VIRGINIA-MARYLAND VETERINARY NOTES

Veterinary Teaching Hospital, Virginia-Maryland Regional College of Veterinary Medicine

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WHAT'S INSIDE!

SOMETHING TO THINK ABOUT

The World's 49 least developed countries will/could triple in population in the next 50 years.

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VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

This newsletter is published quarterly in support of the outreach program of the Veterinary Teaching Hospital VMRCVM, Blacksburg, VA and is prepared for and distributed to veterinarians in the Mid Atlantic Region

University of Maryland 18 56

Veterinary Teaching Hospital Update

This message has been long in coming and my nearsighted predictions soon after June 6th when we closed our Large Animal Hospital were pitiful reflections of what all has transpired to this point. I also realize that its priority when compared to the events of 9/11/01 was insignificant but it has still been the major concern to us as a hospital. I am pleased to announce that we begin the New Year with our Large Animal Hospital reopened! Complete floor renovation was necessary and the expense drove the process through the state purchasing system of specifications development, bid submission and selection of the lowest bidder that met the specifications. To then have the contractor's crew walk away from the job mid-way through did not expedite its completion in the least. Our goals were to have a sealed floor to inhibit harboring of organisms, a floor that drains properly, and one having adequate 'footing' for large animal patients walking on a wet surface. We believe those goals were achieved. We also researched the experiences of other large animal hospitals that have had outbreaks of nosocomial infections to learn from their experiences. As a result we combined their solutions with our own to put into place a heightened surveillance plan to manage our patients and monitor our facility using the very best collective wisdom we could gather to protect the future health and well-being of all our patients.

I know that we inconvenienced many of our referring doctors who depend on us to provide referral services and, for that I sincerely apologize. We remain confident, though, that our decision to close and renovate to resolve the contamination of our facility was the appropriate ethical and medical measure to invoke. Our doctors, including our interns and residents, the technical and support staff, and our students are all anxious to resume operating a fully functioning hospital to serve our referring doctors and their clients while teaching our students under the best of circumstances as we train competent professional colleagues. We believe we can now offer better service than ever before and that is our goal and commitment.

It seems reasonable that we are anxious to reestablish relationships with our referring doctors who have used our service expertise and facilities over the years. Our outpatient services have continued and we are hopeful that our inpatient demands will quickly return to the level established prior to our closure. Training of our students during the closure period took place using the university flocks and herds, our food animal and equine field services, the continued outpatient hospital service, and, for a few students, repeating rotations at the Equine Medical Center in Leesburg. Teaching in our on Large Animal Hospital, though, offers greater advantages in efficiency and convenience for us all.

I welcome your input and perspective of our handling of the hospital closure and I would be pleased to share the measures we have instituted to manage our patients and facility. On behalf of our dean, our college, and the university, I extend to you my best wishes of a joyful and prosperous New Year in this anno Domini 2002.

Robert A. Martin, DVM
Hospital Director
VD-MD Regional College of Veterinary Medicine

Pubic Symphysiodesis and Canine Hip Dysplasia

Canine hip dysplasia (CHD) treatments include medical care and surgical options. A less-extensive surgical treatment resulting in beneficial hip remodeling would be advantageous. The objective of this study was to determine the long-term effects of juvenile pubic symphysiodesis (JPS) in dysplastic puppies. Seven dysplastic Chesapeake Bay retriever puppies and 2 beagle-cross puppies (BX1 and 2) were used in this research. Five puppies had JPS performed with electrocauterization at 12,16,20,22, and 24 weeks of age, respectively. Two puppies served as controls. Hip evaluations included acetabular angle (AA), dorsal acetabular rim angle (DARA), laxity, coxofemoral range of motion, hip pain, and gait analysis by force-plate technique at 44 and 137 weeks of age.

JPS surgery, performed on young dysplastic (lax) dogs using electrocautery, resulted in premature closure of the pubic physes. Surgery significantly improved all objective and subjective preoperative hip evaluation values. Greater acetabular responses were related to younger ages at surgery. The final mean AA in dogs that had JPS was 25° greater than preoperative values; 40% increase over control. The DARA final mean was 10°,52% less than preoperative values and 46% less than control. The final mean distraction index in dogs having JPS was 0.28,47% improved over preoperative values and 58% better than control. Mean Pelvic dimensions in dogs that had JPS were 18% less than control. Gait analyses were normal for all dogs at 137 weeks. No urinary or bowel complications occurred.

JPS surgery initiated acetabular rotation in dysplastic dogs and these beneficial results appeared to be long-term. Premature pubic growth arrest appears to modify the acetabular growth by decreased pelvic canal height and width. The shortened pubic rami cause tension (traction) on the ventral acetabula, which results in ventro-lateral acetabular rotation. Maximal AA rotation (49°) was found in the youngest surgery dog (12 weeks of age), and the least rotation occurred in the eldest dog at surgery (24 weeks of age). The urethra of both sexes was anatomically close in the pubic symphysis as viewed in the prone (sternal) position. Evacuation of the rectum may further increase urethral-pubic distance and therefore seems prudent before cautery techniques. The close proximity of the urethra to the pubic symphysis warrants surgical awareness to prevent inadvertent thermal damage to pelvic organs. A small abdominal incision cranial to the pubis or trans-rectal palpation is used to digitally reflect pelvic structures during cauterization. Neutering of JPS dogs is not only advised, but strongly recommended to eliminate dysplastic dogs from the gene pool and to avoid misrepresentation of treated animals.

In current and other experimental dogs, plus our clinical cases, no adverse effects with JPS surgery have been seen in approximately 50 dogs with follow-ups at 1 to 2 years of age. Significant ventrolateral acetabular rotation, increased hip coverage, diminished hip laxity, normal pain-free gait, and insignificantly reduced pelvic size occurred after JPS. Although a reduction in JPS mean pelvic dimensions occurred from JPS surgery, there were no clinical implications. Dysplastic hips in young dogs were significantly improved by JPS.

Taken from Dueland, R. T., et al Vet Surg 30:201-217, 2001 , as reported in VetMed, Vol.8 Issue 1, October 2001, Iowa State University, Ames, IA

Would You Believe?

There are over 740,00 tax exempt charities listed with the IRS

Helicobter Species in the Gastric Mucosa of Cats

Infection with *Helicobacter* spp. is common in domestic cats with reported prevalence rates ranging between 41% and 100%. *Helicobacterfelis* and *Helicobacter heilmannii*-like organisms are the most common species infecting cats. Other gastric *Helicobacter* organisms detected in cats include H. pylori and *Helicobacter pametensis*. *H. heilmanniilike* organisms have been detected in dogs, nonhuman primates, cheetahs, swine, rats, and humans.

In this study, the presence and localization of different species of *Helicobacter* in the stomach of cats was investigated. *Helicobacter* were detected by Steiner stain in all infected cats at the mucosal surface, in the lumen of gastric glands, and in the cytoplasm of parietal cells. Intracytoplasmatic organisms were clearly detected in parietal cells from all *Helicobacter* infected cats. Electron microscopic observations indicate that these organisms are within dilated intracellular canaliculi of parietal cells. In silver-stained sections, *H. pylori* was easily differentiated from *H. felis, H. heilmannii,* and unclassified *Helicobacter spp.*, which were larger and more tightly coiled. Colonization of fundic mucosa by *H. felis, H. heilmannii*, and.unclassified *Helicobacter spp.* was dense and was more extensive than that in the pyloric mucosa. In contrast, *H. pylori* densely colonized both the pyloric and fundic mucosa, despite marked cellular inflammatory response in the pyloric mucosa.

Histological findings in the stomachs of *Helicobacter*-infected animals range from "normal" to severe inflammation, apparently dependant on the species and strain of *Helicobacter* involved. *H. pylori* infected cats showed signs of chronic gastric inflammation characterized by severe lymphoid follicular hyperplasia and minimal to moderate mononuclear inflammation, accompanied by the presence of granulocytes. In *H. felis* infected cats, the lesions were characterized by lymphoid follicular hyperplasia and mild but pangastric mononuclear inflammation with eosinophils. Mononuclear inflammation of minimal intensity was present in cats infected with unclassified *Helicobacter spp.* and in most of the *H. heilmannii* infected cats.

Taken from Scanziani, E., et al. J Vet Diagn Invest 13:3-12, 2001, as reported in VetMed, Vol.8 Issue 1, October 2001, Iowa State University, Ames, IA

Where Did They Go?

The results of a recent AVMA survey of graduating students in the class of 2000 revealed the following information regarding Virginia-Maryland Regional College of Veterinary Medicine graduates.

Employment accepted:

SA exclusive	28	LA exclusive	1
Advanced study	12	Equine practice	2
SA predominant	7	LA predominant	2
Uniformed services	2	State & Local government	1
Mixed practice	5	Other	2

Starting Salaries:

Overall range: $23,000 - 59,000

$39,000 - 42,999	31 %
43,000 - 46,999	19%
47,000 - 50,999	8%
51,000 - 54,999	5%

States of likely permanent employment

Virginia	38	California	4
Maryland	14	Florida	4
N. Carolina	3		

Job Offers:

19 students had 4 or more offers 15 students had 3 offers

Total educational debt:

Range of 0 to $100,000 with 16 students having $70,000 - 79,000
9 students having $60,000 - 69,999
9 students having $50,000 - 59,999
13 students having no debt at graduation

The response rate for the class of 2000 was 85%.

Feline Infectious Peritonitis

Feline infectious peritonitis virus (FIPV) infects domestic and wild felines of all species and can cause a severe fatal polyserositis. FIPV belongs to the group of feline coronaviruses that includes feline enteric coronaviruses. Most of these viruses are not pathogenic. The prevalence of FIP is increasing and is thought to be caused by increased fecal exposure of an increased number of indoor cats sharing litter boxes.

Most FIP cases occur in "indoor" cats from catteries, multiple-cat households, or shelters. In comparison, the incidence of exposure to feline coronavirus in feral cats is low (about 4 percent); whereas 59 percent of pet cats have antibody titers to feline coronavirus.

Transmission of feline coronavirus occurs primarily from ingestion or inhalation of virus particles from feces. Respiratory secretions, saliva and urine may also contain virus, but the feline intestinal tract is the primary reservoir for the FIPV. The virus is relatively stable and will remain viable in the environment for 3 to 7 weeks under dry conditions. However, it is rapidly inactivated by most common household disinfectants. Although all cats are susceptible to infection with FIPV, clinical disease is seen most commonly in cats 3 months to 3 years old. Young kittens are protected from FIPV by maternal antibodies until about 6 weeks old, after which 90 percent of kittens which are exposed to FIPV will seroconvert. Transplacental infection is rare as kittens removed from contact
with shedding adults at weaning will not seroconvert. Healthy carriers can shed virus for up to 10 months after infection. Up to 75 percent of naturally infected cats shed the virus, but only 10 percent of shedders develop classical lesions of feline infectious peritonitis (FIP).

Feline coronavirus can be found in almost any tissue tested from FIPV-positive cats. However, messenger RNA, which is synthesized only when virus replicates, is detected exclusively in the ileum, colon, and rectum. Current information suggests that FIPV is a virulent mutation of feline enteric coronavirus and that there are numerous naturally oncurring mutations of feline enteric coronavirus that result in "multiple" pathogenic FIPVs. Data indicates that alterations in the genetic code of feline enteric coronavirus occur quite frequently and are moderate. This means that chances are, no two cases of FIP are caused by the same virus. Most mutations are nonpathogenic. However, once a feline enteric coronavirus mutates into a virulent biotype, it can invade macrophages and replicate. Macrophages containing virulent FIPV are carried to regional lymph nodes where the virus further replicates and produces a viremia. Clinical disease can develop if the cat does not mount a sufficiently strong cell-mediated immune response to neutralize and clear the virus. If the cat cannot moderate infection, deposition of virus-laden macrophages in vascular endothelium may result in a complement-mediated vasculitis and effusion of fluid seen in wet or effusive FIP.

Humoral immunity is not protective, as cats having antibody titers to feline coronavirus(es) and /or FIPV can develop fulminating cases of FIP, leading to rapid death. Any seropositive cat may succumb to FIP, irrespective of the titer. Hence, there is no correlation between high titers, prognosis, and evidence of clinical disease. Forty percent of cats with titers <1:300 develop FIP; whereas about 50 percent of cats with titers >1:1000 succumb to FIP. Serology does not distinguish between infection with harmless feline coronaviruses and virulent FIPVs. In the absence of clinical signs, serology is of no use in determining prognosis. Clinical signs, historical factors, and laboratory values are useful for antemortem predication whether or not a cat has FIP. Clinical findings (fever, uveitis, neurological signs, or icterus) combined with historical factors (young cat, multicat household or possible exposure to carrier animals, and a recent stressful event) and laboratory findings (hyperglobulinemia [>Slg/dl] and lymphopenia (<1.S x 103 cells/uL) result in high predictive value (>85 percent) that FIP will be diagnosed postmortem.

Doster, Alan R. (Veterinary Quarterly, Veterinary Extension, College of Veterinary Medicine, TAMU 2001:17:2, as reported in Animal Health Spectrum, Volume 12 Mo. 3 Fall 2001, Missippii State Extension

Continuance of Studies on Population S Benzimidazole-Resistant Small Strongyles in a Shetland Pony Herd in Kentucky: Effect of Pyrantel Pamoate

Research on benzimidazole-resistant Population S small strongyles (*Cylicostephanus spp., Cyathostomum catinatum, Coronocyclus coronatus and Cylicocyclus nassatus*) in a Shetland pony herd in Kentucky, USA, has been carried out for over 25 years. The present update for the period 1992-1999 evaluates the activity of pyrantel pamoate (PRT), administered bimonthly at 6.6 mg/kg, in field tests. Additional critical tests with PRT (6.6 mg/kg) and oxibendazole (OBZ; 10mg/kg) were made in foals. The activity of PRT was initially excellent in field tests, based on epg/lpg count data, but declined rapidly during the second full year of treatment. Critical test data for small strongyles indicated that efficacies of PRT were about 60% at the beginning of the period and that this intermediate level of removal continued throughout the 7-year period except for 1994 (75%). Field tests epg/lpg data on small strongyles indicated a much lower activity of PRT than that found in worm count data in critical tests. The previously reported ineffective activity of OBZ on this population of small strongyles was confirmed. Data are presented on prevalence and drug activity on several species of parasites (*Strongyles* spp., *Gasterophilus intestinalis, Parascaris equorum, Oxyuris equi, Thelazia lachrymalis, Anaplocephala perfoliata and Habronema muscae*) other than small strongyles.

Veterinary Parasitology, 2001:94:4:247-256.
E.T. Lyons, S.C. Tolliver, J.J. Drudge, S.S. Collins, T.W. Swerczek, as reported in Animal Health Spectrum, Vol. 12 No. 4, Mississippi State Extension

Relationship Between Microfilaria Count and Sensitivity of the Direct Smear for Diagnosis of Canine Dirofilariosis

Direct blood smear examination (using 0.05 ml of whole blood) detected 168 (80.9%) of 204 microfilaremic canine blood samples as determined by the modified Knott test for microfilariae (mff) of Dirofilaria immitis (using 1 ml of whole blood). Direct smear examination detected all of 134 microfilaremias greater than 50 mff/ml but only 31 of 70 (44.3%) microfilaremias having less than 50 mff/ml. In a separate retrospective analysis of a database of 963 dogs with necropsy-confirmed heartworm infections,834 (86.6%) were positive by the DiroCHEK heartworm antigen test and 504 (52.3%) were microfilaremic by the modified Knott test. Only 2 (0.4%) of the microfilaremic dogs were DiroCHEK negative and another 18 (3.6%) were very weak positives. Although these dogs were not tested by direct smear, only one of the 2 DiroCHEK negative and 6 of 18 weekly DiroCHEK-positive dogs had microfilaremias so low that a direct smear may have given a false negative result. Significant adverse reactions to either diethylcarbamazine or the macrolide endectocides have not been reported for microfilaremias less than 500 mff/ml. Thus substitution of the direct smear for a concentration test for mff, such as the modified Knott test or membrane filtration, does not appear to increase the risk of an unexpected adverse reaction to heartworm prophylactic drugs. Such a substitution results in only a very slight decrease (~0.1%) in the overall sensitivity of heartworm screening, provided a test for mff is run concurrently with an antigen test. If a test for mff is the only screening test used, then substitution of a direct smear for a concentration test may decrease the sensitivity of screening by nearly 20%, depending on the prevalence of low level microfilaremias in the dog population tested. Veterinary Parasitology, 2001:94:3:199-204.

C.H. Courtney and QiYun Zeng, as reported in Animal Health Spectrum, Vol. 12 No. 4, Mississippi State Extension

VMRCVM Class of 2004

The class of 2004 was selected from a total of 920 qualified applicants. Virginia students were selected from 155 who applied, with 85 interviewed and 50 accepted. Maryland students were selected from 124 who applied, with 60 interviewed and 30 accepted. The 10 "at-large" students came from a pool of 641 applicants of whom 45 were interviewed.

In the class of 90 veterinary students, 75 held a bachelor's degree, three have a masters and one a Ph.D. degree. These 90 students attended 46 different institutions of higher learning prior to their acceptance, with 26 attending Virginia Tech. Other institutions included Penn State (5), University of Deleware (5), University of Maryland (4), William & Mary (5), and University of Virginia (2). Their college majors ranged from accounting to wild life with 39 in biology and 24 in animal science. Two majored in nursing, and one each in art history, journalism, and mechanical engineering.

The grade point average of those accepted was 3.53, varying from 2.92 all the way to 3.98. Their science GPA was 3.45 and their GRE scores averaged 3.54.

The gender of all applicants was 194 males and 791 females, and those accepted were Virginia: 13 males, 37 females; Maryland: 1 male, 29 females; and the "at large" students were 5 males, 5 females – for a total of 19 males and 71 females.

The average age of those accepted is 24.89, with the youngest being 21 and the oldest being 49.
K.C. Roberts, VMRCVM, Blacksburg, Virginia

Opportunities in Continuing Education

Spring 2002

Date	Topic	Location	Contact Hours
March 8 & 9	**Diagnostic Ultrasonography**	**Blacksburg**	**10**
March 11 - 13	**Soft Tissue Surgical Week**	**Blacksburg**	**40**
March 15 & 16	**Applied Ultrasonography**	**Blacksburg**	**10**
March 22 & 23	**Introductory Echocardiography**	**Blacksburg**	**10**
April 12 & 13	**Practical Eye**	**Blacksburg**	**10**
May 3 & 4	**Gastrointestinal Endoscopy I**	**Blacksburg**	**10**
May 17 & 18	**Applied Ultrasonography**	**Blacksburg**	**10**
May 20 – 24	**Intensive Orthopedic Surgical Week**	**Blacksburg**	**40**
May 31 & June 1	**Introductory Echocardiography**	**Blacksburg**	**10**

Please note:
The courses listed above are limited enrollment and feature a hands-on laboratory experience under the guidance of clinical faculty members. Program brochures provide course details. For registration or more information, please contact **Anne Clapsaddle**, aclapsad@vt.edu,VMRCVM – Virginia Tech, Blacksburg, VA 24061, (540) 231-5261; or **Conference Registration**, Continuing Education Center, (540) 231-5182.

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