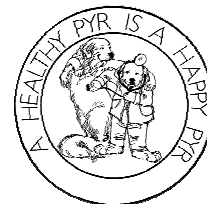




GPCA Health Committee



Cancer in the Great Pyrenees

Overview:

Results from the Health Committee database reveal that cancer is the most prevalent health problem occurring in our breed. The volume of information available on this topic is daunting, and our intent here is to provide an overview of the most common types. This overview will address primary symptoms, diagnosis & treatment recommendations, and current Study & Grant information. We encourage additional investigation on your own.

The most common types of cancer affecting our breed are: Osteosarcoma (bone cancer), which affects the leg bones in larger breeds in 75%-80% of the cases; mammary (breast) cancer, which is most common in unspayed middle-aged bitches but can occur in dogs also; Lymphoma (lymph nodes enlarged and firm); Melanoma (muscle, mouth, toes, behind the eye, or on the skin); Hemangiosarcoma (malignant tumor of blood vessel cells); Meningioma (brain); Lung cancer (usually not a primary site).

The causes are unknown, but research is leaning toward a genetic component, viral causes (e.g., as in Human Pappiloma Virus), and environmental links (exposure to chemicals).

Symptoms:

Osteosarcoma: develops deep within the bone and becomes progressively more painful as it grows outward; the bone is destroyed from the inside out. Lameness is usually the first visible sign, and progresses from intermittent to constant over 1-3 months; eventually obvious swelling becomes evident as the tumor grows and normal bone is replaced by tumorous bone.

Mammary cancer: presents as a solid mass or as multiple swellings. Initially these feel like small pieces of pea gravel just under the skin. They are very hard to the touch and difficult to move around under the skin; they grow rapidly, sometimes doubling their size every month or so.

Lymphoma: Typically occurs in middle-aged dogs and bitches that are brought to the vet because one or more lumps have been found. The veterinarian determines that all of the peripheral lymph nodes (those near the skin surface) are enlarged & firm. Usually, the dog has not been showing any signs of illness and the lumps were discovered during grooming, petting, or playing.

Melanoma: can occur in a dog's mouth, toes, behind the eye, or on the skin. Symptoms are variable, depending upon the location, and can include odd color and odd shaped skin lesions, bad breath, loss of appetite, drooling, coughing, weight loss, trouble swallowing, and visible tumors.

Meningioma: a tumor of the membranes which surround the central nervous system, which consists of the brain and spinal cord. The symptoms noted depend upon the brain area involved, but can include seizures (the most common sign), walking in circles, blindness, dragging toes, and ataxia (drunken gait).

Hemangiosarcoma: a malignant tumor of blood vessel cells, this tumor is associated with serious internal bleeding and rapid internal spread. Theoretically, this form of cancer can arise from any tissue where there are blood vessels (anywhere in the body), but the most common are skin & subcutaneous forms, spleen, and heart based. Clinical signs will vary greatly depending on the site of the primary tumor. These can be vague symptoms such as weight loss, episodic weakness, shortness of breath, abdominal distension, ataxia, lameness, blood in the urine, nose bleeds, and rapid heart rate. Occasionally, sudden death will occur with no prior symptoms.

Diagnosis:

Osteosarcoma, by far the most prevalent reported cancer in the Great Pyrenees, can be diagnosed by x-ray as a first step in evaluating lameness. The osteosarcoma is visible in the x-ray as area of bone that has been eaten away (a lytic lesion) and a “sunburst” pattern shows as a corona effect as the tumor grows outward and pushes the more normal bone up and away.

Mammary tumors almost always require a biopsy for analysis and to identify the type. A chest x-ray and physical inspection of the surrounding lymph nodes should also be performed to rule out metastases.

Lymphoma and Melanoma diagnosis usually requires a blood panel and urinalysis, with one or more lymph nodes aspirated and biopsied for confirmation.

Meningioma diagnosis commonly requires imaging of the brain via a CAT scan or MRI. The MRI is preferred over the CT as it is better able to identify fluid build up, swelling or other subtle soft tissue changes inside the brain.

Hemangiosarcoma diagnosis is dependent upon which form is suspected. The skin form requires a biopsy of the tumor (just like Lymphoma and Melanoma); splenic masses are commonly diagnosed upon physical examination and abdominal x-rays or ultrasound exam; heart base forms of Hemangiosarcoma require echocardiography.

Treatment:

Note - Treatment of animals should only be performed by licensed veterinarians after consulting the current literature and treatment protocols.

Osteosarcoma treatment involves two aspects, treating the pain caused by the bone tumor and fighting the spread of the cancer. Osteosarcoma is unfortunately a fast spreading tumor, and metastasis to the lung is common. Although several treatment regimens are currently being used, amputation followed by radiation or chemotherapy appear to be the most often recommended treatment. Median survival times for dogs who do not receive chemotherapy for osteosarcoma is 4-5 months from the time of diagnosis regardless of whether or not they have amputation.

Mammary tumors require surgical removal of the mass unless the patient is very old. If the surgery is performed early in the course of this disease, the cancer can be eliminated in over 50% of the cases. Chemotherapy has not been a very successful nor widely used treatment for mammary tumors in dogs. However, with the constantly changing and improving drugs available, a veterinarian oncologist should be consulted. The effectiveness of radiation therapy to treat mammary cancer has not been thoroughly researched.

Lymphoma treatment is chemotherapy. The stage (I through V) of the disease does not impact upon the response to chemotherapy (i.e., it is not true that a stage II will have a better response than a stage IV). The exception is Stage V, the most advanced stage. Patients with stage V Lymphoma tend to have a poor response to chemotherapy.

Melanoma treatment includes surgical removal of the tumor, radiation to promote shrinking of the tumor, and chemotherapy. The prognosis for Canine Melanoma is poor at best when found in the dog's skin and even poorer when located in the mouth, toes, or behind the eyes. Tumors spread quickly when they are not treated and they may spread even with treatment. The treatment, requiring surgery, radiation, and chemotherapy is expensive and may prolong the dog's life for a short time.

Meningioma treatment involves surgical removal of the tumor and/or radiation therapy. Surgery alone has produced median survival times of 7 months. Radiation can be done instead of surgery or in combination, but what protocols yield the longest survival times is not clear.

Hemangiosarcoma seems to respond best to surgical intervention via removal of the bleeding mass. This intervention seems to provide relief from clinical signs for a period of time, although it does little to improve overall survival, as many times it has already spread by the time it is diagnosed. Chemotherapy has become a principal component in treatment and alternative routes of administration, including inhalation and intra-abdominal administration are being investigated. Immunomodulator therapy (a mixed bacterial vaccine and L-MTP) have also been associated with increased median survival times. Radiation therapy is rarely used; it may help to control clinical signs but has not been shown to significantly improve survival times.

Studies / Grants:

Osteosarcoma:

Broad Institute - Grant # 373A Mapping Genes Associated with Osteosarcoma in Large Breeds.
Funded and supported by the GPCA.

Focus upon genetic risk factors for Osteosarcoma which could be used for the development of genetic tests that could be used to eliminate carriers from breeding populations, eventually reducing the frequency of this disease. Currently a total of 33 samples have been received by the Broad Institute for Great Pyrenees. Of these, 7 were affected with osteosarcoma and 26 were healthy. The sexes for these submissions are 10 females, 21 males, and 2 unknown. 4 males (3 neutered) were affected and 1 female was affected and 2 unknown were affected. In addition the information from the Broad Institute was the color of all affected animals was white. No data regarding age or date of diagnosis, protocol of treatment or death.

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AMC Cancer Research Center & University of Colorado Health Science Center: Not funded by the GPCA. This research is requesting blood samples. Financial incentive is available for owners whose dogs provide tumor samples www.modianolab.org

Mammary tumors: not funded by the GPCA. www.dog-info@broad.mit.edu

Lymphoma: not funded by the GPCA. www.dog-info@broad.mit.edu
www.modianolab.org

Melanoma: not funded by the GPCA. www.dog-info@broad.mit.edu

Hemangiosarcoma: not funded by the GPCA. dog-info@broad.mit.edu
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GPCA Health Committee:

Breed occurrence rates are based upon data received from the GPCA Health Survey. It is obvious that this problem, based upon the following data, is vastly under reported. Justification for funding research programs is based upon reliable data reflecting the occurrence of cancer in our breed. Please complete and return the confidential health survey.

The following data consists of raw numbers obtained from surveys reported upon in 1999 & 2004:
Osteosarcoma – 75; Mammary – 18; Lymphoma – 14; Melanoma – 12; Hemangiosarcoma – 3;
Meningioma – 2; Lung, Bladder, & Stomach – 1 each.

Information sources:

GPCA Bulletin (pg. 20): April/ May/ June 2006

PetEducation.com

www.dogcancer.net

College of Veterinarian Medicine, University of Georgia