

OADDL E-News

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It's a fungus! It's a parasite! It's ... pythium?

Pythium insidiosum is an opportunistic, fungal-like, water mold that is found in warm stagnant water with high levels of organic debris (e.g. wetlands, ponds, and swamps). This organism is mostly found in Gulf coast states, but also affects dogs in Oklahoma and surrounding states. *P. insidiosum* is classified as an oomycete. It is similar to a fungus in that it forms mycelia, but differs in cell wall structure and that it does not sporulate. *P. insidiosum* forms zoospores, which have two flagellae that act as tiny propellers so the organism can swim.

P. insidiosum can infect dogs, cats, horses, and humans. Although it has

not been reported to be contagious, protective wear is recommended when handling suspected cases. There is no reported age or sex predilection in dogs. Clinical signs depend on the route of infection; direct contact with an open wound results in the cutaneous (skin) form and ingestion of infected water results in the intestinal form. Affected dogs are usually febrile. With the cutaneous form, the animal will have a non-healing necrotizing lesion, often associated with pus-filled draining tracts and enlarged lymph nodes (Figure 1). With the intestinal form, animals may vomit, have a long

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Figure 1: Dog, skin, lateral abdomen: Cutaneous pythiosis.
Photo courtesy of Dr. Heather Herd.



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Pythium continued from page 1

term history of weight loss, and have a thickened segment of intestine (Figure 2).

Definitive diagnosis of *P. insidiosum* can be difficult. In biopsy samples, hyphae may be sparse and difficult to visualize on routine H&E stain, requiring the use of special stains such as PAS or GMS. Culture of fresh tissues may also be attempted, but *P. insidiosum* is a notoriously slow grower (2-3 weeks) that requires additional confirmatory analysis such as polymerase chain reaction (PCR) testing. Treatment is also difficult and of extended duration. Current treatment includes wide surgical excision, antifungals, and immunotherapy, all with variable reports of success. Prevention includes avoiding exposure to open skin wounds and preventing your animal access to potentially infected water sources.

— Dr. Heather Herd



Figure 2: Dog, intestine: Intestinal pythiosis, note the markedly thickened wall. Photo courtesy of Dr. Heather Herd.

References:

Gaastera, W., et. Al., *Pythium insidiosum: An overview*. Veterinary Microbiology, 2010, 146:1-2, p 1-16
 Gross, T.L., *Cutaneous Pythiosis, Lagenidiosis, and Entomophthoromycosis*, In: *Skin Diseases of the Dog and Cat, Clinical and Histopathologic Diagnosis*, 2005, Blackwell Publishing Co, p 303 - 309

Director's Note

This edition of the OADDL e-News contains articles relevant to spring-time, the time of the year that Charles Dickens so aptly described as summer in the sun and winter in the shade.

Several changes have recently occurred at OADDL in our effort to provide value-added diagnostics and exceptional client services. I would like to thank everyone who participated in our Client Satisfaction Survey earlier this year. We received feedback from clients in 40 Oklahoma counties. The feedback gathered during the survey has already been utilized to shape changes in testing fees. While many of our test fees recently saw minor increases, some of the fees were reduced in response to client feedback.

A major change based on client feedback was package pricing for common bacteriology submissions. The primary objective of this new approach was to provide clients with fixed fees so they can accurately predict testing costs and bill owners accordingly.

OADDL continues to expand diagnostic tests. Based on recent reports of the canine influenza outbreaks in the Midwest, we quickly introduced canine respiratory disease panels in live animals as well as postmortem specimens. Working closely with fellow faculty in the Center for Veterinary Health Sciences we have brought on new diagnostic tests including polymerase chain reaction (PCR) analysis for Ehrlichia

species endemic to Oklahoma (i.e. *E. canis*, *E. chaffeensis* and *E. ewingii*) and common pathogens associated with abortions in sheep and goats.

OADDL continues to work closely with the Oklahoma Department of Agriculture, Food and Forestry (ODAFF) to test poultry for avian influenza. We performed 154 PCR tests for avian influenza in the first quarter of 2015. Avian influenza remains a significant threat to Oklahoma poultry.

At OADDL, we are proud to serve you. Your feedback and input is always appreciated. Please contact us at (405) 744-6623 or at www.cvhs.okstate.edu/oaddl.

Dr. Keith L. Bailey

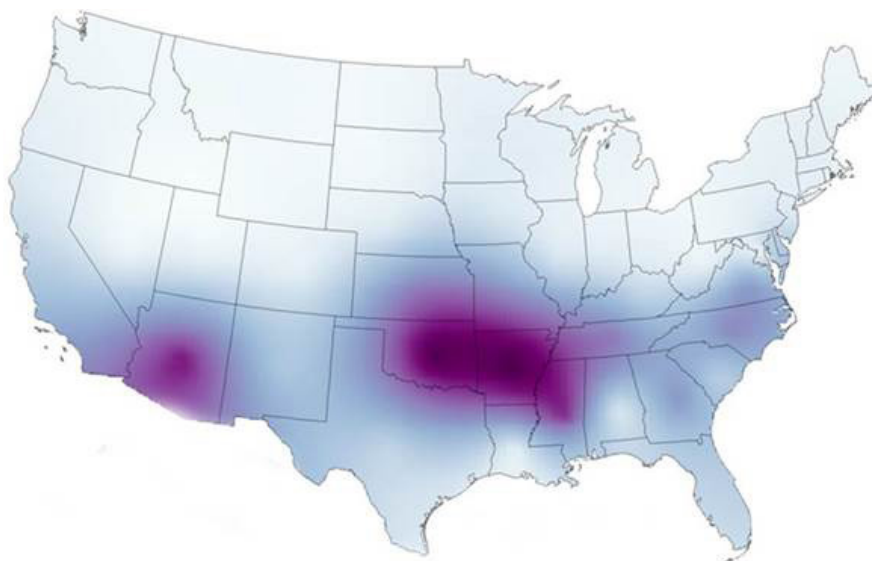
NEW Ehrlichiosis PCR Panel for Dogs

Ehrlichiosis is a tick-borne disease of dogs characterized by acute onset of fever, thrombocytopenia and lymphadenopathy. Within the U.S., Oklahoma and Arkansas have one of the highest incidence of canine infections by multiple *Ehrlichia* spp.^{1,2,3}. OADDL is offering a PCR panel for detecting *E. canis*, *E. ewingii* and *E. chaffeensis* in whole blood. This PCR protocol was developed and validated for use in clinical specimens in the research laboratory of Dr. Susan Little (Director, National Center for Veterinary Parasitology, OSU)¹.

Test fee: \$45.00

Sample type: EDTA blood (1-2 mL)

Turnaround time: 1-2 business days



Seroprevalence to *Ehrlichia* spp. in dogs in the United States documenting hyperendemic status of Oklahoma and Arkansas (based on Bowman et al., 2009).

1. Ehrlichia ewingii infection and exposure rates in dogs from the southcentral United States. Little SE, O'Connor TP, Hempstead J, Saucier J, Reichard MV, Meinkoth K, Meinkoth JH, Andrews B, Ullom S, Ewing SA, Chandrashekar R. Vet Parasitol. 2010 Sep 20;172(3-4):355-60.

2. Seroprevalence of Ehrlichia canis, Ehrlichia chaffeensis and Ehrlichia ewingii in dogs in North America. Beall MJ, Alleman AR, Breitschwerdt EB, Cohn LA, Couto CG, Dryden MW, Guptill LC, Iazbik C, Kania SA, Lathan P, Little SE, Roy A, Saylor KA, Stillman BA, Welles EG, Wolfson W, Yabsley MJ. Parasit Vectors. 2012 Feb 8;5:29.

3. Canine infection with Dirofilaria immitis, Borrelia burgdorferi, Anaplasma spp., and Ehrlichia spp. in the United States, 2010-2012. Little SE, Beall MJ, Bowman DD, Chandrashekar R, Stamaris J. Parasit Vectors. 2014 May 30;7:257.

4. Bowman, D., Little, S. E., Lorentzen, L., Shields, J., Sullivan, M.P., Carlin, E. P., 2009, Veterinary Parasitology 160, p138-148. Prevalence and geographic distribution of Dirofilaria immitis, Borrelia burgdorferi, Ehrlichia canis, and Anaplasma phagocytophilum in dogs in the United States: Results of a national clinic-based serologic survey.

Spring Has Sprung! Tick Season Reminders

Following a relatively mild winter, return of some much needed rainfall and spring-time weather patterns it is time for ectoparasite re-emergence from winter dormancy. There are several tick-borne diseases of importance to veterinary patients and OADDL can assist in the diagnosis in many of these cases. Remember, in addition to blood loss anemia, ticks in particular can transmit several rickettsial, ehrlichial and anaplasmosis type infections to both small and large animals. More information on ticks and management is available in a fact sheet jointly produced by Agriculture Extension and the Center for Veterinary Health Sciences (CVHS). <http://pods.dasn.okstate.edu/docushare/dsweb/Get/Document-2097/EPP-7001web2014.pdf>.

Many pathogenic organisms transmitted by ticks are intracellular parasites. Preparation of a fresh blood smear in your clinic is often the most

accurate and rapid diagnostic test, and can be point-of-service testing for the client. If you are uncertain about organisms, forward the stained and unstained blood smears to OADDL for interpretation by our Parasitologists. Submitting whole blood (EDTA/Purple Top Tube) is also beneficial however some of these organisms will detach from cells with time and the freshly prepared blood smears are critical in these cases.

In addition to direct examination for organisms, OADDL offers several tests in the Serology and Molecular Diagnostics Laboratories which can aid in diagnosis. Several of the molecular tests are recent additions to service at OADDL and are the result of collaboration with Dr. Susan Little and the National Center for Veterinary Parasitology at CVHS.

Drs. G. Rezabek, A. Ramachandran & E. Johnson

	Direct Exam	Serology Antibody Testing	Polymerase Chain Reaction (PCR)
Cattle	<i>Anaplasma marginale</i> <i>Babesia</i> sp. <i>Mycoplasma wenyonii</i>	<i>Anaplasma</i> sp.	<i>Anaplasma marginale</i>
Dogs	<i>Ehrlichia</i> spp. <i>Anaplasma</i> <i>Babesia canis</i> <i>Hepatozoon canis</i>	<i>Ehrlichia canis</i> <i>Ehrlichia ewingii</i> <i>Borrelia burgdorferi</i> (Lyme) <i>Anaplasma phagocytophilum</i> <i>Anaplasma platys</i> <i>Rickettsia rickettsii</i> (RMSF)	<i>Ehrlichia canis</i> <i>Ehrlichia chaffeensis</i> <i>Ehrlichia ewingii</i> <i>Hepatozoon canis</i>
Cats	<i>Cytauxzoon felis</i>		<i>Cytauxzoon felis</i>
Horse	<i>Anaplasma phagocytophilum</i> <i>Babesia caballi</i> <i>Theileria equi</i>	<i>Babesia caballi</i> (Piroplasmosis) <i>Theileria equi</i> (Piroplasmosis) <i>Borrelia burgdorferi</i> (Lyme) <i>Anaplasma phagocytophilum</i>	<i>Ehrlichia risticii</i> (Potomac Horse Fever)

Lead Toxicity in Spring Time

Sometimes it seems that broken automobile batteries sprout from the ground in spring just as cattle and other grazers seek new forage growth. Ready access to metallic and compounded lead waste in pastures, dumps, sheds and homes increases the likelihood that large and small animals will consume toxic amounts.

Lead is found in the metallic form as exposed automobile battery plates, expended bullets and shot, fishing weights, old plumbing, roofing nails,



and electrical cable shielding. Other common sources are paint from old structures, home renovation waste, caulking, putty, drilling pipe thread compounds, lead arsenate insecticides, soil and mine waste.

Cattle with lead toxicosis may exhibit a range of neurologic symptoms including blindness, head pressing, circling, trembling, depression and death.

Dogs, cats, horses, and avian species may exhibit a wide range of neurological and gastrointestinal symptoms such as seizures, incoordination, paralysis, depression, anorexia, diarrhea, and

anemia. Diagnosis of lead poisoning requires evaluation of symptoms with appropriate laboratory testing.

OADDL offers rapid detection (i.e. same day) of blood lead. The preferred clinical specimen from a live animal is whole blood. Quantitation of liver or kidney lead levels in dead animals can also support the diagnosis of lead toxicosis.

We have seen six (6) positive cases so far this year. All of them have been in April.

— Brent W. Johnson
Toxicology Lab Manager

Cases of Lead Toxicosis at OADDL in 2015 (as of April 10, 2015)

Species	Specimen Tested	Clinical Signs
Bald Eagle	Whole blood	None provided
Golden Eagle	Whole blood	None provided
Bovine (3 month old)	Whole blood	Circling and blindness
Bovine	Whole blood	None provided
Bovine (1 year old)	Whole blood	Staggering, slobbering, blindness
Bovine	Whole blood	None provided

Getting to Know Us

Zachary Bahm has worked at OADDL as the Necropsy Lab Manager for one year. He grew up in Minot, North Dakota and moved to Oklahoma in 2008 to attain his Bachelors of Science in Animal Science and a Minor in Ag Economics from Oklahoma State University in 2012. Zach and his wife Ashley have a 2 year old son Conway. In his spare time, Zach enjoys spending time with his family, training and showing cutting horses as well as skiing.



Jordan Vickers has worked at OADDL since the middle of 2012 and currently serves as the Necropsy lab technician. He grew up in Hoxie, a small town in NW Kansas. He and his wife Erika have two spoiled dogs Ryleigh and Dezi. They love sports, especially the Dallas Cowboys! Jordan enjoys working in the yard, fishing and working out.



Ideas/Suggestions for Future Content

We want to hear from you. Send your ideas and suggestions to oaddl@okstate.edu.

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