

OADDL E-News

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Diagnosing Heartworm in Dogs and Cats Just Got Better

Research from parasitologists at Oklahoma State's Center for Veterinary Health Sciences has revealed that many dogs and cats infected with *Dirofilaria immitis* may test false-negative on commercial heartworm antigen tests due to the presence of antigen-antibody complexes.

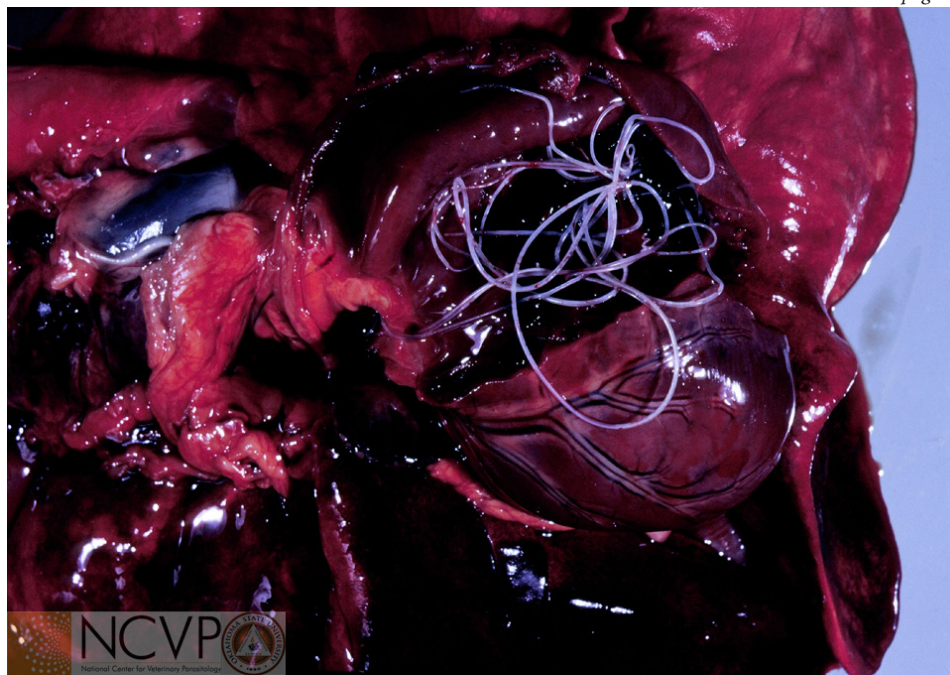
Recent publications document that [samples from 5-10% of dogs in animal shelters in the southern United States](#), and [more than 50% of dogs on slow kill](#), may test false negative on antigen tests regardless of the testing platform used. [Blocked antigen is also common in feline samples](#). Pre-treatment of dog or cat serum prior to running the antigen test [removes the blocking antibody and allows detection of antigen](#).

This phenomenon was well recognized when antigen tests were

developed in the 1980s but had since largely been forgotten. The importance of antigen blocking again became evident when a number of dogs in the Oklahoma City area were identified by veterinarians as microfilaria positive but antigen negative. Morphologic and molecular analysis confirmed the microfilaria to be *Dirofilaria immitis*, but samples tested negative for heartworm antigen across all available testing platforms. After pre-treatment to remove blocking antibodies, samples from these patients converted to strong antigen positive. Mixing samples from multiple dogs prior to testing can also block antigen in samples from infected dogs, preventing accurate diagnosis.

The parasitology diagnostic laboratory at OADDL now offers testing for blocked heartworm antigen. The

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Numerous adult *Dirofilaria immitis* in the heart of a dog.



CENTER FOR VETERINARY HEALTH SCIENCES
Healthy Animals — Healthy People

Dr. Sandra Morgan Retires

After serving 34 years as a distinguished veterinarian, toxicologist, instructor and mentor, Dr. Sandra Morgan retired from OSU on July 1, 2015.

Dr. Morgan earned her DVM from OSU in 1980 and practiced for one year in a mixed animal practice in Blackwell, OK. She joined OSU in 1981 as a large animal (ambulatory) clinician and spent the next 17 years treating animals and educating future veterinarians. During that time she also completed a toxicology residency program at OADDL and became board certified in toxicology in 1987. Following completion of boards, Dr. Morgan accepted a joint appointment as veterinary toxicologist at OADDL and Associate Professor in the Physiological Sciences Department. For the past 17 years, Dr. Morgan has served as diagnostic veterinary toxicologist and provided toxicology



PHOTO COURTESY OF
GARY LAWSON / OSU MARKETING

instruction to 3rd-year veterinary students.

Dr. Morgan has been recognized for her teaching efforts by receiving the Outstanding Instructor award an amazing 13 times! Even though Dr. Morgan officially retired on July 1, she has agreed to teach veterinary students again this fall.

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test is recommended for both dogs and cats who are suspected to have heartworm despite testing negative on any standard heartworm antigen test including those run at national service laboratories. Blocked heartworm antigen should be considered in any dog that presents with coughing, murmur, or radiographic evidence leading the veterinarian to suspect heartworm disease but tests negative; samples from dogs not on preventive, those with an inconsistent history of preventive use, and heartworm-infected dogs that have been managed with “slow kill” should be particularly suspect. Microfilaria are present in many but not all of these dogs.

To date, over half of samples submitted by veterinarians from dogs strongly suspected to have heartworm despite an initial negative heartworm antigen test have converted to heartworm antigen positive after pre-treatment, confirming the presence of antigen. Fewer data are available on

feline samples but early research suggests this phenomenon also is common in cats infected with heartworm.

To request testing for blocked antigen, complete the OADDL Submittal Form and request “blocked heartworm antigen testing”. To detect blocked antigen, 1 mL of serum is needed. A heartworm antigen test will be performed before and after treatment of serum and the results of both tests reported. If the test is negative before but positive after treatment of serum, then blocked antigen was present. In dogs, whole blood (1 mL, EDTA) for microfilaria identification by a modified Knott’s test is also recommended. Both the Companion Animal Parasite Council and the American Heartworm Society recommend screening dogs annually for heartworm using both an antigen test and a microfilaria test.

— *Susan E. Little, DVM, PhD, DACVM*
Regents Professor, Krull-Ewing Chair in
Veterinary Parasitology

Director’s Note

In this edition of e-News, we highlight the career of a distinguished OADDL faculty member, Dr. Sandra (Sam) Morgan. I have had the great pleasure of knowing Dr. Morgan since I arrived in Oklahoma in 2010. Dr. Morgan will be retiring from OSU in July, and will be sorely missed by colleagues, students and clients!

This edition of e-News has a wonderful article from Dr. Susan Little describing improved methods of heartworm detection in dogs and cats. OADDL is fortunate to have strong internal partners such as faculty in the National Center for Veterinary Parasitology (NCVP), which is based in the Center for Veterinary Health Sciences (CVHS).

As most of you are aware, outbreaks of avian influenza virus continue to plague the US. For several years, OADDL has been partnering with the Oklahoma Department of Agriculture, Food and Forestry (ODAFF) to provide critical surveillance testing in our state for this devastating disease. It is estimated that 47-49 million commercial chickens and turkeys in the US have died or been euthanized because of avian influenza infection so far in 2015. States with the highest poultry mortality are Iowa, Minnesota and Nebraska. Fortunately, the number of newly reported cases has begun to slow as summer temperatures rise.

We also continue to partner with ODAFF to provide diagnostic testing on Oklahoma horses that have neurologic disease. This edition of e-News describes our first confirmed case of equine West Nile Virus infection in Oklahoma on June 17 and a reminder to vaccinate horses.

In addition to playing a key role in the detection of devastating diseases, we are extremely proud to meet the diagnostic needs of our clients on a daily basis. Your feedback and input are always appreciated. Please contact us at (405) 744-6623 or through our [website](#).

— *Dr. Keith L. Bailey*

Two Cases of Equine West Nile Virus detected at OADDL



PHOTO COURTESY OF OSU AGRICULTURAL COMMUNICATIONS SERVICES

The year's first case of equine West Nile Virus (WNV) infection in Oklahoma was reported on June 17, 2015. The Garvin County horse had an unknown vaccination history. Clinical signs included ataxia, muscle fasciculations and hyperexcitability. The horse's serum tested positive by IgM ELISA, an indicator of acute infection. Testing was performed in-house at the Oklahoma Animal Disease Diagnostic Laboratory (OADDL).

The second case was a Hughes County horse with unknown vaccination history, ataxia, dog sitting,

recombancy, leg pain/weakness.

Although the majority of Oklahoma equine WNV cases occur in the fall we have already seen two this year. OADDL continues to partner with the Oklahoma Department of Agriculture, Food and Forestry to offer subsidized testing of horses with central nervous system disease. Additional information on this Special Program is available on our website, <http://cvhs.okstate.edu/oaddl>.

Remember to vaccinate your horses for WNV!!

Dr. Jerry Ritchey assumes new role as Department Head in CVHS

Dr. Jerry Ritchey became the Department Head of Veterinary Pathobiology (VPB) on July 1, 2015. Dr. Ritchey is a proud graduate of OSU (DVM, 1991) and has served as Veterinary Pathologist at OSU since 1997. Dr. Ritchey also served as Interim Laboratory Director of OADDL in 2013-2014.



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