

VIRGINIA-MARYLAND
REGIONAL COLLEGE
OF
VETERINARY MEDICINE

VIRGINIA VETERINARY NOTES



January-February, 1987

No. 25

VM Library

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Kent C. Roberts, DVM
Extension Veterinarian

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FEB 6 1987

BLACKSBURG, VA

BLOOD GLUCOSE VS URINE GLUCOSE FOR THE REGULATION OF CANINE DIABETES

Even though some veterinary internists recommend adjusting the insulin dose in diabetic dogs and cats based upon home monitoring of urine glucose, this practice is fraught with problems and can lead to disastrous results. Urine glucose does not reflect the minute to minute glucose concentrations in blood in response to insulin, but provides a long term estimate of blood glucose content. Individual variation in renal threshold, duration and peak of insulin activity, and time interval during urine collection in the bladder prior to voiding causes the discrepancy between urine glucose and actual blood glucose values. When urine is negative for glucose, blood glucose values may be low, normal, or high normal. A diabetic animal, therefore, may have no glucose in the urine and be very well controlled, or be dangerously hypoglycemic.

Blood glucose determination in the hospital for titration of the optimal insulin dose is both valid and practical. The peak and duration of activity of a particular intermediate acting insulin preparation should be determined for each patient by measuring blood glucose every 2 hours for 14 to 24 hours after insulin is given. After this information is gained, the lowest and highest daily blood glucose will be affected by changing the insulin dose, but the peak and duration of insulin activity will remain approximately the same. The optimum insulin dose may then be determined by measuring blood glucose at the lowest, about 6-12 hours after insulin, and highest, 24 hours after insulin, daily glucose concentrations. Repeated blood glucose measurement can be done practically with a drop of blood from venipuncture using a small gauge needle, 25 to 27, and colorimetric test strips (Chemstrips^R, Glucostix^R), evaluated by the naked eye or using a reflectance colorimeter (Glucometer^R).

Once the optimal insulin dose is determined, the animal is sent home on a fixed insulin dose. Adjustment of the dose as per daily morning urine glucose evaluations is inconvenient, and may lead to complications caused by insulin over-dosing and the Somogyi effect. Home monitoring should consist of daily evaluation of the dog's attitude, appetite, and water consumption. Periodic evaluations of blood glucose by the practitioner at the peak of insulin activity and in the morning before insulin dosing, or every 2 hours for a 14-24 hour period, are then used to further evaluate glucose control and adjust the dose if necessary. If owners desire to do so, urine glucose can be monitored at home to look for trends that may alert the owner to problems in management and stimulate in-office evaluation. Adjustment of the insulin dose however, should not be based upon the urine glucose concentrations.--**William E. Monroe, D.V.M., M.S., Diplomate A.C.V.I.M., VA-MD Regional College of Veterinary Medicine.**

THOUGHT FOR THE MONTH

The best part of a person's life is
not his fame, wealth or ability.

The best part of a good person's
life is the little nameless,
unremembered acts of kindness
and love given to others.

You are remembered and respected
for the good you do for others.

CATS AND PHARMACEUTICALS

Editor's Note: This is the second 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.

Analgesics

Acetylsalicylic acid (aspirin), an over-the-counter pharmaceutical, is a common cause of poisoning in the cat. Daily administration of less than one-half of an adult human aspirin (2 grains) can produce intoxication within one to two days in cats. Clinical signs include anorexia and depression progressing to vomiting after approximately the fourth dose. Higher levels of the drug produce more intense toxic effects, such as hematological disorders, fever, dyspnea, acid-base disturbances, possibly convulsions, and death.

Treatment of aspirin intoxication is basically supportive. Fluid therapy is complicated by the fact that the cat may be either in respiratory alkalosis or, as the intoxication progresses, in metabolic acidosis. A practitioner can circumvent the uncertainty of acid-base status by using a Harleco apparatus to determine the metabolic state of the animal. If aspirin ingestion is relatively recent, emesis or enterogastric lavage may be indicated. Alkalinizing the urine to a pH greater than 8 will hasten the excretion of the aspirin and help correct the metabolic acidosis which is most commonly present.

Analgesics even more dangerous to cats are acetaminophen (Tylenol^R) and phenacetin (a compound which is converted to acetaminophen in the liver). One Extra Strength Tylenol^R (500 mg) or two Regular Strength Tylenol^R capsules (325 mg) given four hours apart may produce toxicity in cats with clinical signs such as depression, anorexia, shallow respiration, pale cyanotic mucous membranes, icterus, vomiting, limb and facial edema, and dark, chocolate-colored urine. Methemoglobinemia, as evidenced by chocolate-colored blood, is a common factor of this toxicity. If the toxicity is left untreated, death may occur within three days post-administration.

Treatment of acetaminophen intoxication is supportive, possibly entailing the use of blood transfusions. Additionally, acetylcysteine has been advocated as a specific antidote. The rationale for the use of this drug relates to the feline's deficient glucuronyl transferase system. Due to the cat's inadequacies in conjugating acetaminophen metabolites with glucuronide, a larger proportion of a toxic reactive metabolite, N-acetyl-p-benzoquinone, is formed. This metabolite is subsequently inactivated by conjugation with endogenous hepatic glutathione by an alternate enzyme system. When the glutathione is depleted, cellular damage ensues due to the unbound reactive metabolite. Acetylcysteine, a compound similar in structure to glutathione, is given in an effort to provide an exogenous substrate for the metabolite. It is available to the practitioner as Mucomyst^R and is provided as a 20% solution. The recommended treatment regime for acetaminophen intoxication is 0.7 ml/kg orally given on admission, followed by a similar dosage at 4, 12, and 20 hours thereafter.

Clinical experience indicates that phenylbutazone is also more toxic in cats than in other species. Acceptable treatment regimes with this drug as well as other newer nonsteroidal antiinflammatory drugs such as flunixin meglumide (Benamine^R) have not been established in the feline.

Fortunately, acceptable narcotic analgesics are available for the management of acute pain situations in the feline. Morphine, when given at the dosage suitable for dogs (1 mg/kg), may produce severe CNS stimulation in cats. However, when administered at a reduced dosage, morphine is an effective, safe analgesic in the cat. The recommended dosage of 0.1 mg/kg SC will produce analgesia for over four hours. Dextro-propoxyphene hydrochloride (Darvon^R), a synthetic narcotic similar to methadone, given at 2.2 mg/kg IM, also produces acceptable, safe analgesia within two hours, with a duration of greater than four hours. Meperidine (Demerol^R), with a plasma half-life of only 0.7 hours, produces acceptable analgesia two hours following IM injection of 11 mg/kg (this dose being comparable to that used in a dog). Unfortunately the analgesic effects of meperidine are short-lived and by four hours pain sensation returns. Finally, a newer semisynthetic narcotic analgesic, oxymorphone (Numorphan^R), at a dosage of 0.4 to 1.5 mg/cat SC, IM, or IV, produces satisfactory analgesia. An obvious disadvantage of these narcotic compounds is the fact that they are controlled substances; however, they do represent effective choices for acute pain management in the cat.

SUCCESS IS NO ACCIDENT

Veterinary practice affords us many worthwhile challenges and opportunities but none greater than the chance to work with other people in providing outstanding service to clients. While patient care cannot be overemphasized, it is the ability to motivate people to work as a team in successfully providing this patient care and client service that presents perhaps our greatest challenge.

Our coworkers are people, first and foremost, with real needs and aspirations. Their first need is to be treated as people, as individuals with talents and hopes. They have a need for training, a need for advancement, encouragement and recognition, and a very basic need to communicate and be listened to. They seek and deserve consideration for these important needs. Their intrinsic value to the team effort, and hence to the practice, should be recognized and rewarded when appropriate.

Are you guilty of taking your co-workers for granted? Have you regularly considered their needs as individuals? Are you helping to provide the practice atmosphere and environment where people are encouraged to develop and perform at their optimum level? Are you, and is your practice, people oriented? You might want to answer these questions before you order that next item of expensive equipment.--Kent Roberts, DVM, VA-MD Regional College of Veterinary Medicine.

FACTORS DETERMINING THE PREPARATION AND UTILIZATION OF FOODSTUFFS IN AMERICA

Sociologically, the entire world is changing, particularly here in the USA. These social changes affect everyone. In the agriculture sector, these changes affect producers, processors, and distributors of meat, milk, eggs, produce, cereal grains, and other human foodstuffs.

The changes started back in the 60's and are continuing every year. Prior to the 60's, the home kitchen was the major site of food preparation. This is no longer so and here is why:

Over 1 meals per capita per day are eaten away from home.

A family of four is now less than 20% of our population.

About 56 to 60% of all women are working away from the home -- over 40% of the meals are not prepared at home but are prepared elsewhere, then warmed and served at home.

Over 20% of the households are occupied by single people and over 50% of these single home occupants don't cook any meals that are made from scratch. single males cook more complete meals than single females.

45% of all households have a microwave.

60% of all Americans limit fat in their diets.

The affluent want quality and will pay for it. Price is really no object.

The non-affluent will eat cheaper foods.

Food consumers want meals prepared to take home that are attractively packaged and easy to prepare.

Communications in Continuing Education, Vol. 2, No. 5, October 1986.

CLASS OF 1990 - COLLEGE OF VETERINARY MEDICINE

The CVM Class of 1990 matriculated in September 1986. Data relative to that class is listed below.

Number of applications	212
Applicants interviewed	157
Applicants accepted for Class of 1990	80
Degrees held - none	13
associates degree	6
bachelors degree	55
masters degree	6
Schools attended (total of 80 students)	37
Virginia Tech	24
University of Maryland	10
Undergraduate/Graduate majors (total)	26
Animal Science	18
Biology	34
Cumulative grade point average	3.42
GRE total score average	1170
GRE Advanced Biology average	52
Sex	male 27 female 53
Age	minimum 20 maximum 40 average 25

The Class of 1990 has 80 members, 30 Maryland residents and 50 Virginia residents.

THE PRODUCTION MANAGEMENT MEDICINE (PMM) SERVICE

Production Management Medicine (PMM) functions as a Veterinary Teaching Hospital service and provides an integrated approach to the identification, solution and prevention of herd/flock health problems in animal populations. The service has applied this concept to populations of food producing animals, horses, small animals, exotic caged birds and poultry. PMM is a field service that functions to: 1) provide health maintenance programs to producers within the 35 mile practice radius of the Veterinary Teaching Hospital; 2) coordinate and implement, on referral from practicing veterinarians, a discipline-integrated "team" approach to field investigations of animal health problems involving animal populations within the states of Virginia and Maryland; and 3) conduct relevant field research projects to develop quantitative approaches to the management of health in animal populations.

PMM, therefore, is a service that is available to the veterinarians of Virginia and Maryland and aims to provide support and expertise to the practitioner in the area of disease problem field investigation as it relates to animal populations.

The producer is charged a reasonable fee for this service. Charges are made for mileage, hourly professional service for time on the farm adjusted for the inefficiency of instruction, drugs and supplies, and diagnostic sample submissions. Fourth year veterinary students participate in all phases of the service. All recommendations concerning our investigation are documented to the producer and the referring veterinarian in letter form.

There are currently six clinicians that are working in the PMM service with a variety of expertise.

<u>Clinicians</u>	<u>Specialty</u>
Craig D. Thatcher, DVM, MS, PhD, Section Chief	Clinical Nutrition Food Animal Medicine
William B. Ley, DVM, MS, Diplomate ACT	Theriogenology Equine Medicine
Pierre R. Lessard, DVM, MPVM	Epidemiology Equine Medicine
David J. Sprecher, DVM, MS, Diplomate ACT	Theriogenology Food Animal Medicine
W. Dee Whittier, DVM, MS	Food Animal Medicine
Calvert T. Larsen, DVM, MPH, PhD	Avian Medicine

The PMM service stands ready to assist the practitioners of Virginia and Maryland with expertise in investigating and solving disease problems in herds and flocks. Please contact the College of Veterinary Medicine for assistance.--
Craig D. Thatcher, D.V.M., M.S., Ph.D., Section Chief of PMM, VA-MD Regional College of Veterinary Medicine.

SHEEP ENCEPHALITIS GRANT

A grant has been obtained by clinicians at the VMRCVM teaching hospital to study the effects of antimicrobial treatment in sheep with naturally occurring *Listeria* encephalitis. Costs of transportation, examination, diagnostic tests and treatment of affected sheep included in the project will be subsidized by the grant. We will also consider purchasing affected sheep. If you have any ambulatory sheep with suspected *Listeria* encephalitis that could become part of this project, or would like further details please contact Dr. Wilcke or Dr. Scarratt at (703) 961-4621.

CONTINUING EDUCATION OPPORTUNITIES

January 25, 1987	Impaired Performance in the Equine Athlete Dulles Marriott - Fairfax, VA
February 13-14, 1987	Equine Breeding Management Omni Hotel - Charlottesville, VA
February 19-22, 1987	Virginia Veterinary Medical Association Annual Meeting - Hot Springs, VA
March 8, 1987	Exotic Animal Medicine Seminar College of Veterinary Medicine - Blacksburg, VA
March 13-14, 1987	Small Animal Eye/Ear Surgery Lecture/Wet Lab - Blacksburg, VA
April 9, 1987	Problems of the Canine Hip Dr. Marvin Olmstead - Richmond, VA
April 10-11, 1987	Problems of the Canine Hip - Lecture/Wet Lab Dr. Marvin Olmstead - Blacksburg, VA
April 22-23, 1987	Small Animal Medicine Update Tidewater (4/22) - Charlottesville (4/23)
April 26, 1987	Pet Bird Medicine Workshop Dr. Kevin Flammer - Norfolk, VA

For more information on these programs, contact:
Kent Roberts, DVM
VA-MD Regional College of Veterinary Medicine
Blacksburg, VA 24061
(703) 961-7666

Virginia-Maryland Regional College of Veterinary Medicine Extension Staff:

Dr. J.M. Bowen - Extension Specialist - Equine
Dr. C.T. Larsen - Extension Specialist - Avians
Dr. K.C. Roberts - Extension Specialist - Companion Animals
Dr. W. Dee Whittier - Extension Specialist - Cattle

K.C. Roberts, Editor

Barbara B. Jones, Managing Editor of VIRGINIA VETERINARY NOTES

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