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18th Annual Symposium: Your Veterinarian and Your Dog
Signals of Cancer

Dr. Stuart C. Helfand, assistant professor of medicine, discussed cancer in the dog. He pointed out that dogs develop diverse forms of cancer and that many of these tumors are quite similar to those of people. It is estimated that approximately two million dogs will be diagnosed with cancer this year. One in 25 dogs will develop a malignancy. On the oncology (cancer) service at VHUP there are about 2,000 patient visits per year.

For the most part, the causes of canine neoplasia are unknown. Certain risk factors have been recognized for a number of tumors, however, and several types of tumors are known to occur more frequently in a particular breed. This latter observation suggests that some cancers are familial, that is, occurring more frequently in certain families than probability would suggest. This does not mean that the tumors are inherited as numerous environmental factors must be considered as well. At this time, the role of genetics is unclear in the etiology of cancer.

Some examples of risk factors include:

- increased incidence of all cancers in dogs 10 years of age and older, and
- increased incidence of mammary tumors in giant dogs.
- history of a chronic inflammatory process at the site of a cancer,
- increased incidence of all cancers in dogs 10 years of age and older, and
- decreased mammary cancer in unspayed dogs that were kept lean during their growth years.

As in people, early detection of canine cancer is vital. By the time a tumor grows large enough to be recognized (about grape-sized), it already contains 1,000,000,000 cells! When the tumor is small, there exists the greatest chance for complete surgical removal. There is also a decreased chance for the tumor to have spread (metastasized). It is imperative that dog owners bring suspicious lesions to the attention of the veterinarian at the earliest possible opportunity. Watching a tumor grow for awhile before seeking veterinary attention is risky because during that time the tumor may invade deeply, making its complete surgical removal impossible. There is also an increased chance for metastasis as tumors enlarge.

Sooner or later, a malignancy will affect the tumor-bearing dog in such a way that the pet owner will observe an abnormality. The dog may show a nonspecific alteration in its usual constitutional make-up (constitutional signs) such as loss of appetite, weight loss, and exercise intolerance.

Other signs may be recognized as dysfunction of a specific organ and include difficulty in eating, swallowing, urinating, or defeating, bleeding or discharge from any body orifice, bleeding into the skin, change in the character of the bark, persistent cough, an abnormal swelling that is persistent or progressive, a non-healing wound, foul oral odor, persistent vomiting or diarrhea, and black tarry stool.

The diagnosis of a malignancy is most often confirmed with a biopsy, the microscopic examination of a tissue sample by a veterinary pathologist. The tissue can be obtained in one of several ways, including a needle biopsy, an incisional biopsy, or an excisional biopsy. In no case should a mass ever be removed without a biopsy being done. Besides identifying the tumor type, the pathologist can also supply information about the completeness of the excision by examining the specimen's edges. It is desirable to identify a border of normal tissue around the periphery of the tumor. Occasionally, a biopsy will not be diagnostic and a second (or third) biopsy may be necessary to confirm the diagnosis of cancer. This is because tumors frequently elicit inflammatory tissue reactions around them which may be biopsied instead of the actual tumor mass. With the naked eye, it is frequently not possible to differentiate this type of tissue from the tumor proper.

Canine tumors most frequently arise from the skin, mammary glands, lymph nodes, oral cavity, bones, and nasal cavity. Tumors are not confined to these locations, however, and can arise from any site in the body.

Skin tumors comprise the largest group of neoplasia in the dog. Most are benign, and it is not unusual for old dogs to have numerous skin lumps and bumps arising from skin glands and hair follicles. Malignancies of the skin include the mast cell tumor, squamous cell carcinoma, and melanoma. Brachycephalic dogs (boxers, bulldogs, Boston terriers, etc.) have the highest incidence of mast cell tumors.

Mammary tumors are also a heterogeneous group with nearly 90 percent being malignant. Surgery remains the treatment of choice, and spaying a bitch before her first heat almost always prevents the development of this form of cancer later in life. It is possible for a dog to have a benign tumor in one mammary gland and at the same time have a malignancy in another. All excised mammary tumors should be biopsied. The dachshund and the cocker spaniel have the highest incidence of mammary malignancy.

Malignant lymphoma is a systemic cancer frequently recognized by enlarged lymph nodes in the throat, over the shoulders, in the groin, and behind the knees. This illness can imitate many other diseases, but a biopsy will readily confirm the diagnosis. There is a higher incidence of lymphoma in the boxer, basset hound,
Seizures and More

Dr. Betty Dayrell-Hart, lecturer in neurology, discussed seizures. "It is not difficult to provoke seizures in dogs," she said. "Dogs and people have seizures much more frequently than any other species. We don't know why." About 2 percent of the patients seen at VHUP are brought because of seizures.

"Seizures normally are not life-threatening," she said. "but they are frightening to the observer. We think that the dog is not in pain while having a seizure, and that it is completely unaware of the event. Afterwards, it often is dazed and disoriented." Dr. Dayrell-Hart said that many events may look like a seizure but in reality are not. Weakness due to muscle or nerve disease may appear to be a seizure. Metabolic disease, cardiovascular disease and internal bleeding, too, may cause seizure-like episodes.

"Seizures tend to occur in phases. Usually there is a "warning phase"—the animal may be restless or wakeful. The post-ictal phase can vary in duration and severity. Some animals may be blind for a period ranging from hours to weeks, some may bark, others may want to eat or drink ravenously. In most cases, the post-ictal phase is short and the dog is back to normal in a relatively short time." The veterinarian has to determine whether the seizure is symptomatic, due to a disease, toxins or tumors, or whether it is idiopathic, where no cause can be found.

To make a diagnosis, a complete history is taken and a thorough physical examination is performed as well as various blood tests and urinalysis. The age of onset of seizure activity is important. Symptomatic seizures can occur at any age; idiopathic seizures due to epilepsy usually occur in animals six months to four years of age. Very young puppies and hunting dogs in the field can have seizures that are due to hypoglycemia. Brain disease, such as inflammation or viral infection, can cause seizures in animals of any age. In older dogs seizures are often caused by tumors.

If the tests show underlying disease, the animal can be treated and the seizures usually will stop. If no underlying disease is found, then the veterinarian must presume idiopathic epilepsy. "These dogs are healthy and perfectly normal between seizure episodes," she said. "It is suspected that epilepsy is inherited and that seizure dogs can produce offspring which may seizure also. We would like to have a test which could show us which animals will seizure. Some preliminary studies have been performed here by Drs. Steinberg and Farnbach to determine which dogs seizure easily, but quite a bit more work needs to be done before we can tell which animals have a low seizure threshold and are suspect of developing epilepsy later."

Dr. Dayrell-Hart said that Oxydren, lamotrigine and acetaminophen are the most common drugs used. "There are many drugs on the market for people," she said. "but the number of drugs effective in dogs is limited because dogs eliminate drugs quickly from their systems. They do this four times as fast as people.

Phenobarbital is one drug which works quite well. It has a fairly long half-life (time it takes the body to eliminate half the dose) in the dog and it has been used for quite a number of years. However, the half-life of the drug varies from dog to dog, so each dose must be individually determined with the help of repeated blood tests. The half-life may change as the animal's system becomes accustomed to the medication, thus the dogs must be closely monitored. Phenobarbital is a barbiturate which depresses the function of the brain. Other drugs, such as Benzo diazepenes, work on a brain area which suppresses function in other parts of the brain. To obtain the most beneficial effect for an animal, veterinarians may utilize more than one drug to prevent seizures, particularly if they occur in clusters.

"Often seizures cannot be stopped completely," she said. "We hope to reduce their frequency and severity with these drugs. Once an animal is on them, they have to be given for life." In some cases current drugs do not work. Then the veterinarians here can use new drugs to try to help the animal. Accupuncture, too, has been used with some success to try to control seizures in a limited number of dogs.

Dr. Dayrell-Hart then discussed a number of other neurologic disorders. "Rabies is a disease we all have to be much concerned about," she said. "It is spreading and is preventable in pets through vaccinations. Owners should have their dogs and cats inoculated. Remember, the only way to diagnose the disease is through a pathologic examination of brain tissue from a dead animal. If the animal has had regular vaccinations, then the question of rabies should not arise should abnormal behavior occur."

Dr. Dayrell-Hart then briefly spoke about spinal cord disease, disc collapse, and fibracriuglanilarum emboli. These disorders are often diagnosed through a myelogram or a CT-scan. Many animals can be helped, though the recovery period may be slow. The CT-scan is also used in the diagnosis of brain tumors. Currently, about six brain surgeries and six radiation therapies are done at VHUP annually. "We have found that we can do a lot of good with these procedures and give the animals additional time to live a normal life," she said. "The data at this point are too small to project the odds for every animal presented."

During the question and answer period it was asked whether brain tumors or spinal cord disease are inherited. Dr. Dayrell-Hart replied that not enough data have been collected about the occurrence of brain tumors and that certain breeds appear to have a predisposition to developing spinal cord disease. She said that dogs on anticonvulsant medication should not be bred if the medication is given to prevent epileptic seizures; if the convulsions are due to other factors, the dog could be bred, though the effects of the drugs on the fetus are not known.

She mentioned that vaccinations are not related to seizures but that dogs with clinical distemper may develop seizures at a later date due to the damage done by the disease. She explained that distemper can affect the liver, and dogs on this drug need to have their liver function evaluated regularly. She explained that an EEG cannot be done on dogs as the animal would have to be anesthetized, which would distort the readings of the test. She also said that it is safe to...
perform surgery on a dog which has had seizures as long as the veterinarian takes special precautions during the anesthesia. She asked that owners be observant and make notes of what occurs while the animal is seizing; she also stated that if seizures last more than three minutes, the animal be brought to a veterinarian at once for treatment. During a seizure, the owner should be sure that the animal cannot be injured by falling furniture or by tumbling from a high place. "A convulsing dog does not swallow its tongue," she said. "Do not touch the mouth as the dog may bite you. It is completely unaware of its surroundings. It is best to leave it alone and then let it rest quietly once the seizure is over."

Epilepsy research in the department of neurology at the School has been supported by the American Kennel Club.

### Allergic Skin Diseases in Dogs

The skin is the largest organ in the body, and more dogs are taken to the veterinarian for skin ailments than for any other medical problem. VHUP’s dermatology clinic is one of the busiest places in the hospital. Dr. Kevin Shanley, assistant professor in dermatology, spoke about allergic skin diseases.

He stressed that an accurate and complete history of the onset and progression of an allergic skin disease in the patient is imperative in helping the veterinarian make the diagnosis and provide appropriate therapy. There are numerous questions applicable to most skin diseases that a veterinarian will ask. By knowing the answers to those questions, an owner will be better able to characterize a dog’s skin disease and help the veterinarian treat the skin condition. Some of the questions asked are:

- How old was the dog when the skin condition began?
- What did the skin condition look like initially?
- How has the skin condition progressed?
- Is the skin disease intermittent or constant? Seasonal or non-seasonal?
- Are other pets in the house affected?
- Are people in the house affected?
- What therapies (topical, oral, injectable) have been used?
- What is the response to the therapies?
- Is the skin condition a "nash that itches" or an "itch that nashes"?
- In what environment does the dog spend time?
- What is the dog's diet?
- Does the dog have any other medical problems?

There are a number of specific allergic skin diseases.

- Flea allergy dermatitis (may also be referred to as flea bite dermatitis or flea allergy) is the most common allergic skin disease in dogs. It frequently presents as the sole cause of a dog’s itchiness but can also be present with other allergic skin diseases and complicate the diagnosis and treatment. There is no breed predilection. The age of onset is variable, but is most common in dogs that are two to six years old. It rarely develops in dogs less than six months old. The pruritus (itch) is most severe from mid-summer through the fall (July through October). Since fleas are adaptable, they can live indoors year round and cause pruritus during all seasons of the year.

- Food allergy usually is associated with one component of the diet and is not associated with a particular brand of dog food. Beef is the most common offending allergen. The distribution of pruritus and skin lesions is tremendously variable in food allergic dogs. It may mimic flea allergy or atopic dermatitis. Food allergy can also be generalized over the entire body or be localized to just the ears or around the eyes. There are no blood or skin tests that can diagnose a food allergy. The best method is to feed a hypoallergenic diet for at least two to three weeks to see if the skin disease disappears. Simply changing brands of dog food is not sufficient. Lamb and rice may be used as the hypoallergenic diet for most dogs. After a diagnosis of food allergies has been made, the specific offending allergen must be identified (for example, beef, pork, chicken, wheat, soy, or preservatives).

- Sarcoptes scabei (parasite) Sarcoptes scabei which burrows through the superficial skin. It is similar to flea allergy in that there is an allergic reaction to the secretion and/or excretions of the parasite. The scabies mite is contagious from dog to dog and can transiently affect people. It usually causes intense pruritus and usually affects the ears, margins, elbows, hocks, and ventrum (underside).

There is no seasonality and any age, breed, or sex can be involved. The severe itching rapidly leads to hair loss and red, irritated skin. Diagnosis is by identifying mites on skin scrapings. However, the mites are usually very difficult to find and, therefore, any dogs suspected of having scabies should be treated. Various treatments are available and usually provide dramatic improvement within two to four weeks.

Allergic skin diseases are very common and tremendously variable in their presentation. They also predispose dogs to developing bacterial skin infections and seborrhea, which in turn will increase the itchiness and help create a vicious cycle. By being a keen observer, the owner can help the veterinarian diagnose and treat the dog’s skin disease.

During the question and answer period Dr. Shanley stressed the importance of reading the labels on dips, powders, and shampoos and to follow the directions carefully. He also indicated that it is best to obtain anti-flea preparations from the veterinarian as he is familiar with the animal’s state of health. He also cautioned against using any preparation containing insecticides on old, sick or very young animals.

### Canine Esophageal Diseases

"The incidence of esophageal diseases in dogs is relatively low when compared to other gastrointestinal disorders," said Dr. Robert Washabau, lecturer in medicine. "We see about one such case per 2,500 admissions." However, esophageal diseases are very serious and an accurate early diagnosis and prompt medical and surgical treatment are imperative. Reflux esophagitis, for example, is a readily treatable disease but, if unrecognized or untreated, may progress to esophageal ulceration or stricture formation.

The esophagus, a hollow muscular tube, transports food from the mouth to the stomach and is not involved in digestion or secretion. A major portion of the esophagus is located in the thoracic cavity and is difficult to examine and impossible to palpate. The esophagus, therefore, must rely on radiographic or endoscopic examination to make a diagnosis of an esophageal disorder.
One of the most important factors in arriving at a diagnosis is a detailed history provided by the owner. The veterinarian and pet owner must initially differentiate between a vomiting disorder and a regurgitation disorder. Regurgitation is seen with esophageal disorders and is the passive evacuation of ingested food without abdominal contractions. Vomiting typifies a gastric or intestinal disorder and is an active process with abdominal contractions; the vomitus appears partially or completely digested. Regurgitation is the classic sign of an esophageal disorder, but the animal may present with other signs. Oropharyngeal and esophageal disorders interrupt the swallowing process, resulting in dysphagia (difficulty in swallowing). Multiple swallowing attempts may be observed as the animal attempts to pass a single bolus of food. Hyper­salivation is sometimes seen as a sign of severe esophagitis or foreign body ingestion. Painful swallowing (odynophagia) is also a sign of esophagitis and may be manifested by crying/geyyping during a swallowing episode. A change in feeding behavior is also sometimes seen with esophageal disorders. Animals with a painful esophagitis may avoid food completely while animals with megaesophagus may have a ravenous appetite. The following table outlines some of the differences between oropharyngeal, esophageal, and gastric disorders. (See table 1.)

Physical examination is an important part of the diagnostic work-up as some esophageal disorders, such as megaesophagus, are associated with a systemic disease. An evaluation of the oropharynx and the lower gastrointes­tinal tract is also included. Survey radiographs of the neck and chest are routinely obtained, and a barium contrast study will provide additional information on esophageal diameter, motility, and presence of divers­ticul or gastroesophageal reflux. A flexible fiberoptic endoscope is sometimes used in the diagnostic process. Endoscopy permits direct visualization of the esophagus and is also used to retrieve foreign bodies and perform biopsies.

One of the most common esophageal disorders seen by veterinarians is the ingested foreign body, frequently bones or cartilage, but sometimes fishhooks, and in one patient here at VHUP a small steak knife. (See Fig. 1) These animals usually have difficulty swallowing, sali­vate excessively, and regurgitate frequently. Foreign bodies are a medical emergency and the animal should have immediate care. Complications of untreated esophageal foreign body are esophageal perforation, neoplasia/pleriasis, and esophageal stricture.

Esophagitis is another common esophageal disorder seen in the dog and cat. It can be the result of the ingestion of caustic substances, foreign bodies, or reflux of gastric juice into the esophagus. Most animals will respond to brief periods of fasting and administration of antacids.

Vascular ring anomalies, such as persistent right aortic arch, cause a proximal esophageal obstruction in young animals. (See Fig. 2) Surgery is the recom­mended treatment for this disorder, and most animals have a good prognosis if treated early. As with other esophageal disorders, the complications and prognosis are worse if diagnosis and treatment are delayed.

Megaesophagus, an enlarged esophagus, may occur as a congenital or an acquired defect. The congenital defect is seen in German shepherds, great Danes, Irish setters, miniature schnauzers, and wire-haired fox terriers. Many of these animals improve spontaneously with time, but others fail to thrive. The acquired form of the disease may occur in any breed and usually has an adult onset. The vast majority of these cases are of unknown etiology. Some of the important known causes are myasthenia gravis, hypothyroidism, polyneuritis, and polyarthritis.

Treatment of megaesophagus is difficult and controversial. Current treatment recommendations include identifying and treating any underlying disease, elevated feedings to permit gravity-dependent drainage of the esophagus, motility modifiers to hasten the passage of food, antacids to treat secondary reflux esophagitis, and systemic antibiotics if secondary pulmonary infection is present. The disorder cannot be corrected surgically. Dr. Washabaugh indicated that many patients with the disorder do not improve, and many pet owners will elect euthanasia.

Esophageal strictures usually result from untreated esophagitis or esophageal neoplasia. The stricture acts as an obstruction to the passage of food, and the animals regurgitate frequently. Strictures are easily identified by barium esophagram. Cancer of the esophagus is rare, and the prognosis for such tumors is poor. Other strictures may be treated by dilation procedures (bougienage, balloon).

Hiatal hernia, a common entity in humans, has also been identified in the dog. Congenital and acquired forms have been described. They are both characterized by the same signs as esophagitis. Diagnosis of this disorder is very difficult and often requires several radiographic studies. Many animals will not show a response to conservative medical treatment and, therefore, require surgery.

During the question and answer period, Dr. Washabaugh stated that force feeding may be dangerous, particularly for animals with esophageal motility problems. He also mentioned that liquid diets can be beneficial to animals with megaesophagus and that animals with other esophageal disorders benefit from frequent small meals.

Dr. Washabaugh is also a Ph.D. candidate in the department of comparative medical studies; he is supported in part by the American Kennel Club.

Table:<br>

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<thead>
<tr>
<th>Time of food ejection</th>
<th>Pharynx and Upper Esophagus</th>
<th>Esophagus</th>
<th>Stomach</th>
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<td>Character of food ejected</td>
<td>Immediate</td>
<td>Undigested</td>
<td>Undigested</td>
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<tr>
<td>Number of swallowing attempts</td>
<td>Multiple</td>
<td>Not present</td>
<td>Present, maybe prolonged</td>
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<td>Visible evidence of bolus passing in cervical esophagus</td>
<td>Poor</td>
<td>Normal</td>
<td>Single</td>
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<td>Associated signs frequently seen</td>
<td>Dyspnea, cough</td>
<td></td>
<td>Presented</td>
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<tr>
<td>Aggravating and alleviating factors frequently seen</td>
<td>Food consistency</td>
<td>Exercise, food consistency</td>
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