



TEST SERVICE UPDATE: 4DX Plus Testing

Introduction

Responding to client request, Phoenix is now offering the 4Dx Plus test. This test detects antigens to *Dirofilaria immitis* and antibodies to *Borrelia burgdorferi*, *Anaplasma phagocytophilum*/*Anaplasma platys* and *Ehrlichia canis*/*Ehrlichia ewingii*. The test methodology does not allow distinction between the species of *Anaplasma* but *A. platys* is uncommon in our area and positives most likely are due to *A. phagocytophilum*. In the sick patient, the 4Dx Plus Test will help identify tick borne disease when assessed in conjunction with history, physical exam findings, routine laboratory testing and travel history. After a tick bite, time to seroconversion varies with the infectious agent and the patient. Testing with the 4DX Plus test eight weeks post bite is a practical time to determine exposure and possible infection. A positive titer will identify tick exposure, and perhaps need for additional tick prevention, but it will not identify disease. It is not recommended to treat an asymptomatic pet with normal blood work that has a positive titer.

4DX Plus Test Code: 387	Price: please call	Turn Around: Daily AM/PM
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Regional Prevalence

Anaplasma phagocytophilum is carried by *Ixodes pacificus* or the Western black legged tick in the Pacific Northwest. We frequently see morulae of *A. phagocytophilum* in neutrophils, concurrently with thrombocytopenia, during the acute stage of Anaplasmosis. *Ehrlichia canis*, the agent of monocytic ehrlichiosis, is primarily carried *Rhipicephalus sanguineus*, the Brown dog tick and less frequently, *Dermacenter variabilis*, the America dog tick. Despite the presence of these two ticks in our area, *Ehrlichia canis* is rarely seen in dogs that do not have travel history. *Ehrlichia canis* is common in other areas particularly the South and Southeastern United States, Mexico and South America. *Anaplasma platys* is also carried by *Rhipicephalus sanguineus*. It is uncommon in our area.

Ehrlichia ewingii, the cause of granulocytic ehrlichiosis in dogs and humans, is carried by *Amblyomma americanum*, the Lone Star tick, which is not present in our area.

Clinical Diagnosis

Polymerase chain reaction (PCR) testing for *Anaplasma phagocytophilum* and *Ehrlichia canis* can help identify early infections before a titer is positive. A positive PCR test will also confirm that a positive titer is due to active infection and not simply exposure. However, a negative PCR result does not rule-out infection. In dogs with travel history and chronic ehrlichiosis, which we see more often in our area, serology and not PCR is the diagnostic test of choice. PCR testing is usually negative in chronic ehrlichiosis.

The 4Dx Plus Test for *Borrelia burgdorferi*, which is based on a C6 ELISA, is not affected by vaccination. Positive results however do not equate with Lyme Disease, particularly in areas of low prevalence. Whether or not to diagnose a dog for Lyme Disease with a positive titer depends on clinical and



laboratory findings, including urinalysis and urine protein:creatinine ratio (UPC). Following a positive result for *Borrelia* on the 4Dx Plus Test, additional serology can be done to quantitate the antibody response but even then, experts stress the importance of clinical signs and laboratory findings in deciding whether to treat for Lyme Disease. UPC can be monitored if initial results are normal. PCR testing for *Borrelia burgdorferi* is not helpful as the organism is found in tissues and rarely in circulation. *Borrelia burgdorferi*, the agent of Lyme disease, is also carried by *Ixodes pacificus*.

Quantitative serology using immunofluorescent antibody (IFA) is recommended when the 4Dx Plus Test is positive for Ehrlichiosis. Acute and convalescent IFA serology is the gold standard to distinguish active infection from exposure particularly in an area endemic for *Ehrlichia canis*. In the Pacific Northwest, most cases of ehrlichiosis are chronic, the dogs having originated from endemic areas months to years before presentation for illness, and a single positive titer in conjunction with laboratory testing is generally sufficient for diagnosis.



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