the American Heartworm Society's Current Canine Guidelines under the Veterinary Resources at www.heartwormsociety.org.

This American Heartworm Society guidance statement is based upon the cumulated knowledge and expertise of the American Heartworm Society's Board of Directors and AHS Scientific Committee experts, considering the latest information on heartworm disease, disease processes, known drug activity, and impact of these factors on disease management as of August 2011.

The American Heartworm Society needs your support. Please help us by becoming a member so that we can continue to provide information and guidance to the profession. Membership applications are available at www.heartwormsociety.org.

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REFERENCES

1. Dillon AR, Brawner WR, Hanrahan L. Influence of number of parasites and exercise on the severity of heartworm disease in dogs. In: Soll MD, Knight DH (eds): Proceedings of the Heartworm Symposium '95. Batavia, IL: American Heartworm Society, 1995, p 113.
2. Fukami N, Hagio M, Okano S, et al. Influence of exercise on recovery of dogs following heartworm adulticide treatment with melarsomine, Recent Advances in Heartworm Disease: Symposium '98. Batavia, IL: American Heartworm Society, 1998, pp 225-227.
3. Lok JB, Knight DH, LaPaugh DA, Zhang Y. Kinetics of microfilaremia suppression in *Dirofilaria immitis*-infected dogs during and after a prophylactic regimen of milbemycin oxime. Proceedings of the Heartworm Symposium '92. Batavia, IL: American Heartworm Society, 1992, pp 143-149.
4. Courtney CH, Zeng QY, et al. The effect of chronic administration of milbemycin oxime and ivermectin on microfilaremias in heartworm-infected dogs. Recent Advances in Heartworm Disease: Symposium '98. Batavia, IL: American Heartworm Society, 1998, pp 193-199.
5. Neer TM, Hoskins JD. Clinical experience with ivermectin used as a microfilaricide and for prophylaxis in the dog. Proceedings of the Heartworm Symposium '89. Batavia, IL: American Heartworm Society, 1989, pp 95-97.
6. Blagburn BL, Paul AJ, et al. Safety of moxidectin canine SR (Sustained Release) injectable in ivermectin-sensitive collies and in naturally infected mongrel dogs. Recent Advances in Heartworm Disease: Symposium '01. Batavia, IL: American Heartworm Society, 2001, pp 159-163.
7. Dzimianki MT, McCall JW, et al. The safety of selamectin in heartworm infected dogs and its effect on adult worms and microfilariae. Recent Advances in Heartworm Disease: Symposium '01. Batavia, IL: American Heartworm Society, 2001.
8. McCall JW, Genchi C, Kramer L, et al. Heartworm and Wolbachia: Therapeutic implications Vet Parasitol. 2008;158:204-214 (Special issue: Heartworm Revisited - Selected papers presented at the 12th Triennial Heartworm Symposium 2007).
9. Bowman DD, Atkins CE. Heartworm biology, treatment, and control. Vet Clin North Am: Small Anim Pract. 2009;39(6):1127-1158.
10. Nelson CT, McCall JW, Rubin SB, et al. Diagnosis, Prevention, and Management of Heartworm (*Dirofilaria immitis*) Infection in Dogs (2010), accessed on 5 Aug, 2011 @ <http://heartwormsociety.org/veterinary-resources/canine-guidelines.html>.