

Dispelling the Myths of Canine Cancer and Its Treatment

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There is still a great stigma attached to a diagnosis of cancer, and it is natural for owners of dogs with cancer to equate cancer treatment in animals with experiences they may have had with treatment of themselves, their friends or family members. Having an understanding of how cancer treatment in animals and humans differs can insure that dog owners make an informed decision when selecting treatment for their dog with cancer.

Is cancer really a problem in dogs? Unfortunately, yes. It is the leading "natural" cause of death in dogs. Up to 50% of dogs will be affected by some type of tumor in their lifetime.

Why does it seem like there so much more cancer in dogs these days? Better health care = longer life. We are getting so good at managing other husbandry-related conditions in dogs (nutrition, infectious/parasitic disease, keeping pets indoors and on leashes) that they are now living long enough to develop more old-age conditions such as heart disease, kidney disease, endocrine disease, and **cancer**. Furthermore, now that there are more cancer specialists and options for treating cancer in pets, it is being reported more frequently.

Did something in the environment play a role in my dog's cancer? Was I feeding the wrong food? There have been some associations proposed between certain types of cancer and environmental influences (canine lymphoma and certain herbicides or living in urban environments, canine mesothelioma and asbestos), but in the vast majority of cases no such association can be made. Thus, based on what we know currently, food additives, lawn chemicals, pesticides, cosmic rays, etc. do not seem to significantly increase a dog's risk of cancer.

Why should I treat my dog with cancer? Because we can! We treat many animals with chronic disease that are never cured (Diabetes, other endocrine diseases, heart disease), and cancer is another chronic disease. Furthermore, cancer is a disease that we can sometimes cure! Even in cases where cure is unlikely, there are many cancers where we can extend an excellent quality of life with treatment.

Do we have to do XXX for this mass now? Can't we just wait and see what happens? This applies to initial diagnostic tests (let's wait and see if it grows), additional surgery or other treatments to prevent local regrowth after surgery (let's wait and see if it grows BACK), or therapy to delay or prevent spread (let's wait and see if it spreads). Let's wait and see if it grows: In general, delay in achieving a diagnosis only serves to increase the difficulty of treatment and, potentially, the likelihood of spread. Larger tumor size is statistically associated with worse outcome for several important veterinary cancers, including canine mammary carcinoma and oral melanoma. The lump you are dealing with may very well be nothing, but if it is a tumor, the time to find that out is sooner rather than later. Let's wait and see if it grows back: Locally recurrent tumors are statistically associated with a worse prognosis in certain diseases such as canine mast cell tumor and oral melanoma, and are suspected of being worse in others. For this reason, if a tumor is incompletely removed the time to get aggressive is the very first time the tumor occurs. Let's wait and see if it spreads: In general, treatment of gross metastatic disease is palliative at best.

Asking drugs to kill a big bulky tumor is asking a lot, but asking those same drugs to have an effect against microscopic tumor cells in the lung or lymph node may be a much more reasonable goal. For example, the median survival time for dogs with osteosarcoma undergoing amputation, but not receiving chemotherapy until the time of metastasis, is approximately **6 months** whereas the survival time for dogs receiving chemotherapy for microscopic metastasis immediately after surgery is approximately **12 months**.

Doesn't performing a fine needle aspirate/biopsy make the tumor "angry" and increase the risk of spread? NO. Getting from the primary tumor into the blood stream is only one of many hurdles a tumor cell must overcome to successfully spread. There are probably many circulating tumor cells in the body all the time, but it is only those few tumor cells with the complete genetic program that allow them to survive and grow at a distant site that will be able to successfully spread. Exceptions to this rule are: (1) Some mast cell tumors may become "inflamed" following a fine needle aspirate due to histamine release, although this in no way hastens spread. This is rarely serious and can be treated or prevented with an antihistamine such as Benadryl; (2) Needle aspiration/needle core biopsy of splenic and bladder masses is inadvisable, due to the risk of local tumor dissemination in the abdomen and/or seeding of the biopsy tract. (3) It is important that needle aspirates and biopsies of cutaneous/subcutaneous masses are planned so that the biopsy tract can be incorporated into the definitive surgical excision to prevent recurrence along the tract.

Why don't we just take the tumor off? Why do we need to do a fine needle aspirate/biopsy first? Obtaining a diagnosis prior to surgery helps to plan the surgical approach and lets the veterinarian know whether additional tests are indicated prior to surgery. This helps avoid situations like "Why didn't you take X-rays before surgery?" and "Why should I have to pay for a second surgery if you 'didn't get it all' the first time?". If surgical removal is used to obtain a diagnosis, it is important to understand that this is only being used as a diagnostic test, and that additional tests or treatments might be necessary, based on the results.

Why should I pay for histopathology? Why don't you just take it off and throw it away? If it's worth removing, it's worth submitting for microscopic evaluation. See "just wait and see" above for problems with the "we'll submit it for histopathology if it recurs" approach. Similarly, it is important to avoid submission of parts of removed tissue or a "representative section" of a removed mass. This cuts the information gleaned from the pathology report in half, as **surgical margins** cannot be interpreted.

My Great Aunt Harriet had chemo, and she felt miserable all the time – I'd never do that to my dog! The drugs we use to treat cancer in animals are the same drugs that humans get, but we give considerably lower doses and don't give as many at the same time to minimize the risk of adverse effects. **With most chemotherapy protocols in common use, less than 1/4 of patients experience unpleasant side effects, and 5% or less experience a severe side effect.** The rare adverse effect necessitating hospitalization can usually be fixed in 24-72 hours. The likelihood of a chemotherapy-related fatality is less than 1 in 200. Should unpleasant side effects occur, doses can be reduced, drugs can be substituted, or additional medications dispensed to minimize the likelihood of further adverse effects. These changes are effective 90% of the time.

OK, suppose my dog is the unfortunate one that has a side effect? What kind of things are we likely to see? This varies by agent, but in general the most common side effect is something related to the **gastrointestinal tract** - perhaps a few days of decreased appetite, mild nausea or vomiting, or loose stool. By way of comparison, it's usually not too different from what you might see if a dog got into the garbage. They might need to eat some bland food for a few days or take some anti-nausea or anti-diarrhea pills at home. Usually this doesn't persist for more than 3-5 days. Some dogs have the potential to develop a low **white blood cell count**. We check this quite frequently, and most of the time it is not low enough to be dangerous. In some cases, a patient might need some oral antibiotics at home, or a treatment might need to be delayed for a few days. If a patient develops a **serious** side effect, it is usually either REALLY BAD vomiting/diarrhea (can't keep anything down, getting weak/dehydrated) or dangerous lowering of their white blood cell count that renders them susceptible to a bacterial infection.

I don't want my dog to go bald! It is true that certain breeds (non-shedding breeds) can lose substantial amounts of hair from chemotherapy. It is rarely complete. Most other breeds experience little or no hair loss, although you may probably find more hair around the house and long-haired breeds have the potential for excessive matting. Hair loss from chemotherapy is non-itchy and nonpainful- it is a purely cosmetic change. Hair that is lost will typically begin to regrow approximately 1 month following the completion of therapy.

I don't want my dog's last weeks / months / years to be in and out of the hospital, like they were with Uncle Mac when he had cancer. Almost all veterinary chemotherapy treatments are done in an outpatient setting, and the majority involve quick injections rather than prolonged infusions (there are exceptions to this however). Many protocols involve a series of treatments, followed by a period of careful observation. Continuous, indefinite chemotherapy is not the norm.

I don't want my family / guests / house / other pets to be contaminated. Urine and feces pose a minimal risk to owners -- few drugs are excreted for longer than 48-72 hours. Common sense (i.e. wear gloves when handling urine or feces) is usually sufficient. Accidents in the house during this period should be cleaned using a dilute bleach solution and the excreta flushed down the toilet. Normal daily interactions (grooming, playing, petting, handling food and water bowls) pose no real risk. It is important to wear gloves when handling oral medications, and that chemotherapy pills should never be crushed or split, nor capsules opened.

But what about her age? Isn't she too old for treatment? AGE IS NOT A DISEASE! Most of the patients we treat with cancer are older dogs. Statistics regarding effectiveness, survival and tolerability of cancer therapy are usually generated in a population of older patients. Far more important than chronological age are general health (e.g. heart, liver, kidneys) and how they are feeling.

So what are our choices? We either do chemo or put him to sleep? Chemotherapy (and cancer therapy in general) is usually **not** an "all-or-nothing" proposition. For many tumor types, a spectrum of treatment options may be available depending on travel constraints, finances, risk of side effects, etc. For example, there are various treatments for canine lymphoma from which an owner can choose, including prednisone alone, prednisone plus doxorubicin, cyclophosphamide/vincristine/prednisone, or a multi-agent injectable protocol such as the UW-Madison protocol. All have different costs, risks of side effects and numbers of trips required and

varying degrees of effectiveness. For osteosarcoma, amputation and platinum-based chemotherapy may be the optimal treatment, but other options could include palliative radiation therapy or amputation plus doxorubicin.

What about radiation therapy for my dog's tumor? Radiation therapy can be very useful for certain tumors. Since it is a local treatment, it is **most often used to treat local disease**, e.g. tumors with a high likelihood of aggressive local infiltration and regrowth but a low risk of spread. Common examples include postoperative treatment of incompletely excised low-or intermediate-grade mast cell tumors, soft-tissue sarcomas, oral tumors such as fibrosarcoma, squamous cell carcinoma and dental tumors, and perianal tumors. It can be used prior to surgery in certain cases to render an inoperable tumor more amenable to surgery. It can also be used as the primary therapy for certain tumors such as nasal tumors. Finally, it can be used to improve quality of life in some highly metastatic tumors such as osteosarcoma and malignant melanoma. The majority of "definitive" or "full-course" radiation therapy protocols in common use involve a series of 10 to 25 treatments delivered either Monday through Friday or three days per week for several weeks. Although there is no reason why these treatments cannot be delivered on an outpatient basis, many animals will spend some of the time in the hospital for practical, travel-related reasons. Most "palliative" or "coarsely fractionated" radiation therapy protocols will involve 1 to 6 weekly treatments on an outpatient basis.

But won't he be horribly sick from radiation? Radiation therapy is a local form of therapy - the radiation is only delivered to the site of the disease. Thus, systemic side effects (nausea, fatigue, bone marrow suppression) generally do not occur. However, each treatment does require very brief anesthesia or heavy sedation to insure that the radiation is delivered to the correct spot. In theory, there could be systemic adverse effects as a result of the anesthesia, but they are very rare in the patient with normal organ function.

What about radiation burns? It's true that animals receiving radiation therapy can develop varying degrees of a sunburn-like reaction at the site where the radiation is delivered. These can range from mild redness and itchiness to moist, oozing or ulcerated skin. Many animals will need to wear an Elizabethan collar to prevent self-trauma and/or receive oral antibiotics and/or pain medications during this period. These effects typically do not start until the second or third week of treatment and are resolved within 2-4 weeks after the completion of radiation therapy. The animal can be left with an area of irradiated skin that is permanently hairless, the hair may grow back only partially, and may turn white within the radiation field. Chronic, long-term side effects are rare, with the exception of the eyes in animals receiving radiation therapy for nasal, oral or brain tumors.

Will he be radioactive when he comes home? The standard form of radiation therapy in animals **is external beam**, i.e. radiation is shone down from an external source, practically not that different from a diagnostic X-ray except using higher energy particles. Animals undergoing radiation therapy pose no health risk to their owners and they are not radioactive.

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Biographical Profile

Dr. Thamm is an Assistant Professor of Oncology at the Colorado State University Animal Cancer Center, within the College of Veterinary Medicine and Biomedical Sciences. He is also a member of the Developmental Therapeutics Section of the University of Colorado Comprehensive Cancer Center and the Cell and Molecular Biology Graduate Program at Colorado State University. Dr. Thamm received his Bachelors and V.M.D. degrees from the University of Pennsylvania. He completed a Residency in Medical Oncology at the University of Wisconsin, and was employed as a postdoctoral researcher there for 5 additional years. He is the author of over 30 peer-reviewed publications, 10 book chapters and 70 research abstracts in the field of veterinary oncology and cancer research. His clinical interests include novel targeted, cytotoxic and biotherapies for animal cancer and the translational application of these therapies to human oncology. His laboratory interests focus on tyrosine kinase growth factor receptors in canine and feline neoplasia, and on novel strategies to increase cancer cell sensitivity to chemotherapy.

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Contacts: www.csuanimalcancercenter.org
970-297-4195 for free consults

Dispelling the Myths of Canine Cancer and Its Treatment – conference notes

Standard of care and what is available now to treat cancer in dogs.

Cancer is the leading natural killer in dogs. Why does it seem like there so much more cancer in dogs these days?

Better pet health care = longer life

Vaccinations, preventative medicine

Nutrition

Leash laws, more pets are indoors and supervised

Cancer is a disease of old age and we are seeing more older pets

Increased reporting of cancer as care of our dogs has increased

Environmental factors

Weak associations between certain cancers and environment

Lymphoma and herbicides

Mesothelioma and asbestos

Nasal tumors in long snouted dogs and 2nd hand smoke

Bladder cancer and insecticide exposure

In most cases are weak and non existent

Food additives, lawn chemicals, etc do not seem to generally cause cancer

Why would one treat cancer in dogs?

Because we can!

We treat many animals with chronic disease that are never cured (diabetes, heart disease)

Cancer is another chronic disease

Tumor removal is usually successful if done appropriately

Extend quality of life

The “wait and see” attitude can often be detrimental.

If it grows ... smaller tumors are easier to remove

If it grows back (after surgery) ...it is harder to remove tumors when it recurs

If it spreads ... chemo is harder when tumors are bigger

Myths of surgery

Needle aspiration cytology/biopsy hastens the spread of the tumor

Removing the primary tumor makes metastasis more likely

The metastatic decathlon

Transformation

Angiogenesis

Motility and invasion

Embolism and circulation

Response to microenvironment and proliferation

Extravasation into organs parenchyma

Adherence to vessel wall

Arrest in capillary beds

Angiogenesis

Metastasis of metastases

Surgical situations to avoid

We'll submit if it recurs ...

We'll get aggressive or think about additional therapy if it recurs

Recurrent tumors are OFTEN worse than first time tumors

*Dogs treated for cancer with chemotherapy fared better if treated the first time. If treated after recurrence, dogs had less than a 15% chance of survival beyond a year.

When removing tumors, your vet must remove the most amount of tissue possible with a good margin of healthy tissue.

Treatment and prognosis:

Interpreting the pathology report

- Tumor type
- Histologic grade (when possible)
- Study of margin of the tumor – was it cancer free? This is extremely important to ask because if it was not fully removed there is a higher chance of recurrence. You must submit the whole tumor to get a margin study. The risks reduce when the tumor removal comes back with clean margins. If it comes back with a tainted margin, go back immediately and remove more tissue.

Myths about chemotherapy

“My great aunt Harriet had chemo and she felt miserable all the time – I’d never do that to my pet”

- Animals get the same drugs that humans get, but we give lower doses and don’t give as many at the same time. Why? Fewer than 1/3-1/4 of patients experience unpleasant side effects, and 5% or less experience side effects.
- When a dog is affected with severe effects requiring hospitalization can usually be treated in 24-72 hours. Chemo will rarely kill a dog.
- Should unpleasant side effects occur, doses can be reduced or substituted or additional anti emetic drugs can be introduced.

Side effects:

digestive tract symptoms – vomiting, diarrhea and may need anti emetic drugs to help the dog.

White blood cell counts – need to monitor carefully

“I don’t want my dog to go bald”

Certain breeds can lose a large amount of hair

Not painful

Not itchy

Will regrow upon discontinuation of chemotherapy (usually w/in a month)

**Most other breeds experience little to no hair loss

“I don’t want my dog’s last weeks/months/years to be in and out of the hospital, like with Uncle Mac”

- Almost all vet chemo is done on an outpatient basis
- Many protocols involve a series of treatments followed by careful evaluation before further treatment

“I don’t want my family/guests/house/other pets to be contaminated”

- Urine and feces can pose a minimal risk w/in 72 hrs of treatment
- Common sense is usually sufficient
- Normal daily interactions pose no risk

** chemo pills should be carefully handled, not crushed, etc

“But what about her age? Isn’t she too old for treatment?”

- Look at the dog’s health otherwise, if in good health – NO
- Most of the patients we treat with cancer are older pets

-Statistics regarding treatment effectiveness, survival and tolerability are usually generated in a population of older patients

“Chemotherapy is an “all-or-nothing proposition” (Cancer therapy in general)

-For many tumor types, a spectrum of treatment options may be available depending on owner availability and means.

*Most patients would die within 24 months of diagnosis, treatment increases quality of life considerably.

Radiation therapy for Veterinary cancer patients

Postoperative treatment of incompletely removed tumors

Preoperative treatment to render these tumors more amenable to treatment

Primary therapies for some tumors (nasal brain dental)

Palliation of pain, swelling, etc (bone, melanoma, lymphoma)

Myths

Animals receiving RT experience nausea and lethargy

RT is a local treatment – side effects usual b/c of anesthesia

Animals receiving RT experience bad burns

RT can cause small burns and can cause hyper pigmentation and hair loss.

To increase the therapeutic index (kill tumor/spare normal tissue)

Use multiple treatments

Careful treatment planning – ct scans, computer plans, port films

Positioning and anesthesia

Animals that receive RT do not become radioactive – this is safe

Truths

Need general anesthesia

Often requires some hospitalization (for practical reasons)

It aint cheap

3-6 treatments cost \$950 to \$1800

Full course of treatment can cost up to \$6000

Consultations for owners/veterinarians: 970-297-4195

www.csuanimalcancercenter.org

This service is free and calls/emails are answered within 48 hours