



newsletter



July 2006

Quarterly Publication

Volume 12 Issue 1

From the Director:

This summer the Arizona Veterinary Diagnostic Laboratory says goodbye to two valued employees and welcomes three new faces.

Joe Marquardt has done a great job for us in specimen receiving and sample log-in making sure your submissions are sent to the appropriate laboratory section and helping answer your inquiries regarding lab results. Joe is leaving in July to go to medical school. We wish him the best and are certain that he will do well. Carla Ruiz will fill in for Joe when he leaves. She and Joe have worked in both the receiving office and specimen log-in for over a year and the transition should be seamless.

Belinda Lockett has been at the diagnostic lab for many years and provided excellent service in our virology section. Belinda performed many important regulatory tests for us including Coggin's AGID, pseudorabies and vesicular stomatitis serologic tests. Belinda is moving to Phoenix so that her husband can pursue a career opportunity. We all wish them success in their new adventure.

We welcome Laurie D'Auria to our administrative section. Laurie will provide report transcription and front office support. She is also cross training to fill in receiving and specimen login functions when needed.

Estehela Gonzales replaces Belinda Lockett in the virology section. Estehela was a student and later a part-time employee in our Molecular Diagnostic section. She has been working with Belinda and will assume responsibility for testing in that section when Belinda leaves.

We also welcome Kathy Strahorn as our new Quality Manager. Her responsibilities are making sure that we are in compliance with our Quality System. This includes reviewing standard operating procedures, investigating complaints, conducting audits and quality control. She has many years experience in the field and has picked up on our system rapidly.

Even though we hate to see valued employees leave we realize that change is inevitable. But we also look forward to the chance to work with new, enthusiastic, bright people who are committed to providing high quality diagnostic services.

Gregory Bradley, Director

In this issue:

From the director.....	page 1
Feature Article.....	page 2 & 3
Diagnostic case update - Jan to Mar.....	page 3 - 5
Informational Articles.....	page 6 - 7

Featured article:

A survey regarding diagnosis and treatment of coccidioidomycosis in dogs was mailed to all licensed Arizona veterinarians in February 2006. The purpose of the survey was to improve diagnosis and treatment of Valley Fever in dogs through consensus of criteria veterinarians use for diagnosis, treatment choices, and observed responses. Two hundred eighty seven (287) survey responses were received, the majority from veterinarians who primarily or exclusively treat small animals (94%) and practice in Maricopa or Pima counties (90%).

The major findings of the survey include:

- " While 24% of respondents recommended treating any positive titer, 69% recommended treatment at a titer of 1:4 or 1:8
- " 58% of practitioners required a positive titer and clinical signs to diagnose primary (pulmonary) coccidioidomycosis
- " 49% of respondents defined a disseminated case with a positive titer and clinical signs; 40% required additional information like radiographic changes or appropriate changes in serum chemistry or CBC values
- " Hyperproteinemia/hyperglobulinemia was the most commonly reported clinical pathological abnormality (49%)
- " 79% of practitioners responded that perihilar lymphadenopathy was the most common thoracic radiographic change they saw; lytic-proliferative bone lesions were the most frequently reported skeletal radiographic abnormality (51%).
- " 86% of veterinarians reported bone to be the most frequent site of dissemination
- " Fluconazole is the overwhelming drug of choice for both primary and disseminated disease, with about 90% of respondents using it as their first choice treatment; most clients obtain the medications through a compounding pharmacy
- " 50 to 60% of respondents felt they had a success rate of about 90%, regardless of medication treatment choice (ketoconazole, itraconazole, or fluconazole)
- " Almost 50% of practitioners stated that they would consider discontinuing treatment when the titer dropped to less than 1:4 and clinical signs had resolved
- " 155 veterinarians routinely use adjunctive treatment; vitamins were most commonly recommended, followed by antibiotics, analgesics, and holistic or alternative therapies

At the end of the survey, we provided space for veterinarians to voice topics of particular interest or concern. We received a variety of responses, but among the most frequently reported were:

- " When to discontinue treatment
- " Whether there is a benefit of one azole over another
- " An update on the vaccine and nikkomycin Z status
- " What to do with dogs that never develop a positive titer
- " Is Valley Fever becoming more common? Is it getting worse?
- " How useful is the titer for diagnosis? For response to treatment?

Our thanks to everyone who took the time to complete and return the survey. The information you provided will help all of us in the diagnosis and treatment of this often frustrating disease. Additionally, you have helped those in research determine where they can best focus their efforts to help practicing veterinarians improve diagnosis and care of coccidioidomycosis in dogs.

*Compilation of survey results and statistical analysis performed by Christine Butkiewicz, DVM, MPH, and Debra Dufficy, DVM, MPH. Supported by Arizona Veterinary Diagnostic Laboratory and The Valley Fever Center for Excellence, The University of Arizona, Tucson, AZ, 2006.

Featured article:

Valley Fever Awareness week is November 12-19th. On Wednesday, November 15th, a round table seminar of canine coccidioidomycosis, similar to the one presented in Tucson in April, will be sponsored for the Maricopa area veterinarians by Roadrunner Pharmacy. The format of this seminar will be similar to the April meeting with a brief presentation of the survey data and then open discussion with a panel of specialists. The collective experience of Arizona veterinarians in dealing with coccidioidomycosis is a valuable resource in determining how research can be focused. Please consider attending and sharing your experience and expertise.

Diagnostic Update

The following are selected samples of cases submitted to the AzVDL during the months of April, May, June 2006

BOVINE

Recent climatic conditions have resulted in a severe drought in parts of Arizona. This has resulted in some challenges with regard to nutritional management in range cattle.

We received a five-year-old Hereford crossbred cow with a history of having calved several weeks before. The cow was reported to have become anorexic and then was apparently blind. The history indicated that the animal had access to a liquid supplement containing a high level of urea. Necropsy findings were unremarkable except for a rumen pH of over 8.5. A rumen pH at this level is nearly always the result of **urea toxicity**. The feeding of urea requires careful balancing of available additional natural protein as well as carbohydrate sources.

EQUINE

A yearling Quarter Horse from Northern Arizona died following a five day course of clinical disease. It was off feed, with mucous nasal discharge. It was treated with flumixin and phenylbutazone for several days, and received a single shot of naproxen. On necropsy, there was severe pulmonary edema, focal areas of subcutaneous edema and hemorrhage, muscular hemorrhages (most prominent in the cervical muscles), and petechial hemorrhages in pleural and peritoneal serosas and in the meninges. Dark, blood-tinged fluid filled the small intestine and colon, although post-mortem autolysis was too advanced for evaluation of the gastrointestinal mucosa. A pure culture of *Strep. equi subsp. zooepidemicus* was isolated from a nasal swab collected prior to death, and from samples of lung, muscle, lymph node, liver and intestine collected at necropsy. Streptococcal infections of the upper respiratory tract in horses can result in disseminated infections, sepsis and hemorrhages. But the possibility of an exacerbation of the disease by toxic side effects of the combined use of NSAIDs (impaired blood coagulation, gastrointestinal mucosal ulceration) can not be ruled out in this case.

We received a 23-year-old gelding with a history of colic that was unresponsive to treatment. Peritoneal tap indicated a very high white cell count. The significant finding in this animal was an **abscessed lesion on the jejunum** accompanied by acute peritonitis. The abscess appeared to be relatively mature with a thick fibrous wall. Speculation was that a foreign body might have penetrated the intestinal wall but this could not be confirmed.

We received a 3-month-old foal with a history of having been treated for two to three months because of variable debilitation. The animal recently became weak and eventually was prostrate. The only significant finding at necropsy was very large numbers of ascarids along with some watery fluid in the intestine. The diagnosis was a heavy infestation of *Parascaris equorum*. This is a reminder that exposure to ascarids can become cumulative in housing situations where horses have been on the same premises over a period of time.

DIAGNOSTIC UPDATE

We received a 2-day-old foal with a history of weakness and failure to respond to treatment. This equine facility had foaled approximately 35 mares with no apparent problems until this foal and the previous foal born died at an early age. The significant finding in the foal was a very congested and hemorrhagic small intestine with blood in the intestinal lumen. Tests for *Clostridium difficile* toxins A and B were positive and a heavy population of *Clostridium perfringens* was identified in the intestine. The diagnosis was **clostridial enteritis**. It is difficult to differentiate lesions caused by *Clostridium difficile* and those caused by *Clostridium perfringens*. With evidence of the presence of both organisms there is no definitive way to determine which clostridial agent was responsible for the animal's death. It is interesting to note that the two foals that died were the last two of the 35 born on these premises for the year. It seems likely that there may have been a build-up of clostridial spores.

We received a 14-year-old mare with a history of severe colic. The diagnosis was **colitis** with severe congestion and edema causing thickening of the entire mucosa and the wall of the large colon. There was also marked edema in the mesentery. This condition has been referred to in the past as colitis X. Cultures were negative for Salmonella and positive for a heavy population of *Clostridium difficile* based on microscopic observation and the presence of *Clostridium difficile* toxins A and B. The cause of this type of colitis has been in question for years and most people now agree that it is the result of clostridial infection with some uncertainty about the relative significance of *Clostridium perfringens* and *Clostridium difficile*.

EXOTICS

An adult **Darwin's Rhea** presented for necropsy after sudden death while being restrained. A 1.5 cm diameter fibrous polyp was attached to the endocardium of the right ventricle 2 cm below the pulmonary valve. Death was attributed to impairment of blood flow due to the polyp.

SMALL RUMINANTS

Stillbirths and premature births of normal kids were observed in a herd of Nubian goats in Northern Arizona. The placenta from a doe that kidded 12 days prematurely was submitted to the laboratory. Histologic evaluation revealed an acute, necrotizing placentitis

with many trophoblasts distended by intracellular aggregates of small (<1 micron) rod-shaped structures. These microorganisms were identified as *Coxiella burnettii* (**Q Fever**) by immunohistochemical staining.

AVIAN

We received some Bobwhite quail that were reported to be 11 weeks of age. The history indicates a gradually increasing death loss. Gross necropsy findings were limited to 2-3mm white spots scattered on the surface of the livers. These were identified microscopically as areas of necrosis. There was also microscopic evidence of enteritis and ventriculitis. *E. coli* was isolated from liver, lung and small intestine of several birds. **Colibacillosis** is not an unusual disease problem in birds housed in confinement.

A one year old Canary died 6 weeks after purchase at a bird fair. It exhibited weakness in a leg for a week prior to death. On necropsy, a large, relatively hard yellow mass was found taking up most of the left lung. Histologically, the mass was a granuloma composed almost entirely of epithelioid cells which contained large numbers of intracellular, acid-fast rods (**Avian mycobacteriosis**).

FELINE

We received a 12-year-old cat with a history of possible exercise intolerance followed by stress, vomiting, dyspnea and collapse. The necropsy observations included a swollen and somewhat mottled liver with 1mm pale foci and 2mm red foci scattered on the liver capsular surface. The spleen was noted to be very large. Histopathology resulted in a diagnosis of **systemic mastocytosis** with dissemination to multiple organs including liver, spleen, lymph nodes, and bone marrow. Microscopic observations included sheets of large, round eosinophilic cells with eccentric nuclei.

A six-year-old **domestic cat** with a history of diabetes and megacolon died suddenly. At necropsy, a 2 cm diameter mass was found on the dorsal surface of the brain between the caudal left cerebrum and the dura mater. **Pisammomatous meningioma** was diagnosed histologically.

A cat presented to the referring veterinarian with acute respiratory distress and a 2-3 day history of lethargy. Crackles were auscultated bilaterally in the lungs. The cat died naturally and was submitted for necropsy. Grossly, the lungs were dark red and somewhat heavy/wet. Histopathology revealed lipid pneumonia as the primary disease process in the lungs. **Endogenous lipid pneumonia** is an idiopathic condi-

DIAGNOSTIC UPDATE

tion in cats. **Exogenous lipid pneumonia** can occur when cats are given mineral oil for treatment of hairballs. No specific cause was found for the disease in this particular cat.

A 2-month-old Balinese cat was euthanized for severe upper respiratory disease and ill thrift. At necropsy, all bones were soft, and **osteogenesis imperfecta** was diagnosed histologically. This bone disease is known to be hereditary in cattle, but specific breed predilections in cats are not reported.

CANINE

We received a 6-year-old dog with a history of shaking. Clinical differentials included hypocalcemia and hypoparathyroidism. There was some response to treatment. The significant finding at necropsy was the presence of thyroid glands that were identified with no identifiable parathyroid tissues. However, microscopically small amounts of parathyroid could be identified associated with the thyroid glands. The parathyroid tissue consisted of some relatively small islands of parenchymal cells surrounded by extensive fibrous stroma and infiltrations of mononuclear inflammatory cells that were primarily lymphoid. The diagnosis was hypoparathyroidism associated with **lymphocytic parathyroiditis**. There is apparently no explanation for why this lesion occasionally occurs but it may be related to immunologic disease.

We received a 5-month-old dog with a history of lameness and extreme pain. There were multiple areas of edema involving the soft tissues of the limbs. Many lymph nodes were enlarged. The spleen was large and pale. Intercostal muscles in some areas had necrosis and hemorrhage present. The musculature of the limbs also had areas of hemorrhage along with the edema observed grossly. Heavy populations of group G *Streptococcus* sp. were isolated from all tissues. The diagnosis was severe, diffuse, **myositis** with some accompanying pneumonia resulting from disseminated infection with group G *Streptococcus* sp.

We received a puppy with a history of having come from one of two litters that were born at the same time and were affected with increasing degrees of paralysis and weakness. The puppy was 19-days-old at the time of necropsy. The only significant finding at necropsy was long bones that were thin walled and fragile, resulting in fractures occurring easily as a result of manipulation. The microscopy revealed osteopenia with dramatic thinning of cortical bone and a deficiency of trabecular bone. This occurrence

is thought to be the result of **osteogenesis imperfecta**. It is thought that the paralysis of the puppies was the result of microfractures of the improperly formed bones. There were no significant lesions in the nervous system.

An eight-year-old **mixed breed dog** with a history of sudden death was found to have **pneumothorax** at necropsy. Several bullae were found in the right cranial lung lobe, and one appeared to have ruptured. There was some inflammation histologically in the lung that suggested bulla formation was due to increased airway pressure secondary to the disease. Trauma could not be ruled out as a possible etiology for the pneumothorax.

A three-year-old Bloodhound was euthanized for progressive hind limb neurological disease after receiving a rabies vaccination in the right rear leg. At necropsy, a 1 cm diameter mass was found in the L6-L7 spinal cord, predominantly on the right with some extension into the left side of the cord. Histopathology of the tumor was consistent with **thoracolumbar spinal cord tumor of young dogs**. This tumor has previously been called spinal nephroblastoma. As the two names imply, this spinal tumor is found in the caudal spinal cord of young dogs and has morphologic similarity to structures found in embryonic kidneys.

WILDLIFE

An adult **Cactus Wren** was necropsied after it was found dead in an aviary. Numerous spuriid worms were found in the serosa of the proventriculus adjacent to the ventriculus. The worms were most likely a species within the *Echiura* genus.

Submission tips:

PCR Tests and Advances in Veterinary Diagnostics

Detection tests that use the polymerase chain reaction (PCR) format are highly sensitive and highly specific. They are capable of detection of the microbial genome at levels as low as 1-5 copies in a specimen, regardless of whether the microbial agent is alive, and they can be applied to a variety of complex specimens. The Lab offers several PCR tests, some of which have become routinely utilized by our clients. In the dog our most requested PCR tests are for canine distemper virus and *Ehrlichia canis*.

Enclosed in this issue of the newsletter there are two pages titled "**Advances in Veterinary Diagnostics**" describing how to use the canine distemper and *Ehrlichia canis* PCR tests. We recommend putting them in a binder for quick reference. Subsequent editions of the newsletter will include similar fact sheets on newer test methods that we think are useful to veterinary practitioners.

Other canine virus PCR tests that we offer are for: canine parvovirus, which is significantly more sensitive than commercial ELISA tests; canine herpesvirus; infectious canine hepatitis.

Feline virus PCR tests we offer are: feline herpesvirus, chlamydia, panleukopenia virus.

Equine Infectious Anemia (EIA) tests:

In addition to the traditional AGID (Coggins) test, we now offer an Elisa test for EIA. The test uses serum samples as for the Coggins test, is slightly more expensive, but results can be reported in 24 hours (same-day results are available in most cases for samples received by 10:00 AM). The cost of the Elisa test is \$18.00. The cost of the AGID test is \$15.00.

Diagnosis of Trichomoniasis in bulls:

The culture of bull preputial samples for *Tritrichomonas foetus* using "InPouch" culture pouches is an economical test and relatively sensitive diagnostic method, estimated to detect 80 to 90% of the infected bulls in a single sampling. A positive culture indicates the isolation of flagellates with the morphology and motility characteristic of *T. foetus*. In very rare cases, non-foetus trichomonads, morphologically similar to *T. foetus*, can be isolated in culture. It is advisable to confirm the identity of positive cultures by PCR, particularly in the case of virgin bulls, very valuable bulls or during bull/herd certification programs. Contact the laboratory when PCR confirmation is desired. We will save all positive cultures for 2 weeks. The cost of the test is \$75.00 per culture.

AZVDL CONTACT INFO:

(520) 621-2356

(520) 626-8696 FAX

(866) 897-1166 TOLL FREE

Emergency preparedness:

Emergency Preparedness, Wildfire Tips for Horse Owners

With the prolonged drought and the start of summer Arizona is bracing for a serious fire season. Horse owners need to be prepared to respond to emergency conditions that may develop with very little warning. By planning before the emergency and having an emergency kit ready for you, your family and your horses you can reduce the risk of serious loss.

Before fire starts:

What can you do to reduce the risk of fire damaging your home, barn? Can you clear bush away, is the roofing material fire resistant?

Prepare for evacuation

- > Plan routes, have agreements for locations to move your horses. This would be a good time to check with local fire authorities to see if pre planned evacuation routes have been established.
- > Have an ID packet for all horses, include age, sex, breed, color, breed registrations or any other unique ID (tattoo, brand, microchip). Have current color photos (front, rear, right and left sides) of each horse.
- > Have water and hay available for 2-3 days
- > Keep trucks and trailers maintained and full of fuel

Health information

- > Current vaccinations, medical records, have written copies
- > Any medications (with dose information), name and telephone number of prescribing veterinarian
- > Special feeding instructions
- > You should have current Coggins Test, this would allow rapid movement outside Arizona and would insure that your horse does not present a risk to other horses if relocated to temporary housing.
- > Keep these records readily available and be sure to take them with you if you are forced to evacuate.

Emergency Kit (should plan for three days)

- > Flashlights (extra batteries)
- > Plastic trash barrel, with a lid
- > Water buckets

Fire resistant (non nylon) leads/halters with your name and telephone number

- > Knife
- > Wire cutters

ALIRT UPDATES

ALIRT (Arizona Livestock Incident Response Team) has been up and running since May 2006. ALIRT is a cooperative program between the Arizona Department of Agriculture, Arizona Cattlemen's Association, and the University of Arizona. The mission of this program is to have trained and equipped first responders in case of unexpected **livestock** death or disease.

Eighteen veterinarians and five cooperative extension agents have been fully trained and equipped as first responders. In addition four of the ALIRT first responders have completed a five-day course on *Exotic and Emerging Diseases of Animals* at the School of Veterinary Medicine, Colorado State University.

To supplement the first responders, extensive training programs have been provided to Arizona Department of Agriculture and to several hundred livestock producers. An ALIRT handbook specifically for livestock producers had been developed by the Animal Science Departments.

To date, there have been three ALIRT responses. These responses involved several hundred head of livestock, four trained first responders, the Arizona Veterinary Diagnostic Laboratory and two faculty members from Animal Science and Veterinary Science.

Under the current drought conditions found throughout the Southwest, veterinarians and livestock producers should be particularly cautious with range cattle. Some of the problems seen in the past under these conditions include; nitrate toxicity from hay, rumen acidosis from non-fat dry milk, toxic plants (dog bane, burroweed, and loco weed) and urea toxicity from protein supplement.

If you would like more information about this program please contact:

Dr. Peder Cuneo, Extension Veterinarian
c/o Arizona Veterinary Diagnostic Laboratory
telephone 520-621-2356 ext 19
e-mail cuneo@u.arizona.edu

The University of Arizona
Dept. of Veterinary Science and Microbiology
Arizona Veterinary Diagnostic Laboratory
2831 N. Freeway
Tucson, AZ 85705-5021

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U.S. POSTAGE PAID
TUCSON, ARIZONA
PERMIT NO. 190

Director: Greg Bradley DVM, Diplomate ACVP

Diagnosticians:

Robert D. Glock DVM, PhD, Diplomate ACVP
Sharon M. Dial DVM, PhD, Diplomate ACVP
Carlos Reggiardo DVM, PhD, Diplomate ACVM
James Collins, PhD
Jennifer Johnson DVM

Extension Veterinarian:

Peder Cuneo DVM, MS, Diplomate ABVP

Administrative Staff:

Darcy Kennedy, Administrative Assistant
Aurora Astorga, Computer Database Specialist
Laurie D'Auria, Office Assistant Sr.
Kathy Strahorn, Quality Control Manager
Elaine Nakash, Document Control Manager
Carla Ruiz, Submission Research Technician
Monica Urrutia-Sheehan, Office Assistant, Sr.
Erin Carlisle, Student Office Assistant
Leslie Pansing, Student Office Assistant

Necropsy:

James Hicks, Animal Technician Senior

Histology:

Shannon Shula, Histotechnologist
John Gaylor, Histotechnologist
Kathleen Rickert, Student Laboratory Assistant
Rachel Casement, Histotechnologist

Immunohistochemistry:

Matt Cuneo, Student Laboratory Assistant
Barbara Rickert, Research Specialist

Microbiology:

Brooke Ludeke, Research Technician
Belinda Lockett, Research Technician
Esthela Gonzalez, Research Technician
Stephanie Woods, Student Laboratory Assistant

Molecular Procedures:

Nancy Guzman, Research Specialist
Lori Nelson, Research Technician
Mark Shupe, MS, Senior Research Specialist
Megan Sieveke, Student Laboratory Assistant

Diagnostic Services offered at AzVDL:

Pathology: gross necropsy, histopathology, cytology, immunohistochemistry or other diagnostic tools used to determine the cause of disease

Microbiology: the use of microbiological techniques to identify bacteria, viruses, parasites, and other infectious agents, and their relationships to animal diseases

Serology: analysis of serum to monitor animals' prior exposure to diseases

Molecular Diagnostics: PCR testing for common diseases of companion animals

This newsletter can be accessed electronically via <http://microvet.arizona.edu/AzVDL/index.htm>
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