It Can Be a Zoo Around Here!

By: Dalen Agnew, DVM, PhD, Dipl ACVP

From mobilizing a team of pathologists to assist in the post-mortem examination of a hippopotamus (one of the oldest ever in captivity at a whopping 58 years) to the microscopic evaluation of critically endangered Kihansi spray toads, the Diagnostic Center for Population and Animal Health (DCPAH) has had a long and productive relationship with zoos. Since the first years (when it was called the Animal Health Diagnostic Laboratory), we have provided pathology support, endocrinology testing, nutritional analyses, toxicology assays, and microbiology resources to zoos in Michigan and around the world. As Will Rogers said, “The best doctor in the world is the veterinarian. He can’t ask his patients what is the matter—he’s got to just know.” For the doctors and diagnosticians who work with zoo animals, it is doubly hard since so little is known about many of the zoo animals and their diseases which we see. DCPAH has two ACVP diplomate pathologists, each with over 20 years’ experience in zoo and wildlife medicine, as well as two board-certified avian pathologists. In addition, we have seven other ACVP pathologists who consult in their areas of expertise ranging from oncology to dermatology to neurology to name a few. Together, these faculty ensure seamless integration of testing between the various laboratories within DCPAH in these often complex and far-from-standard zoo cases.

Extrapolating from domestic and human diseases is one way we have learned to work effectively without having all the answers. For instance, thyroid disease is a common disease in dogs and cats—something most small animal practices are well-versed in diagnosing and treating. What if your patient was an endangered bongo—a West African forest antelope? It turns out that goiter is very common in these animals, and likely has a genetic basis. Due to the limited size of the captive population, inbreeding may have inadvertently allowed this trait to spread. If recognized, however, it can be monitored and treated if necessary. Neoplasia of the thyroid is also common in our small animal patients and not surprisingly, we see this in wild animals too. A Sumatran rhino recently was diagnosed with a malignant thyroid tumor which led to secondary hypertension. While wild animals often hide their signs until it’s too late—this rhino was no exception—we were able to use our knowledge of thyroid disease in other animals to piece together the cause of this rare beast’s death. In another case, hyperthyroidism was diagnosed in a family of cotton-topped tamarins, which were successfully managed medically.

DCPAH has recently developed a new immunohistochemical test for melanoma, particularly for amelanotic melanomas, which are notoriously difficult to identify. We have also been able to use this test in zoo animals—for instance, a flock of penguins which has had an unusually high incidence of these deadly neoplasms, and a large boa constrictor named Princess. Similarly, we leveraged DCPAH’s expertise in the diagnosis of Tritrichomonas foetus (a protozoan that can cause abortion in cattle and diarrhea in cats) to identify similar organisms in species as diverse as turkeys, giant anteaters, frogs, and laboratory mice using specialized antibodies.
Tuberculosis is a disease that large animal veterinarians, particularly in Michigan, are hearing a lot about. This age-old scourge has resurfaced among deer and cattle in Michigan. DCPAH has been a leader in identifying and managing this and similar diseases in the animal population. Unfortunately, tuberculosis and other mycobacterial diseases have also been a big problem for zoos. From toads, fish, and snakes to penguins, langurs (Asian primates), takin (mountain goats from the Himalayas), and elephants, the DCPAH has helped zoos to manage this difficult disease. Always aware of the risk to exhibit mates, zookeepers, and the public, when a zoo veterinarian sees an abscess or a granuloma that might be TB, they are very assertive in identifying the specific bacterium responsible. Often, it turns out to be one of the many opportunistic *Mycobacterium* sp. that are common in soil or other parts of the environment. In these cases, we have assisted in identifying and remedying the environmental sources. However, if a more dangerous *Mycobacterium* is isolated, DCPAH also has the resources to specifically identify it, work with the regulatory agencies that will be involved, and help to develop a management plan.

When working with zoo animals, it is not at all unusual to be the first to identify a particular disease. While exciting, this serendipity carries responsibility too. Several years ago, we identified a deadly calicivirus among the tiger cubs born at the Potter Park Zoo. This virus was similar to that seen in domestic cats in animal shelters at the time. Unfortunately, it appeared that the currently available vaccine was not protective, so the Potter Park Zoo, in collaboration with many other zoos, the pharmaceutical industry, and DCPAH, tested a new effective vaccine to be used in zoos throughout the United States. DCPAH has also identified herpesviruses in zebras and polar bears, papillomaviruses in fruit bats, and a new calicivirus in rabbits.

Our relationships with our area zoos are far from one-sided. While we are delighted to provide quality diagnostics and make a significant impact in wildlife conservation, the zoos also provide DCPAH with great training opportunities for our residents and veterinary students, particularly those with an interest in zoo or wildlife medicine. DCPAH has also partnered with the MSU Veterinary Teaching Hospital, the Michigan Department of Natural Resources, the Toledo Zoo, and the Potter Park Zoo to develop a zoo medicine residency, unique in its interdisciplinary emphasis, including pathology and wildlife conservation as part of the training. And there is no doubt that having a wallaroo, bintourong, tinamou or diamondback rattlesnake as a patient can liven up the day.

We have found all of the departments at DCPAH to be very responsive to the diagnostic challenges we send their way. Dr. Agnew started his zoo medicine career at the Detroit Zoo, and approaches our cases with the wisdom of a former clinician. The care we provide our animals is definitely improved through our relationship with MSU’s DCPAH.

- Dr. Ann Duncan, Detroit Zoo

Thank you to ALL of our zoo clients—for your business, your support, and your partnership. We’re happy you enjoy working with us. The feeling is mutual!

DCPAH is a full-service veterinary diagnostic laboratory offering more than 800 tests in 11 service sections.

Any news or information you’d like to see here? Want reprints or copies of our client education guides? Please contact DCPAH communications manager Courtney Chapin at: chapinco@dcpa.msu.edu.
Poison Control Updates: Flea & Tick Products, Rodenticides

Flea and tick season warrants an important reminder: products designed with the added active ingredient permethrin (and other pyrethroids) that are generally recognized as safe for application on dogs may be quite dangerous for cats. Cats are rather unique in their inability to metabolize these compounds which are neurotoxic.

The DCPAH toxicology section has recently received a seasonal influx of feline hair samples from cats exhibiting signs such as tremors and seizures associated with neurotoxin exposure. These hair samples have tested positive for flea and tick medications designed specifically for dogs and are present in amounts consistent with direct application. In addition to topical applications, sprays, powders and other treatments available for use inside the home or in the yard may also contain permethrin/pyrethroid compounds and can be just as dangerous.

We encourage practitioners to remind their clients that cats have a special sensitivity to these compounds and to further recommend careful reading of product labels before purchasing or using a product in a home with cats.

A guide designed to help clinicians educate pet owners about pets, poison control, and making their homes safer is available at animalhealth.msu.edu. Included is an important notice about rodenticides.

Recent regulation changes by the EPA required that manufacturers of rodenticides for consumer use stop using second-generation or long-acting anticoagulants. Manufacturers must also contain bait in tamper-resistant bait stations. Pellets and other forms of bait that cannot be secured are prohibited.

The manufacturer of d-CON products has not complied with the new EPA regulations and has recently requested a hearing be held to review the EPA’s Notice of Intent to Cancel (NOIC). Information about EPA inquiries is available on the d-CON website (d-conproducts.com/faq).

The new generation of rodenticides currently on the market often use bromethalin, a toxin for which there is no antidote. There is also no current test to detect it—except for a postmortem exam. Bromethalin is a fast-acting neurotoxin.

Leptospira Test Method Change

We are now conducting Leptospira assays by PCR instead of FA. Leptospira by FA - Tissue and Urine have been discontinued and replaced with Leptospira by PCR - Food Animal (95052) and Non-Food Animal (95053). All other Leptospira orderables remain unchanged. Please see our test catalog at animalhealth.msu.edu for prices and additional details; search “lepto” to see all Leptospira orderables.

Diseases in the News: West Nile Virus

According to the Centers for Disease Control and Prevention (CDC), as of June 4, 2013 non-human West Nile virus (WNV) infections have been reported from Arizona, California, Florida, Louisiana, Michigan, Pennsylvania, Texas, and Utah. Human WNV infections have been reported from California, Mississippi, and Texas.

As part of DCPAH’s mandate to protect the public by ensuring the health of animals in the state of Michigan and around the nation, our faculty and staff work with national, state, and local officials to research and counter threats including WNV. WNV is a seasonal disease where infection is possible when mosquitos are present. It can affect birds, horses, humans and many other mammals.

Both DCPAH’s Immunodiagnostics/Parasitology and Virology sections perform diagnostics for WNV. Testing for acutely infected and non-vaccinated horses is done by West Nile Virus IgM Capture ELISA. For vaccinated horses, the West Nile Virus Neutralization (VN) test is preferred. It is important that you provide information on vaccination history for West Nile. Either of those tests is performed as part of the Equine Neurologic Disease Core Panel. West Nile Virus isolation and West Nile Virus VN tests are available for all species. Polymerase chain reaction (PCR) tests are available for cerebrospinal fluid, fresh frozen tissues, and formalin fixed-paraffin embedded tissues.

For prices and additional details including collection protocol and shipping requirements, visit our Orderable Catalog available at animalhealth.msu.edu and search “West Nile.” WNV tests are submitted using our General Submissions form.

Additional information on WNV is available through CDC at cdc.gov/westnile.

Leptospira Test Method Change

We are now conducting Leptospira assays by PCR instead of FA. Leptospira by FA - Tissue and Urine have been discontinued and replaced with Leptospira by PCR - Food Animal (95052) and Non-Food Animal (95053). All other Leptospira orderables remain unchanged. Please see our test catalog at animalhealth.msu.edu for prices and additional details; search “lepto” to see all Leptospira orderables.
It’s a Tick-y Issue

Experts agree that 2013 is shaping up to be another bad year for ticks—or perhaps better put, a good year for ticks and a bad year for the animals (including humans) that are likely to come in contact with them. Veterinary publications and news sources are reporting the 2013 forecast released by the Companion Animal Parasite Council (capcvet.org).

Here at DCPAH we know that our clients are seeing a lot of ticks in their practices, because many of those ticks are coming to us for identification and for tick-borne disease screening. Remember, any tick can cause disease, and many ticks are expanding their ranges, moving into areas where they have not been found historically. While ticks can be found on pets during all seasons of the year, spring and summer (April – July) are when the highest numbers of ticks are submitted.

April through August yield the most submissions for *Dermacentor variabilis* (American dog tick) and *Amblyomma americanum* (lone star tick). These ticks carry *Anaplasma phagocytophilium*, *Ehrlichia spp*, and Rocky Mountain spotted fever caused by *Rickettsia rickettsii*.

The *Ixodes scapularis* ticks, which carry Lyme disease caused by *Borrelia burgdorferi*, anaplasmosis caused by *Anaplasma phagocytophilum*, and *babesiosis* caused by several species of *Babesia* are submitted most frequently from October to May.

See the article from the Fall 2012 issue of *Diagnostic News*, “Ticks from Coast to Coast, Year-Round,” available on our website (animalhealth.msu.edu/news) for more information on ticks, tick-borne disease, how to submit a tick, and available diagnostics.

A guide on ticks and tick-borne diseases for clinicians and pet owners is available at animalhealth.msu.edu. It includes quick tick facts, resources for additional information, and resources specifically for our Michigan clients. Need printed copies? Contact DCPAH communications manager Courtney Chapin at chapinco@dcpah.msu.edu to request copies for your clinic.