

Supplements That May Counteract Side Effects from Conventional Cancer Therapies

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The following side effects are very rarely seen during or after chemotherapy or radiation therapy in pets. If they occur, the recommended supplements might be beneficial in their treatment.

Nausea/Vomiting—These may occur following direct damage to the stomach/intestinal lining or from stimulation of the vomiting center in the brain. Supplements that soothe the GI tract include ginger, marshmallow, slippery elm, and deglycyrrhizinated licorice root (DGL.) Glutamine helps heal damaged intestinal cells; *however, it should be used cautiously, if at all, in pets with brain tumors.*

Sore Mouth/Throat/Oral Ulcers—Chemotherapy or radiation therapy of the head and throat may cause oral ulcers. Grapefruit seed extract (mouth rinse), Traumeel (a homeopathic remedy from Heel), coenzyme Q-10 (swallowed and prepared as a mouth wash), vitamin E (rubbed on the ulcerated areas), and glutamine (taken orally) may reduce the incidence of ulcers as well as heal ulcers.

Hair Loss—This very rarely occurs in pets (other than in an area irradiated during radiation therapy). Administering antioxidants (including quercetin, curcumin, green tea, and hesperidin) and biotin may help.

Decreased Blood Counts—In addition to medications such as erythropoetin and colony stimulating factor, supplements including curcumin, folate, vitamin B 12, niacinamide, vitamin C, and vitamin E are recommended.

Heart Toxicity—This most commonly results from cumulative doses of the chemotherapy drug doxorubicin (and in people, mainly cyclophosphamide, 5FU, and mitoxantrone). Administering vitamins C, E, selenium, omega-3 fatty acids, hawthorn, and N-acetylcysteine (NAC) can reduce acute heart damage. These supplements can be administered before, during, and after doxorubicin therapy. Coenzyme Q-10, administered AFTER doxorubicin therapy has been completed, can help prevent delayed heart damage.

Lung Toxicity—In people, busulfan and bleomycin may cause pulmonary fibrosis. Rutin, quercetin, hesperidin, green tea, vitamin E, *Boswellia*, and curcumin may help.

Diarrhea—Probiotics, enzymes, ginger, and glutamine (*glutamine should not be used in pets with brain tumors*) may help.

Liver Toxicity—Liver detoxification using homeopathics, milk thistle, curcumin, indole-3-carbinol, MSM, and mixed carotenoids are recommended.

Kidney Toxicity—Curcumin, *Panax* ginseng, N-acetylcysteine (NAC) (helpful for hemorrhagic cystitis, a condition involving bleeding from the bladder in pets taking cyclophosphamide), and intravenous glutathione (for pets treated with cisplatin) may be helpful.

Nerve Toxicity—Protecting the nervous system from free radical damage of DNA may be accomplished by administering alpha-lipoic acid, curcumin, quercetin, milk thistle, and coenzyme Q-10. *Ginkgo biloba*, an herb known for its ability to reduce cognitive disorder, would be helpful as well. However, since pets with cancer are usually treated with high doses of omega-3 fatty acids, the combination of ginkgo plus fish oil can cause (fatal) hemorrhagic stroke and is not usually recommended.

Specific Benefits of Antioxidants

Antioxidants concentrate in cancer cells in much higher amounts than in normal cells. They have the following potentially beneficial properties:

- Block cancer cell DNA reproduction
- Induce apoptosis (cancer cell death)
- Block enzymes used by cancer cells for growth
- Block enzymes used by cancer cells for local invasion of normal tissue
- Block enzymes used by cancer cells for metastasis (spread)
- Block eicosanoid formation (eicosanoids such as various prostaglandins produce inflammation, suppress immunity, and support cancer cell growth and spread)
- Improve cell to cell communication
- Turn off cancer genes
- Exert anti-hormone effects
- Act as chelating agents (they bind iron)
- Improve detoxification

References

Messonnier S. *The Natural Health Bible for Dogs & Cats*. New York, NY: Crown Publishing Group. 2001.
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