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Symposia for Breeders and Owners: The 22nd Annual Feline Symposium and the 29th Annual Canine Symposium

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The 29th edition of Penn's Annual Canine Symposium for breeders and owners was held on January 30, 1999 at VHUP. On March 6th cat breeders and owners came for the 22nd Annual Feline Symposium. Both events were generously supported by Pedigree®, and the feline event received additional support from Mrs. Robert V. Clark, Jr. and Mrs. Edith Young.

At each symposium the first morning session was devoted to *New Diagnostic Options at VHUP*, showcasing new equipment that aids in the treatment of companion animals. Later sessions were more specifically aimed at either dogs or cats.

Following are the summaries of the seminars. Please note that we placed the *New Diagnostic Options at VHUP* at the beginning of the section. 🐾

CT Scan Technology and Its Use in Small Animal Practice

Addressing the Canine and the Feline Symposium audiences, Dr. Mark Saunders, associate professor of radiology, said, "a cat scanner" is a very expensive piece of equipment. He was referring to the imaging device more technically known as a computed tomography (CT) scanner and the technology it employs explains the hefty price tag. The CT scanner uses a highly collimated x-ray beam and computer processing to mathematically reconstruct a cross-sectional image of a body area. The final image is simply a picture of the varying tissue densities and therefore varying absorption of the x-ray beam as it passes through the body. The varying degrees of x-ray absorption are reconstructed by the computer into thin tomographic images representing a particular area of the body. The major advantage of CT over conventional radiography is greater contrast resolution which allows subtle differences in

tissue density to be depicted on the image.

The new CT scanner at VHUP employs the most recent scanning technology. Slip ring technology allows the x-ray tube to execute a continuous, non-interrupted rotation around the patient and makes it possible for both axial and helical scanning modes to be performed. The VHUP CT can perform up to 60 revolutions per scanning run with fine adjustments to timing and thickness of images — down to 1mm — being possible. Helical scanning may allow a pet's entire chest to be imaged in 20 to 30 seconds. This helical imaging eliminates the distracting movement artifacts created during normal breathing as occurs when using axial format. It also means that more patients can be scanned during any day than can be imaged with conventional axial scanning. And it will be capable of performing studies not possible with

New Clinical Laboratory Methods

"Technology is truly a double-edged sword" said Dr. Raquel Walton, clinical pathologist at VHUP. In the clinical laboratory, exhaustive techniques and protocols are followed in a meticulous way to ensure accuracy and reliability. The laboratory must produce results that the clinician can trust and rely upon. Point-of-care tests are often hand-held or countertop devices that give immediate results in critical care or emergency situations. However, quality control is difficult to implement with this type of testing. Point-of-care tests may be useful for providing quick guidelines, but, they should not replace the clinical laboratory.

The new hematology analyzer at VHUP uses light and lenses to magnify objects that cannot be seen with the naked eye. A representative sample of blood is passed through a stationary laser beam. The beam of light is deflected

according to the size and complexity of the cells it encounters and an overall image of the sample's cellularity is produced. The analyzer then produces a graphic representation of the different cells called a scatterplot. Each cell type produces a characteristic scatter image. All mammalian blood samples produce the same characteristic patterns representative of the cells present. The system can also use depolarized light to distinguish between neutrophils and eosinophils. Platelets and red blood cells are also plotted, albeit by an older technology called impedance which is based on electricity and only allows cells to be differentiated by size. Lasers allow to distinguish between cell types by their size as well as their complexity.

The information produced must be interpreted appropriately and accurately by the clinician. For example, steroids

will affect the blood cells in a very specific manner and will produce a scatterplot of cells that tells the clinician the animal is ill, under stress or is receiving exogenous corticosteroids. Inflammation and leukemias also produce characteristic blood scatterplots. The plots provide information about what is happening in the patient's blood without having to perform a manual count. The cellular differential as it is known can now be accomplished in seconds with laser technology. This is an extremely important time and money saver for clients especially when their animals are having blood drawn and analyzed regularly.

These technologies will ultimately provide benefits to the client and patient, however, responsibility will always rest with the clinician who must interpret and apply the information with intelligence and insight. M.R.



conventional scanners, such as CT angiography.

An accompanying CT work station will permit image manipulation and 3-D image generation while other patients are being scanned. The digital image format allows for the selective removal of tissues not necessary to the evaluation of the condition — such as removal of portions of the skull image in order to see the brain.

The CT scanner will allow veterinary radiologists to image and diagnose abnormalities in anatomic locations previously inaccessible to conventional radiography and ultrasound. For example, the brain and spinal cord, surrounded by the dense bone of the skull and vertebra, can be imaged using CT. The CT study is usually accompanied by the injection of contrast media into the blood to help identify vessels. Derangements in vascular integrity will allow contrast media to back into abnormal areas, helping to identify the lesion. With properly trained technicians to operate the CT unit and veterinary radiologists to interpret the images, VHUP can now offer a wide range of diagnostic and therapeutic options to veterinary patients. M.R.

Computed Dental Radiography

Intraoral radiographs are taken to aid in the determination of a diagnosis in nearly every dental patient at VHUP according to staff dental hygienist Bonnie Miller. They are used to visualize the extent of bone loss in periodontal disease, to observe the pulp cavity prior to and during endodontic therapy. Assessment of resorptive lesions, tooth development, malocclusions, oral tumors and jaw fractures are additional applications for intra-oral dental radiography in veterinary medicine.

At VHUP each patient receives a complete oral examination. Dental radiographs, which require general anesthesia, are necessary to detect abnormalities

Endoscopy

“Endoscopy quite literally translates as looking within and may be considered as another diagnostic imaging tool for recording and characterizing anatomic structures,” said Dr. Robert Washabau, associate professor of medicine. The endoscope provides a non-invasive way to diagnose and treat a variety of disorders involving the gastrointestinal, airway and urinary tracts. It is also possible to view the abdominal and chest cavities with an endoscope.

At present there are two types of endoscope — fiberoptic and video chip — that employ different image producing technologies. The earlier scopes use fiberoptics and are somewhat limited by the fragility of their fibers which can be damaged through improper handling. The more recent video chip cameras are less fragile, give improved images and have greater versatility and are better suited for instructional use.

Before endoscopy was available, the GI tract was commonly evaluated using radiography and contrast studies, and abdominal surgery was often necessary for a definitive diagnosis and/or treatment. An endoscope is a versatile diagnostic tool allowing the clinician to look within the animal without the need for

surgical intervention. The endoscope can be used to take tissue biopsies, remove foreign bodies and project images of the intestinal mucosa for evaluation. With this information the clinician may be able to diagnose cancer, strictures, and ulcers involving any portion of the GI tract as well as abnormalities of the urinary system and airways.

Endoscopic airway studies may involve the trachea, mainstem bronchi and bronchioles. Once inside the airway a brush sample can be taken to evaluate the cellular material present and to diagnose diseases such as chronic bronchitis or asthma. In addition to this, foreign bodies may also be retrieved and the instrument may be used to perform biopsies from masses or bronchial lymph nodes that can be sent to the laboratory for cytologic evaluation.

Endoscopy has a wide variety of non-invasive diagnostic applications that are easily performed with the patient under general anesthesia. After an endoscopic exam the animal is expected to recover without complications and the clinician may be able to arrive at a diagnosis without the cost, time or possible complications of surgery. This makes endoscopy an attractive and practical application of technology for the veterinary clinician. H.R.

not clinically visible in the mouth. Computed dental radiography (CDR) utilizes a receptor that is placed into the mouth, rather than film, that is connected by a fiber optic cable to the computer. Instead of storing the image on the receptor once it is exposed to the x-rays, the image is sent back to the computer where it is stored as digitized pixels and is immediately available for viewing.

In contrast to conventional dental radiography, there is no film to develop (therefore, saving up to 5 minutes per image), no chemicals are required, and, there is a 90% reduction in radiation exposure to the patient. The image on the computer screen can be modified to enhance magnification and contrast. Calibrated measurement and coloring of the image are also possible. With the use of electronic mail, the radiographs can be

sent immediately to consultants or referring veterinarians. The CDR saves time along with the associated reduction in the expense of additional anesthetics and processing solutions; however, the cost of the system may be prohibitive to many practitioners. The software alone costs \$10,000 and the receptors cost \$5,000 each. Currently, the image quality of the digital radiograph is less than that of the conventional radiograph, although, the comparison of resolution is improving as the technology is constantly improving. Since the digital image can be manipulated, digital radiographs may not be acceptable as legal evidence in the courtroom.

The new technology used in Computed Dental Radiology brings VHUP into an era of improved dental diagnostics to enhance the treatment of our veterinary patients. M.R.



Vaccine-associated Feline Sarcomas

In the late 1980s and through the early 1990s, Dr. Mattie Hendrick, associate professor of pathology, noticed an increase in incidence in feline fibrosarcomas seen in the pathology department of the School. Pennsylvania had recently enacted a law that made rabies vaccinations mandatory for all cats, and new, powerful rabies vaccines as well as feline leukemia vaccines had just been introduced. A retrospective analysis of the cases found that these sarcomas had occurred at sites typically used for injections, and a microanalysis of some of the tumor sites revealed measurable amounts of aluminum hydroxide, a commonly used adjuvant in vaccines surrounding the tumors. Clinicians worldwide were made aware of the possible connection between vaccines and feline sarcomas.

Many vaccines cause a lump or an inflammatory reaction in cats one to two weeks after vaccination. Dr. Hendrick said that it has been hypothesized that in some cases, something during the inflammatory reaction causes the local cells at these reaction sites to "change from normal cells that proliferate in response to injury or wounding to become tumor cells." Some investigators are looking at the role of growth factors and oncogenes in the proliferation of the sarcomas.

Feline vaccine-associated sarcomas have occurred in cats that received all different types of vaccines, including those with and without adjuvants. The clear majority of the tumors in one study, however, was associated with the FeLV and rabies vaccines. The effect of vaccines has been found to be additive, that is, the more vaccines injected simultaneously into one site, the greater the tumor risk.

Although the cats that experienced these sarcomas were of all ages, the mean age was eight years and most of the tumors appeared two months to 10 years after vaccination. No breed of cat was particularly susceptible. Females and males were equally affected. Neither

Feline Birthing Problems

Dystocia or feline birthing difficulty is an uncommon, yet serious problem in cats when it occurs. Dr. Cynthia Otto, assistant professor of critical care and a clinician in VHUP's Emergency Service, discussed feline dystocia and presented the report of a retrospective study of 110 cases seen in ES from 1986 to 1996.

The normal gestational period in domestic cats is 64 to 69 days, and pregnancy is followed by three stages of birth. In the first stage, which typically lasts two to 12 hours (or as much as 36 hours for a primipara), there are relatively few signs of outward labor, including restlessness, nesting behaviors, vocalization, and increased respiration. Evidence of dystocia is very rare in first-stage labor. Most dystocias occur in second-stage labor, when the kittens move into the birth canal and are born, a period typically lasting from 30 minutes to one hour per kitten. The third stage of birth, the delivery of the fetal membranes, happens anywhere from immediately following delivery of a

kitten to 15 minutes later.

Some queens experience what Dr. Otto calls "interrupted labor," a normal delay between births. Sometime confused with dystocia, this delay can last 12 hours or more. In contrast with a cat in birthing distress, an animal in interrupted labor will engage in normal behaviors such as caring for kittens already born or eating.

Some of the causes of feline dystocia include uterine inertia, in which the uterus is unable to contract or contracts weakly, fractured pelvis, narrow birth canal, fetal-maternal disproportion, or malpresentation (usually breech).

Of the 110 queens in the VHUP study, 80% were domestic shorthairs, and among the purebred cats, 10% were Persian. Most of the cats were indoor/outdoor animals and were not receiving the highest level of care; many of the owners were unaware of the date of the conception, or even of the existence of the pregnancy, and were consequently not looking for signs of labor. This was the first litter for half of the cats, and the majority were two years old or

feline leukemia virus (FeLV) or feline immunodeficiency virus (FIV) infections were factors in incidence. To approximate an accurate rate of prevalence, 2,000 cats vaccinated in one practice were followed for five years. Five developed sarcomas — all at rabies vaccination sites.

One study showed that vaccine-associated sarcomas have a recurrence rate as high as 62%; most tumors recurring two to five times in the period six months to two years after the initial occurrence. Metastasis, however, is uncommon.

The tumors themselves are characterized as grey-white, firm, and usually well demarcated, often with central areas of necrosis. One of the reasons that the sarcomas have such a poor prognosis and high rate of recurrence is that this characteristic demarcation can be extremely deceptive. There are often tumor "fingers" that stretch out along the fascial plane and can be very difficult to excise completely. Excision of the tumor

"fingers" is vital and provides the cat with the best chance of prolonged survival. "Most people believe that aggressive surgery with wide margins is the best treatment," said Dr. Hendrick, "and 'aggressive' is the important part." The results of radiation and chemotherapy remain largely unclear.

In 1996, the Vaccine-Associated Feline Sarcoma Task Force (VAFSTF) was formed. One of the first achievements of the VAFSTF was the issuance of a list of recommendations to veterinarians, recommending, among other things, that veterinarians keep complete vaccination records, vaccinate at separate sites, and keep those sites distal. The group has also funded a number of ongoing studies in the epidemiology, etiology and pathogenesis, and treatment of vaccine-associated feline sarcomas. The ultimate goal of all research is, as Dr. Hendrick pointed out, prevention or cure of this condition. *P.C.*



younger. A full 60% of the cats in this study had concurrent health problems, including tachypnea (rapid breathing), elevated temperature > 103° F, poor pulse quality, anemia, dehydration, hypothermia, purulent vaginal discharge, sepsis, and decreased responsiveness.

Queens in the study received three kinds of treatment. The first and least invasive type of treatment was digital manipulation of the fetus. The second type involved administration of oxytocin, a drug that stimulates uterine contractions, usually resulting in birth within 30 minutes. Oxytocin injections were successful in half the cats treated in this

study. Abdominal radiographs should be taken before administration of oxytocin, to rule out structural abnormalities that may be preventing delivery, and to prevent subsequent uterine rupture. The third type of treatment was surgical. Cesarean sections were performed in 11% of the queens in the study, for conditions such as fractured pelvises or abnormally small birth canals.

All queens seen at VHUP received a thorough examination and diagnostic work-up, including tests for anemia and dehydration and evaluations of serum glucose levels and kidney function. Feline leukemia virus (FeLV) and feline

immunodeficiency virus (FIV) are associated with fetal malformation and stillbirth, and should be tested for in queens experiencing dystocia. EKGs will show the cat's heart rate and rhythm and pulse oximetry measures the amount of oxygen reaching the blood. Fetal ultrasound can be used to show the viability and heart rate of the kittens.

Dr. Otto explained that one of the most important elements in treatment of the animals in this retrospective analysis was educating the owners about the responsibilities attendant with pet ownership, particularly regarding spaying and neutering. P.C.

Feline Ringworm

Dermatophytosis — or ringworm — is a common infection in cats. Dr. Kevin Byrne, lecturer in dermatology at the School, discussed the etiology, pathogenesis, diagnosis and treatment of feline ringworm.

Feline dermatophytosis may be caused by any of three different fungi; the most common is *Microsporum canis*. Cats become infected by the arthrospores — reproductive structures — of *M. canis* through direct contact with infected cats or contaminated environmental components, such as bedding, clipper blades or insect vectors. Quite hardy, these spores may persist in the environment and be spread between cats indirectly through contaminated household ventilation systems.

Ringworm infection is more prevalent and severe in young cats. Severity of infection may also be increased in cats that are immunocompromised due to disease (particularly FIV or FeLV), poor nutrition, steroid treatment, pregnancy or lactation. Ringworm lesions are generally limited to alopecia and crusting, and typically occur on the head, neck or ears. They may, however, be generalized. The remaining hair of an affected cat appears brittle. Less frequent sequelae of ringworm infection include fungal mycetoma, miliary dermatitis and eosinophilic plaques.

Cats are unique in that their immune response to ringworm is minimal, with little or no inflammation. This mild response, Dr. Byrne explained, “probably enables these organisms to persist on some cats and maybe lead to the development of a carrier state.”

About half of the strains of *M. canis* fluoresce under Wood's lamp, which can be a useful screening tool for dermatophytosis. Microscopic examination of broken hairs may reveal grape-like clusters of arthrospores. The “gold standard” for diagnosis of ringworm is fungal culture.

A combination of oral and topical treatments may be effective in treating ringworm. Oral systemic therapy is necessary to decrease the duration of infection. Oral therapies include griseofulvin and itraconazole. Careful monitoring is advocated with the use of these drugs, as liver enzyme elevations may result. Topical treatments include lime sulfur dip, chlorhexidine and miconazole shampoo. New oral and topical therapies are currently under investigation.

Careful clipping the hairs around lesions may decrease the spore burden on the haircoat and slow the spread of infection. Total-body clipping is recommended only for generalized infections.

Further spread of infection can be prevented by separating cats into treatment groups based on presence and severity of lesions, and culture results, and by treat-

ing the environment. New cats should be quarantined for three weeks and have two negative fungal cultures (at least one week apart) before being introduced into the resident cat population. The *M. canis* vaccine has been shown to decrease the duration and severity of infection, but not its occurrence. Dr. Byrne sometimes recommends the vaccine in catteries, but not in one- or two-cat households. J.C.

Feline Vaccinations — a Discussion

Vaccination protocols have prompted considerable controversy in recent years, as veterinarians have begun to reevaluate vaccination strategy on a risk-benefit basis. “We began to see that there were some adverse effects to vaccination — that these vaccines weren't as benign as experts have led us to believe,” said Dr. Diane Eigner, president-elect of the American Association of Feline Practitioners (AAFP).

New data and fresh reanalysis of key therapeutic issues have prompted the AAFP to revise its feline vaccination guidelines. Dr. Eigner, who operates the Philadelphia-based veterinary practice, The Cat Doctor, discussed the key issues regarding vaccination and presented the current vaccination guidelines.

To address the issue of adverse

(continued on page 25)



The Geriatric Dog — Signs of Trouble That Cannot be Ignored

Dogs are living longer today than ever before. But those extra years come at a price. Dr. Meryl Littman, associate professor of medicine at the School, lectured on health problems in the geriatric dog and discussed preventive measures that can help to preserve the quality of life in these animals.

"Veterinary medicine has reached a point at which we don't have to worry as much about those infectious diseases that animals often succumbed to in the past," said Dr. Littman. "Now we put our expertise into prolonging life and preventing the diseases that make older animals sick."

"Old age" in dogs varies according to the size of the individual. Small dogs (<20 lbs.), who tend to live longer than larger dogs, become geriatric after about 10 to 12 years of age. Large dogs reach their senior years at eight or nine years old.

Signs of canine aging include graying of the muzzle, clouding of the ocular lenses, joint stiffness, alterations in fat and muscle distribution, lethargy and behavioral changes. Among the more common old-age diseases in dogs are arthritis, cancer, kidney and heart failure, diabetes, prostate disease, and cataracts. Signs such as weight loss, vomiting/diarrhea, drinking or urinating more, nosebleeds and growing masses are just a few of the changes seen in aged dogs that should not be ignored.

One of the most common and critical disease manifestations is polyuria/polydipsia (PU/PD), which is present in a dog that is urinating 50 ml/kg/day, drinking 100 ml/kg/day, and has a urine specific gravity <1.025. Some causes for PU/PD include kidney disease, diabetes mellitus, Cushing's disease, liver disease, and hypertension. The work-up for PU/PD is quite extensive, as it involves a number of ruleouts. The top differential for PU/PD is kidney failure. The kidneys excrete metabolic waste products, maintain the salt, water and acid-base balance, and regulate the levels of certain vitamins, minerals and hormones. Once 67% of their kidney function is

lost, dogs begin to show PU/PD. Serum abnormalities may not be seen until 75% of kidney function is lost.

Other clinical signs of chronic renal failure (CRF) include weight loss, decreased appetite, vomiting, oral/gastric ulcers and anemia. Management for CRF involves hydration (fluids/electrolytes) and possibly antibiotics (if infection is present), aluminum hydroxide (phosphorus binder), antiemetics, antihypertensives and dietary modification (low protein and salt; high carbohydrate; and vitamins).

Vigilance on the part of the owner can

perhaps forestall renal and other geriatric problems in the dog. Dr. Littman advocates baseline testing for dogs at six to eight years of age, just prior to their geriatric years. Geriatric baseline tests include routine bloodwork, urinalysis, dental exam and, if heart problems are suspected or a breed predisposition exists, heart/lung diagnostics, including EKG and chest radiographs. A nutrition consultation should also be done at this time. Thereon after, she said, healthy geriatric dogs should have an annual or twice-yearly veterinary checkup. J.C.

Vaccinations — Should We Change the Protocol?

Too much of a good thing is bad? This statement seems custom-made for the subject of vaccination. Dr. Nicola Mason, lecturer in medicine at the School, presented relevant immunological principles and made a compelling case for the conservative approach to canine vaccination.

The aim of vaccination, Dr. Mason explained, is to prime the immune system to respond rapidly and efficiently to antigenic challenge. The first puppy and kitten vaccinations will stimulate the primary immune response that is characterized by a relatively slow increase in antibody titers. The puppy and kitten booster vaccinations and thereafter annual vaccinations stimulate an anamnestic response during which the antibody titers rise more rapidly and to a greater extent than is seen with the initial introduction to the vaccine antigen.

Vaccines may contain either killed or attenuated antigen. Killed vaccines require parenteral administration and usually contain high levels of antigen together with an adjuvant. Killed vaccines will not revert to virulence. Modified live vaccines (MLV) are generally more potent, and are formulated in lower antigenic doses without the necessity for adjuvants. MLV's may be administered locally (i.e. intranasally) and reversion to virulence is possible.

Whether they are administered subcu-

taneously, intramuscularly, intranasally or orally, vaccines are not entirely benign. The most immediate adverse effects of vaccination are anaphylaxis and anaphylactoid responses. These responses are very uncommon, but when they do occur the effects are often seen within minutes to hours of vaccination and appear to be more frequently seen with the use of killed vaccines.

Dr. Mason also addressed the topical issue of vaccine-induced hemolytic anemia. "Retrospective studies have demonstrated a temporal relationship between vaccination and the onset of immune-mediated hemolytic anemia. Although suggestive, a true cause and effect relationship between vaccination and immune-mediated hemolytic anemia has not yet been demonstrated," Dr. Mason said.

The potential adverse effects of vaccination underscore the need to tailor vaccination protocols on an individual basis. Canine "core" vaccinations include rabies, distemper, adenovirus, parvovirus and parainfluenza. Use of "non-core" vaccines such as Lyme, leptospirosis, coronavirus and broadtail should be determined based on the risk-to-benefit ratio of administration for each individual patient. Dr. Mason did not support the use of the Lyme vaccine stating that most cases of "Lyme disease" in the dog are often self-limiting or readily responsive to antibiotic therapy (Lyme

Pancreatitis in the Dog

Pancreatitis is a highly destructive disease that often progresses quite rapidly. Dr. Rebecka Hess, senior lecturer of medicine at the School, described normal pancreatic function, as well as the pathogenesis, diagnosis and treatment of acute pancreatitis in the dog.

The pancreas is a "v"-shaped organ located in the cranial abdomen adjacent to the stomach, duodenum and liver. The endocrine portion of the pancreas secretes hormones, such as insulin and glucagon. In its exocrine role, the pancreas secretes enzymes that digest food.

"They chop up proteins into amino acids, fats into fatty acids, and carbohydrates into sugars so they can then be absorbed," Dr. Hess explained.

In the case of pancreatitis, these digestive enzymes become overactivated, with serious sequelae. "Instead of attacking food, they attack other proteins, fats and carbohydrates in the abdomen. In so doing, they damage nearby abdominal organs," such as the stomach and intestines.

Through the release of these enzymes, the pancreas also digests itself and becomes very inflamed and enlarged. With inflammation, more digestive enzymes are released, setting up a vicious cycle. Additionally, pancreatic enlargement may obstruct normal flow from the bile duct into the duodenum, resulting in icterus.

Any dog can develop pancreatitis. The disease, however, is seen more commonly in middle-aged (5-9 years old) and older (7-10 years old) dogs, obese dogs and Yorkshire terriers; intact female

dogs, Labrador retrievers and miniature poodles carry decreased risk. Predisposing medical factors include diabetes mellitus, hyperadrenocorticism (Cushing's disease), hypothyroidism, prior gastrointestinal disease and epilepsy. Dietary indiscretion (high fat ingestion) and treatment with L'asparaginase and sulphonamide antibiotics are also implicated in the etiology of pancreatitis.

Diagnosis of pancreatitis, often challenging, is based on history, clinical signs, physical examination findings and diagnostic tests. Clinical signs of acute pancreatitis include anorexia, vomiting (+/- blood), diarrhea and weight loss. On physical examination, affected dogs often are febrile and exhibit abdominal pain, bleeding in some form (i.e. epistaxis, ecchymosis, hematoma) and, perhaps, icterus. Bloodwork may show elevated pancreatic amylase/lipase and white blood cell count, decreased platelets, lipemia, and serum chemistry changes reflective of liver and kidney dysfunction. Radiographs may show loss of abdominal detail, and ultrasound may reveal an enlarged, hypoechoic pancreas. On histopathologic examination, pancreatic tissue is inflamed and fat necrosis is often present.

Treatment, which can be quite extensive, is primarily supportive, said Dr. Hess. It includes fasting "to let the pancreas rest," intravenous fluids, and perhaps antibiotics, antiemetics, analgesics and plasma. The prognosis for recovery is very variable, ranging from excellent to very poor. *J.C.*

nephropathy was the exception).

Typically canine vaccination protocols call for DA2LPPi immunizations every 3-4 weeks between the ages of 6-8 weeks and 16 weeks. Rabies vaccines are usually administered at 13 weeks of age. The frequency of booster vaccinations is controversial. Most of the U.S. veterinary schools advocate annual revaccination with DA2LPPi; however,

some are now recommending booster vaccinations every three years.

"Although vaccination protocols and vaccines are under increasing scrutiny with respect to adverse effects, we should not forget that the frequency of adverse effects is extremely low and because of vaccination, we are able to protect our pet population from a number of potentially fatal diseases," Dr. Mason said. *J.C.*

Arthroscopy

The School now has state-of-the-art equipment to perform arthroscopic diagnostics and surgeries on joints of dogs. The acquisition of the equipment was made possible by a generous gift from John and Margrit McCrane and the McCrane Foundation.

Arthroscopic equipment, used for quite a few years in human and equine medicine, is beginning to be utilized for dogs because the instruments are now small enough to be useful for canine patients and their smaller, tight stifle and shoulder joints. Dr. Gail Smith, professor of surgery, discussed the applications of the equipment and the advantages of arthroscopy over conventional surgery.

When an arthroscopy is performed, the trauma to the joint is less because it is not opened as it would be during a conventional arthrotomy. Arthroscopy instruments are inserted into a joint through three small incisions. The arthroscope contains a chip and a light and an image of the joint is transmitted to a video screen. The clinician can view the joint and determine whether there are lesions, loose fragments of cartilage, foreign bodies or whether the joint is infected. Fragments or foreign bodies can be removed with instruments introduced into the joint through one of the channels in the arthroscope. The joint can be debrided, osteophytes can be excised, a synovectomy or a capsular release can be performed. The joint can be irrigated or flushed. All these procedures cause very little trauma and the animal has much less pain and a faster return to normal function.

In addition to treatment, Dr. Smith explained, the equipment is used for diagnostics to determine what is wrong with a joint or to obtain a biopsy of cartilage. It will also be used for research purposes to study joints in dogs. He stated that the procedures are technically difficult and take just as long as a full arthrotomy because canine joints are small and the set up and take down take considerable time. However, the advantages for the patient are less pain and faster return to function.

Student Government Teaching Awards

degrees are not included after the surname. To be grammatically correct, the name should be John Doe, V.M.D. or Dr. John Doe, never Dr. John Doe, V.M.D.

Another error of semantics is using the word veterinary as a noun (it is an adjective). A veterinarian practices veterinary medicine.

Manatees

The Florida manatee, with an estimated population of 2,300, is an endangered marine mammal facing extinction because of human activities. The largest human-related mortality factor is collision with boats. Unrestricted development is another serious threat. Federal, state, private and industry groups are working to save the manatee. They are protected by the Endangered Species Act. Boat speed regulations are enforced. Unfortunately, manatees are not considered as "important" as other endangered species such as the great apes, giant pandas, and dolphins. This leads to the question: how important is the manatee's ability to help keep waterways clear by consuming vegetation?

The Florida manatee is a member of the order Sirenia. In folklore, Sirenia were mythical mermaids. Manatees are intolerant of cold weather. They can move between salinity extremes and can live in fresh or salt water. Adults may reach a length of nine to 10 feet and weigh between 900 and 1,200 lbs. They have a low reproductive rate. A calf is produced only one in three to five years. The gestation period is about 13 months and calves are dependent on their dams for about two years. Calves nurse underwater for three to five minutes every one to two hours.

Manatees appear remarkably resistant to natural disease and research indicates this may partially result from remarkable efficient and responsive immune system.

A recent study indicates that manatees can co-exist indefinitely with humans if boating and other regulations are completely enforced and effective. It seems that the manatee has gotten in the way of our lifestyle. ■

Students, faculty and staff gathered at the Academy of Sciences on April 10 for the Annual Student Government Teaching Awards Ceremony. The award recipients are selected by the individual classes. The Norden Award, won by **Dr. Cynthia Ward**, assistant professor of medicine, is presented on the basis of the vote of the entire student body. The Lindback Distinguished Teaching Award is presented by the University to outstanding teachers on the faculty. There is a limited number of these awards, so not every school is lucky enough to have a faculty member selected. This year, **Dr. James Lok**, associate professor of parasitology at the School, was a recipient of this prestigious award.

The Class of 1999 presented its Faculty Award to **Dr. Rebecca Hess** and its Resident Award to **Dr. Patricia Kull**. **Dr. Kim Casey** and **Dr. Chick Weisse** received the Intern Award. The class honored the following technicians: **Jo Graugh**, New Bolton Center; **Tracy Mansueto** and **Joe Rogosky**, Philadelphia.

The Class of 2000 presented its award to **Dr. Cynthia Ward**. **Dr. Tom Van Winkle** was honored by the Class of 2001, and the Class of 2002 presented its

award to **Dr. Olena Jacenko**.

Harcum students presented the Veterinary Technician Award to **Carla Garcia**, Philadelphia, and **Colleen Klein**, New Bolton Center. The nursing staff presented Senior Student Patient Care Awards to **Diane Cordray, V'99**, New Bolton Center, and **Erica Pathum, V'99**, and **Dana Frederick, V'99**, Philadelphia.

Colleen Klein received the Gretchen Wolf Swartz Award for Outstanding Nursing at New Bolton Center. **Dr. Bonnie Burke** received the Jules and Lucy Silver Animal Bedside Manner Award.

The Resident's Award for Outstanding Teaching by a Faculty Member was presented to **Dr. Kenneth Drobatz**.

The Interns' Mentor Award was given to **Dr. Matthew Beal**. **Dr. Brett Dollente** received the Boucher Award. The VMSC Commendation Award was presented to **Kathleen Aucamp**, **Richard Aucamp** and **Barbara Grandstaff**.

Dr. Richard Miselis was the recipient of the Dean's Award for Leadership in Basic Science Education. The Dean's Award for Leadership in Clinical Science Education was presented to **Dr. Eric Parente**. ■

Feline Vaccination (continued from page 19)

reactions to vaccines, the AAFP modified its recommendations regarding which vaccines to administer and the frequency at which they should be given. Core antigens were defined as those for which the consequences of infection are severe, public health issues are involved, and infection is prevalent. The AAFP listed the following as core antigens: rabies, feline panleukopenia (FPL), feline viral rhinotracheitis (FVR) and feline calicivirus.

The AAFP classified as non-core antigens: feline leukemia virus (FeLV), feline infectious peritonitis (FIP), chlamydia and *Microsporium canis*, and recommended that FeLV and FIP be given only to at-risk cats.

Based on clinical studies that revealed durations of vaccine immunity to exceed one year, the AAFP recommended that vaccinations not be given annually, as has been the convention. They advocated vac-

inating kittens for the three core antigens, and revaccinating at one year of age and then every three years thereafter (annually in high-risk populations, such as breeding colonies and cats being boarded). The rabies vaccine should be administered at three months of age, one year of age, and then every three years thereafter, unless local law mandates greater frequency. For FeLV, at-risk cats should be vaccinated according to manufacturers' recommendations (generally annually).

The AAFP also made suggestions regarding vaccine type (killed vs. attenuated), composition (single antigen vs. multivalent) and administration route.

Dr. Eigner encouraged owners to learn about vaccination issues and participate in making decisions regarding the vaccination of their cats. "We want people to look at the benefits as well as the risks." J.C.