

# Spinal Tumors

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## BASIC INFORMATION

### Description

The spine is a complex structure that is composed of vertebrae (bones), intervertebral discs (cartilaginous structures situated between vertebrae), and the spinal cord. Spinal tumors can arise from any of these anatomic structures (called *primary tumors*), or they can spread to the spine from nearby structures or from tumors elsewhere in the body (metastasis). These latter two types of tumors are referred to as *secondary tumors*. Although any animal can be affected, large-breed dogs are predisposed. These tumors occur more often in older dogs and cats.

### Causes

Common vertebral tumors include osteosarcoma, fibrosarcoma, and hemangiosarcoma. These tumors usually affect only one vertebra and are the most common types of spinal tumors in dogs.

The brain and spinal cord are covered by layers of tissue called *meninges*. A meningioma is a tumor that arises from the meninges; it is a common spinal tumor in dogs.

Spinal tumors can also develop from the spinal cord itself, and these cancers are collectively known as *gliomas*. Tumors can also arise from the nerves exiting the spinal cord. (See handout on **Peripheral Nerve Sheath Tumors**.)

Some cancers arising from white blood cells can affect multiple vertebrae, including multiple myeloma, plasmacytoma, and lymphoma. Lymphoma may also develop within the spinal canal without affecting the vertebrae, and it is a common spinal tumor in cats.

### Clinical Signs

Signs typically develop slowly; however, an acute onset is observed in some animals. All types of spinal tumors tend to produce similar signs. The most common, and sometimes the only, clinical sign is neck or back pain.

Clinical signs depend on the location of the tumor and the degree of associated spinal cord damage. Tumors of the neck can affect the function of all four legs, whereas those of the spine in the chest and back areas affect only hind leg function. As the tumor grows, it compresses (squeezes) the spinal cord, which results in weakness and incoordination. Inability to walk, paralysis, and inability to feel a painful stimulus (such as pinching a toe) can occur with severe compression.

### Diagnostic Tests

A spinal problem may be suspected based on the history, signs, and results of neurologic examination. X-rays of the spine may reveal loss of vertebral bone suggestive of a tumor. Special imaging

techniques are often required to make a diagnosis. Magnetic resonance imaging (MRI) allows detailed evaluation of the spinal cord and surrounding structures. Computed tomography (CT scan) or myelography may also be recommended. Myelography is an x-ray study of the spine that is done after a dye is injected around the spinal cord. Definitive diagnosis of a spinal tumor may require a biopsy, which often involves surgery.

Routine laboratory tests and x-rays of the chest and abdomen may be recommended to search for metastasis. A spinal tap and cerebrospinal fluid analysis may be helpful in eliminating other diseases that cause similar signs.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Treatments options include medical, surgical, and/or radiation therapy, depending on the type and location of the tumor. Treatment that is solely designed to provide pain relief and temporarily improve clinical signs (palliative therapy) may be considered in some cases. Steroids are often used to reduce inflammation associated with a spinal tumor and thereby improve clinical signs. Steroids may also provide pain relief. Other medications, such as tramadol, can be used in conjunction with steroids to relieve pain.

Chemotherapy may be used for some spinal tumors, such as lymphoma and multiple myeloma. Depending on the location of the tumor, surgery may be performed to remove as much of it as possible. Although some tumors appear to be completely removed at the time of surgery, microscopic cells often remain. Despite this, surgery may provide temporary relief of pain and clinical signs. Spinal tumors that are not operable may be treated with radiation therapy. Radiation therapy can also be performed after surgery to treat any remaining cancerous tissue.

### Follow-up Care

Follow-up examinations are needed to monitor for improvement or progression of the neurologic abnormalities. Animals receiving chemotherapy must also be rechecked frequently and laboratory tests repeated to monitor for side effects. Radiation therapy typically requires several weeks of treatment.

### Prognosis

Overall, the prognosis for animals with spinal tumors is variable, depending on the type of tumor and the degree of spinal cord damage prior to treatment. Some types of spinal cancers can be treated successfully for long periods, but some types do not respond even to aggressive therapy.