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VIRGINIA-MARYLAND  
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### WHAT'S INSIDE!

<u>HUMAN INFECTION WITH THE DOG TAPEWORM</u> .....	Page 2
<u>DANGER IN LONG-TERM USE OF CORTICOSTERIODS</u> .....	Page 2
<u>EFFECT OF CALORIC DEPRIVATION ON HOST DEFENSE IN THE HORSE</u> .....	Page 3
<u>THE "FADING PUPPY COMPLEX"</u> .....	Page 3
<u>WILDLIFE RABIES SYMPOSIUM</u> .....	Page 4
<u>PATHOPHYSIOLOGIC BASIS FOR ASPIRIN THERAPY IN HEARTWORM DISEASE</u> ..	Page 5
<u>ACETAMINOPHEN TOXICITY IN CATS</u> .....	Page 6
<u>CONGENITAL HEART DISEASE</u> .....	Page 6
<u>EQUINE RESEARCH</u> .....	Page 7
<u>EMPLOYMENT INTERVIEWS</u> .....	Page 7
<u>SUCCESS IS NO ACCIDENT</u> .....	Page 8
<u>THOUGHT FOR THE MONTH</u> .....	Page 8
<u>FRACTURE REPAIR NOTES</u> .....	Page 8
<u>MEETINGS</u> .....	Page 9

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BLACKSBURG, VA

  
Kent C. Roberts, D.V.M.  
Extension Veterinarian

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### HUMAN INFECTION WITH THE DOG TAPEWORM

The Consolidated Laboratories, Bureau of Microbiological Science, has reported the identification of parasite proglottids and eggs obtained from an 8 month old child as those of *Dipylidium caninum*, the dog tapeworm. The identification was confirmed at the Centers for Disease Control (CDC).

Dipylidiasis is rarely reported; only six identifications of the parasite were reported to CEC in 1977, and only about 30 case reports have appeared in the U.S. medical literature since 1903.

Most cases involve infants and small children. Infection may be asymptomatic or associated with nonspecific complaints such as irritability, anorexia, insomnia, anal pruritus and vague abdominal pain. The manner in which cases are usually recognized is for a parent to discover the small, white, motile proglottids ("grains of rice") in a child's diaper, on his stool, or on his perineum.

Dipylidiasis may be confused with pinworm (*Enterobius vermicularis*) infection. Several bedside clues for distinguishing these two infections were recently summarized.

Examination of stool for ova and parasites is frequently of no help in confirming either of these two infections. Tapeworm segments (proglottids) must be placed in isopropyl alcohol or dilute formalin for transport to a parasitology laboratory; dessication will cause the segments to disintegrate.

The treatment of choice for dipylidiasis is niclosamide (Yomesan, by Bayer) whereas pinworm infection is treated with pyrantel pamoate, mebendazole, piperazine citrate, or pyrvonium pamoate.

Dipylidiasis is acquired from the dog or cat flea. Flea larvae ingest *D. caninum* eggs released from proglottids which has passed out of the rectum of an infected dog or cat. Humans, usually children, become accidental hosts when they ingest infected fleas from infested pets, floors or upholstery. After ingestion, a tapeworm cysticeroid develops over 3 to 4 weeks into a 5-30 inch-long adult worm in the small intestine. --as reported in Epidemiology Bulletin, August, 1983, Vol. 83, No. 8.

### DANGER IN LONG-TERM USE OF CORTICOSTEROIDS

An item in Cornell's Animal Health Newsletter warns that their studies show that long-term use of corticosteroids causes joint cartilage and bone problems in horses. Studies over the last few years indicate that "the cartilage structure is the target for dexamethasone and other synthetic cortisone-like drugs. Damage to joint cartilage results in complete loss over extended areas, with exposure of the underlying bone. The cartilage fails to produce bone, and detachment of cartilage results." This may be a major cause of osteochondritis dessicans. --Equine Veterinary Data, August 20, 1983, as reported in Nebraska Veterinary Extension Newsletter, Dec. 1983, Vol. 12, No. 12.

### EFFECT OF CALORIC DEPRIVATION ON HOST DEFENSE IN THE HORSE

Horses were deprived of food but not water for a period of five days. There was a progressive decrease in circulating lymphocyte count and compromised host defense. In vitro phagocytosis of yeast fell from a mean of 97 percent in fed horses to 78 percent in horses deprived of food for five days. The Arthus response to intradermal challenge with allergens fell to 57 percent of fed values. These changes indicate that food deprivation increases the susceptibility to bacterial infections; persistent anorexia in chronic bacterial infections may limit the horse's ability to cast off infection.

This has important implications for horse welfare. Periods of elective food deprivation during transport or for veterinary purposes should be kept as short as possible. Anorexia commonly accompanies illness in sick horses and efforts to improve food intake may bolster host defense. --by J. M. Naylor and S. J. Kenyon, as printed in Res. in Vet. Sci. 31:1981; as reported in Veterinary Professional Topics, Vol. 9, #3 1983, University of Illinois.

### THE "FADING PUPPY COMPLEX"

Recent research at the Animal Health Trust's Small Animals Centre at Newmarket has shown that canine neonatal mortalities occur in the first three weeks of life. However, there was a strong indication that a group which died within the first five days fell into the category of the "fading puppy complex". This incorporated 54 percent of all neonatal deaths which occurred in the first five days of life.

Certain clinical and pathological findings were common to this group. Signs of illness included general passivity and weak sucking response from day 1 or day 2, and/or crying, lateral recumbency with limb paddling, an inability to stay on the teat, and occasionally, rigors before lapsing into passivity and death by day 5. Some bitches rejected the pups by pushing them away from the nursing area.

Common post mortem features included bodyweight at death below that of birthweight although low birthweight was not a feature of the majority of fading puppy complex cases. All the puppies had an empty stomach and intestines largely devoid of content although meconium was passed normally. There were no gross lesions or defects. Histological examination did not demonstrate specific lesions but examination of the growth plate at the costochondral rib junction revealed that a marked growth arrest had occurred in 75 percent of fading puppy complex cases that had died by day 3. A significant proportion of a series of the fading puppy group showed that the main constituent of lung surfactant, a diphosphatidylcholine (lecithin), was notably lower as a percentage compared with the group which died of other identifiable causes ( $P=0.01$ ). Similar findings have been found in "sudden infant death" babies. --abstracted from A.S. Blundell, Vet. Record, 113 (1983) p 201, as reported in Iowa State University Veterinary Medical Extension Newsletter, Nov. 1983, as reported in Vet. Medicine Newsletter, University of Florida, VM 2584, Nov. 1983.

### WILDLIFE RABIES SYMPOSIUM

A North American Symposium on Rabies in Wildlife was recently held at the Johns Hopkins University School of Hygiene and Public Health. The symposium brought together people from a variety of disciplines and countries, and papers presented covered a wide field, from the epidemiology of rabies in different wildlife species, to the use of various techniques to control wildlife rabies.

Much concern was expressed over the current outbreak in the mid-Atlantic states, and Virginia reported approximately 500 confirmed rabies cases so far during 1983. Almost 150 cases occurred during the same period in Washington, D.C. However, the increased reported incidence of rabies has not been confined to this region, and both Canada and the southeastern United States reported an increasing number of confirmed cases. In southern Ontario, Canada, the principal species involved are the fox and the skunk, while in the S.E. United States, raccoon rabies predominates, where 42% of all their confirmed cases since 1947 have occurred during the last 5 years.

A further contribution to the understanding of the epidemiology of wildlife rabies has been made by the use of monoclonal antibody techniques. Reports from the Wistar Institute of Anatomy and Biology in Philadelphia, and the Center for Disease Control in Atlanta indicated that differences in rabies virus isolates have been detected using a panel of nucleocapsid-directed monoclonals. While preliminary in nature, these results suggest a geographical differentiation of various isolates rather than a species differentiation. For example, isolates from Iowa, Tennessee, northern Alabama and the southwest tip of Virginia, where skunk rabies predominates, are all distinct from isolates from the raccoon dominant area of the mid-Atlantic states. Similarly, both of these differ from virus isolates from Maine and Ontario, Canada, where fox rabies predominates. Bat rabies isolates did not fit into this pattern, and show more antigenic diversity.

Of the control measures discussed, the most exciting for the future was the use of an oral vaccine. Much work has been done in Canada on the delivery system for such a vaccine, where greatest success was achieved with the dropping by airplane of a 200 gram mince-meat bait in plastic bags, containing a tetracycline marker in order that the level of uptake by the target species (foxes and skunks) could be determined. So far, a good delivery system for raccoons has not been developed. The field use of oral vaccines has not been attempted in North America, but studies in Europe, where vaccine was distributed in chicken-head baits in an attempt to create an immune barrier zone in an area of Switzerland, have proved promising.

Delegates highlighted the need for research in the ecology of wildlife species, particularly the urban and suburban raccoon, in order to understand the patterns of intra and interspecies transmission, and supply the baseline data necessary for the application of any eventual oral vaccination programs. --Brian D. Perry, BVM&S, DTVM, MSc, MRCVS, Virginia-Maryland Regional College of Veterinary Medicine.

### PATHOPHYSIOLOGIC BASIS FOR ASPIRIN THERAPY IN HEARTWORM DISEASE

We have been investigating the pathophysiology of dirofilariasis for several years. During these studies, several interesting facts have been discovered. The adult worms cause pulmonary hypertension and resultant right-sided heart failure by producing arterial damage which results in the production of obliterative arteriosclerosis. The physical presence of the adult worms has no direct effect on blood flow and only in the caval syndrome does obstruction to blood flow occur. Thus, in the vast majority of cases, the damage produced by D. immitis adults is arteriosclerotic in nature.

The presence of D. immitis adults results in endothelial cell damage in the pulmonary arteries. This is followed quickly by the emigration of leukocytes, and then endothelial cells are lost from the arterial surface. When this occurs, platelets adhere, become activated, and undergo aggregation forming the initial hemostatic plug in an attempt to maintain the structural integrity of the vessel wall. Platelet activation initiates prostaglandin (PG) synthesis within the platelet, and PG production is directly linked to the release of platelet a-granule contents. Platelet-derived growth factor (PDGF) is one of these components and causes smooth muscle cells from the media of the artery to migrate into the intimal area of the artery and begin to multiply. The endothelial cells on the periphery of the lesion divide and cover the multiplying area. Within 30 days, these areas are the typical villous arteriosclerotic plaques seen in dirofilariasis. Small arteries and arterioles are completely obliterated by these lesions, and as a result, pulmonary vascular resistance increases, causing pulmonary hypertension.

The platelet appears to be the primary source of growth factors for these arteriosclerotic plaques, and we have been investigating ways to prevent platelet release of growth factors.

Since PG synthesis causes platelet release of PDGF, we thought that drugs which prevent PG production might be useful in heartworm disease. Aspirin is an excellent PG inhibitor, and we have studied its effect on 30-day and 1-year experimental heartworm infections. Our findings indicate that aspirin (5mg/Kg daily, orally) significantly reduces the damage caused by D. immitis. In fact, this dose appears to allow resolution of existing arteriosclerotic lesions. In the one-year study, no gastrointestinal damage was encountered with this dosage.

Thus, it appears that aspirin will not only prevent arteriosclerotic plaques from forming, but will also allow regression of preexisting disease. Aspirin administration has been shown to improve the condition of dogs in right-sided heart failure caused by D. immitis infection when administered at this same dose.

We have also studied the effect of aspirin on post-caparsolate thromboembolism and found that aspirin at a dose of 10mg/Kg daily significantly reduces the amount of thromboembolism.

Based on all of our findings, we recommend that aspirin (10mg/Kg daily) be given to all dogs undergoing caparsolate therapy beginning the first day of therapy and continuing for a minimum of four weeks. (Incidentally, we also studied the effect of prednisolone in the post-caparsolate period and found that it

increased the number of worms surviving the arsenical therapy. Therefore, glucocorticoids should only be given if the febrile response to caparsolate occurs as the adults begin to die.)

We also recommend that animals presented in right-sided heart failure be given aspirin (5mg/Kg daily), in addition to cage rest and diuretic therapy, for at least two to three weeks before caparsolate therapy.

Finally, in animals with advanced renal and hepatic disease, which preclude caparsolate therapy, aspirin (5mg/Kg daily) will prevent the progression of heartworm disease and may actually improve the animals' quality of life. --James C. Keith, Jr., DVM, PhD, Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech.

#### ACETAMINOPHEN TOXICITY IN CATS

Cases of acetaminophen toxicity in cats are being diagnosed more commonly these days. If caught in time, this serious, life threatening drug reaction can be treated effectively.

Acetaminophen is particularly toxic to cats because it is broken down (biotransformed) by hepatic enzymes, as in all animals, except that in cats the liver's ability to produce the critical detoxifying enzyme glucuronyl transferase is very limited. The cat's liver attempts to conjugate the breakdown products with glutathione instead but the liver's supply is quickly exhausted, allowing the buildup of toxic metabolites. These by-products alter the red blood cells, changing hemoglobin to methemoglobin. The resulting methemoglobinemia causes cyanosis and dyspnea. Other common signs of toxicity are depression, lethargy, vomiting and head and neck edema.

If treatment begins within four to six hours after the administration of a toxic dose, the prognosis is good. Effective therapy consists primarily of giving acetylcysteine to replenish the glutathione supply in the liver. Acetylcysteine is chemically very similar to glutathione and serves as a precursor for this critical detoxicant.

A recommended treatment regime for acetaminophen poisoned cats is: acetylcysteine 140 mg/kg orally as a loading dose, and then 60 mg/kg every four to six hours for a minimum of two days. The loading dose of acetylcysteine can be doubled for particularly severe cases or those involving a delayed diagnosis. Fluids (100-125 ml physiological saline) given subcutaneously and ascorbic acid (Vitamin C) dosed 20 mg/kg are of value when given with acetylcysteine treatments. --Kent C. Roberts, DVM and Dennis Blodgett, DVM, Ph.D., Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech; reference: Acetylcysteine for Treatment of Acetaminophen Toxicosis in the Cat., AVMA Journal, May 1, 1980, Vincent V. St. Omer, DVM, PhD and Edward D. McKnight, III.

#### CONGENITAL HEART DISEASE

Congenital heart disease is a common finding in a small animal practice. The incidence in the mongrel population is about 2.5/1000 cases while the incidence

in purebreds is approximately 9/1000 cases. Many of the congenital diseases have very specific breed predispositions and even though this is not absolute, the knowledge of these breed characteristics may be a valuable aid in diagnosis. The veterinarian is often placed in an awkward position with the owner of a new purebred puppy when a congenital disease is discovered. Since many purebred animals may be purchased with the thought of eventually breeding them, the veterinarian may be even more embarrassed if a congenital lesion is not discovered. The stethoscope is still the best instrument for the detection of heart disease. It is disconcerting to realize that many puppies initially presented for routine immunizations never have a stethoscope placed upon their chests. The veterinarian may not be able to completely diagnose every congenital heart problem he or she detects, but at least the owner can be informed that a congenital problems exists. --Dr. E. E. Musselman, Univ. of Illinois, College of Veterinary Medicine, Veterinary Professional Topics, Vol. 8, No. 3, 1983.

#### EQUINE RESEARCH

Researchers at Texas A&M University recently studied the effects of washing on the bacterial flora of the stallion's penis. They concluded that after washing the penis of stallions once daily for 14 days then allowing a 14 day rest and taking swabs for bacterial culture from the semen, prepuce, and urethra, that washing may be contraindicated in certain instances. They washed the penis with either Ivory soap and water, betadine surgical scrub and water, or water alone. All forms of cleansing the penis altered its bacterial flora. Washing in plain water seemed to have the least effect on the bacterial flora of the penis. However, it caused a primary change to occur by increasing the numbers of coliform organisms. Ivory soap caused an increase in potential pathogens on the penis, especially the coliform organisms. Betadine surgical scrub caused the most detrimental primary changes in the miroflora. Resisting organisms seem to survive with betadine scrub; the organisms which were cultured after the 14 days of washing stallions prior to servicing mares naturally should be discontinued. If washing is needed then it should be with water, followed by proper drying. All other forms of penile washing may result in changes in the microflora of the penis which can be associated in certain instances with infections of the uterus in mares, particularly when natural cover occurs. --reported by D. G. Pugh. DVM, MS., Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech.

#### EMPLOYMENT INTERVIEWS

Arrangements have been made to schedule employment interviews between interested veterinarians and senior veterinary students from the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Tech during the VVMA annual meeting in Springfield, VA, February 17-19, 1984.

A list of interested senior students is being compiled. Veterinarians desiring to interview students at Springfield on Friday afternoon, February 17, and Saturday morning, February 18, should send their name, address, type of practice, and other particulars, including prospective employee requirements to the address listed below.

Veterinarians needing professional assistants who are unable to participate in the interviews at Springfield may schedule student interviews at the Veterinary College in Blacksburg by sending their requirements to this address: Kent Roberts, DVM, VA-MD Regional College of Veterinary Medicine, Virginia Tech, Blacksburg, VA 24061, Telephone (703) 961-7666.

#### SUCCESS IS NO ACCIDENT

Personal experience suggests that most practices and practice receptionists would be unable to function without the HOLD button on their telephones. It would be unfair to say this device is abused at the expense of the caller, but I would say that many clients and potential clients spend a significant percentage of their telephone time on HOLD.

This common inconvenience might be worthy of investigation in your practice. Are you HOLDing people right off your appointment sheet? Do you enjoy spending 30 seconds to three minutes in the HOLDing pattern while your blood pressure mounts?

The telephone company has a device that will cause the telephone on HOLD to rering after a preset time. Part time help at peak times might warrant considertaion.

Remember, callers on HOLD probably are not forming favorable impressions.  
--K. C. Roberts, DVM, Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech.

#### THOUGHT FOR THE MONTH

The population of the world rose by 82 million people in the past year, to approximately 4.7 billion. It was the greatest 12 month leap in history.

#### FRACTURE REPAIR NOTES

##### Osteomyelitis

E. Coli and staph organisms are most commonly cultured from affected bone. Effective treatment in the form of antibiotics and fracture stabilization within 3-5 hours after the fracture occurs is critical in prevention.

##### Post Operative Infection

A bactericidal antibiotic (penicillin/ampicillin) given at the time of the presurgical prep and continued for three days after surgery is an effective means of prevention.

Double gloving prior to orthopedic surgery is a good precaution. Thomas splint is contraindicated in femoral and humeral fractures as it causes movement of the fracture side.

##### Chronic Hip Problems

Increase exercise, decrease weight and give buffered aspirin (25 mg/kg every 8 hours)

--as reported at Fracture Repair Short Course, Nov. 18-19, 1983, Kent C. Roberts, DVM, Virginia-Maryland Regional College of Veterinary Medicine.

## MEETINGS



For further information concerning these meetings contact:

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## NEW ANTIFUNGAL TREATMENT FOR DOGS

A new treatment for systemic fungal infections in dogs has just been made available with the introduction of ketoconazole (Nizoral, Janssen Pharmaceutica, Inc., New Brunswick, NJ), a synthetic, broad-spectrum, orally administered antifungal agent. Nizoral has been shown effective against a variety of fungal infections, including Candidiasis, ringworm, canine histoplasmosis, and canine blastomycosis (the latter are fungal diseases characterized by chronic cough, diarrhea, or both).

A year-long study of the new drug conducted at the Department of Small Animal Clinics, Purdue University, W. Lafayette, Indiana, revealed complete remission of symptoms in most dogs after 12 weeks' therapy. In some cases there was complete remission after a six-week treatment program. The drug is also thought to be almost completely devoid of serious toxicity and has been used for more than a year without side effects. Nizoral will not necessarily make the present drug of choice, amphotericin B (Fungizone, E.R.. Squibb and Sons, Inc., Princeton, NJ), obsolete. The Purdue research team found that combination therapy with both drugs is possible because of their different modes of action. Combining the drugs allows the veterinarian to take advantage of the immediate antifungal effect of Fungizone, but at the same time avoid the renal toxicosis associated with long-term use of that drug. Once the life-threatening infection is controlled by Fungizone, the drug can be discontinued and therapy continued with Nizoral alone. In dogs with renal disease, Nizoral can be used alone with good results. --Animal Health Newsletter, Nov. 1983, as reported in Veterinary Medicine Newsletter, University of Florida, Dec. 1983, VM 2594 - 2609.

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