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WHAT'S INSIDE!

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LYMPHOSARCOMA IN CATTLE

Lymphosarcoma is the most common neoplastic disease of cattle. Classification of bovine lymphosarcoma is based upon the age of the affected animal and the anatomical distribution of the neoplastic lesions (see chart). Fitting a case of lymphosarcoma into one of these categories is essentially an academic exercise as the appearance of the neoplastic tissue is identical and does not effect the outcome of this fatal disease.

Neoplastic lymphocytes may invade a tissue or organ either in a diffuse or nodular pattern. A diffuse infiltration is characterized by generalized enlargement of the organ, which usually appears paler than normal or may have a grey tan hue. Often the parenchyma is more friable than would be expected. Foci of necrosis or infarction may be present. If the neoplastic infiltrate is nodular yellow to grey tan masses are present randomly scattered throughout the affected organ. Foci of necrosis or infarction may be present in the neoplastic tissue or adjacent parenchyma. diffuse and nodular involvement may occur within the same organ.

The adult form of lymphosarcoma is the one most frequently observed. Organs commonly affected include the heart, particularly the right atrium, visceral and subcutaneous lymph nodes, the uterus, and the abomasum. Neoplastic masses are frequently found in the vertebral canal (extradural) causing compressing of the spinal cord. The liver and kidney are often affected. This is the only form of lymphosarcoma that is associated with Bovine Leukemia Virus, a retrovirus that infects B-lymphocytes. Bovine Leukemia Virus infection has also been associated with persistent lymphocytosis, but neither persistent lymphocytosis nor serological evidence of viral infection means that solid tumor masses will develop. The cutaneous form of lymphosarcoma in which the skin is thickened and coarsely nodular is rare. It usually occurs as a separate entity, but may be seen in conjunction with the adult form.

The lesion of thymic lymphosarcoma is that of a mass in the anterior mediastinum. This may be associated with dyspnea.

The neoplastic infiltration in juvenile lymphosarcoma frequently involves lymph nodes, the liver, kidneys, and periosteal tissue, neoplastic infiltration with infarction often occurs in the long bones of affected animals. There also may be involvement of thymic tissue. Fetuses may also get this form of the disease.

Forms of Bovine Lymphosarcoma

	Age	Sites Commonly Involved
Juvenile	Fetus - 2 yrs.	Lymph nodes, liver, bone
Thymic	1-2 yrs.	Thymus
Cutaneous	1-3 yrs.	Skin, superficial lymph nodes
Adult	> 3 yrs.	Multiple

Lois Roth, DVM, PhD, Diplomate ACVP, VA-MD Regional College of Veterinary Medicine.

EYE-IMMOBILITY DURING OCULAR SURGERY IN THE DOG

The intricate nature of many ophthalmic procedures demands a predictably immobile eye. The anesthetist can produce this in four ways.

1. Deep anesthesia (DA) Administering high doses of injectable or inhalation anesthetics will result in a centrally-positioned, immobile eye with pupillary dilatation. This state may be tolerated by young, healthy animals but may result in cardiopulmonary collapse in older, less-healthy individuals.

2. Methoxyflurane (MOF) Under methoxyflurane anesthesia, the eye fixes centrally and pupillary dilatation occurs at lighter planes of anesthesia when compared with other inhalation agents. The use of this agent therefore provides satisfactory conditions with a lower risk of cardiovascular compromise. It has recently been established that the administration of flunixin (Banamine) during methoxyflurane anesthesia may precipitate renal failure in dogs.

3. Retrobulbar block (RBB) The injection of local analgesic solution behind the globe may cause physical damage to retrobulbar structures such as the optic nerve. The technique is extremely difficult to perform satisfactorily in dogs that are not heavily sedated or anesthetized. The technique is also made challenging by the wide variation in orbital conformation of dogs of different breeds which makes landmark identification and insertion depth consistency difficult. The blocks duration may be variable, difficult to monitor, and unsatisfactory for lengthy procedures.

4. Neuromuscular blockade (NMB) The administration of short-acting neuromuscular blocking drugs such as atracurium (Tracium) or vecuronium (Norcuron) provides an immobile eye without excessive central nervous or cardiovascular depression during anesthesia. The use of these drugs mandates artificial ventilation and requires a degree of expertise, but despite this the technique provides the optimal conditions for both patient and surgeon. At Virginia-Tech, it has been used for over three years with excellent results.

The relative merits of these techniques are summarized below.

	DA	MOF	RBB	NMB
Conditions	good	good	moderate	excellent
Safety	V. low	high	low	high
Expertise required	none	moderate	high	V. high
Predictability	high	good	low	V. high

R.E. Clutton, K. Schwink, D.L.S. Richards, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, Virginia 24061.

BLOOD BANK PROGRAM

The Teaching Hospital, VA-MD Regional College of Veterinary Medicine, is home to six retired racing Greyhounds which serve as the source for all canine whole blood and blood components prepared and administered in the Hospital. The dogs are all blood typed, universal donors and negative for CEA-1, CEA-2, and CEA-7. In addition, all donor animals have undergone extensive testing to ensure they are free of infectious diseases.

Blood is routinely collected from each donor every two weeks. Each unit of blood is separated into packed red blood cells and fresh frozen plasma. The packed RBC's and fresh-frozen plasma are prepared by differential centrifugation in a refrigerated centrifuge. Packed red blood cells are most commonly used in the treatment of anemias where serum proteins are normal. By flash-freezing the plasma, clotting factors as well as albumen and globulins are preserved. Thus, fresh-frozen plasma is ideal for use in the treatment of animals with bleeding disorders as well as hypoproteinemic patients. Fresh-frozen plasma may be stored for 12 months.

As needed, the Blood Bank can also provide fresh whole blood and platelet-rich plasma (PRP). Fresh whole blood is most often used when there has been extensive blood loss, while PRP is administered to thrombocytopenic patients. In addition, the blood bank has the capability of preparing cryoprecipitates. These products are prepared by slow-thawing the fresh-frozen plasma which allows concentration of clotting factors in very small volumes. These products are ideal for the treatment of patients with coagulation factor deficiencies, such as hemophilia A. In the future, the Blood Bank hopes to offer additional services. These would include the preparation of platelet and white blood cell concentrates.

The Blood Bank program also maintains two feline blood donors. These donors are bled as necessary for fresh whole blood. The blood bank is not currently preparing or storing feline blood components.

Funds for the purchase of equipment used in the Blood Bank were generously donated by the Virginia Federation of Dog Clubs and Breeders. Items purchased include a centrifuge rotor, a 37°C water bath for warming packed RBC's and thawing frozen plasma, and a heat sealing unit for sealing blood bags.--**Deborah Davenport, DVM, MS, Diplomate ACVIM, VA-MD Regional College of Veterinary Medicine.**

LABORATORY GUIDE FOR PRACTITIONERS

A new book Veterinarian's Guide to the Laboratory Diagnosis of Infectious Diseases, VM Publishing Co., Lenexa, KS is now available. Written by Gordon Carter, DVM, MS, DVSc of the faculty, VA-MD Regional College of Veterinary Medicine, this book presents concise and specific information on the multitude of infectious diseases of animals and how to proceed with obtaining a laboratory diagnosis. The interpretation of lab results is also covered in this "quick consultation" publication.

Dr. Carter is an internationally known microbiologist with wide experience in the field of veterinary lab diagnostics.

CATS AND PHARMACEUTICALS

Editor's Note: This is the fourth of a series of articles on cats and their special pharmaceutical problems. These articles are taken from Veterinary Topics, University of Illinois, Vol. 11, #1, 1986.

Miscellaneous Drugs

Griseofulvin induces teratogenic effects when given to pregnant queens; therefore its use in these animals is not recommended. Animals are particularly vulnerable during the first trimester of pregnancy, when multiple malformations including cleft palate, cyclopia, and exencephaly are produced. Treatment during the third or fourth week of gestation may result in weak or stillborn fetuses; however, treatment during the last half of pregnancy is apparently without ill effects on the fetus.

Urinary antiseptics containing methylene blue may cause a severe Heinz body hemolytic anemia and concurrent pallor, icterus, dyspnea, depression, and death if left untreated. Blue urine and feces may be one of the presenting signs. Methylene blue causes an irreversible oxidation of the hemoglobin molecule leading to the formation of Heinz bodies in the red blood cells. These cells then undergo intravascular hemolysis to produce the observed clinical signs.

Phosphate-containing enemas (e.g., Fleet®) may produce profound depression, collapse, violent vomition, hypersalivation, tachycardia, cyanosis, hypothermia, muscle fasciculations, and tetany within 20 minutes post-administration; their use is an absolute contraindication in cats. Serum electrolyte analysis at the time of presentation will show a severe hypocalcemia, hyperphosphatemia, and hypernatremia. Treatment is aimed at restoring the serum calcium levels to normal. Initially, a 10% solution of calcium gluconate should be administered slowly IV. Given until the tetany and muscle fasciculations have ceased, this approximates a dose of 1.5 ml/kg. Concurrent EKG monitoring is advised during calcium administration. The cat should then be put on a maintenance drip of 5% dextrose in water supplemented with 10% calcium gluconate. Serum calcium levels should be monitored daily and the trip discontinued when calcium levels return to normal.

A decreased ability to conjugate phenols with glucuronic acid and the sebsequent buildup of toxic quinones explains the cat's generalized sensitivity to phenol-containing compounds. One example of such a product is hexachlorophene. Used in germicidal soaps (e.g., Septisol®), hexachlorophene may be potentially toxic if incorporated into enemas or used as a surgical scrub. Because it is readily absorbed from the skin and digestive tract, it may cause the following clinical signs: vomiting, depression, ataxia, patellar hyperreflexia progressing to hyporeflexia, anuria, and flaccid paralysis. Treatment is supportive and may entail gastric lavage or administration of a saline cathartic. In addition, management of cerebral edema may be necessary.

Finally, benzyl alcohol, used as a preservative in many solutions for parenteral administration, may be toxic to cats if given in excessive amounts. Small amounts can be conjugated by the cat's glucuronyl transferase system but quantities such as those involved in fluid replacement therapy cannot be effectively eliminated. A toxic metabolite, benzoic acid, accumulates and causes the central signs of ataxia, hyperesthesia, muscle fasciculations, and depression. Overzealous use of solutions containing benzyl alcohol as a preservative should therefore be avoided in cats.

Much research needs to be done to further our understanding of the cat's unique sensitivities to drugs. The ability to design rational dosage regimes with drugs depends on information provided by sophisticated pharmacokinetic studies, which are now becoming more commonplace in veterinary medicine. It behooves the practitioner to maintain careful scrutiny of veterinary journals for reported intoxications and to limit his or her armamentarium to those drugs and dosage regimes which have been shown to be safe and efficacious in cats.--**by Nina Shoulberg, DVM, MS, and Wayne S. Schwark, DVM, PhD and Associate Professor of Pharmacology at Cornell University College of Veterinary Medicine. Reprinted with permission from the Summer 1984 issue of "Veterinary News", a newsletter for veterinary professionals published by the Cornell Feline Health Center, Ithaca, NY.**

DIAGNOSING SEPTICEMIA IN FOALS

At the University of Florida, we analyzed clinical signs and laboratory results in 66 confirmed cases of foal septicemia. Ninety-seven percent of the foals displayed mild to moderate depression, 53% were febrile, 48% had some degree of scleral injection, and 38% had diarrhea.

In one-third of the septicemic foals, the white blood cell count was within normal limits. Neutrophil abnormalities, however, were present in the majority of the cases. Eight percent of the foals had abnormal neutrophil counts, 90% had >50 band neutrophils, 64% had >200 band neutrophils, and 70% of these septicemic foals had toxic neutrophil.

Toxic neutrophil changes are easy to identify with practice. A veterinary technician can be trained to identify Doehle bodies, toxic granulation, and cytoplasmic vacuolization.

In the study, 50% of the septicemic foals were hypoglycemic. Blood glucose levels can be checked on the farm with dextrose sticks or, for more exact measurements, with a glucometer.

Practitioners should consider clinical signs present during physical examination, laboratory data on neutrophil numbers and cytology, and blood glucose levels to ascertain the condition of the foal and to arrive at an early diagnosis of foal septicemia.--**by Barbara Brewer, DVM, University of Florida, Gainesville, as printed in the March 1987 Oklahoma State University/Stillwater newsletter, Capsules.**

FACTS ABOUT FELINE T LYMPHOTROPIC VIRUS (FTLV)

Researchers at the University of California, Davis have recently isolated a new retrovirus from cats which they have designated as feline T-lymphotropic lentivirus (FTLV). This discovery has received a lot of media attention, including coverage on the Paul Harvey radio show, etc., and has raised concerns among cat owners. Many of you have or will be asked about this new virus. Hopefully, the following information will help you answer questions. More detailed information on the virus can be found in the article "Isolation of a T-Lymphotropic Virus from Domestic Cats with an Immunodeficiency-Like Syndrome" by Neils C. Pedersen, et. al., Science, Vol. 235:790-793, Feb. 13, 1987.

1. Domestic cats may become infected with several retroviruses including feline leukemia virus (FeLV), feline sarcoma virus (FeSV), and feline syncytium-forming virus (FeSFV).

2. Researchers at the School of Veterinary Medicine, University of California at Davis, isolated another retrovirus from cats exhibiting a chronic AIDS-like syndrome.

3. The infected cats came from a cattery in northern California. The cats were homeless prior to entering the cattery, and some were feral.

4. The cats were routinely tested for FeLV and proved negative. The colony was kept free of FeLV because any cat testing positive was not allowed into the colony.

5. Disease problems in the cattery were low until the introduction of a female kitten from San Francisco into one of the pens.

6. At 7 months of age, the San Francisco cat began having intermittent bouts of diarrhea, developed a persistent mucopurulent rhinitis and conjunctivitis, and aborted a litter of kittens. The cat eventually died.

7. Later, the other cats in the same pen exhibited similar signs.

8. In July, 1986, two sick cats from this pen were presented to Dr. Niels Pederson at the Veterinary Medical Teaching Hospital for diagnosis and treatment. Serum samples from the sick cats were taken.

9. Experimental specific-pathogen-free (SPF) kittens were inoculated with plasma or blood from the sick cats. After four weeks, peripheral lymph nodes enlarged; two weeks after that a low-grade fever appeared that was associated with a drop in the total leukocyte count.

10. Morphologically, this virus, identified in tissue culture, resembles human immunodeficiency virus (HIV)--the human AIDS virus. FTLV has been shown to be genetically different from HIV.

11. Clinical signs of FTLV infection include chronic rhinitis, emaciation, anemia, gingivitis, periodontis, pustular dermatitis, ear infections, chronic conjunctivitis, diarrhea, and a rough haircoat.

12. This disease may be widespread in the cat population throughout California, but it is difficult to predict on the basis of present evidence.

13. FTLV seems to be transmitted by prolonged close contact, possibly by the saliva through mutual grooming or bites.

14. This virus is highly infectious and causes immunodeficiency in cats, the same way as human AIDS causes immunodeficiency in people.

15. Cats who live together in large numbers and come from varied or unknown backgrounds are more likely to develop FTLV.

16. Households that contain one or two cats where the cats are rarely outside or have little contact with other cats are less likely to contract the virus.

17. Breeding colonies or other closed colonies where the background of every cat is known are less likely to develop FTLV infections.

18. FTLV is infectious to cats ONLY. THERE IS NO EVIDENCE THAT IT IS INFECTIOUS TO HUMANS.

19. Because FTLV behaves in much the same manner as human AIDS, it is a useful model in which to study both diseases. These studies will benefit both the human and feline populations.

From a fact sheet prepared by the Office of Public Programs, School of Veterinary Medicine, University of California, Davis. Small Animal Professional Topics Vol. II, #4, 1986. University of Illinois.

RABIES VACCINATION FOR FERRETS

An article on ferrets in the May-June Virginia Veterinary Notes referred to the vaccination of these animals against rabies as a part of the recommended routine immunizations.

Dr. Brian Perry, epidemiologist at the VA-MD Regional College of Veterinary Medicine, promptly pointed out that there is no rabies vaccine approved for use in ferrets and none has been proven efficacious. If a "vaccinated" ferret subsequently bites a person or persons, it cannot be considered vaccinated and should be destroyed followed by a laboratory examination of the brain, as is done with other wildlife species. Veterinarians who vaccinate pet ferrets, skunks or raccoons should make this information clear to the animal's owner.

Dr. Suzanne Jenkins, among others, made the same observation as Dr. Perry. Dr. Jenkins is an assistant state epidemiologist with the Virginia Department of Health in Richmond.--**The Editor.**

HEARTGARD-30®

Heartgard-30® (ivermectin) has been recently approved as a once-a-month prescription heartworm (HW) preventive tablet at 6 mcg/kg for dogs as young as 6 weeks of age. Tablets are packaged in 6- and 9-month supply dispensers for dogs of three size ranges (68 mcg=1 to 25 lb, 136 mcg=26 to 50 lb, 272 mcg=51 to 100 lb). Dogs larger than 100 pounds may be given multiple tablet combinations for their appropriate body weight.

If practitioners switch clients' dogs to Heartgard-30® from diethylcarbamazine (DEC), it would be wise to recommend HW testing (by a concentration technique and if negative by occult antigen testing). Tests should be performed at the time of the HW preventive change and 4 months later. The reason for testing is that DEC-treated dogs may have an occult HW infection. An occult HW antigen test performed after a negative HW concentration test should be positive if adult heartworms are present. However, some occult HW infections may be missed even after both tests. This occult infection may have been initiated by errors or interruption of DEC administration or starting dogs on DEC without a HW check. If microfilariae exist in large numbers when DEC is administered, a possibly severe, anaphylactic reaction could be expected. Even though Heartgard-30® is not recommended to be used in HW positive dogs, research has demonstrated that only an infrequent, mild hypersensitivity type reaction, possibly due to dead or dying microfilariae, involving a transient diarrhea may occur in microfilariae positive dogs (heavy infection). When these reactions occur they usually appear within 6 hours of administration and are resolved by 48 hours.

If dogs test microfilariae or occult antigen positive at the time of the preventive change or 4 months later, the practitioner and client must decide if adult and microfilariae HW treatment is appropriate. Treatment to remove all HW adults and microfilariae is recommended prior to the initiation of a Heartgard-30® preventive program.

In summary, to avoid long explanations for alleged ivermectin HW prevention failure when an estimated 5 to 10 percent of dogs you have switched from DEC to Heartgard-30® test HW positive a year or so later, HW test all such dogs as previously described. If dogs are HW negative, dispense not more than a 6-month supply of Heartgard-30®, recommend HW testing 4 months later and thoroughly explain why.--**Veterinary Quarterly Review, Spring 1987. Texas A&M University.**

POTOMAC FEVER VACCINE AVAILABLE

It was recently announced that the State Veterinarian, Dr. William D. Miller, has approved the use and sale of the new Schering Ehrlichia Risticii Bacterin in Virginia. The vaccination program requires an initial dose followed two to three weeks later by a second dose, it is recommended that this be followed by an annual booster dose. To order the vaccine please contact your veterinary wholesaler or Schering at (800)228-9663.

POTOMAC TEST NOW AVAILABLE IN VIRGINIA

The Virginia Department of Agriculture and Consumer Services recently announced that the state diagnostic laboratories now have the laboratory capabilities to carry out the indirect fluorescent antibody (IFA) test for Ehrlichia Risticii. The price for both the acute and convalescent samples will be $30.00, while the cost of a single untitrated sample will be $10.00. Please inform the laboratory when submitting the first (acute) sample submission if a second convalescent sample will not follow.

FALL 1987
CONTINUING EDUCATION OPPORTUNITIES

		Contact Hours
September 16-17, 1987	Small Animal Medicine Update Tidewater (9/16) Charlottesville (9/17)	4
September 25-26, 1987	Bovine Practitioners Workshop Quality Inn - Frederick, MD	10
October 2-3, 1987	VVMA Fall Board Meeting Grand Rounds (10/2) - Blacksburg, VA	3
October 9-10, 1987	VMRCVM Alumni Conference College of Vet. Med. - Blacksburg, VA	3
October 22, 1987	Local Associations Meeting Donaldson Brown Center - Blacksburg, VA	2
November 13-14, 1987	Orthopedic Surgery of the Canine Hind Limb Lecture/Web Lab - Blacksburg, VA	10
November 15, 1987	Birds & Wildlife Seminar College of Vet. Med. - Blacksburg, VA	6
November 19, 1987	Small Animal Anesthesia Workshop Days Inn - Charlottesville, VA	6
December 4-5, 1987	Practical Surgery of the Eye & Ear Lecture/Wet Lab - Blacksburg, VA	10

VETERINARY ALUMNI CONFERENCE

The Virginia-Maryland Regional College of Veterinary Medicine is planning a first annual conference for graduates of the College in Blacksburg on October 9-10, 1987.

The festivities will start on Friday afternoon with registration and tours of the new Phase III building. A reception and dinner will follow at the Donaldson Brown Center with Dean Eyre as the after dinner speaker. Class reunions will follow the dinner program. A continuing education program with small animal and large animal sessions running concurrently will be given at the College on Saturday morning. Breakfast and lunch will be provided in the new College Center. The program will conclude following lunch. The projected registration fee is $25.00.

All VMRCVM alumni are encouraged to attend this first ever alumni gathering.

MAILING LIST UPDATE

We need your help in our continuing efforts to update our mailing list of veterinarians in Maryland and Virginia. This list provides the labels for mailing Virginia Veterinary Notes and our continuing education program brochures.

Please assist us by making any of the following additions or corrections:

_____ 1. New addition-not receiving mailings at present

_____ 2. Change of address

_____ 3. Delete from mailing list

New Address

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Questions/Comments on newsletter or CE programs

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Please mail to:

Virginia Veterinary Notes
VA-MD Regional College of Veterinary Medicine
Blacksburg, VA 24061

Thank you,

Kent C. Roberts, D.V.M.

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