

How to talk to clients about heartworm disease

Answers to pet owners' most commonly asked questions

Q: Why should my dog be tested for heartworm disease?

A: Transmitted by mosquitoes, heartworm disease has been found in dogs in all 50 of the United States. Once a dog is infected, heartworm larvae begin to mature and enter the pulmonary arteries and heart. While heartworm is both treatable and preventable, it is a serious and deadly disease that shows no signs in its early stage.

Q: How often should my dog be tested?

A: Heartworm screening should be performed annually. Yearly tests ensure that your dog is heartworm-free and preventives are working. And if your dog is infected, early detection can improve treatment outcomes. Also, heartworm preventives are nearly 100% effective when administered properly, but dogs on preventives sometimes test positive. There are many reasons for this, and regular testing is the only way to accurately determine infection status.

Q: What does it mean if my dog tests positive for heartworms?

A: A positive result from an antigen test indicates with a high degree of certainty that heartworms are in the pulmonary arteries or in the right chamber of the dog's heart. Most dogs can successfully be treated if infection is detected early enough. If infection is not treated, disease will progress and eventually cause death.

Q: I forgot to give my dog preventative the last two months. Should I be worried?

A: No, but you should resume preventive right away. Monthly preventives kill larvae that may have accumulated in your dog's body during the previous month. And most preventives have a retroactive "safety net" of one month that takes effect once dosing is resumed. If the lapse in preventive is 3–6 months or more, restart as soon as possible and have your dog retested within 7–12 months.

TAKE NOTE

It's important to recognize the risk of your pet contracting heartworm disease. Here's how:

Put your dog on preventive and test annually:

- Heartworm preventives are nearly 100% effective when administered properly.
- Regular testing ensures your dog is heartworm-free and preventives are working.

Watch for signs of heartworm disease, including:

- Coughing (**mild disease**)
- Coughing with exercise intolerance, abnormal lung sounds (**moderate disease**)
- Above signs with difficulty breathing, temporary loss of consciousness, swelling of the abdomen, enlargement of the liver (**serious disease**)
- Remember, early infection shows few if any signs

Take your dog to the veterinarian regularly and include a screening test during your dog's next annual visit. For more pet health information, go to dogsandticks.com.



Detecting heartworm infection early generally allows for a faster and more effective response to treatment.

Heartworm Disease

Dirofilaria immitis



59% of dog-owning households in the U.S. administer heartworm preventives.¹

What is heartworm disease?

Heartworm disease is a serious and potentially fatal condition caused by infection with the *Dirofilaria immitis* parasite. Parasitic larvae are transmitted through the bite of a mosquito carrying the infective stage of heartworm. Heartworms mature and migrate throughout the body, eventually inhabiting the arteries of the lungs and the right side of the heart. While it can cause serious health issues, even death, heartworm is both treatable and preventable.

Why is heartworm disease dangerous?

Mature heartworms interfere with a dog's blood flow and cause inflammation in and around the vessels of the heart. This can lead to a weakening of the heart muscle, affecting the heart's ability to pump blood. Other complications of the disease include liver and kidney failure. Any one of more of these health issues may lead to death.

What clinical signs should I watch for?

Most dogs won't show any sign of the infection during the early stages, making testing and preventives critical. Signs to watch for as the disease progresses include:

- Coughing (**mild disease**)
- Coughing with exercise intolerance, abnormal lung sounds (**moderate disease**)
- Cough, exercise intolerance, dyspnea (difficulty breathing), abnormal lung sounds, hepatomegaly (enlargement of the liver), syncope (temporary loss of consciousness due to poor blood flow to the brain), ascites (fluid accumulation in the abdominal cavity), abnormal heart sounds (**serious disease**)

Are tests available for heartworm disease?

There are several heartworm antigen tests you can choose from, each with varying degrees of sensitivity and accuracy. Only the SNAP® 4Dx® Test gives you the ability to screen four vector-borne diseases, including heartworm, with just one sample:

- Canine anaplasmosis (*Anaplasma phagocytophilum*)
- Lyme disease (*Borrelia burgdorferi*)
- Canine ehrlichiosis (*Ehrlichia canis*)
- Heartworm disease (*Dirofilaria immitis*)

Why is testing important?

Heartworm infection often shows no signs in dogs in the early stages. Testing is the only way to confirm infection status and determine whether treatment is necessary. Also, dogs on preventives sometimes test positive. Annual screening can help you determine if a patient is heartworm-free and whether preventives are working.

It is estimated that more than 1 million dogs throughout the United States are currently infected with heartworms.²

References:

1. Do you KNOW heartworms in cats?: new studies call for prevention & redefinition of heartworm disease in cats [news release]. Orlando, FL: American Heartworm Society; January 14, 2007. www.heartwormsociety.org/inthenews/1-14-07.html. Accessed March 23, 2010.
2. New canine heartworm guidelines released [news release]. Wilmington, DE: American Heartworm Society; February 15, 2010. www.heartwormsociety.org/inthenews/2-11-10.html. Accessed March 23, 2010.

How to talk to clients about canine anaplasmosis

Answers to pet owners' most commonly asked questions

Q: What is canine anaplasmosis?

A: Canine anaplasmosis is a disease that can be transmitted to your dog by the deer tick and the brown dog tick. There are two forms of the disease that both pose serious risks and can cause vomiting, diarrhea, and arthritis-like stiffness and pain. Canine anaplasmosis is also a common companion infection, or coinfection, with Lyme disease as the same types of ticks often carry the bacteria that cause both infections.

Q: Why should my dog be tested?

A: We recommend regular testing, preferably on an annual basis, because many dogs won't show any signs of disease for 21 days or more after initial infection. Regular testing gives us a chance to detect disease early, before serious signs appear, which has been shown to improve treatment and patient prognosis.

Q: How can I protect my dog from infection?

A: There's no available vaccine for canine anaplasmosis, but you can prevent infection by applying a tick-control product every month. Nothing will completely prevent the possibility of infection, so it's important to apply the product each and every month to reduce your dog's risk. Also, be sure to check your dog for ticks daily and remove any attached ticks immediately.

Q: How often should I have my dog tested?

A: Screening for exposure to canine anaplasmosis should be incorporated as part of annual heartworm testing.

Q: Can I get anaplasmosis from my dog?

A: No, if your dog is infected with anaplasmosis, they cannot transmit it to you. However, the same tick that infected your dog can also transmit disease directly to you or your family. It's important to take preventative measures for yourself and your family, including wearing protective clothing, performing frequent tick-checks and using tick-repellant products.

TAKE NOTE

It's important to recognize the risks of your pet contracting tick-borne diseases. Here's how:

Inspect your dog's coat for ticks daily:

- Feel for ticks or hard bumps.
- Remove ticks immediately. For removal procedures, go to dogsandticks.com.

Watch for signs of anaplasmosis infection, including:

- Arthritis-like stiffness with painful joints
- Fever accompanied by loss of appetite, vomiting and diarrhea
- Lethargy and/or depression
- Anorexia, weight loss
- Neurological signs resulting in seizures and neck pain (infrequent)

Take your dog to the veterinarian regularly and include a screening test during your dog's next annual visit. For more pet health information, go to dogsandticks.com.



Detecting canine anaplasmosis early generally allows for a faster and more effective response to treatment.

Canine Anaplasmosis

Anaplasma phagocytophilum
Anaplasma platys



It takes just 24–48 hours for an infected tick to transmit *Anaplasma* organisms to a dog.

What is canine anaplasmosis?

Canine anaplasmosis is a disease that is caused by the organisms *Anaplasma phagocytophilum*, which is transmitted by the deer tick, and *Anaplasma platys*, transmitted by the brown dog tick. Although *A. phagocytophilum* infection is generally more severe than *A. platys*, both forms of the disease pose serious risks to canine patients

Why is canine anaplasmosis dangerous?

Canine anaplasmosis is considered dangerous, in part, because infection often goes undiagnosed, according to Susan E. Little, DVM, PhD, DEVPC, professor of veterinary parasitology at Oklahoma State University. Many dogs only appear to recover from acute infection but can harbor a chronic infection. This can become severe if the dog is immunocompromised or coinfecting with other vector-borne disease.

What clinical signs should I watch for?

Associated clinical signs, including fever, depression, lethargy, weight loss, polyarthritis and thrombocytopenia, tend to mimic those of other tick-borne diseases. Therefore, it is difficult to establish a diagnosis based on clinical signs alone. Also, canine anaplasmosis is a common coinfection with Lyme disease and canine ehrlichiosis, which may cause an animal to present with more severe disease.

Are tests available for canine anaplasmosis?

The SNAP® 4Dx® Test is the only in-house test that screens four vector-borne diseases with just one sample:

- Canine anaplasmosis (*Anaplasma phagocytophilum*)
- Lyme disease (*Borrelia burgdorferi*)
- Canine ehrlichiosis (*Ehrlichia canis*)
- Heartworm disease (*Dirofilaria immitis*)

The SNAP 4Dx Test has also been shown to cross-react with *A. platys*. In a study by IDEXX, the SNAP 4Dx Test showed a positive result for *A. phagocytophilum* with serum from 10 of 10 dogs infected with a laboratory strain of *A. platys*.¹

Why is testing important?

According to Dr. Little, it's important to test for canine anaplasmosis because:

- Results are used to support initiation of antibiotic treatment to clear the infection (doxycycline at 5–10 mg/kg orally, twice daily for four weeks).
- Testing documents exposure to the disease agent in dogs, so practitioners can more fully assess the presence of a disease state.
- Testing also documents exposure to ticks, which can help team members successfully promote tick-control products to their clients.

Dogs exposed to the brown dog tick are at risk for developing a chronic infection, even if they appear healthy.

How to talk to clients about Lyme disease and canine anaplasmosis coinfection

Answers to pet owners' most commonly asked questions

Q: What is Lyme disease and canine anaplasmosis coinfection?

A: Ticks are able to transmit more than one disease-causing organism, which can result in multiple infections, or coinfection, in the same dog. Coinfection with Lyme and canine anaplasmosis is common as both diseases are spread by the same type of tick, the deer tick (often referred to as black-legged tick). While Lyme and canine anaplasmosis can be very serious health threats on their own, the combination of the two can pose significantly greater risk to your dog.

Q: Why should my dog be tested?

A: Coinfection with Lyme disease and canine anaplasmosis can be difficult to detect based on clinical signs alone. Testing is the only way to know for sure if your dog has been exposed. If they have been infected, testing can help determine the best course of treatment for your dog's individual health profile and provide a benchmark for monitoring progress.

Q: What does it mean if my dog tests positive for coinfection?

A: Infection does not necessarily indicate disease and additional testing may be required. If your dog does have active coinfection, there are a number of options to help treat and manage disease. And if infection is caught early enough, your dog will likely have a better response to treatment and an improved overall prognosis.

Q: How can I protect my dog from infection?

A: While vaccine is available to protect your dog from Lyme disease, there's no available vaccine for canine anaplasmosis. You can help prevent infection by applying a tick-control product every month. Nothing will completely prevent the possibility of infection, so be sure to apply the product each and every month. Also, be sure to check your dog for ticks daily and remove any attached ticks immediately.

TAKE NOTE

It's important to recognize the risks of your pet contracting tick-borne diseases. Here's how:

Inspect your dog's coat for ticks daily:

- Feel for ticks or hard bumps.
- Remove ticks immediately. For removal procedures, go to dogsandticks.com.

Watch for signs of Lyme disease and canine anaplasmosis coinfection, including:

- Arthritis-like stiffness with painful joints
- Fever accompanied by loss of appetite, vomiting and diarrhea
- Recurring lameness lasting 3–4 days with loss of appetite
- Lethargy and/or depression; weight loss
- Neurological signs resulting in seizures and neck pain (infrequent)

Take your dog to the veterinarian regularly and include a screening test during your dog's next annual visit. For more pet health information, go to dogsandticks.com.



Detecting Lyme disease and canine anaplasmosis coinfection early generally allows for a faster and more effective response to treatment.

Coinfection

Lyme disease
Canine anaplasmosis



A study found that of 621 naturally infected Lyme-positive canine samples collected from 2002–2004, 45.9% were also positive for canine anaplasmosis.¹

What is coinfection?

When ticks are able to transmit more than one disease-causing organism, it can result in multiple infections, or coinfection, in the same dog. Lyme disease is caused by infection with the bacterium *Borrelia burgdorferi*, and canine anaplasmosis is caused by *Anaplasma phagocytophilum*. In this case, the same types of tick carry both diseases: the deer or black-legged tick (*Ixodes scapularis*) and the western black-legged tick (*Ixodes pacificus*).

Why is coinfection with Lyme disease and canine anaplasmosis dangerous?

It's simple. When a dog contracts either Lyme disease or canine anaplasmosis alone, its immune system is more likely to suppress the disease. Dogs with seroreactivity to both *B. burgdorferi* and *A. phagocytophilum* may have two times the risk of developing clinical illness than singularly infected dogs.²

What clinical signs should I watch for?

Associated clinical signs can mimic those of other tick-borne diseases, making it difficult to establish a diagnosis based on clinical signs alone. Dogs with clinical signs of Lyme disease and canine anaplasmosis coinfection will likely present with the following:

- Fever
- Lethargy
- Anorexia
- Arthritis
- Lameness
- Swollen lymph nodes

Keep in mind that coinfection may cause an animal to present with more severe disease. Dogs with canine anaplasmosis may also present with red, swollen eyes and low platelet counts.

Are tests available for coinfection?

Yes. The SNAP® 4Dx® Test is the only in-house test that screens four vector-borne diseases with just one sample:

- Canine anaplasmosis (*Anaplasma phagocytophilum*)
- Lyme disease (*Borrelia burgdorferi*)
- Canine ehrlichiosis (*Ehrlichia canis*)
- Heartworm disease (*Dirofilaria immitis*)

The SNAP 4Dx Test has also been shown to cross-react with *A. platys*. In a study by IDEXX, the SNAP 4Dx Test showed a positive result for *A. phagocytophilum* with serum from 10 of 10 dogs infected with a laboratory strain of *A. platys*.¹

Ticks can transmit more than one disease-causing organism to a dog, resulting in multiple infections, or coinfection.

References:

1. Data on file at IDEXX Laboratories, Inc. Westbrook, Maine USA.
2. Beall MJ, Chandrashekar R, Eberts MD, et al. Serological and molecular prevalence of *Borrelia burgdorferi*, *Anaplasma phagocytophilum*, and *Ehrlichia* species in dogs from Minnesota. *Vector-Borne Zoonotic Dis.* 2008;8(4):455–464.

How to talk to clients about canine monocytic ehrlichiosis



Detecting the infection early generally allows for a faster and more effective response to treatment.

Answers to pet owners' most commonly asked questions

Q: What does it mean if my dog tests positive for canine monocytic ehrlichiosis?

A: A positive result on the SNAP® 3Dx® Test or the SNAP® 4Dx® Plus Test means your dog has been exposed to *Ehrlichia* and may be infected with *Ehrlichia canis* bacteria. **Additional tests are needed to determine if your dog has an active infection requiring treatment.**

Q: Do people get this disease? Can I get it from my dog?

A: No, you cannot get an *E. canis* infection from your dog. While it is possible for people to be infected with other types of *Ehrlichia* bacteria, it is uncommon for an *E. canis* infection to occur in humans.

Q: What is my pet's health outlook now that he has been exposed?

A: Exposure does not indicate active infection, and additional testing is needed to determine whether or not treatment is required. Detecting the infection early generally allows for a faster and more effective response to treatment.

Q: How often should I have my dog tested?

A: Screening for exposure to *E. canis* should be incorporated as part of annual heartworm testing.

Q: My dog was positive last year. What should I do this year?

A: In areas where the brown dog tick is common, reexposure and reinfection are possible even in dogs with antibodies to *E. canis*. Basic blood work will help to identify dogs that are reinfected, and treatment is only recommended for those dogs with evidence of active infections.

TAKE NOTE

It's important to recognize the risks of your pet contracting tick-borne diseases. Here's how:

Inspect your dog's coat for ticks daily:

- Feel for ticks or hard bumps.
- Remove ticks immediately. For removal procedures, go to dogsandticks.com.

Watch for signs of *E. canis* infection, including:

- Lameness, reluctance to move or exercise
- Swollen or painful joints
- Lack of energy or depression
- Loss of weight or appetite
- Vomiting, diarrhea

Take your dog to the veterinarian regularly and include a screening test during your dog's next annual visit. For more pet health information, go to dogsandticks.com.

Canine Monocytic Ehrlichiosis

Ehrlichia canis



Canine ehrlichiosis is the second most common infection in the U.S.¹

What is canine monocytic ehrlichiosis?

Sometimes referred to as tick fever, canine monocytic ehrlichiosis is caused by infection with *Ehrlichia canis* bacteria transmitted by the brown dog tick (*Rhipicephalus sanguineus*). *Ehrlichia* are gram-negative bacteria that infect and multiply in white blood cells (primarily monocytes).

Why is canine monocytic ehrlichiosis dangerous?

E. canis infection alters the dog's ability to clot and puts a strain on the bone marrow where blood cells are produced. It can be fatal in both acute and chronic forms. Over time, canine monocytic ehrlichiosis can cause the bone marrow to fail, resulting in a deficiency of red cells, white cells and platelets. Dogs with more severe clinical signs resulting from canine monocytic ehrlichiosis are typically more difficult to treat.

What clinical signs should I watch for?

Canine monocytic ehrlichiosis can be mild or severe, acute or chronic, with varying clinical signs that include:

- Discharge from eyes and nose
- Depression and loss of appetite
- Enlarged lymph nodes, spleen and liver
- Muscle and joint pain, lameness
- Bruising, nose bleeds or severe blood loss

Clinical signs can also be limited to changes in blood only, so it is important to note that apparently healthy dogs with no outward signs could be infected with *E. canis*.

Are tests available for canine monocytic ehrlichiosis?

Yes, the SNAP® 3Dx® Test and the SNAP® 4Dx® Plus Test, simple, in-house blood tests, can determine if a dog has been exposed to *E. canis*. However, additional tests, such as a complete blood count (CBC) and clinical chemistry profile, are needed to identify underlying abnormalities of infection. Polymerase chain reaction (PCR) tests may also be helpful in identifying an active infection in sick dogs.

Why should dogs be tested?

Transmission of *E. canis* is common in the southern half of the United States. Dogs exposed to the brown dog tick are at risk for developing a chronic infection, even if they appear outwardly healthy. Regular testing ensures that chronic infections won't go undetected, potentially becoming more difficult to treat.

Can canine monocytic ehrlichiosis be prevented?

Currently, there is no vaccine available for ehrlichiosis. Topical tick-control products remain the key to preventing canine ehrlichiosis, as well as performing regular tick checks. Controlling ticks in and around the home can also minimize exposure to infection.

Dogs exposed to the brown dog tick are at risk for developing a chronic infection, even if they appear healthy.

How to talk to clients about canine granulocytic ehrlichiosis



Detecting the infection early generally allows for a faster and more effective response to treatment.

Answers to pet owners' most commonly asked questions

Q: What does it mean if my dog tests positive for canine granulocytic ehrlichiosis?

A: A positive result on the SNAP® 4Dx® Plus Test means your dog has been exposed to *Ehrlichia* and may be infected with *Ehrlichia ewingii* bacteria. Additional tests are needed to determine if your dog has an active infection requiring treatment.

Q: Do people get this disease? Can I get it from my dog?

A: No, you cannot get an *E. ewingii* infection from your dog. The lone star tick can transmit *E. ewingii* to people and, more significantly, *Ehrlichia chaffeensis*, the causative agent of human monocytic ehrlichiosis.

Q: What is my pet's health outlook now that he has been exposed?

A: Exposure does not indicate active infection, and additional testing is needed to determine whether or not treatment is required. Detecting the infection early generally allows for a faster and more effective response to treatment.

Q: How often should I have my dog tested?

A: Screening for exposure to *E. ewingii* should be incorporated as part of annual heartworm testing.

Q: My dog was positive last year. What should I do this year?

A: In areas where the lone star tick is common, reexposure and reinfection are possible even in dogs with antibodies to *E. ewingii*. Basic blood work will help to identify dogs that are reinfected, and treatment is only recommended for those dogs with evidence of active infections.

TAKE NOTE

It's important to recognize the risks of your pet contracting tick-borne diseases. Here's how:

Inspect your dog's coat for ticks daily:

- Feel for ticks or hard bumps.
- Remove ticks immediately. For removal procedures, go to dogsandticks.com.

Watch for signs of *E. ewingii* infection, including:

- Lameness, reluctance to move or exercise
- Swollen or painful joints
- Lack of energy or depression
- Loss of weight or appetite

Take your dog to the veterinarian regularly and include a screening test during your dog's next annual visit. For more pet health information, go to dogsandticks.com.

Canine Granulocytic Ehrlichiosis

Ehrlichia ewingii



Canine ehrlichiosis is the second most common infection in the U.S.¹

What is canine granulocytic ehrlichiosis?

Canine granulocytic ehrlichiosis is caused by infection with *Ehrlichia ewingii* bacteria transmitted by the lone star tick (*Amblyomma americanum*). *Ehrlichia* are gram-negative bacteria that infect and multiply in white blood cells (predominantly neutrophils).

Why is canine granulocytic ehrlichiosis dangerous?

Infection with *E. ewingii* may lead to a decrease in the dog's platelets, which are important in the formation of blood clots, and the infection may produce marked joint pain or central nervous system signs.

What clinical signs should I watch for?

Canine granulocytic ehrlichiosis can be inapparent, mild or severe and typically acute, with varying clinical signs that include:

- Depression and loss of appetite
- Weight loss
- Joint pain, lameness
- Head tilt or tremors

Clinical signs can also be limited to changes in blood only, so it is important to note that apparently healthy dogs with no outward signs could be infected with *E. ewingii*.

Are tests available for canine granulocytic ehrlichiosis?

Yes, the SNAP® 4Dx® Plus Test, a simple, in-house blood test, can determine if a dog has been exposed to *E. ewingii*. However, additional tests, such as a complete blood count (CBC) and clinical chemistry profile, are needed to identify underlying abnormalities of infection. Polymerase chain reaction (PCR) tests may also be helpful in identifying an active infection.

Why should dogs be tested?

Transmission of *E. ewingii* is common in the south central and southeastern portions of the United States. Dogs exposed to the lone star tick are at risk for developing an infection, even if they appear outwardly healthy. Regular testing ensures that persistent or recurrent infections won't go undetected.

Can canine granulocytic ehrlichiosis be prevented?

Currently, there is no vaccine available for ehrlichiosis. Topical tick-control products remain the key to preventing canine ehrlichiosis, as well as performing regular tick checks. Controlling ticks in and around the home can also minimize exposure to infection.

Dogs exposed to the lone star tick are at risk of harboring a persistent infection, even if they appear healthy.