

# Osteosarcoma (Bone Cancer) in Dogs

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Osteosarcomas account for only 5% of all tumors in dogs, but 80-90% of malignancies involving the bone. Much more common in large breed dogs, osteosarcoma is an aggressive cancer of the bone that often requires amputation of the affected limb coupled with chemotherapy to provide temporary relief from this disease.

Which dogs are at risk for developing osteosarcomas?

Osteosarcomas generally affect older large or giant breed dogs. The giant breeds at greatest risk for developing osteosarcoma include Great Danes, Saint Bernards, Great Pyrenees, Newfoundlands, Bernese Mountain Dogs, and Irish Wolfhounds. Large breeds such as Rottweilers, Labradors, Golden Retrievers, Shepherds, Dobermans, Weimaraners, and Boxers are also at an increased risk. It is not a very common tumor in small breed dogs and rarely occurs in cats. While older dogs more commonly develop osteosarcomas, there does appear to be an increased incidence in one to two year old dogs as well. Male dogs have an increased incidence of osteosarcomas. Neutered and spayed dogs appear to be at higher risk for developing osteosarcoma

What are the symptoms of osteosarcomas in dogs?

The symptoms of osteosarcomas are often closely associated with their location. Most osteosarcomas develop on the limbs of dogs below the elbow or near the knee. The tumors usually form at or near the growth plates. Affected dogs will often have a pronounced bone swelling. These tumors often produce pain is first detected as lameness in the affected limb. In some dogs, the first sign that osteosarcoma is present may be a fracture at the tumor site.

X-rays often reveal a characteristic bone pattern that, coupled with history and breed, may indicate the development of an osteosarcoma. Up to 90% of these tumors will have metastasis to the lungs at the time of diagnosis, but because of the small initial size of the metastases, less than 10% will initially show up on a chest x-ray. Because of this high incidence of metastasis, all dogs with osteosarcomas are treated as if they have metastasis to the lungs regardless of the findings on the initial lung x-rays. Bone scans may be recommended to look for osteosarcoma in other bones. Metastasis of the osteosarcoma to the lungs or other organs is the most common cause of death in dogs with this tumor.

Osteosarcomas will occasionally show up at different locations and likewise other tumor types can initially appear to be an osteosarcoma. Because of this possibility, a biopsy is recommended if there is any uncertainty about the diagnosis. Fungal bone infections can produce similar symptoms and appearance on an x-ray, so a fungal culture is often performed to help clarify the diagnosis.

A blood test for total alkaline phosphatase and bone alkaline phosphatase prior to surgery can provide information as to the prognosis. In general, the higher the values, the poorer the diagnosis.

What is the treatment for osteosarcoma in dogs?

Osteosarcoma is an aggressive, highly metastatic cancer that requires an intensive treatment protocol. Once the tumor has been positively identified as an osteosarcoma, the affected limb is usually amputated. After the amputation, a course of chemotherapy is usually begun. The most successful drugs have been carboplatin and cisplatin. Carboplatin is more expensive, but safer and easier to administer. Doxorubicin is sometimes used as well, usually in combination with carboplatin. A qualified veterinary oncologist is often the best source of information and he or she will be aware of the newest chemotherapy protocols. The life expectancy of a dog with a properly identified and treated osteosarcoma varies greatly, but can approach a year or longer.

Because osteosarcomas are very painful, if the limb is not amputated, therapies to relieve the pain should be included. Radiation therapy is used, at times, to decrease the pain. While it does not significantly affect progression of the disease, it does greatly improve the quality of life in many dogs. In addition, pain relieving medications are used.

In rare cases where the tumor is small and in the right location, some limb-sparing surgeries have been performed, but that is not usually the case. In this surgery, the affected bone is removed and replaced with a bone graft and plated. There are potential complications with this procedure including the development of infection, recurrence of the tumor, and failure of the bone graft to "take".

Is osteosarcoma in dogs preventable?

It does not appear that osteosarcoma is preventable. Because of some strong breed correlations, any breed line that has a history of osteosarcoma should be examined closely prior to breeding. Unfortunately, we do not completely understand the cause of osteosarcoma, but hopefully as our knowledge improves, we can continue to provide more effective treatments and early diagnostic tests.