



Chemotherapy for Dogs and Cats

Chemotherapy is a valuable form of treatment for many types of cancer in dogs and cats. An important step in choosing chemotherapy for your pet is understanding about its limitations. ***Our goal for cancer treatment is to improve the health and quality of life for our patients. We never want the treatment to be worse than the disease.*** This goal may or may not include a successful cure. Many forms of cancer are not curable, but chemotherapy can often prevent or reduce the severity of symptoms from the cancer and add quality time to your pet's life.

How does chemotherapy work?

Cancer is generally defined as a rapid, uncontrolled growth of cells. Chemotherapy works to interfere with the ability of cancer cells to grow and multiply at different stages of division. For example, one anti-cancer drug may interfere with a specific phase of the cell division cycle while a different drug blocks another step in cell division. In many cases, a combination of different drugs is the most effective way to kill the cancer cells. Since chemotherapy targets all rapidly dividing cells in the body, in addition to killing cancer cells, these drugs will also affect normal cells such as those found in the bone marrow and lining of the gastrointestinal tract. This can lead to potential side effects, although most normal cells are better able to recover and repair themselves compared to the cancer cells.

How is chemotherapy given?

Most anti-cancer drugs are given by one of five routes:

- Oral: These drugs are given by mouth to be absorbed by the stomach or small intestines.
- Intravenous: The drug is injected directly into a vein through a catheter. This is the most common way chemotherapy is administered.
- Subcutaneous: These drugs are given by injection under the skin and are slowly absorbed into the blood stream.
- Intra-lesional: These drugs are injected directly into the tumor, usually in a time-release formulation.
- Intramuscular: The drug is injected directly into the muscle. Depending on the drug, the medication may either be absorbed fairly quickly or more slowly.

How long will my pet receive chemotherapy?

The length of time and frequency of drug administration depends on the type of cancer being treated. Treatment may be given daily, weekly, or monthly. Your Veterinary Cancer Group Oncologist will work with you to design the best treatment option for your pet.

Am I at risk of exposure to these drugs?

For orally administered chemotherapy drugs, it is important that the capsules or pills are kept out of the reach of children. If you are pregnant, trying to get pregnant, or nursing, it is safest not to handle these drugs; you should have someone else administer them. Most oral chemotherapy drugs have a protective coating but we do recommend that you wear latex or poly-vinyl gloves when handling these medications. It is very important that you do not cut pills into pieces or open the capsules, as this can increase your risk of exposure.

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Should my pet be vaccinated while receiving chemotherapy?

We **do not** recommend vaccinating your pet during chemotherapy, especially during the initial treatments. Your pet's immune system may be compromised secondary to both the cancer and the chemotherapy, and it is unknown whether your pet will have the normal beneficial response to the vaccine. Vaccines stimulate the immune system and we do not want your pet's immune system unnecessarily challenged. We recommend waiting for a scheduled break in the chemotherapy before resuming vaccinations. *Please contact us before vaccines are given.*

Can my pet continue receiving monthly heartworm, flea and tick preventative medications while receiving chemotherapy?

Yes! Many of our patients receive Advantage, Capstar, Frontline, Program or other flea/tick preventatives while on chemotherapy. There have been no reports of contraindications using these products with chemotherapy.

Will my pet experience side effects?

With the drug dosages used in veterinary medicine **the majority of animals experience minimal to no side effects.** Despite this, there is a slight risk of side effects and a small percentage of animals may become ill after chemotherapy. Most side effects occur during the first few weeks of therapy, although they can occur at any time during treatment. If your pet does experience side effects, the drug type or dosage will be modified to minimize the chance of side effects recurring. Symptoms of illness can range from a slight decrease in energy and appetite to severe lethargy, anorexia, diarrhea and vomiting. The following are potential adverse reactions and guidelines to help you assess your pet's condition.

Fever: The normal temperature for cats and dogs ranges from 100.0 to 102.5 degrees. You can determine your pet's normal temperature by measuring it daily, at the same time each day, with a rectal thermometer for the first 3-5 days after the initial treatment. To take the temperature, lubricate the end of the thermometer with Vaseline and insert into the rectum ½ -1" for 1-2 minutes. Digital thermometers are safe and accurate, and a flexible-tip, 10 second thermometer may minimize your pet's discomfort. Ear thermometers do not conform to the shape of dog and cat ears and have not been shown to be accurate in pets. After the first week, you only need to monitor the temperature when your pet appears ill (tired, decreased appetite, etc). At the first sign of your pet "not looking right," please take the temperature. If it is over 103 degrees Fahrenheit or more than 1.5 degrees above normal, you should bring your pet to us or your local veterinarian to determine if antibiotics are needed. If the temperature is over 104.0 degrees or your pet is vomiting or severely depressed, your pet will need to be examined within a few hours and possibly hospitalized. Once you start a course of antibiotics, you must give the full 5-7 day treatment, even if your pet improves the first day.

Nausea: Your pet may become mildly lethargic, experience loss of appetite or even drool. If he or she is still drinking water, not vomiting and has normal temperature, anti-nausea pills (Reglan, ondansetron, or Cerenia) should be given. Continue it for several days until your pet feels well again. Bland diets or over-the-counter antacids may also help (see Side Effects page). Feeding small meals versus one large meal may also be of benefit. If these symptoms worsen or persist for 24-48 hours, please call us.

Vomiting: If your pet vomits once or twice, but is otherwise feeling well, withhold food and water for 4-6 hours. If no vomiting occurs during that time, offer your pet a few ice cubes to lick and start the anti-nausea pills. If no vomiting occurs after another few hours, you can then offer a small amount of water (1/4 -1/2 cup). Gradually offer larger amounts of water and then offer a bland diet if no vomiting has occurred in 12 hours (see suggestions that follow). If the vomiting continues or becomes more frequent, please call. Your pet may need to have injections of fluids and anti-nausea medications in order for the digestive tract to rest.

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Diarrhea: Diarrhea without vomiting or fever may be managed with a bland diet until the stools are normal. Then gradually over 3-5 days, slowly transition back to your pet's normal diet, decreasing the amount of bland diet and increasing the amount of the normal diet over 2-3 days. Make sure your pet has fresh water available at all times. Please call if your pet has diarrhea and is not drinking. If a bland diet alone does not produce a normal stool within 2 days, a probiotic nutraceutical (Nutrigest) can be added to the diet. Blood or mucus in the stool may be treated with antibiotics.

Constipation: Constipation is a rare side effect, but may be seen after *Vincristine* therapy. Signs include loss of appetite, straining to defecate and scant stools. Offering Metamucil cakes, bran, or canned pumpkin to increase fiber after *Vincristine* therapy may help prevent this side effect.

Bloody urine: *Cytoxan* (cyclophosphamide) can irritate the bladder. Signs of bladder irritation include straining to urinate, urinating small amounts frequently and bloody urine. To try to prevent this complication, ALWAYS GIVE THIS MEDICATION IN THE MORNING. You can help your pet "flush" the medication residue from the bladder by encouraging him or her to drink frequently and to urinate every 2-4 hours for 24 hours after giving the cyclophosphamide. This can be done by lightly salting the food, giving bouillon or popsicles (to dogs) and canned tuna water (to cats). If you notice signs of bladder irritation, please stop the drug and notify us right away. We will likely request that a urine sample be brought in for evaluation. It is likely *Cytoxan* will then be discontinued and another drug may be given instead.

Hair loss: Most animals do not experience hair loss. Shaved areas will grow back slowly. Cats may lose their whiskers and guard hairs. Dogs that need to be clipped and groomed such as poodles and terriers are likely to have mild to moderate hair loss. The hair loss tends to be worse following treatment with *Adriamycin*. The hair will regrow once the treatments have finished. Occasionally, the hair will grow back a different texture or color.

Special note about PREDNISONE and DEXAMETHASONE:

If these medications are used as part of your dog's therapy, expected side effects include **increased water intake, appetite, urination, restlessness and panting**. Your dog must have access to water at all times. If your pet receives this drug only once a day, it is helpful to give it in the morning. Do not increase the amount of food you give your dog, or excessive weight gain may occur. Your dog may feel less hungry if you divide his or her normal amount of food into two or more meals throughout the day.

Cats rarely show side effects with prednisone. They may have increased appetite, thirst and urination. Occasionally, cats may have diarrhea or depression. If predisposed, cats may develop diabetes while receiving these medications either by mouth or as injections. If your cat has a sudden increase in water intake or urine production, please contact us or your regular veterinarian.

Remember to tell us about any reactions your pet may experience, even mild ones, at his or her next appointment. Our goal is to ensure that your pet's quality of life while undergoing treatment is as normal as possible. In the vast majority of cases we can adjust the drug dosage or timing of administration, or substitute another drug to greatly lessen the chance of side effects developing. *Your feedback allows us to optimize your pet's chances of continuing good health.*

BLAND DIETS

DOGS: Low-fat cottage cheese, cooked (preferably boiled) skinless chicken breast (dark meat is too fatty) or lean ground beef. *Mix with an equal amount* of cooked white rice or pasta, mashed potatoes or dry white toast.

CATS: Meat baby food that does not contain onion powder (such as chicken with broth or veal with broth), cooked fish or skinless chicken, or canned tuna can be mixed with small amounts of Cream of Wheat or rice baby cereal to maintain stool consistency.

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SUMMARY: IF SIDE EFFECTS DEVELOP...

FEVER (>103.0 or 1.5 degrees above your pet's normal temperature)

1. Start antibiotics and continue for one week
2. Monitor temperature 1-2 times a day

NAUSEA/LETHARGY

1. Start Pepcid AC or Zantac 75.

Do not use "chewable" forms of these medications; Generics are fine.

DOGS:

Pepcid AC ½ tablet per 15 pounds, every 12-24 hours

Zantac 75 ¼ to ½ tablet every 12 hours

CATS:

Pepcid AC ½ tablet every 12-24 hours

Zantac 75 ¼ to ½ tablet every 12 hours

2. **Dogs and Cats:** Steep 1 teaspoon ginger root (freshly grated or dried spice) in 1 cup hot water. Give 1 teaspoon orally three times daily.
3. Feed bland diet in small meals versus one large meal.

VOMITING

1. Withhold food and water for 4 to 6 hours.
2. If no vomiting after at least 4 hours, offer ice cubes (or a few laps of water) and start Reglan.
3. If no further vomiting after another 4 to 6 hours, offer a small amount of water.
4. Gradually offer larger amounts of water and start a bland diet.
5. If your pet continues to vomit after removing food and water or vomits more than 2 times in 24 hours, contact us or your local veterinarian.

DIARRHEA

1. Feed a bland diet.
2. Make sure your pet has water available at all times.
3. Medications:

FOR DOGS ONLY:

Pepto Bismol* ¼ caplet or 2.5 ml (1/2 teaspoon) per 15 pounds

Kaopectate* ½ caplet or 2.5 ml (1/2 teaspoon) per 15 pounds, every 4-6 hours

Immodium* 2ml per 15 pounds OR 1 capsule (2mg) per 70 pounds

Do not use the "chewable" forms of these medications

CONSTIPATION

1. Increase fiber in the diet by adding Metamucil, bran flakes or canned pumpkin.
2. Make sure your pet has water available at all times.

BLOODY URINE

1. Stop Cytoxan immediately.
2. Make sure your pet has water available at all times.
3. Call us and/or your local veterinarian to report this occurrence.

PLEASE CALL IF ANY OF THESE SIDE EFFECTS PERSIST FOR MORE THAN 48 HOURS. CONTACT US SOONER IF SYMPTOMS SEEM SEVERE, ESPECIALLY THEY ARE RELATED TO FEVER, LETHARGY OR VOMITING.

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