O – Oncology

TOP TEN ADVANCES IN VETERINARY ONCOLOGY 2005/2006

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The popularity of oncology is increasing dramatically in veterinary medicine in part because of the many advances in veterinary cancer diagnostics and therapeutics. The objectives of the following document are to recognize ten of the most amazing advances in veterinary oncology and to:

- Discuss the integration of cancer prevention into health and wellness programs to increase cancer cure rates.
- Examine how clients and the veterinary health care team perceive cancer, dispel the myths associated with cancer treatment and replace these myths with accurate concepts about how dogs and cats with cancer and their caregivers should be approached, supported and treated.
- Discuss key advances in cancer care including the management of transitional cell carcinomas, hemangiosarcoma, transitional cell carcinoma, and primary lung tumors.
- Briefly review a condition that may be a debilitating consequence of caring called 'compassionate fatigue'.

Cancer Prevention

Cancer care will succeed if the profession is active at developing health and wellness programs that incorporates cancer prevention and screening. Cancer prevention and early detection and diagnosis are the key to reducing cancer related deaths in veterinary medicine. The initiation of these prevention and screening programs for all stages of life is not only the right thing to do for the patient, but it is the correct thing to do for the concerned client.

Cancer can be prevented if the known risk factors are identified. Lifetime obesity is one risk factor. Eicosapentaenoic and docosahexaenoic acids have been shown consistently to inhibit the proliferation of breast and prostate cancer cell lines in vitro and to reduce the risk and progression of these tumors in many species (Am J Epidemiol 141(4): 352-359, 1995).

A lifetime study of restricted daily intake of the same food was done with Labrador retrievers that came from seven litters (J Am Vet Med Assoc 220; 1315-1320, 2002). The median life span of the restricted-fed group was significantly longer. While the prevalence of cancer between groups was similar, the mean age due to cancer-related deaths was 2 years later in the dogs that received the restricted diet.

Secret #1: **Lifetime weight management is associated with decreased risk of developing cancer and other diseases such as diabetes mellitus. DHA and EPA may reduce the risk of cancer.**

Dogs have been shown to have an increased risk of developing cancer of the respiratory tract, especially of the lung and nasal cavity, when exposed to coal and kerosene heaters and passive tobacco smoke. Mesothelioma is more common in dogs owned by people who worked in the asbestos industry. The use of chemicals by owners, specifically 2,4-dichlorophenoxyacetic acid, paints, asbestos or solvents, as well as radiation and electromagnetic field exposure were associated with increased risk for several types of cancer in pet dogs. Application of insecticides (but not in a spot-on formulation) increased the risk of bladder cancer in Scottish terriers in another study (Environ Res 32(2): 305-313, 1983).

Secret #2: **It is important to eliminate exposure to environmental carcinogens such as pesticides, coal or kerosene heaters, herbicides such as 2,4-dichlorophenoxyacetic acid, passive tobacco smoke, asbestos, radiation, and strong electromagnetic field exposure. These steps may be particularly important for clients of susceptible breeds (e.g., a Scottish terrier) and herbicide exposure.**

Commandments

Perhaps the greatest barrier to enhanced cure and control of cancer is that the caregiver, and the veterinary health care team often have preconceived notions about cancer and its treatment. This is true regardless if you are talking about cancer prevention or treatment. The first and possibly the most difficult task facing the veterinary health care team is the dissolution of the negative myths and misperceptions regarding cancer and the efficacy and toxicity of cancer therapy. The first step is to recognize the fears associated with cancer and to address those head on. The approaches to the biggest fear about cancer are called the commandments of cancer care.

• Do not let them hurt: Providing an active, preemptive, and ongoing pain management/ prevention program for the dog with cancer is absolutely imperative. This reassures the caregiver that quality of life is optimal. Management should begin with comfort care and then, when needed, include oral medications (morphine, codeine, piroxicam (Feldene), carprofen, or others), transdermal delivery systems (fentanyl patches), acupuncture or more advanced analgesic delivery systems (eg: constant rate intravenous infusion, epidural catheters, intrathoracic pleural analgesia).

• Do not let them vomit or have diarrhea. Dispensing oral medication such as metoclopramide to the caregiver each and every time a potentially nauseating drug is administered, empowers the caregiver to prevent this symptom at home. In addition, we must be prepared to stop nausea and vomiting should it occur, ensuring that medications and supportive care are immediately available. Having access to drugs such as ondansetron hydrochloride and dolasetron mesylate, although costly, will provide this level of assurance for all members of the team. Some believe that tylosin, metronidazol and imodium can reduce the risk of small and large bowel diarrhea and often dispense these drugs to their cancer patients to prevent problems. Enhancing fiber content can be of great value at enhancing bowel health.

• Do not let them starve: Nursing care (e.g., warming food, providing aromatic foods and comfortable environments), medicinal appetite stimulants, and, when needed, assisted feeding techniques such as esophagostomy, gastrostomy, or jejunostomy tube placement should be employed. All of these components of nutritional care must be available early in the course of disease, and weight loss must not be tolerated, particularly in dogs that have fewer reserves due to their small size. To our caregivers, appetite is a vital, objective assessment of quality of life that must not be overlooked or left to chance.

Secret #3: **Meeting the medical needs of the patient and the non-medical needs of the client can be done by preventing and treating pain, nausea, vomiting and anorexia early and often.**

Recent Advances in Cancer Care

Gene therapy has been around, at least conceptually for forty years, however the technology to manipulate genes and to deliver them safely has only recently been realized. In its simplest definition, gene therapy is the introduction of a gene or genes into a cell to treat or prevent cancer. One recently completed trial of xenogeneic DNA vaccination in canine advanced oral malignant melanoma using the human tyrosinase gene was performed (Clin Cancer Res 9(4): 1284-1290, 2003). This novel approach using a gene from another species elegantly and simply induced a good immune response against the malignant melanoma, but not the patient's own tissue. The Kaplan-Meier median survival time for all nine dogs in this study was 389 days with some of the dogs having stabilization of disease or reduction

in the size of the cancer. The investigators concluded that xenogeneic DNA vaccination of dogs with advanced malignant melanoma is a safe and potentially therapeutic modality.

Secret #4: **Gene therapy provides and exiting option for cancer control and cure.**
Doxorubicin has been shown to improve the disease free interval in dogs that have had incompletely excised soft tissue sarcomas (Selting, Proceedings Vet Cancer Society 2004). Local lymph node involvement was a significant negative prognostic factor. Similarly, doxorubicin has been shown to be of value for the treatment of surgically resected hemangiosarcoma (J Vet Intern Med 10(6): 379-84, 1996). A pilot study by an Australian group (Langova et al) presented at the Veterinary Cancer Society in 2004 utilizing alternating carboplatin and doxorubicin with piroxicam for the treatment of nasal tumors resulted in a median survival time of 550 days with 4/8 CR and 2/8 PR.

Secret #5: **Doxorubicin is the most effective agent for the treatment of lymphoma and it has efficacy for the treatment of hemangiosarcoma, soft tissue sarcomas and osteosarcoma.**
CCNU is an oral alkylating agent that has been shown to result in a 50% response rate (8.3% CR) and median survival time of 128 days by Skorupski et al against histiocytic sarcoma (Proceedings, Veterinary Cancer Society 2004). Similarly, this drug has recently been shown to be helpful for treating mycosis fungoides. Thrombocytopenia and hypoalbuminemia at the time of diagnosis were significant negative prognostic factors. Fifty-seven dogs with MCT were treated with prednisone and alternating vinblastine/Lomustine (Hershey); almost all as an adjuvant to surgery, and about twenty percent for non-resectable disease. The median DFI is > 375 days and most dogs had a measurable response.

Secret #6: **CCNU is effective for the treatment of lymphoma, histiocytic sarcoma, mycosis fungoides, and mast cell tumors.**
Piroxicam and possibly other NSAIDs have been shown to have anticancer effects. Several studies have been performed confirming that piroxicam is effective for the treatment of transitional cell carcinoma and oral squamous cell carcinoma. Some oncologists favor the combination of mitoxantrone and piroxicam. In one study, Forty eight dogs with histologically convirmed transitional cell carcinoma were treated with mitoxantrone and piroxicam (Clin Cancer Res. 2003 Feb; 9(2): 906-11). Forty eight dogs were treated with the following responses: one complete response, 16 partial responses, 22 with disease stabilization, and 9 with progressive disease for an overall 35.4% measurable response rate. Subjective improvement occurred in 75% of treated dogs. Median time-to-treatment failure and ST were 194 and 350 days, respectively.

Secret #7: **Piroxicam has been shown to be very effective for the treatment of transitional cell carcinoma and squamous cell carcinoma in the dog.**
Primary lung tumors have been ineffectively treated until vinorelbine was shown to be effective (J Vet Intern Med 18(4):536-9, 2004). The investigators concluded that The well-tolerated toxicity profile and clinical activity observed in dogs with bronchoalveolar carcinoma treated with vinorelbine warrants further investigation.

Secret #8: **Vinorelbine is a promising new agent for the treatment of pulmonary tumors in dog and cats.**
Inadequately excited mast cell tumors have been shown to be effectively treated with vinblastine and prednisone. In one study, 27 dogs with inadequately excised, cutaneous mast cell tumors were treated with a vinblastine and prednisolone chemotherapeutic protocol. Twenty dogs were available for follow-up examination after 12 months. Over half were disease free after one year.

Secret #9: **Vinblastine is a relatively safe and effective therapy for mast cell tumors in the dog.**

Compassion Fatigue

When we care for our patients with compassionate care, we must do so by expressing empathy. The act of extending empathy as we care for our patients and their clients can lead to compassion fatigue. When any member of the veterinary health care team finds themselves giving more without allowing themselves to be replentished emotionally, it is only a matter of time before there will be a shortage of compassion. Simply put, compassionate fatigue results when there is a depletion of emotional resources from within as we care and provide compassion for others. This depletion is not a reflection of the character, professionalism, or even the professional skill level of the veterinary health care team member. Rather, the strength and willingness to be emotionally engaged with another being is affected. All members of the veterinary health care team joined the profession to care, from their minds through medical/surgical/preventative skills and through their hearts by supporting and

providing for the emotional needs of caregivers. It is vital to the success of veterinary care to allow for this level of compassionate care and to support those individuals who provide it. By appreciating the issue of Compassion Fatigue and providing mechanisms within a practice to mitigate its effects, a practice can thrive by providing the finest in compassionate care.

Key Points for Prevention:

- Educate the entire veterinary health care team
- Establish weekly debriefing sessions for entire staff
- Identify and work with professionals within the community who clearly understand the condition
- Define and preserve a 'comfort room'
- Allow team to have adequate closure at the end of any patient's life
- Define and teach team member limits and boundaries
- Employ humor whenever appropriate
- Find a colleague who understands and share

Secret #10: **Recognizing and treating compassion fatigue is essential to enhance professional, personal and financial success.**

References Available Upon Request