

# Canine Lymphosarcoma (Lymphoma, LSA)

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## Incidence/cause

Lymphosarcoma, (LSA) a tumor caused by a cancerous proliferation of lymphocytes (cells that normally function in the immune system), is one of the most common tumors seen in dogs. It affects dogs of any breed and age, although most dogs will be middle-aged or older at the time of diagnosis; Golden retrievers are considered a breed at increased risk of developing LSA. The cause of LSA in dogs, as is true for most canine tumors, is not known.

## What you might see/ Clinical presentation

The presentation of dogs with LSA is highly variable as lymphocytes can be found in virtually any organ in the body. Nonetheless, the most common

form (referred to as stages) of LSA causes a non-painful enlargement of one or more lymph nodes that can be seen or felt from the body surface. Occasionally, a lymph node becomes large enough to impair function (obstruction of blood flow or airway, for example). Other forms of LSA can involve the liver, spleen, bone marrow and gastrointestinal tract, skin or nervous system (and other organs) and the clinical signs will reflect the organ system involved (e.g. vomiting or diarrhea with gastrointestinal forms; weakness or pale mucous membranes and others that reflect impaired production of blood cells from the bone marrow); many dogs will simply feel ill (lose appetite, become lethargic) with any of the different forms. In some dogs, lymph node enlargement is an incidental finding when an otherwise healthy-appearing dog is seen by a veterinarian for an unrelated reason (e.g. vaccination).

## Lymph node staging

**Stage I:** single lymph node enlarged

**Stage II:** multiple nodes enlarged on either the front half or back half of the body

**Stage III:** multiple nodes enlarged on both front and back halves of body

**Stage IV:** involvement of the liver and/or spleen

**Stage V:** bone marrow involvement, or involvement of other organs (e.g. gastrointestinal, skin, nervous system)

Each numbered stage can be further divided into substages, of which there are two: a and b. Patients with substage a feel well while patients with substage b are ill.

## Biological behavior of LSA

LSA is viewed as a systemic disease, and as such is not really viewed to “spread” to other organs. This tumor is not generally viewed as a curable tumor in dogs, although occasional dogs will experience what seems to be a cure with appropriate treatment (see below). A dog can start with one stage of the disease and progress over time to another (usually more advanced) stage of LSA.

## Clinical staging (determination of the extent of the tumor)

Because of the organs that LSA commonly involves, staging a dog with a LSA can involve aspiration of one or more lymph nodes, thoracic radiographs, abdominal radiographs or ultrasound (to look for big nodes in the abdomen and to look at the liver and spleen), or bone marrow examination. Often, obtaining blood for a complete blood count and biochemical profile, and a urinalysis will be advised as these can help assess overall health and provide information that potentially influences treatment recommendations. Sometimes, special stains to determine if the LSA is of B-cell or T-cell origin (B-cells and T-cells are specific types of lymphocytes) are recommended because of prognostic

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significance, although treatment recommendations are the same for either type.

### Treatment options

The mainstay of treatment of LSA is administration of chemotherapy drugs; the best responses in terms of length of tumor control and survival are generally seen with protocols that entail administration of more than one chemotherapy drug, although there are approaches that involve administration of a single drug. Chemotherapy drugs commonly used include: doxorubicin, vincristine, cyclophosphamide, prednisone, and L-Asparaginase, but many others are also used. In some dogs with very localized disease, surgery or radiation therapy can play a role in treatment, although chemotherapy is still often recommended in these cases.

### Prognosis

The prognosis of dogs with LSA is highly variable, and depends on

the clinical stage (ill dogs fare more poorly than dogs that feel well, and dogs with Stage V disease are generally considered to have a poorer prognosis), the type of tumor (dogs with B-cell LSA usually do better than dogs with T-cell LSA). Most dogs treated with chemotherapy will experience a remission, a period in which there is no detectable cancer and the dog feels well. Remission times are variable, but most dogs with the lymph node forms of LSA will have initial remissions lasting in the range of 6-9 months before evidence of the tumor is seen again; second remissions can be achieved in many of these dogs, but any subsequent remission is expected to be shorter in duration than the first remission. Survival times for most dogs treated with combination chemotherapy protocols are in the range of approximately 1 year. And even though an individual dog will have received a lot of chemotherapy over that year, their quality of life

is generally very good. Statistics, while useful, can never predict how an individual dog will fare with or without specific treatment.

### Future treatment options:

New protocols are tried with great regularity in canine lymphoma but results have been similar with each drug regime investigated. Most likely our survivals will always be similar until we either accept greater toxicity (meaning most dogs will be very sick from the treatment and some may even die), or a completely novel treatment is invented. Using half or whole body radiation therapy may prove helpful. The development of an antibody specific for dog lymphoma, which could recognize all dog lymphomas and yet no normal lymphocytes, and be attached to a toxin or other cell killing mechanism, is a far off dream.

### Key points

LSA is one of the most chemotherapy-responsive tumors seen in veterinary medicine, and most dogs tolerate chemotherapy very well with minimal impact on their quality of life. If you notice fast growing lumps on your dog that seem to be in the area of the major joints (at the neck, in front of the shoulders, in the armpits, at the back of the knees or in the groin) have your dog examined soon by a veterinarian even if he feels well. Remember, lower stage disease, and dogs that feel well, will do better with treatment than dogs that are ill and/or have more advanced disease.

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