



CHW Ag/Anaplasma Ab/E.canis Ab/Lyme Ab Test Kit

Canine Heartworm Ag/*Anaplasma* Ab/*Ehrlichia canis* Ab/Lyme Ab test kit

AI38



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CHW Ag/Anaplasma Ab/E.canis Ab/Lyme Ab Test Kit

Canine Heartworm Ag/Anaplasma Ab/Ehrlichia canis Ab/Lyme Ab test kit

Catalog number	AI38
Summary	Detection of Canine <i>Dirofilaria immitis</i> antigens, Anaplasma antibodies, E.canis antibodies and Lyme antibodies within 10 minutes
Principle	One-step immunochromatographic assay
Detection Targets	CHW Ag : <i>Dirofilaria immitis</i> antigens Anaplasma Ab : Anaplasma antibodies E. canis Ab : <i>E. canis</i> antibodies Lyme Ab : <i>burgdorferi Borrelia</i> (Lyme) antibodies
Sample	Canine Whole Blood, Plasma or Serum
Reading time	10 minutes

Test kit	Sensitivity	Specificity	Detection Limit
CHW Ag	99.0 % vs. PCR	100.0 % vs. PCR	Heartworm Ag 0.1ng/ml
Anaplasma Ab	100.0 % vs. IFA	100.0 % vs. IFA	IFA Titer 1/16
E. canis Ab	97.7 % vs. IFA	100.0 % vs. IFA	IFA Titer 1/16
Lyme Ab	100.0 % vs. IFA	100.0 % vs. IFA	IFA Titer 1/8

Quantity	1 box (kit) = 10 devices (Individual packing)
Contents	Test kit, Buffer tube, and Disposable dropper
Storage	Room Temperature (at 2 ~ 30°C)
Expiration	24 months after manufacturing
Caution	Use within 10 minutes after opening Use appropriate amount of sample (0.01 ml of a dropper) Use after 15~30 minutes at RT if they are stored under cold circumstances Consider the test results as invalid after 10 minutes

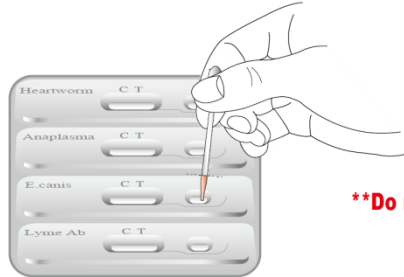
Instruction for CHW Ag/Anaplasma Ab/E.canis Ab/Lyme Ab test



Sample fill line (black line) : 1 drop (10 μ l)

1

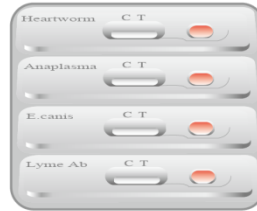
Sampling & loading



1 drop of sample
**Do not overload the sample !!

2

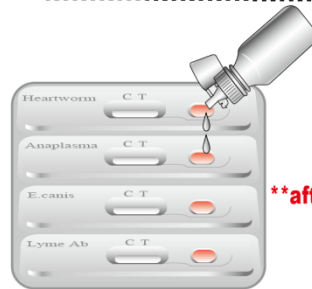
Absorption



Wait for complete absorption

3

Buffer addition

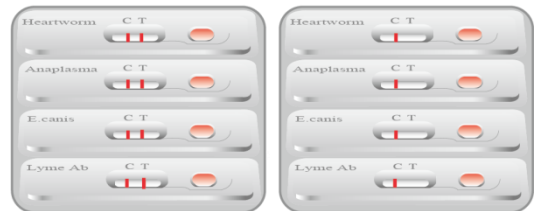


2 drops of buffer
**after complete absorption

4

Reading

00:05:00-00:10:00



Read the result 10 min

5

Discard



Discard the used device
In valid result after 10 min



Canine Heartworm

Infection route of canine heartworm



A dog having canine heartworm, microfilariae, in blood is bitten by mosquito. Then, the mosquito carries the heartworm's larva in the blood from the dog.

2~3 weeks later, the larva grows able to infect other dogs.

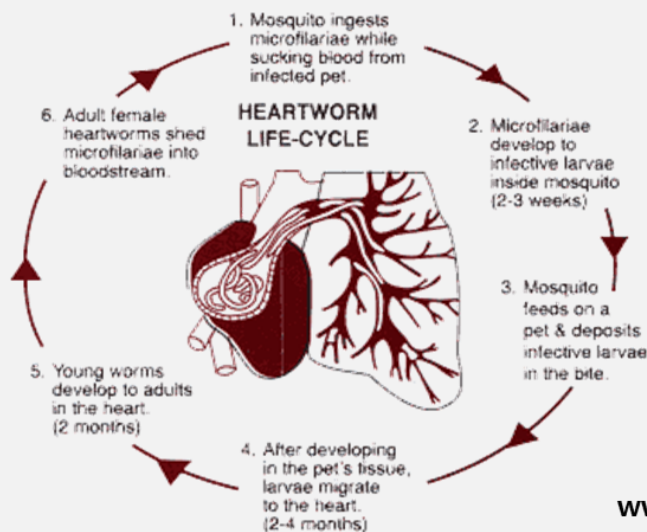


When the mosquito bites another dog, the infectious larva is transmitted into the dog. After penetrating the skin and growing in the tissues for several months, the heartworm enters the heart of the dog.



When in the heart, the heartworm grows 14 inches in length, doing severe harm to the heart, lung, and other critical organs and, in the end, causing the death if not treated properly.

www.avma.org



www.speedwayvet.com

Canine Heartworm

Information

Adult heartworms grow several inches in length and reside in the pulmonary arteries where it can obtain enough nutrients. The heartworms inside the arteries trigger inflammation and form hematoma. The heart, then, should pump more often than before as the heartworms increase in number, blocking the arteries.

When infection deteriorates (over 25 heartworms exist in a 18 kg dog), the heartworms move into the right atrium, blocking the flow of blood.

When the number of heartworms reaches more than 50, they could occupy atriums and ventricles.

When infected with over 100 heartworms in the right part of the heart, the dog loses the function of the heart and eventually dies. This fatal phenomenon is called as "Caval Syndrom."

Unlike other parasites, the heartworms lay small insects called as microfilaria. Microfilaria in mosquito moves into a dog when the mosquito sucks blood from the dog. The heartworms that can survive in the host for 2 years die if they do not move into another host within that period. The parasites residing in a pregnant dog can infect its embryo.

Early examination of heartworms is very important in eliminating them. Heartworms go through several steps such as L1, L2, L3 including the transmission stage through mosquito to become adult heartworms.



Canine Heartworm

Heartworms in mosquito

Microfilaria in mosquito grows into L2 and L3 parasites able to infect dogs in several weeks. The growth depends on the weather. Favorable temperature for the parasite is over 13.9°C.

When an infected mosquito bites a dog, microfilaria of L3 penetrates into its skin. In the skin, the microfilaria grows into L4 for 1~2 weeks. After residing in the skin for 3 months, L4 develops into L5, which moves into blood.

L5 as the form of adult heartworm enters the heart and pulmonary arteries where 5~7 months later heartworms lay insects.



Canine Heartworm

Diagnosis

The disease history and clinical data of a sick dog, and various diagnostic methods should be considered in diagnosing the dog. For example, X-ray, ultrasound scan, blood examination, detection of microfilaria and, in worst case, autopsy are required.

Serum examination;

Detection of antibodies or antigens in the blood

Antigen examination;

This focuses on detecting the specific antigens of female adult heartworms. The examination is carried out in the hospital and its success rate is high. Test kits available on the market are designed to detect 7~8 month-old adult heartworms so that heartworms younger than 5 months are hard to detect.

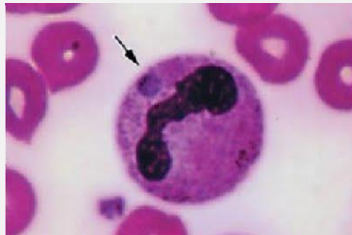
Treatment

The infection of heartworms is successfully cured in most cases. To eliminate all heartworms, the use of medicines is the best way. Early detection of the heartworms raises the success rate of the treatment. However, in the late stage of infection, complication can occur, making the treatment more difficult.

Anaplasma Phagocytophilum

Information

The bacterium *Anaplasma phagocytophilum* (formerly *Ehrlichia phagocytophila*) may cause infection in several animal species including human. The disease in domestic ruminants is also called tick-borne fever (TBF), and has been known for at least 200 years. Bacteria of the family Anaplasmataceae are gram-negative, nonmotile, coccoid to ellipsoid organisms, varying in size from 0.2 to 2.0µm diameter. They are obligate aerobes, lacking a glycolytic pathway, and all are obligate intracellular parasites. All species in the genus *Anaplasma* inhabit membrane-lined vacuoles in immature or mature hematopoietic cells of mammalian host. *Anaplasma phagocytophilum* infects neutrophils and the term granulocytotropic refers to infected neutrophils. Rarely organisms, have been found in eosinophils.



Anaplasma phagocytophilum

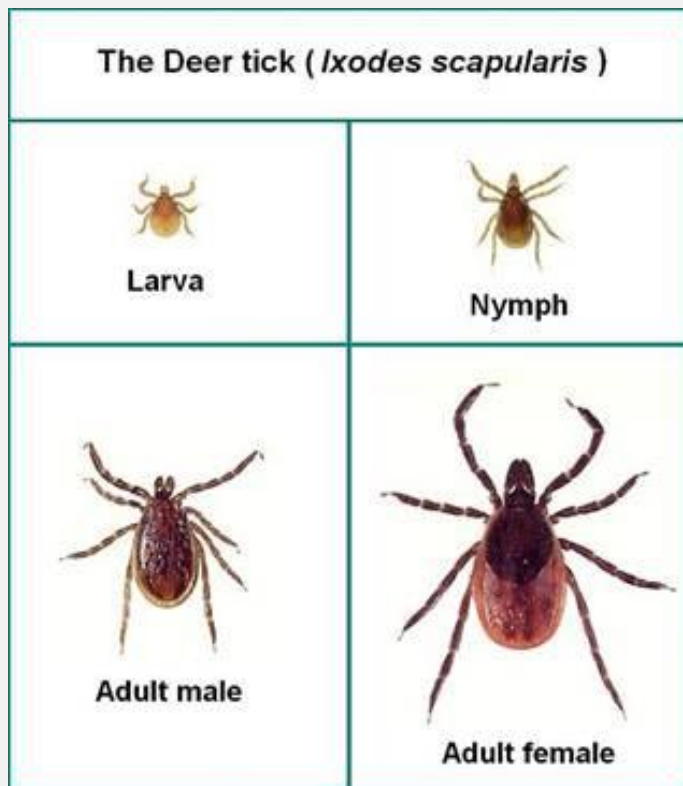
Symptoms

Common clinical signs of canine anaplasmosis include high fever, lethargy, depression and polyarthrits. Neurologic signs (ataxia, seizures and neck pain) can also be seen. *Anaplasma phagocytophilum* infection is seldom fatal unless complicated by other infections. Direct losses, crippling conditions and production losses have been observed in lambs. Abortion and impaired spermatogenesis in sheep and cattle have been recorded. The severity of the infection is influenced by several factors, such as variants of *Anaplasma phagocytophilum* involved, other pathogens, age, immune status and condition of the host, and factors such as climate and management. It should be mentioned that clinical manifestations in humans range from a mild self-limited flu-like illness, to a life-threatening infection. However, most human infections probably result in minimal or no clinical manifestations.

Anaplasma Phagocytophilum

Transmission

Anaplasma phagocytophilum is transmitted by ixodid ticks. In the United States the principal vectors are *Ixodes scapularis* and *Ixodes pacificus*, while *Ixodes ricinus* has been found to be the main exophilic vector in Europe. *Anaplasma phagocytophilum* is transstadially transmitted by these vector ticks, and there is no evidence of transovarial transmission. Most studies to date that have investigated the importance of mammalian hosts of *A. phagocytophilum* and its tick vectors have focused on rodents but this organism has a wide mammalian host range, infecting domesticated cats, dogs, sheep, cows, and horses.



Anaplasma Phagocytophilum

Diagnosis

Indirect immunofluorescence assay is the principal test used to detect infection. The acute and convalescent phase serum samples can be evaluated to look for a four-fold change in antibody titer to *Anaplasma phagocytophilum*. Intracellular inclusions (morulea) are visualized in granulocytes on Wright or Gimsa stained blood smears. Polymerase chain reaction(PCR) methods are used to detect *Anaplasma phagocytophilum* DNA.

Prevention

No vaccine is available to prevent *Anaplasma phagocytophilum* infection. Prevention relies on avoidnig exposure to the tick vector (*Ixodes scapularis*, *Ixodes pacificus*, and *Ixode ricinus*) from spring through fall, prophylatic use of antiacaricides, and prophylactic use of doxycycline or tetracycline when visiting *Ixodes scapularis*, *Ixodes pacificus*, and *Ixode ricinus* tick-endemic regions.

Ehrlichia canis

Information

Ehrlichia canis is a small and rod shaped parasites transmitted by the brown dog tick, *Rhipicephalus sanguineus*. *E. canis* is the cause of classical ehrlichiosis in dogs. Dogs may be infected by several *Ehrlichia* spp. but the most common one causing canine ehrlichiosis is *E. canis*.

E. canis has now been known to have spread all over the United States, Europe, South America, Asia and the Mediterranean.

Infected dogs that are not treated can become asymptomatic carriers of the disease for years and eventually die from massive hemorrhage.



Female *Rhipicephalus sanguineus*.
http://webpages.lincoln.ac.uk/fruedisuelli/FR-webpages/parasitology/Ticks/TIK/tick-key/background_rhipicephalus.htm



Ehrlichia canis seen in a membrane-bound inclusions (morulae) within the cytoplasm of a monocyte.
<http://www.vet.uga.edu/VPP/clerk/Bockino/>

Symptoms

Ehrlichia canis infection in dogs is divided into 3 stages;

ACUTE PHASE: This is generally a very mild phase. The dog will be listless, off food, and may have enlarged lymph nodes. There may be fever as well but rarely does this phase kill a dog. Most clear the organism on their own but some will go on to the next phase.

SUBCLINICAL PHASE: In this phase, the dog appears normal. The organism has sequestered in the spleen and is essentially hiding out there.

CHRONIC PHASE: In this phase the dog gets sick again. Up to 60% of dogs infected with *E. canis* will have abnormal bleeding due to reduced platelets numbers. Deep inflammation in the eyes called "uveitis" may occur as a result of the long term immune stimulation. Neurologic effects may also be seen.

Ehrlichia canis

Diagnosis and treatment

Definitive diagnosis of *Ehrlichia canis* requires visualization of morula within monocytes on cytology, detection of *E. canis* serum antibodies with the indirect immunofluorescence antibody test (IFA), polymerase chain reaction (PCR) amplification, and/or gel blotting (Western immunoblotting).

The mainstay of prevention of canine ehrlichiosis is tick control. The drug of choice for treatment for all forms of ehrlichiosis is doxycycline for at least one month. There should be dramatic clinical improvement within 24-48 hours following initiation of treatment in dogs with acute-phase or mild chronic-phase disease. During this time, platelet counts begin to increase and should be normal within 14 days after initiation of treatment.

After infection, it is possible to become re-infected; immunity is not lasting after a previous infection.

Prevention

The best prevention of ehrlichiosis is to keep dogs free of ticks. This should include checking the skin daily for ticks and treating dogs with tick control. Since ticks carry other devastating diseases, such as Lyme disease, anaplasmosis and Rocky Mountain spotted fever, it's important to keep dogs tick-free.

Canine Lyme

Information

Lyme disease is caused by a bacteria called *Borrelia burgdorferi*, which is passed to dogs through a bite from the deer tick. The tick must remain attached to the dog's skin for one to two days before the bacteria can be transmitted. Lyme disease can be a multi-systemic illness, with signs that may include fever, swollen lymph nodes, lameness, loss of appetite, heart disease, inflamed joints, and kidney disease. Disorders of the nervous system, while uncommon, may occur as well. A vaccine is available to prevent dogs from developing Lyme disease, although some controversy exists regarding its use. An owner should consult with a veterinarian for vaccine recommendations. Without treatment, Lyme disease causes problems in many parts of the dog's body, including the heart, kidneys, and joints. On rare occasions, it can lead to neurological disorders. Lyme disease most commonly is associated with symptoms such as a high fever, swollen lymph nodes, lameness, and a loss of appetite.



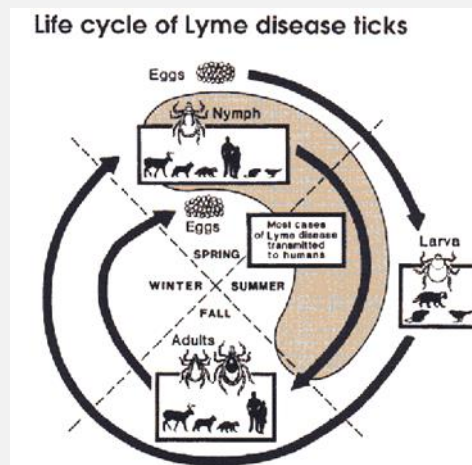
Ixodes ticks: larva, nymph, adult male, adult female.

Canine Lyme

Transmission

It is common knowledge among most pet owners that Lyme Disease is most frequently transmitted to a dog from a bite by an infected tick. Ticks use their forelegs to attach to a passing host, and then proceed to penetrate the skin in order to obtain a blood meal. A common infected host that could possibly pass *Borrelia burgdorferi* to a deer tick is the white-footed mouse. It is possible for a tick to retain this bacteria for its entire lifetime without becoming sick itself.

When an infected tick attaches to your dog, it needs to prevent the blood from clotting in order to keep feeding. To do this, the tick injects special enzymes on a regular basis into your dog's body to prevent clotting. By 24-48 hours, the bacteria from the tick's mid-gut is transmitted into the dog through the tick's mouth. If the tick is removed before this time, the chances of a dog being infected by Lyme Disease are relatively low.



Symptoms

Dogs with canine Lyme disease will show a variety of symptoms. One of the main symptoms is limping, usually with one of his forelegs. This limping will hardly be noticeable at first, but will get much worse within three to four days. Dogs with canine Lyme disease will also have swelling in the lymph nodes of the affect limb. Many dogs will also have a high fever and a loss of appetite.

Canine Lyme

Diagnosis and treatment

Blood tests are available to assist in the diagnosis of Lyme disease. The standard blood test detects antibodies made by the dog in response to infection with *B. burgdorferi*. Many dogs show positive test results, but are not actually infected with the disease. A new specific ELISA recently developed and approved for use in dogs also appears to be able to differentiate among naturally infected dogs, vaccinated dogs, and dogs with cross-reacting antibodies secondary to other disease.

Dogs with canine Lyme disease will generally begin to recover within three days of being given treatment. In some cases, the disease may recur within a few weeks or months. If this happens, the dog will have to take another round of antibiotics for an extended period of time.

Prognosis and prevention

Dogs should begin to show signs of recovery two to three days after beginning treatment. However, the disease may recur within a few weeks or months; in these cases, the dog will need to return to antibiotic therapy for extended periods.

There is a vaccine for the prevention of Lyme disease. Quick removal of a tick also will help prevent Lyme disease because the tick must remain attached to the dog's body for one to two days before the disease can be transmitted. Consult with a veterinarian about the different tick prevention products that are available, as they can be an effective way to prevent the disease.