BONE AND JOINT TUMORS IN CATS

These notes are provided to help you understand the diagnosis or possible diagnosis of cancer in your pet. For general information on cancer in pets ask for our handout “What is Cancer”. Your veterinarian may suggest certain tests to help confirm or eliminated diagnosis, and to help assess treatment options and likely outcomes. Because individual situations and responses vary, and because cancers often behave unpredictably, science can only give us a guide. However, information and understanding for tumors in animals is improving all the time.

We understand that this can be a very worrying time. We apologize for the need to use some technical language. If you do not understand anything please do not hesitate to ask us.

What are these tumors?

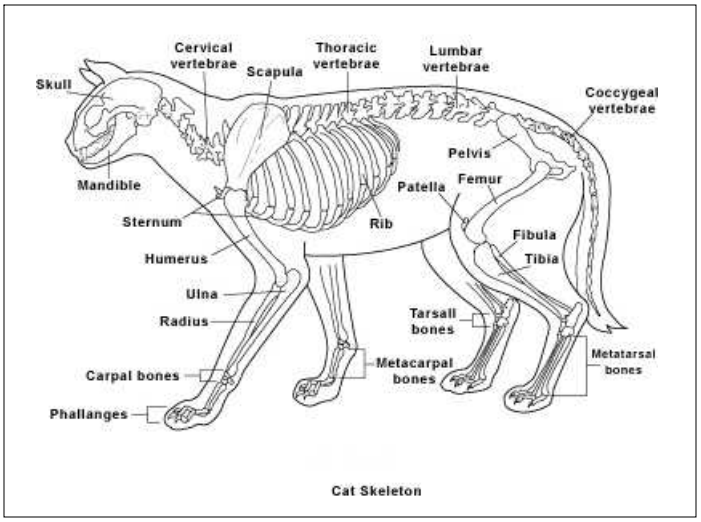
Non-cancerous bone tumors are rare in cats and mainly due to abnormal development. They include **bone cysts** and single or multiple lumps of bone in abnormal places (**exostoses**). **Fibrous dysplasia** is another developmental condition that causes bone swelling around areas of bone destruction.

‘Benign’ (non-spreading, local) tumors are also rare and of several types. **Ossifying fibroma** (**osteofibroma**, **fibrous osteoma**) is an expansile lesion in the jaw that destroys existing bone structure. **Osteomas** are benign tumors in immature animals.

‘**Feline osteochondromatosis**’ is progressive and occurs in skeletally mature animals and occur on any bone, growing progressively. They have viral particles (feline leukemia and sarcoma viruses: FeLV, FSV) in proliferating cells. Malignant change (transformation) of these cells and appearance of new lesions is common, imparting a poor prognosis in all cases.

Chondromas are benign but some progress to malignancy (**chondrosarcoma**) and infiltrate locally.

90% of bone cancers are malignant (capable of spreading to other body sites). **Osteosarcoma** is by far the most common. In cats, the tumors are most common in the non-limb (axial) skeleton. They often spread to other parts of the body (metastasize).



Cat Skeleton

Rare malignant cancers include the locally aggressive ‘**giant cell tumor of bone’** derived from bone marrow cells and very rarely ‘**multilobular tumor of bone’**. Joint tumors (**synovial sarcomas**) are rare. Blood borne metastases of cancer from carcinomas of mammary, liver and lung origins are relatively common in bones.

What do we know about the cause?

The reason why a particular pet may develop this, or any cancer, is not straightforward. Cancer is often seemingly the culmination of a series of circumstances that come together for the unfortunate individual.

Non-cancerous bone tumors such as cysts and exostoses are due to abnormal development.

'Feline osteochondromatosis' has viral particles (FeLV, FSV) in proliferating cells. Giant cell tumors in cats have also been associated with virus particles suggesting viral cause. There is also some evidence that some osteosarcomas in cats are virus associated. A history of previous fracture at the site of osteosarcoma is also not unusual as excessive proliferation of cells to heal the fracture gives greater opportunity for neoplastic mutation.

Why has my pet developed this cancer?
Some animals have a greater tendency (genetic susceptibility) to cancer.

Are these common tumors?
All the non-cancerous and benign tumors are rare.

Malignant bone cancer is not common but one survey found an incidence of 4.9 cases per 100,000 cats. Osteosarcoma accounts for 70% of feline bone tumors. The age range for cats with osteosarcoma is wide with rare cases less than a year, although the average age of cats with the tumors (10.5 years) is older than that of dogs. Sex and breed predisposition is uncertain.

Chondrosarcomas are the second most common primary tumor of bone.
Multilobular tumors of bone are rare in cats. Sites include the skull and rib. Giant cell tumors are rare.

Synovial tumors usually affect the stifle and elbow. They are rare and difficult to diagnose with certainty unless specialized techniques are available.

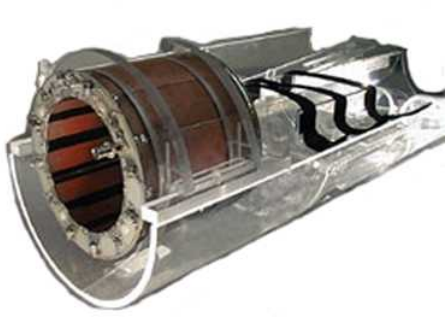
How will these cancers affect my pet?
Non-cancerous and benign bone tumors are usually hard swellings. Clinical signs vary with the site. Cysts, fibrous dysplasia and ossifying fibroma, cause bone destruction but there is swelling as well.

'Feline osteochondromatosis' is a syndrome of multiple growths and is progressive.

Lameness is almost always the first sign of malignant limb bone cancer. Pain and swelling follow and the limb may become increasingly painful and hot. As the swelling increases and muscles atrophy, pain decreases but the bones may fracture. Tumors in the backbone cause pain. Those in the ribs and head often cause less pain as they are slower growing. In some sites such as the nose, there may be signs due to local blockage.

The growing cancer causes weight loss and increased blood calcium, which damages the kidneys.

How are these cancers diagnosed?
Bone cancer often induces typical clinical and X-ray (radiography) but sometimes, the accurate diagnosis also requires microscopic examination of the bone. The samples for this are usually small parts of the cancer (biopsy) taken by needle or open biopsy. These are submitted for histopathology. This is the microscopic examination of specially prepared and



MRI Machine

stained tissue sections and is done at a specialized laboratory where the slides are examined by a veterinary pathologist.

The veterinary pathologist usually adds a prognosis (what will probably happen). This may include information on local recurrence or metastasis (distant spread).

Sensitive MRI (magnetic resonance imaging) or computed tomography (CT) can demonstrate the extent of tumors.

What types of treatment are available?

The most common treatment is surgical. For benign tumors, removal of the lump is sufficient but for malignant tumors, surgery may be extensive and include amputation of the affected limb. The over-riding consideration in treating cats with malignant cancer is that most will die with metastatic disease despite control of the primary tumor by amputation.

There is no recommended drug therapy for cats with osteosarcoma but radiotherapy has been used to reduce pain in some cases.

Can these cancers disappear without treatment?

Cancer is a multi-step process so it may stop at some stages. The body's own immune system can kill cancer cells but it is rarely 100% effective. Rarely, loss of blood supply to a cancer will make parts of it die but the dead tissue will still need surgical removal.

How can I nurse my pet?

After surgery, your pet may need to wear an "Elizabethan collar" so he or she cannot interfere with the operation site. This needs to be kept clean. Any loss of stitches or significant swelling or bleeding should be reported to your veterinarian. If you require additional advice on post-surgical care, please ask.

Pain control in bone cancer is vital, particularly for aggressive bone tumors.

How will I know how the cancer will behave?

Histopathology will give your veterinarian the diagnosis that helps to indicate how it is likely to behave. The veterinary pathologist usually adds a prognosis that describes the probability of local recurrence or metastasis (distant spread).

A blood test (for alkaline phosphatase enzymes) can predict the behavior of some limb osteosarcomas in dogs and possibly cats. High blood levels of bone-specific alkaline phosphatase before surgery are associated with significantly shorter survival and disease-free intervals following surgery.

When will I know if the cancer is permanently cured?

'Cured' has to be a guarded term in dealing with any cancer.

Non-cancerous and benign cancerous bone swellings do not spread and many stop growing as the cat reaches maturity. If they interfere with the mechanics of the skeletal system, they can be cured by surgical excision.

'Feline osteochondromatosis' is progressive and therefore has a poor prognosis. Chondromas may recur following surgical removal and some progress to malignancy and infiltrate locally. Chondrosarcomas of the limbs may be cured by amputation. Survival is longer for tumors in these sites rather than those occurring in the ribs.

In general, cats survive longer than dogs with osteosarcomas. One third of cats are alive five months after surgery for a limb tumor but survival for axial tumors is usually less than this, mainly because of the difficulty of surgical removal of these tumors. Feline tumors affecting long bones may metastasize but do so less readily than those affecting axial skeleton. The median survival time after amputation is four to five years.

Giant cell tumors are locally aggressive but rarely metastasize. Amputation may be the treatment of choice but there is limited information on success rate because they are very rare. In man benign-looking tumors have metastasized after radiotherapy.

'Multilobular tumor of bone' is slow-growing but locally aggressive. If complete removal is possible, the cancer may be cured but recurrence following surgery is the usual pattern of behavior.

Most joint tumors destroy local tissues and are difficult to remove surgically. Amputation appears to be the most effective form of therapy for joint tumors but only 25% of cases have been reported to survive more than a year following diagnosis.

Are there any risks to my family or other pets?

Some of these tumors may be due to virus infection but the tumors themselves are not transmitted from pet to pet or from pets to people.
The viruses implicated in some bone tumors may be transmitted between pets, occasionally from an infected queen to her kittens before birth but more commonly from close contact with infected cats, which shed the virus in saliva, urine and feces. If your cat is infected, he or she can pass the infection to other cats. The infection is not transmissible to people or other animals such as dogs.
