

# Canine Symposium

The 31st Annual Canine Symposium was held at the Veterinary Hospital of the University of Pennsylvania on January 27, 2001. About 100 dog breeders and owners attended the event which was supported by Pedigree®.

Following are brief summaries of the presentations which focused, with the exception of the first, on emergencies.

## Alternative Veterinary Medicine: An Overview

“Natural” and “safe” are not synonyms—and, in the context of clinical medicine, are sometimes mutually exclusive. So said **Dr. Robert Poppenga**, associate professor of pathology at the School. Dr. Poppenga discussed the safety and regulatory aspects of complementary and alternative medicine (CAM).

Dr. Poppenga presented the case of Jake, a 7-year-old, female German shepherd treated with pennyroyal oil, a botanical flea repellent. Within an hour of dermal oil application, Jake became listless and soon began vomiting. The next day, the dog developed diarrhea, coughed up blood and bled from the nose. He eventually died. The cause of death: pennyroyal oil toxicosis. The substance: All natural, but not without peril, said Dr. Poppenga.

“There is a perception out there that if something is natural, it’s going to be safe,” he said. “That is not true. Natural does not always mean safe.”

According to Dr. Poppenga, health food safety claims are often false. The Food and Drug Administration (FDA) is far less vigilant about regulating such CAM modalities as nutraceuticals, phytomedicines and dietary supplements than about traditional medicines. Therefore, the safety of these therapies is poorly assessed, and the quality control in their manufacture loosely policed.

This regulatory laxity has not dampened the popularity of CAM treatments. In fact, some 50 percent of people questioned in one survey use some form of CAM. In the human sector, homeopathy is a growth industry, with retail sales — \$200 million in 1995 — increasing at a rate of 20 percent annually. Dr. Poppenga estimates a similar growth rate for these therapies exists within the veterinary sector.

In 1996, The American Veterinary Medical Association (AVMA) recognized the following CAM modalities — acupuncture, acutherapy, nutraceuticals, chiropractic physical therapy, massage, homeopathy, botanical medicine and holistic medicine — and developed general

guidelines for their use. Before prescribing CAM therapies, Dr. Poppenga urges veterinarians to thoroughly evaluate them by reading about them in open-review journals and critically assessing the quality of the studies that claim their benefits.

“CAM in veterinary medicine is not going to go away. We tell our veterinary students to keep an open mind, look at things based on scientific evidence, and communicate closely with their clients.”

## Neurologic Emergencies Affecting the Brain

Momentary electrical disturbances in the brain, seizures, can have serious consequences in our pets. **Dr. William Bush**, resident in neurology at VHUP, discussed the types, neural mechanisms, clinical signs and sequelae of seizure disorders.

A seizure, explained Dr. Bush, is abnormal activity of populations of neurons in the central nervous system, resulting in brief changes in behavior. Neurons are tightly regulated to maintain negative internal charges relative to their external environment. When a neuron becomes positive due to the influx of positively-charged ions or the efflux of negatively-charged ions, an action potential occurs and neurotransmitters are released. A seizure occurs when a group of inappropriately-positive neurons trigger disorganized, uncontrolled action potentials. Inhibitory mechanisms exist that maintain surrounding populations of neurons in their delicate balance. These, however, can fail. When this happens, the seizure can spread throughout the brain via normal anatomic pathways. A seizure has three phases. During the pre-ictus phase — or “aura,” which corresponds to the initial excitation of neurons in a sensory area of the cortex, a dog might, among other things, become restless, vocalize, stare absently, seek attention or hide. Ictus — the actual seizure — follows, and is characterized by persistent muscle contractions, rhythmic jaw movements, stiffness of the neck, falling over, and loss of autonomic control resulting in salivation, urination, defecation, and dilation of the pupils. During the ensuing post-ictal — or recovery — phase, the dog may exhibit aimless pacing, increased thirst and blindness. Seizures can lead to synaptic reorganization that renders the patient more prone to future seizures. A particularly damaging type of seizure is status epilepticus, which is a continuous seizure

lasting at least five minutes or two or more discrete seizures between which there is incomplete recovery of consciousness. A potential cause of multi-organ failure, Dr. Bush said, “status epilepticus must be addressed promptly. It’s an emergency and many patients die.”

Another seizure condition is idiopathic epilepsy, or recurrent seizure without discernible cause. The epileptic dog usually experiences its first seizure between one and five years of age, and may have seizures throughout its life. Thought to result from a DNA error, epilepsy in dogs is typically controlled by the phenobarbital derivative, phenytoin.

## Spinal Cord Emergencies

Spinal cord lesions may deteriorate rapidly, leading to permanent damage and loss of function. **Dr. Amy Kapatkin**, assistant professor of surgery at VHUP, presented a variety of spinal cord emergencies in dogs.

The following questions must be answered when assessing a patient with a spinal cord emergency: Does the patient require surgery? If so, how soon must it be accomplished? And which procedure should be performed? The patient’s prognosis depends on the location and severity of the lesion, chronicity of the problem, cause of the insult, and selected treatment.

The most common spinal cord emergency is intervertebral disc disease (IVDD). “This is what we all think about as the classic spinal cord emergency,” Dr. Kapatkin said. Two types of IVDD exist: Hansen type I, which features acute extrusion of the disc material and subsequent spinal cord compression. It is more common in Basset hounds, dachshunds and other chondrodystrophic breeds; Hansen type II is chronic spinal cord compression, more prevalent in older dogs.

The main diagnostic tool for IVDD is myelography. Treatment depends on the chronicity of the problem. If the patient’s neurologic status deteriorates rapidly over a few hours, or if deep pain sensation is absent, immediate surgery to decompress the spinal cord is likely indicated. Conservative treatment can be used if the presenting neurological signs are mild. They may include corticosteroids and cage rest.

Another spinal cord lesion is atlantoaxial instability, which involves the C1-C2 joint. Patients present with neck pain and

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neurological signs ranging from mild to severe paresis or paralysis. They are usually young, small breed dogs that have either a congenital malformation of their dens or trauma. Another cervical problem is caudal cervical spondylomyelopathy, or wobbler's syndrome. Clinical signs — which are generally chronic — range from cervical pain to neurological weakness in all four limbs. Spinal fractures and luxations can also occur, and are often accompanied by potentially life-threatening injuries affecting other organ systems. These can be surgically stabilized with a variety of techniques.

The spinal cord can get infections, called discospondylitis, vertebral osteomyelitis or phylitis. Affected animals typically present with fever, pain on palpation of the affected vertebrae, and occasionally neurologic dysfunction.

Like IVDD, these other spinal cord lesions must be promptly characterized in terms of their location and cause. Diagnostic tools include conventional radiography, fluoroscopy, myelography, computed tomography (CT) and magnetic resonance (MR) imaging, and blood and cerebrospinal fluid culture. Treatment may be surgical or conventional (cage rest, splinting, analgesics and antiinflammatory drugs).

## Canine Diabetes Mellitus: Diagnosis and Treatment

Diabetes mellitus (DM) is a disease that deprives the body's cells of their most fundamental need — to procure energy. **Dr. Rebecka Hess**, staff veterinarian at VHUP, lectured on the pathophysiology, clinical signs, diagnosis and treatment of canine DM.

DM is a disease of the pancreas, which secretes insulin. Insulin is the problematic hormone in DM, which exists in two distinct varieties. Type I — or insulin-dependent — DM is the form typically seen in cats and dogs. Here, the pancreas does not secrete adequate insulin due to destruction of the beta cells that produce the hormone.

Dogs that present with DM are usually middle-aged or older, with a possible female predilection. Several breeds of dog are at high risk for DM, particularly samoyeds, miniature schnauzers, miniature/toy poodles and pugs. The clinical signs of DM are large volume of urine and excessive thirst (PU/PD), profound weight loss coupled with increased appetite, and acute blindness. On physical exam, affected dogs may manifest abnormalities, including

poor body condition, obesity, enlarged liver, lethargy and cataracts.

Diagnosis is made by blood and urine tests which, in the diabetic patient, may reveal persistent hyperglycemia, elevated liver enzymes, azotemia, lipemia, persistent glucosuria, ketonuria, proteinuria, and white blood cells and bacteria in the urine.

DM is treated with insulin, dietary changes, oral hypoglycemics and therapy for any concurrent diseases. At-home care for DM is quite onerous, Dr. Hess explained. "Owners need to be very much attuned to the dog, and they often have to be able to change their lifestyles to treat these pets."

This includes administering insulin twice daily after the dog has finished its meals (usually a high-fiber, complex-carbohydrate diet); monitoring the urine glucose; noting clinical signs like PU/PD, weight loss and appetite fluctuations; altering the insulin dose if the dog's food consumption changes; and bringing the dog to their veterinarian for periodic blood glucose curves to ensure that the insulin dosage is appropriate. Diabetic dogs must receive emergency treatment for seizures or ketonuria; the latter problem is an indicator of diabetic ketoacidosis, a complicated form of DM that carries a guarded prognosis.

## Canine Immune-Mediated Hemolytic Anemia

Immune-mediated hemolytic anemia (IMHA) is an important canine health problem, both for its high frequency and for its debilitating effects in dogs. **Dr. Beth Callan**, assistant professor of medicine at VHUP, described the disease process, causes, clinical signs, diagnostic procedures and therapeutic regimens for IMHA.

Red blood cells, or "erythrocytes," are produced by the bone marrow. They contain hemoglobin, which has the critical role of oxygen transport to the tissues. Erythrocyte levels are expressed as "packed cell volume" (PCV) — or "hematocrit" — which, in a healthy dog, ranges from 37 to 55 percent. The anemic dog experiences a drop in PCV. This reflects decreased erythrocyte mass, which disables the body's ability to transport oxygen efficiently. Thus, the main clinical signs of anemia are pallor and weakness. Icterus — or jaundice — may also result, as yellow-hued bilirubin, a breakdown product of erythrocyte destruction, is released into the tissues. Owners may also

observe pigmenturia; here, the urine becomes darkened or wine-colored as blood breakdown products are excreted into the urinary tract. IMHA may occur as either primary or secondary disease. In primary disease, or autoimmune hemolytic anemia (AIHA), autoantibodies are produced against the erythrocytes; this may occur in autoimmune diseases like lupus, or in hereditary conditions affecting certain breeds (i.e., Cocker and English Springer spaniel, Old English sheepdog, West Highland white terrier). In secondary IMHA, erythrocyte destruction occurs as a result of infection (i.e., babesiosis), exposure to toxins (i.e., zinc, onions), iatrogenic insults (i.e., vaccines, drugs such as sulfonamides) or systemic disease (i.e., chronic renal failure, cancer). Diagnosis of IMHA is confirmed by the presence of one or more of three hallmark laboratory findings: autoagglutination, or erythrocyte clumping; spherocytosis, or presence of small, abnormal erythrocytes; and a positive direct Coombs test, which signals the presence of antibody-coated red blood cells. The investigative work begins, however, after IMHA is diagnosed, Dr. Callan noted. "Anemia itself is not a diagnosis," she said. "It's just a sign of another disease." Further testing may include chest radiographs, abdominal ultrasound, blood titers and smears, and lymph node and bone marrow aspirates. Treatment for IMHA includes blood transfusions, free hemoglobin solution (Oxyglobin), corticosteroids and other immunosuppressive agents, and supportive care that may incorporate four to six months of treatment and monitoring. Unfortunately, IMHA carries a guarded prognosis, with an overall mortality rate of over 40 percent.

## Gastric Dilatation and Volvulus

Gastric dilatation and volvulus (GDV) is a life-threatening condition requiring emergency surgical intervention. **Dr. David Puerto**, surgery resident at VHUP, discussed the pathogenesis, clinical signs, surgical procedure, predisposing factors and prognostic indicators for GDV.

GDV occurs secondary to rapid dilation of the stomach with food or air, resulting in rotation of the stomach. When GDV occurs, there is a malposition of the stomach that results in massive gastric distention. This abnormal gastric positioning causes the blood supply in the stomach and associated tissues to become

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compromised, resulting in endotoxemia, sepsis, hypovolemic shock and, in the absence of rapid surgical intervention, death.

The overall incidence of GDV is low, ranging from two to six percent. However, large-breed or giant breed dogs, such as the great Dane, Weimaraner, German shepherd and Irish setter, are at substantially higher risk (21-24%). GDV occurs more commonly in middle-aged to older dogs, with a slightly higher frequency in male dogs. Other risk factors for GDV include a once-daily feeding schedule, rapid food consumption, elevated feeding, stressful events, nervous temperament, and occurrence

of GDV in a first-degree relative.

The main clinical signs for GDV are vomiting, retching, salivation, restlessness, reluctance to lie down, depression and abdominal distention. Diagnosis is made by abdominal radiography. Although derotation of the stomach is sometimes achieved through gastric tubing and decompression, surgery is usually required.

“The goals of the surgery,” said Dr. Puerto, “are to decompress the stomach and reposition it back to normal.”

Once the stomach is intraoperatively repositioned, a stomach tube is passed and the stomach lavaged. Abdominal exploratory is per-

formed to assess ischemic damage to the gastric wall, and necrotic portions are removed. The final step is a gastropexy, by which the stomach is sutured to the body wall to reduce the likelihood of GDV recurrence.

The overall survival rate for GDV is 85 percent, with rapid admission to surgery being a critical factor for survival. By contrast, negative prognostic indicators include depressed or comatose state upon presentation, preoperative arrhythmias, elevated lactate levels, and gastric or splenic necrosis.

J.C.G.

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