

Feline Heartworm Tests Revisited

Lab Locations:

Atlanta, GA

Chicago, IL

Dallas/Fort Worth, TX

Honolulu, HI

Houston, TX

Los Angeles, CA

Memphis, TN

New York, NY

Phoenix, AZ

Portland, OR

San Francisco, CA

Tampa, FL

This newsletter reprints information from the June, 1988 Antech News in preparation for the upcoming heartworm season. In the last 12 months, the Antech East Coast Laboratory on Long Island tested an average of 1,044 cats per month for feline heartworm disease, with the peak testing months being March-October, 1998. The highest number of cats screened was in July (1,460) and August (1,311), 1998.

Diagnostic tests available for feline heartworm disease include those which detect antibodies against heartworm larvae or adults, and tests for antigen released by adult female heartworms. Heartworm antibody tests typically become positive 2-3 months after infection with heartworm larvae, whereas antigen tests detect current infections with adult female heartworms.

Accurate diagnostic testing is especially important given the low prevalence of heartworm disease in cats, frequent lack of symptoms, or variable nonspecific clinical signs of pulmonary, neurologic or other disease. Results of an assessment by McCall et al of data on feline heartworm testing from 3 laboratories are summarized below:

Sensitivity and specificity of several feline heartworm serologic tests were compared using serum samples collected serially from 42 laboratory cats experimentally infected with heartworms (n = 33), gastrointestinal hematomes (n = 6) or lungworms (n = 3). The 33 cats with *Dirofilaria immitis* infection were sampled before and 1, 2, 3, 5 and 6-9 months afterwards. The 6 cats with GI parasites (tapeworms, roundworms and hookworms) were tested beforehand and 4 times afterwards, whereas the 3 cats infected with lungworms were assessed prior to and 1 and 2 months afterwards. Three sets of split serum samples from 233 bleedings of these cats were submitted for

in-house feline heartworm antibody and antigen testing to laboratories A, B and C*.

Of the 42 preinfection samples, all were negative with each of the three test labs. All three laboratories detected **heartworm antibody** with a high degree of sensitivity (97-100% at three months post-infection, and 100% thereafter). At two months post-infection, lower sensitivity results were found [85% (lab C), 64% (lab B) and 27% (lab A)]. Only the tests measured at labs C and B detected infection at one month (24-30%), indicating increased sensitivity for early exposure. None of the samples from cats infected with GI parasites was positive at lab C, however, 1 of 23 samples from cats with GI parasites was positive at both labs A and B. The six samples from cats with lungworm infection were negative at all 3 labs.

With respect to **heartworm antigen testing**, samples were evaluated at labs A and B only. Sixty-three percent of cats with adult heartworms present at necropsy were antigen test-positive 6-9 months post infection at lab A, whereas 100% were antigen test-positive at lab B. For cats with no heartworms at necropsy, all 40 samples were antigen test-negative at lab A (specificity 100%), whereas 4 of 42 were antigen test-positive at lab B (specificity 90%). None of the pre-infection, GI parasites or lungworm infected cat samples were positive for heartworm antigen.

Feline Heartworm Tests

East/Test Express . . . West

Test codes: **Antibody** #568 #15
Antigen #570 #16
Ab/Ag Combo . . #572 #17
Specimen requirement Serum (0.5 ml)
Turnaround time Monday - Friday

*Lab A, Heska Corp., Ft. Collins, CO; Lab B, Animal Diagnostics, Inc., St. Louis, MO; Lab C, Antech Diagnostics, using reagents from Hansen Immunologics.

Reference: McCall et al, Triennial Meeting, American Heartworm Society, Tampa, FL, May 1-3, 1998, abstr.

Note: *With the heartworm season approaching, please remember the preferred specimen for heartworm testing is a Red Top tube. Lavender Top tubes can cause false positives.*

Feline Heartworm Tests: Diagnostic Summary

Antibody Tests

- Detection of heartworm antibodies is highly sensitive for exposure to heartworm larvae or adults. The test can be positive as early as 30 days post-infection, and virtually all infected cats become positive by 3 months. However, not all larval-infected cats will develop adult heartworms, and a positive heartworm antibody test does not necessarily mean that the cat has adult heartworms.
- Positive antibody test in a cat with pertinent clinical signs (vomiting, cough, respiratory distress) supports the diagnosis of heartworm disease.
- Positive heartworm antibody test in a cat without clinical signs indicates past exposure or asymptomatic infection.

- Negative heartworm antibody test excludes the diagnosis of heartworm disease, although it does not detect a recent (< 30 days) exposure.
- There is no cross-reactivity of Antech's feline heartworm antibody test with GI parasites or lungworms.

Antigen Tests

- Positive heartworm antigen test is diagnostic for the presence of adult heartworms.
- False negative heartworm antigen results can occur with low worm burdens or single sex infections. If the cat is heartworm **antigen** negative and has symptoms of heartworm disease, additional testing with heartworm antibody, radiographs, blood profile and ultrasonography may be indicated.

Avian and Exotic Corner

Liver Disease

Liver disease can occur in pet psittacine birds of all species and ages. In young birds, infectious causes are most common, whereas in older birds, degenerative diseases are more prevalent. Signs of hepatic disease are dependent on the severity of liver damage. Non-specific signs such as anorexia, listlessness, and fluffed feathering are common. More specific signs include green or yellow colored urates; and polyuria and polydipsia can also occur. Since birds have biliverdin rather than bilirubin, jaundice is rare in avian liver disease. Husbandry concerns may be key to the etiology of hepatic disease, therefore, it is important to obtain a good history. Exposure to other birds, the source of the sick bird, diet, any illness amongst family members, and length of illness are some useful questions to ask. Physical examination may reveal no specific findings of liver disease, although an enlarged liver can be palpated occasionally.

Use signalment and history to limit the rule-out list for hepatic disease. Chlamydial infections can cause liver disease and are more common in younger birds and those exposed to other birds. A

longterm pet that never leaves the home is less likely to have psittacosis than a bird just purchased at a bird fair. Other bacteria and viruses such as Pacheco's disease also cause liver dysfunction. Older birds may have degenerative liver ailments such as hepatic lipidosis. Hepatic neoplasia has been described in birds, including reports of biliary adenocarcinoma in blue-front amazons. It is not uncommon for multiple organ disease to be present in association with liver disease in birds. This complicates both diagnosis and treatment.

The ideal initial data base includes a CBC, plasma biochemistries, protein electrophoresis, and bile acids. One or more chlamydial tests may be warranted depending on the signalment. Further tests might include radiographs and coelomic ultrasound. A liver biopsy is often required to determine the etiology.

Treatment of liver disease obviously depends upon the cause. Until an etiology is determined, supportive care is administered. This includes parenteral fluids and tube feedings as most liver disease patients are anorexic. Antibiotics should be given if bacterial hepatitis is suspected. More specific treatments are instituted once etiology is determined.

LAB TIPS

Insulin Measurement

Most submissions that we receive for measurement of insulin concentrations are done to diagnose an insulin-secreting tumor. An insulinoma is diagnosed by demonstrating normal or increased insulin concentration in the presence of hypoglycemia (glucose < 60 mg/dl) measured on the same sample. Therefore, to interpret the insulin, the concurrent glucose must be known precisely. An insulin-glucose pair is especially

important to verify blood glucose values that are obtained by a glucometer.

The price of an insulin-glucose pair is \$32.00. The preferred sample is separated serum, heparinized plasma, or a spun SST. The test code for the East and Test Express is #828, and the West is #10148. If you order an insulin concentration along with a panel, that includes glucose, the price for the insulin concentration is \$30.00.