

Questions Related to Interpretation of the IDEXX Snap[®]4DXPlus[®] assay

For diagnosis of Lyme Borrelia (*Borrelia burgdorferi*) and Heartworm (*Dirofilaria immitis*), the VBDDL makes use of a commercially available ELISA based kit manufactured by IDEXX Corp. This kit also is useful for the detection of antibodies against *Anaplasma* spp (*A. phagocytophilum* and *A. platys*) as well as *Ehrlichia* spp (*E. canis*, *E. ewingii* and cross-reactive other *Ehrlichia* spp. has been documented) in serum or EDTA whole blood obtained from dogs. The analytes used to detect *Anaplasma* and *Ehrlichia* spp do not distinguish the causative species, but can be used to indicate exposure to tick bites that have exposed the host dog to pathogens of these genera. IDEXX Corp has modified the kits over time from the 3DX that detects Lyme Borrelia, Heartworm and *E. canis* to the 4DX platform that added a peptide that detects *Anaplasma* spp. A third format Snap[®]4DXPlus[®] has expanded the *Ehrlichia* component to include detection of antibodies to *E. ewingii*. Many dogs previously negative in the 4DX kit from *E. ewingii* endemic regions are now testing positive in the Snap[®]4DXPlus[®]. PCR can be used in conjunction with serology to distinguish causative agents in active infections.

The test, as designed, is intended to be used as a screening test, not a diagnostic test. For this reason, the test does not detect low antibody titers (ie most IFA titers below 1:256 will result in a negative kit result). As a screening test, occasional false positive test results should be anticipated and can be clarified by IFA testing in the case of *E. canis* or by PCR testing. Failure to provide a specific antibody titer (an indication of antibody concentration) is one disadvantage of the Snap[®]4DXPlus[®] test as compared to IFA testing.

Treatment: Historically, when veterinarians tested only sick dogs, the presence of antibody appeared to correlate with active infection, regardless of the level of the antibody titer. This may not be true in a healthy dog population. If a positive *Anaplasma* or *Ehrlichia* Snap[®]4DXPlus[®] antibody test were obtained on a healthy dog, examination of a complete blood count is recommended prior to treatment. If the dog is anemic, neutropenic, thrombocytopenic or hyperglobulinemic, then treatment with doxycycline 5-10mg/kg every 12 hours for 28 days would be recommended. If complete blood count values are within normal reference ranges, treatment may not be indicated. Current infection status of the dog can be determined by PCR testing for *Anaplasma* and *Ehrlichia* spp. Although our experience to date is limited, some dogs may remain Snap[®]4DXPlus[®] test positive for years after the initial positive test result and following appropriate treatment with doxycycline. This observation should be considered when repeating an annual test on a dog that was previously Snap[®]4DXPlus[®] positive.

In healthy dogs, *B. burgdorferi*, *Anaplasma* and *Ehrlichia* test results should be recorded in the patient record. This information would be useful to the clinician if the dog develops compatible disease manifestations at some future time.

The heartworm component of the Snap[®]4DXPlus[®] kit detects the presence of *Dirofilaria immitis* adult worms in circulating blood and therefore indicates the need for appropriate treatment and management.

References:

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