Virginia Cooperative Extension Service

VIRGINIA VETERINARY NOTES

VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE

July-August, 1991 **No. 52**

WHAT'S INSIDE!

THOUGHT FOR THE MONTH

This we know, the Earth does not belong to man. Man belongs to the Earth. All things are connected, like the blood that unites us all. Man did not weave the web of life. He is merely a strand of it. Whatever he does to the web, he does to himself.

Chief Seattle, responding to governmental demands for western Indian lands, 1852
--Water News, Vol. 2, No. 12, Dec 1990.

Kent Roberts

Kent C. Roberts, DVM
Extension Veterinarian

Virginia Tech and Virginia State • Virginia's Land-grant Universities

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VETERINARY MANPOWER

A few weeks ago, I represented AABP at an AVMA sponsored veterinary manpower workshop in Chicago. A number of administrators and admission personnel from most US allied veterinary organizations attended the meeting. The workshop focused on the current shortage of veterinary school applicants and the shortage of graduate veterinarians in many areas. Apparently, the shortage of new veterinarians in the food animal sector we have noted for the last few years is now being seen in other areas of veterinary medicine.

In 1990, for the first time since statistics have been kept, the applicant to position ratio of US veterinary schools is less than that of medical schools (1.81 vs 1.82). Just 10 years age the ratio for veterinary school applicants to available positions in entering classes was 3.52. The total number of veterinary school applicants in 1980 was 7286 compared to 3955 in 1990. While the number of applicants to medical and dental schools have also declined since 1980, the decline is not as large as seen in veterinary medicine.

While the number of veterinary school applicants has declined, surprisingly the number of years of preveterinary preparation has remained constant at approximately 4.2 years. Also, while average applicant grade point average has declined slightly, the average GRE, VAT and MCAT aptitude tests have not changed. Even though average medial aptitude scores have not changed, there is likely a greater standard deviation in the scores in both applicants and those admitted to veterinary college. In other words, there is a wider spread from top to bottom. This trend is also exemplified in a slow progressive increase in academic attrition from veterinary schools seen over the last 10 years.

I'm sure most of you know at least one bright youngster in your community who is capable of becoming an outstanding veterinarian who would be a credit to the profession. Why not take the time to discuss with them the opportunities and rewards of veterinary medicine? If we are going to graduate approximately 2,300 new veterinarians each year in the US and Canada, why not make them the best 2,300 candidates available? **--David McClary, DVM, President, Abstracted from AABP NL, 2/91, as reported in Veterinary Newsletter, Utah State University, Logan, Utah, April, 1991.**

DRUG INCOMPATIBILITIES

Vitamin B complex rapidly diminishes the potency of many antibiotics. Do not mix penicillins in dextrose solutions of pH 8 or greater; pH should be between 6 and 8. Ampicillin in a dextrose solution of pH 4.5 will lose 10% to 65% of its potency in 24 hr period. Do not mix penicillins with the newer aminoglycosides such as gentamicin, kanamycin, amikacin, tobramycin, or netilmicin, since the aminoglycosides are destroyed with time and nearly 100% by 96 hours. This has not been documented with neomycin or streptomycin. Do not mix lidocaine solutions with oxytetracycline, since precipitation will occur due to radical pH difference of the two solutions. As a general rule, Banamine is incompatible with all solutions; the only known exception is oxytetracycline solutions. Sodium salts of cephalosporins are precipitated when mixed with solutions containing calcium ions (i.e., milk fever solutions, lactated Ringer's solution). Oxytetracycline likewise can be precipitated when mixed with calcium-containing IV solutions such as milk fever preparations or lactated Ringer's solution. Vitamin A in A & D injections reduced sodium selenite in selenium and vitamin E solutions to selenous acid which is not efficacious in prevention of white muscle disease. **--D. M. VanDamme, The Capsule Report, May 1990, in <u>KSU Notes from Extension Veterinarians</u>, April 1991, as reported in Veterinary News, May 1991.**

TREATING LYME BORRELIOSIS

Should a healthy dog which tests positive for B. burgdorferi be treated for Lyme borreliosis?

A New York veterinarian who participated in a serologic study for borreliosis offered antibiotics to owners of healthy dogs who tested positive in the study. One owner reported back that his dog's activity improved markedly after antibiotics. He had blamed increased sleeping on age. (1) Another report indicated that a healthy, seropositive horse given penicillin developed signs of Lyme borreliosis presumable due to a Herxheimer reaction, which is a response attributed to the killing of spirochetal organisms. The conclusion is that the horse was latently infected. (2) My recommendation would be to offer antibiotics to owners of healthy animals who test positive, but not insist on treatment of these animals. Owners should be advised that all the information is not in. If I had a seropositive athlete (an animal in top condition), I would not be likely to recommend antibiotics at this time. A healthy animal who seems to have some signs of aging would warrant a trial course of antibiotics.

My treatment of choice is two to four weeks of amoxicillin at a dose of 5 mg/lb BID in the dog, up to 10 mg/lb TID if non-responsive and Lyme still appears the only possibility. In the cat, I start with 10 mg/lb OD, but have gone to 20 mg/lb TID for several months in one young cat with meningitis-like signs where other diagnoses were excluded. Doxycycline should be used wherever Rocky Mountain Spotted Fever is a consideration, but since it is bacteriostatic, I do not feel it is the antibiotic of choice for Lyme borreliosis. Current Veterinary Therapy gives the dose. Tetracycline does not penetrate the CNS, and is no longer recommended for the treatment for Lyme borreliosis in man.

1. Benzaia D. Protect Yourself from Lyme Disease. Dell, 1989, pg. 96.
2. Post JE. Lyme Disease in Animals. Lyme Disease Update, April, 1989.

Wendy P. Feaga, D.V.M., Twin Oaks Animal Hospital, Ellicott City, MD.

U.S. MEAT CONSUMPTION

The figures for U.S. per capita consumption of meat for 1988-90 are listed below:

Type of meat	1988	1989	1990
Beef	72.3	68.9	67.0
Pork	63.5	63.2	60.3
Veal	1.4	1.2	1.0
Lamb/Mutton	1.4	1.5	1.5
Total red meat	138.6	134.7	129.8
Chicken	65.2	68.7	72.2
Turkey	15.9	17.1	18.3
Total poultry	81.1	85.8	90.4
Total all meats	219.7	220.5	220.2

Meat consumption is on the increase in this country after a decline over several years. **--USDA Economic Research Service, August 1990.**

LENS LUXATIONS IN DOGS

The incidence of lens luxations in domestic animals is not known. It occurs more commonly in dog than cats, and primary lens luxation in the dog is a common cause of secondary glaucoma.

The lens is suspended in its normal position by zonules, which is a system of fibers that originate from the ora ciliares. The zonule holds the lens in contact with a depression on the anterior surface of the vitreous body, known as the patellar fossa. In a normal eye, the zonular fibers form a tough membrane which is difficult to rupture.

Lens subluxation is a partial rupture of the zonules with displacement of the lens, but it remains in the patellar fossa. Lens luxation is the loss of all zonular attachments with lens dislocation from the patellar fossa. The lens may luxate anteriorly or posteriorly. Anterior luxation is more likely in young animals with gel-like vitreous, while posterior luxation is more likely in older animals with liquefied vitreous.

Lens luxations can be categorized as primary or secondary. Primary luxations are due to a congenital or heritable defect in the zonules which is clinically inapparent until luxation occurs. Secondary luxations occur as a result of intraocular disease which causes mechanical stretching, inflammatory disintegration, or degeneration of the zonule. It is not uncommon for lens luxations to occur secondary to cataracts or glaucoma, but most luxations are primary, occurring spontaneously in the adult dog without any apparent ocular disease.

Congenital lens luxations are rare, and are usually associated with other congenital ocular defects. Congenital luxations have been reported in Cavalier King Charles Spaniel and the Old English Sheepdog.

A recessive heritable defect is suspected in certain dogs, particularly in some of the terrier breeds. Primary lens luxations were reported most commonly in the wirehaired fox terrier, Sealyham terrier, Jack Russell terrier, and Blue Healer. Many other terrier breeds have been added to this list, as well as some nonterrier breeds such as basset hounds, beagles, spaniels, border collies, Tibetan terriers (not a true terrier), and poodles.

The age of onset for primary lens luxations is usually 4-5 years, but can range from 3-8 years. There is no sex predilection. The condition occurs spontaneously, but may be precipitated by vigorous activity or trauma. The lens usually luxates anteriorly and bilaterally. However, the lenses may not luxate simultaneously, and the second lens usually luxates within several months of the first.

The etiology of primary lens luxations is unknown. On histopathology, inflammatory cells may be seen engulfing defective zonules, and an immune mediated process has been suggested. In a group of Tibetan terriers which were bred for lens luxations, there was abnormal development of the zonule with bizarre reticulate formations of fibers. These changes were seen before there was clinical lens subluxation. There was no increase in intraocular pressure (IOP) until after the lens luxated, which suggests the elevated IOP was secondary to the lens luxation.

Secondary lens luxations occur as a sequela to other ophthalmic diseases and are usually seen in older dogs. Lens luxations may be seen with trauma. Trauma violent enough to cause lens luxations often causes other severe ocular lesions. Prolonged increases in IOP, as seen with chronic glaucoma, can cause stretching and rupture of the zonules. Since terrier breeds may be predisposed to (primary) angle closure glaucoma, it may be difficult to distinguish secondary from primary lens luxations. Occasionally, advanced cataracts with associated degenerative changes in the zonule can cause lens luxations. Other diseases which can lead to lens luxation include anterior uveitis and intraocular tumors.

Clinical signs of lens luxation may include a sudden onset of eye pain or irritation, blepharospasm, slight lacrimation, or milk conjunctival hyperemia. The dog may also carry the head in an abnormal position and have impaired vision.

On ophthalmologic examination of an anterior lens luxation, the lens may be seen in the anterior chamber. If the lens is transparent, it may be difficult to see, but the lens surface may be visualized when a light is directed across the anterior chamber. Using a bright light source, a bright halo may be seen at the periphery of the lens. Additionally, there may be a change in the depth of the anterior chamber. An anterior luxation may also cause a discrete subcentral area of corneal edema as a result of the lens contacting the endothelium. If the lens remains in the anterior chamber, the cornea may become diffusely opaque and may eventually vascularize. Elevated IOP can also occur with anterior lens luxation. Vitreous may be herniated into the anterior chamber where it can obstruct the pupil and iridocorneal angle and impair aqueous drainage. Aqueous flow through the pupil may also be blocked by the lens, resulting in increased pressures which force the root of the iris forward. In some cases, it is difficult to tell whether glaucoma is the cause of lens luxation or secondary to it.

Ophthalmologic examination of a posterior lens luxation may reveal an aphakic crescent. The lens may be free floating or resting against the retina, and may be difficult to see. Once the vitreous is damaged, it will liquefy and be replaced by aqueous. This process, syneresis, will continue until the vitreous disappears and the lens may settle on the retina. If a primary lens luxation is suspected in one eye, the other lens should be carefully evaluated for subluxation. Iridodonesis may be seen with lens luxation or subluxation and is pathognomonic. It is a trembling of the iris due to lack of support from the lends and may be elicited with movement of the globe. Subluxation may also be evidenced by irregularity of the pupil and local bulging of the iris. Additionally, displaced or herniated vitreous may be present which appears as cotton wool-like bodies within the pupil margin. If lens subluxation is suspected, the pupil should not be dilated unless surgical facilities are available because the lens may luxate anteriorly and require immediate removal. Lens subluxations often result in glaucoma (IOP>30mm Hg). Gonioscopy may reveal a narrowed iridocorneal angle secondary to the increased pressure. This will exacerbate the increased IOP, but the narrow iridocorneal angle does not necessarily indicate primary glaucoma.

There are several guidelines to use in deciding whether a luxated lens should be removed. If the lens is subluxated with no complications (e.g. pupillary block or increased IOP), no treatment is needed. However, the owners must be aware that these complications or complete luxation may develop. Lens removal is indicated when luxation is followed by an increased IOP, when the lens is contracting the corneal endothelium, or when a subluxation seems as if it is ready to luxate. <u>An acute anterior lens luxation is a surgical emergency</u> and the lens should immediately be removed to prevent glaucoma. Otherwise, complications such as pupillary block or obstruction of the vitreous may occur and allow retinal detachment. Posterior lens luxations can be managed medically with miotics to decrease the change of anterior luxation or removed to prevent the lens from moving back and forth through the pupil and causing glaucoma. **--J. Davidson, DVM, DM Lindley, DVM, MS, Diplomate ACVO, S.G. Krohne, DVM, MS; Purdue Veterinary Notes, Purude University, No. 170, January, 1991.**

TUBE TOPS

Firstly, there are those among us who are color blind. Secondly, it is good medicine to know what is in the tube and why. The following lists tube top colors used for most routine analyte testing.

Red Top - a plain glass tube used generally when serum is the specimen required. **NOTE**: We require a red topped tube for cerebrospinal fluid chemistry determinations.

Blue Top - contains 3.8% citrate, an anticoagulant which reversibly chelates calcium (Factor IV, that is calcium, is a necessary cofactor for blood coagulation). Citrate anticoagulated blood is used for most hemostatic analyte testing. In the citrated vacuum tube, a minimal blood draw is required for accurate hemostatic testing, that is, the ratio of 9 parts of blood to 1 part citrate **IS CRITICAL**. **NO** hemolysis is tolerated in hemostatic testing!

Purple Top - contains ethylenedinitrilotetraacetic acid (EDTA) which irreversibly chelates calcium (for all intents and purposes) and thus prevents blood coagulation. EDTA anticoagulated blood is used for most hematological analyte testing. **NOTE**: 5 mls of EDTA blood are ideal for small animal hematological testing. 10 mls of EDTA blood are ideal for large animal hematological testing.

Green Top - Heparin is an anticoagulant which hyperactivates antithrombin III, thus inhibiting all of the serine proteases in the coagulation pathways. Heparinized tubes are the rule for blood gas testing (specimen is iced), for many hormone tests, for meta- and sulfahemoglobin determinations, for lupus erythematosus preparations and, for erythrocyte osmotic fragility determinations. **NOTE**: Heparinized blood is ideal for running blood chemistry profiles as it requires no waiting prior to centrifugation and does not interfere with biochemical analysis! **--Bernie Feldman, DVM, PhD, Clinical Pathology, VA-MD Regional College of Veterinary Medicine, Blacksburg, VA.**

COLLEGE NEWS

Stephen Smith, DVM, PhD has joined the CVM faculty in Blacksburg as an assistant professor of aquaculture and a specialist in fish health. A native of Pennsylvania, he received his DVM from the Ohio State University and a PhD in aquatic medicine from North Carolina State University. He has been involved in raptor rehabilitation programs at Ohio State and the University of Minnesota.

These new residents and interns are arriving July 1 to start their clinical duties in the Veterinary Teaching Hospital in Blacksburg.

Todd Howerton, DVM, VPI '90, internship at NCSU, Small Animal Medicine Resident.
Kurt Schulz, DVM, Cornell '90, internship at Missouri, Small Animal Surgery Resident.
Charles Kuntz, DVM, FL '90, internship at AMC, Small Animal Surgery Resident.

Teresa DeFrancesco, DVM, Cornell '91, Small Animal Intern.
Rose LeMarie, DVM, LSU '91, Small Animal Intern.
Laurie Goodrich, DVM, IL '91, Large Animal Intern.
Annette Leroux, DVM, Cornell '91, Large Animal Intern.
Kathryn Nelson, DVM, WIS '91, Large Animal Intern.

LYME SYMPOSIUM

Lyme borreliosis and other tick borne diseases are increasing in importance to veterinarians and their clients. The differential diagnosis of these often subtle diseases is a challenge to practitioners, as is the treatment and management of suspected or confirmed cases.

The Virginia-Maryland Regional College of Veterinary Medicine is sponsoring a six hour symposium on Lyme borreliosis on August 29 at the Days Hotel in Charlottesville. This program is open to all human and veterinary medical professionals, including technicians, who would like to learn more about this baffling disease. Program speakers are experienced and well informed on the human as well as veterinary manifestations of Lyme disease. Plan to attend.

CONTINUING EDUCATION OPPORTUNITIES
VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE
CE PROGRAMS - FALL 1991

Date	Program	Location	Hours
August 29	Lyme Disease Symposium	Charlottesville	6
September 26	Small Animal Medicine Update	Charlottesville	4
*October 4-5	Orthopedic Surgery - Canine Hindlimb	Blacksburg	10
*October 11-12	The Computer in Veterinary Practice	Blacksburg	10
*November 1-2	Gastrointestinal Endoscopy	Blacksburg	10
*November 22-23	Practical Eye Surgery	Blacksburg	10
*December 6-7	Wound Management & Reconstructive Surgery	Blacksburg	10
*December 13-14	Small Animal Dentistry	Blacksburg	10

*Limited enrollment course

Note 1: Program brochures are mailed six-eight weeks prior to the course dates. Course reservations cannot be accepted until the brochures are mailed.

Note 2: Because of scheduling conflicts, changes were necessary in the College's continuing education fall schedule. Practical Eye Surgery was moved from October 4-5 to November 22-23 and Orthopedic Surgery was moved from October 11-12 to October 4-5. A short course on the use of computers in veterinary practice was added on October 11-12.

For CE course information, please contact:

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