The Vocabulary of Cancer - By Patricia Long
November 20, 2002

Websites to bookmark:
www.cancer.gov
www.cancer.org
www.vetcancersociety.org
www.oncolink.com/templates/types/section.cfm?c=22&s=69

Like any area of study, cancer has its own vocabulary, which can be very confusing to someone who is already stressed and scared. Learning to understand what the experts are saying is the first step of the treatment determination and decision process.

What is cancer? The word itself comes from the Latin word for crab, and an ancient Greek physician noticed the similarity in the shape of a tumor to a crab, hence the name. Cells normally have a life cycle - they grow, divide, and die. Cancer is caused when those cells begin to grow out of control, become abnormal, and lack the genetic agent that causes them to die. A neoplasm (new growth) is tissue that wasn't there before: in cancer - a lump, a tumor. A tumor, which is an abnormal mass of cells, can be either benign or malignant. A benign (good) growth does not invade surrounding tissue, and it does not spread to other parts of the body - it is not cancer. (However, as with the example of fibroid uterine tumors, a benign tumor can cause problems severe enough that they need to be removed.) A malignancy (mal = bad), which does invade and can spread, is cancer.

Prevention of cancer is the first step, but not one that is always very helpful for canines. Don't let them smoke, feed them healthy foods, provide good exercise - that's about all you can do. However, it's an important part!

The next step in the process is detection. Early detection of cancer helps to increase survival. In humans, there are tumor marker tests, substances that can be found in the blood that indicate ovarian, breast, GI tract, or prostate cancer long before symptoms would be seen or felt. We don't yet have screening tools like these for dogs, but given the research efforts underway, there may be tests like these in the future. In dogs we generally feel a lump, notice a behavior change, appetite changes, something that prompts us to take Bernie to the vet for a thorough exam. Some lumps can be felt, but by the time they are more than 2 cm big it can be too late to treat effectively. Early detection is still the most important part of treatment.

From the American Veterinary Medical Association:
Ten Common Signs of Cancer in Small Animals

1. Abnormal swellings that persist or continue to grow
2. Sores that do not heal
3. [unexplained] Weight loss
4. Loss of appetite
5. Bleeding or discharge from any body opening
6. Offensive odor
7. Difficulty eating or swallowing
8. Hesitation to exercise or loss of stamina
9. Persistent lameness or stiffness
10. Difficulty breathing, urinating, or defecating

Diagnosis is the next step of the process. Some of the tools that are used can include a physical examination, an x-ray, MRI, CAT Scan, a blood test, a fine needle aspirate to draw out some of the affected cells for testing, a biopsy to surgically remove some of the affected tissue. The size and location of the growth will help to determine the methods that can be used.

When a surgical biopsy is performed, some of the tumors may be removed completely at that time. The surgeon may attempt to remove the entire growth and also to remove enough of the surrounding tissue to make sure all the cancerous cells have been eliminated. Cross sections will be made of the tissue removed for examination under a microscope by a pathologist. The pathologist will attempt to determine several things. What type of growth is it, benign or malignant? What is the origin of the cellular structure (from what organ)? Are the cells well differentiated? What is the significance of well differentiated cells? What is the grade of the tumor? What is the stage of the disease? Did any tumor cells appear at the edges of the sample indicating some may have been left behind during surgery? Or did the edges of the sample have “clean margins” with normal cells appearing at all edges? All of this results from several small microscopic samples, and you wonder what takes them so long as you bite your nails waiting for the answers.

Cell structure is very well defined: there is a surrounding cell membrane and a nucleus, a bit like an egg without the shell. This is a well-differentiated structure. But as cancer cells grow out of control, this structure breaks down, and often becomes an amorphous (no definite form, shapeless) mass with lots of nuclei and very few distinct cell membranes. This is called an anaplastic tumor (ana - backward, plasia - growth), and is not differentiated enough to even determine the type of cancer cells present. The anaplastic tumors are very aggressive, fast growing cancers. Grading is done based on how well differentiated (the cells are immature and don’t look much like the normal cells in the originating tissue) the cell structure appears, and helps to predict how aggressive the cancer may be.

Staging is a method used to indicate how far the cancer may have spread. In 1929 the World Health Organization developed a tool called the Clinical Staging System. The system is used to divide cancers into categories to help classify the extent of the disease. This classification helps to determine possible treatment options, follow up, and supportive care. These categories vary from cancer to cancer. In the lowest stage, the cancer is self-contained and hasn't spread to any surrounding tissue. The next stage may still have the single site tumor but also may have lymph node involvement indicating that it has begun to spread. The next stage may have multiple tumor sites with no lymph node involvement, and the highest level might be multiple
tumors in multiple sites with other organ involvement. The spread of tumors to other sites is called metastasis (change).

General types of cancers:

- -oma, suffix used when a tumor is malignant.
- sarcoma, cancer of the bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissue. (fibro - fibrous connective tissue; hemangio - blood vessels, soft tissue; osteo - bone)
- lymphoma, cancer of the lymphatic system (used in vet medicine interchangeably with lymphosarcoma)
- melinoma, a form of skin cancer.
- carcinoma, cancer in the skin or in tissues that line or cover internal organs.

Prognosis is the next phase of disease management. This is an imperfect art at best, the prediction of the likely course of the disease, the chance for recovery or recurrence. Prognosis will be based on literature studying many similar cases, as well as the veterinarian's experience. Each dog is different, and until the vets all have working crystal balls, this is only their best guess. The prognosis will vary from cancer to cancer, from breed to breed, from dog to dog, and from treatment to treatment. This is the part of the visit when you have to start determining where to go from here.

Many things must be considered when planning any treatment. What is the overall health of the dog? The age of the dog? How aggressive is the cancer? What is the probability of remission, either temporary or complete? What is the possible extension of life that can be reasonably expected? What are the side effects, or risks, to the dog associated with each treatment option? What is the impact to the family in terms of supportive care? What is the cost? How accessible is the treatment? How stressful are vet visits for the dog? There is not an answer that is 'right' for all patients or patients' families, and the decision is never easy. The goal of any treatment should be to improve the chances for quantity and quality of life, as long as quality life as is possible.

Treatments continue to expand as researchers find new and often exciting ways to fight cancer.

Surgical excision is one type of treatment. Cut it out, just get rid of it! This is not always possible if the growth has invaded surrounding tissue, has spread too far to remove the surrounding tissue, or is in an organ that can't be surgically reduced (heart, brain, spine, etc) without severe risk or complications.

Chemotherapy uses drugs to reduce or eliminate cancer. This is usually an adjuvant therapy, or one that is used after the primary therapy of surgical excision. The drugs used will be those that have been found to be effective in killing the cancer cells.
Cancer cells grow rapidly, and drugs that target rapidly growing cells may also damage the healthy cells that normally grow rapidly, such as the cells in the GI tract or hair. The normal cells will repair themselves after the drugs are gone.

Radiation therapy uses energy to target specific cells in order to destroy them. This is usually also an adjuvant therapy, and is often used in combination with chemotherapy. X-rays are the most common form of this therapy. Radioactive implants are used for some forms of human cancers, and research is ongoing to find other effective means of targeting the specific cells to receive the radiation energy.

Homeopathic treatments (the use of a dilute dose of an agent that can cause the symptom being treated) can help to support the body's own defense system. Supplements can target specific organs and the immune system. These are becoming more accepted by the traditional veterinary community, and are often used in conjunction with the traditional therapies, or instead of traditional therapies - especially for cancers that do not respond to the traditional therapies.

Biological therapies, or immunotherapy, use the body's immune system to fight the cancer. Using substances to boost or suppress the general immune system, to help the immune system target the cancer itself, to use the tumor to create a vaccine to help boost immunity, to stimulate bone marrow production of white blood cells - these are all various forms of immunotherapies. Terms used: immunomodulating agents, biological response modifiers, interferons, interleukins, colony-stimulating factors, monoclonal antibodies.

Angiogenesis inhibitors are used in one new area of cancer treatment. These substances inhibit, or prevent the formation and proliferation of blood vessels that are necessary to feed a tumor. Cancer cannot grow without the development of supporting blood vessels.

The Veterinary Hospital of the University of Pennsylvania is piloting some research into the use of Interventional Radiology.

1. Provide clients with appropriate information, dietary plans, and appetite stimulants such as cyproheptadine and megesterol acetate from the very beginning. The goal is to prevent anorexia and weight loss from ever happening.
2. Consider foods that are highly bioavailable, easily digested, and highly palatable with a good smell and taste.
3. Consider foods that are relatively low in simple carbohydrates, have moderate amounts of good-quality sources of proteins, include soluble and insoluble fiber, and have moderate amounts of fats. Fats of the n-3 fatty acid series may be effective in reducing or eliminating some of the metabolic alterations associated with cancer cachexia. Antioxidants, such as vitamin E, are essential whenever n-3 fatty acids are used.
4. Enhanced quantities of arginine, cystine, and glutamine may be of value in maintaining a more normal immune [system], hematologic [system], and GI tract.
5. Fiber, both soluble and insoluble, is essential to maintain normal bowel health. A diet with adequate amounts of fiber is essential to prevent or to treat various problems of the GI tract.

… As a general rule, with the exception of septic animals, dogs and cats with cancer or critical-care illnesses or are recovering from surgery do not have energy needs that exceed those of normal animals."

References:


www.cancer.gov, National Cancer Institute website.