

Cancer

Cancer occurs when there is a specific change in an animal's DNA. Each cell in the body has DNA strands that are used as templates for the production of life-sustaining molecules. Random changes or **mutations** occur constantly in DNA. If a mutation occurs at a specific location on a DNA strand, cancer may ensue.

For example, a cell from an animal's mammary gland may undergo a mutation. The mutation, or change in the genetic code, involves a section of DNA necessary for controlling cell growth and division. Now two cells exist which will not stop reproducing. These cells divide; their daughter cells divide, etc. Soon there is an obvious lump of cells, a mass, in the breast tissue. Cancer of the breast now exists.

Why do animals develop cancer? There are many possible explanations. If a female pet is not spayed, the repeated hormonal influences of her heat cycles increase her chances of developing breast cancer. Perhaps the dam or a littermate had cancer, indicating an inherited disease process. Perhaps the animal was chronically exposed to a toxin, or too much direct sunlight. Maybe the owner was a heavy smoker, exposing the pet to tobacco carcinogens. **Carcinogens** are chemicals known to increase an individual's risk of developing cancer. Perhaps the animal ate an inappropriate diet, or had recurrent episodes of inflammatory disease(s). Multiple phenomena have been associated with the onset of cancer. Most, as in humans, are still poorly understood. The above example is a brief, generalized explanation of exposures/occurrences that may increase an animal's risk of developing cancer.

Not only are there many potential **causes** of cancer; there are also many **types** of cancer. Cancer can occur in the skin, muscle, bone, kidney, spleen, liver, heart, bladder, brain, and many other cell types. It is important to differentiate between growths that are malignant (cancer) and growths that are benign. A benign growth is simply a mass that does not threaten your pet's life. Benign growths can be irritating, and if so should be removed surgically. Conversely, malignant growths tend to invade and destroy surrounding tissue and spread to other areas of the body. Malignant tumors may impair your pet's health and shorten your pet's life.

Some dog breeds are more prone to developing cancer. For instance, large and giant dog breeds are more likely to develop bone cancer. Pugs and Boxers are prone to skin (mast cell) tumors. Golden retrievers may have an increased incidence of many types of cancer. White-faced cats that sit in the sun are prone to facial squamous cell carcinoma, a type of skin cancer. And, as mentioned above, female dogs and cats that have undergone one or more heat cycles are at an increased risk of developing breast cancer later in life.

What can be done for pets with cancer? Accurate diagnosis of the type and severity of the cancer is the first challenge. For skin masses, a test called a **fine needle aspirate** (\$40-95) is the place to start. A small needle is inserted into the mass several times. Cells collected from the mass are transferred to a microscopic slide. The cell sample is then stained and analyzed under the microscope. Sometimes definite cancer cells are seen and a diagnosis can be made. Other times, the sample may give clues, but no definite answer. Occasionally, the tissue sample is an inadequate representation of the mass, and the fine needle aspirate is non-diagnostic.

A more aggressive and more accurate step in diagnosing a tumor involves obtaining a tissue sample or **biopsy** of the mass. An anesthetic is used, and a section of tissue is removed. The tissue sample is preserved and sent to a pathologist for analysis. The price for this procedure, including local anesthesia, surgery, recovery, and histopathology of the mass is approximately \$230-250.



If a tumor is malignant (or even benign), surgical removal of the mass is usually recommended. Prior to scheduling surgery, your veterinarian will attempt to determine whether or not the cancer cells have spread to other areas of the body. Complete bloodwork and chest radiographs, which run from \$400-500, are usually the next step. In some cases, an abdominal ultrasound (\$350) is indicated. If diagnostic tests show that cancer cells have spread, the patient may not be a good candidate for anesthesia and surgery. If there is no indication that the cells have spread, surgical removal of the mass is scheduled. There is a wide range in cost for surgical removal of a cancerous mass, depending upon cancer type and location, from \$500 to over 1,000.

It is important to note that different cancer types behave differently. Some types of cancer are more aggressive than others. Radiation therapy (\$3,000-5,000 per year) and/or chemotherapy (\$1,500-3,000+ per year) may be indicated following surgical removal of a mass. There are people who feel that acupuncture and herbal medicine may help their pets survive longer with cancer. In addition to surgery, radiation therapy, chemotherapy, and herbal remedies, many types of cancer can be additionally managed with use of special diets formulated to meet the needs of these patients. Your veterinarian is a valuable resource when it comes to managing your pet's health regarding the diagnosis and treatment of cancer.

If you suspect that your pet has cancer, contact your veterinarian as soon as possible. Medical intervention, if timed early in the course of disease, can make a great difference in your pet's health and longevity.

