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Chemotherapy in Animals

Cancer, or malignancy, is the uncontrolled growth of abnormal cells and can occur anywhere in the body.

As with humans, cancer in animals can be difficult to control and commonly involves a variety of treatments including surgery and chemotherapy, either alone or in combination. Although radiotherapy is used in human medicine, the lack of availability and cost in New Zealand is often prohibitive.

Chemotherapy is often used in cancers that cannot be treated by surgery or surgery alone. It may be appropriate where there is metastasis, or a risk of metastasis, there are residual cells left after surgery, or when it may enhance the effectiveness of other treatment.

What is chemotherapy?

Chemotherapy is the administration of anti-cancer medications designed to kill cancer cells or slow the growth of them.

The goal of veterinary chemotherapy is to achieve 'complete clinical remission' or to make your pet as normal as possible with no outward signs of cancer and allow a good quality of life. This differs to that of in humans where the goal is to achieve 'cure'. Doses of chemotherapy drugs are lower in animals than in people as we tend to treat them less aggressively. For this reason, animals treated with chemotherapy do not have such severe side effects as those seen in humans.

Chemotherapy can be administered to your pet as an injection or as an oral medication. When given by injection, it is usually administered into a vein via an intravenous catheter, however, it is occasionally given into the muscle, under the skin, or directly into the tumour.

Recent reported studies surveyed dog owners whose pets had received chemotherapy concluded that after chemotherapy 92% were happy they had treated their dog, and 80% said they would treat another pet with chemotherapy if the need arose. Quality of life scores during chemotherapy were reported to be the same as prior to developing lymphoma in nearly 70%, while the other 30% felt their pets life was less than before lymphoma, but very acceptable; none felt quality of life was poor during chemotherapy. In the other study 89% of dog owners did not regret using chemotherapy in their pet, and the same percentage felt their pet's quality of life was good during therapy.

Does chemotherapy cure my pet?

Chemotherapy in animals does not cure cancer but aims to control it by killing cells or slowing their growth. The length and time of drug administration depends on the type of cancer being treated and how well your pet tolerates it.

Our aim is to achieve 'complete clinical remission' so that your pet has a normal life and have minimal or no signs of cancer. They behave just like they did before they were diagnosed with cancer.

Despite receiving chemotherapy, it is possible for some of the cancer cells to survive in very low numbers that are too small to detect. Eventually, these few cells can grow, and the cancer will become evident again. If this happens, animals are said to be 'out of remission'. Sometimes a second remission can be achieved with 'rescue chemotherapy however eventually the cancer cells may become resistant or insensitive to all drugs, and no further treatment is available. In such cases, the cancer cells have become resistant to the drugs in a similar way bacterium become resistant to antibiotics. When resistance to one drug occurs, we can often use other drugs. However, if resistance develops it becomes more difficult to find a drug that the cancer will respond to. In some cases, cancer develops resistance to all drugs. At this point a palliative approach is followed with the aim of making your pet as comfortable as possible for the remainder of their life.

Side Effects

It is important to remember that although your pets' cancer may not be curable, they can still have a good quality of life whilst receiving chemotherapy.

As with administration of any drug, there is potential for side effects to occur. Approximately 70-80% of pets have no or very mild side effects and those that do are often managed on an outpatient basis.

The starting dose of any chemotherapy drug is one that we know most pets will tolerate without significant side effects, however a small number of pets will experience some side effects that have an unacceptable impact on quality of life and in rare occasions require treatment in the hospital. If this occurs, future doses of that drug are reduced, or an alternative drug is used.

There are some normal cells in the body that are actively dividing and therefore they can also be affected by chemotherapy. These cells are found in the blood and bone marrow, gastrointestinal tract, skin and reproductive system, consequently potential side effects can be seen.

- **Low white blood cell count** – prior to each chemotherapy dose a blood test is taken to check your pets blood cell count. Lowering of the white blood cell count is one of the most common findings, however this does not cause a problem unless the count drops too low, and the body cannot fight off infections. If this happens, your pets' symptoms may include fever, lethargy, vomiting, and loss of appetite. Your pet may be given antibiotics

preventatively the first time they receive a new medication that can cause this side effect. Infections are most likely to occur 5-7 days post chemotherapy administration.

- **Lethargy** – pets sometimes feel tired post chemotherapy and not as energetic as normal. This is usually short in duration however if you have any concerns then please contact our team.
- **Vomiting** – if vomiting occurs then it is usually 2-5 days after receiving chemotherapy. We will usually send your pet home with some anti-nausea medication for you to have at home and administer if needed. If vomiting persists then please contact our team.
- **Diarrhoea** – as with vomiting, if diarrhoea occurs it will usually be 2-5 days after receiving chemotherapy. Offer bland, digestible food such as cooked chicken or rice and gradually increase their normal diet. In some cases, we may prescribe your pet some antibiotics.
- **Anorexia** – this can occur after some treatments, and more commonly in cats. Offer them something tasty and try warming their food. If your pet still won't eat after 24 hours, then please get in contact with our team.
- **Alopecia (hair loss)** – this is a rare side effect in animals although in some cases hair regrowth can be slow and there may be a change in colour when the hair does grow back.

Other side effects are possible and are often unique to individual drugs (for example bladder irritation, kidney and heart failure). Prompt treatment can often prevent more serious side effects from developing. We routinely perform blood and urine test and check the blood cells before chemotherapy treatments to ensure that the white cell count is acceptable for treatment and the

How is chemotherapy administered?

The majority of chemotherapy drugs are administered injection during a day-stay at the clinic. In some cases, oral medication is given during an appointment or for you administer at home. Many chemotherapy protocols involve a series of treatments that can be given daily, weekly or every 2–4 weeks. This is often followed by a period of careful observation.

When your pet is admitted to the clinic a full history is taken and we ask that you bring any medication with you that your pet may be on. A full clinical examination is performed, and blood tests are taken to check that your pets blood cell counts, and organ function are adequate for treatment. As long as the vet is happy with the results of the blood tests, chemotherapy will be administered.

We have a dedicated chemotherapy room that provides a quiet environment for your pet to receive their treatment in. A 'clean first stick' intravenous catheter is placed to allow safe administration of the chemotherapy. Some of the drugs are given over a short period of time, however others require slow administration over 20-30 minutes. An Equashield system (needless injection system) is used to prevent staff exposure to chemotherapy drugs and increase safety.

After administration, the catheter is removed and a light bandage is placed, this will be removed before your pet leaves the clinic. If your pet licks excessively at the injection site (i.e. for longer than a day) or if the site turns red, this may be a sign that some drug went outside the vein. Please contact us **immediately** since this may be a serious complication.

When oral tablets or capsules are dispensed for you to give at home, please make sure that the pills **are not** crushed or split, and capsules **are not** opened as this can expose you to chemotherapy.

Is there any risk to me?

Usually there is no risk to owners as long as general hygiene measures are followed. Most chemotherapy drugs leave the body through the faeces and urine however can be present in the saliva so they could be potentially a risk to you if you come in contact with them within the first 48 hours of treatment.

It is important to wear gloves if any accidents occur inside your home and clean the area with disposable items (i.e. paper towels). Wash your hands thoroughly afterwards. If toileting is done outside, simply leave faeces for 48 hours before collecting them, the ultraviolet light in the sun will often deactivate any potential residue in the faeces. In general, it is recommended that if clothing/bedding is soiled by faeces, urine or vomit within 48 hours of chemotherapy treatment it should be washed twice in hot water or thrown out.

Women who are or may be pregnant should **not handle any** chemotherapy medication that is dispensed to be given at home, and should avoid contact with the urine or faeces of a pet that has received chemotherapy within the past 3 days.

Can my pet have regular exercise?

It is important that you treat your pet as normal as possible and you can take your pet for as much exercise as they feel up to doing. If your pet has a low white blood cell count it is suggested that you do not take them to areas with where they may come in contact with a lot of other animals to reduce the risk of them getting an infection. If they have a low platelet count, then rigorous exercise will be restricted until levels are back to normal.

What should I feed my pet?

In other countries a special formulated cancer diet is available however this unfortunately isn't the case in New Zealand. You shouldn't change your pets' diet suddenly however the food you feed should be of good quality and balanced as possible.
We do not recommend feeding a raw meat diet whilst your pet undergoes chemotherapy as it appears to increase their risk of infection if the immune system becomes suppressed.

Some evidence exists that higher protein and fat and lower carbohydrate content is beneficial to pets that have a high tumour burden. Supplementation with fish oil may improve response to chemotherapy.

Hill's have recently released the Hill's ONC diet which is designed for cats and dogs that have serious illnesses such as cancer. It is highly digestible and designed to help maintain and strength and energy. It has highly digestibly protein and favourable fats as well as supporting digestive health.

Remember, it is more important that your pet eats, than it is for them to eat a specific cancer diet. If your pet refuses to eat the discussed foods, then speak to one of our team about alternative suggestions. Try warming the food to room temperature before feeding and make sure cats have access to food throughout the day.

Can my pet receive regular health care?

Ideally vaccination should be delayed until 6 months after finishing chemotherapy as the response to vaccine may not be optimal. In some cases, it may be necessary to give your pet vaccinations i.e. they are going into a high-risk environment such as a cattery or kennels. It is safe to give your pet vaccines while they are receiving chemotherapy and most pets respond normally with no increase in risk of problems from the vaccine.

Your pet should continue to receive flea and worm treatment whilst undergoing chemotherapy. Topical forms are preferred, although more recently some of the oral forms e.g. fluralaner (Bravecto) are reported not to have any interactions with chemotherapy drugs. Spinosad (Comfortis) should be avoided as it can increase toxicity of some drugs.

How do I choose what is best for my pet?

Your pets' quality of life is the main priority. Chemotherapy is aimed to provide disease free time for your pet. No one can accurately predict how long this will be. For some cancers there is more information available, and we can sometimes give you an estimation of what you might expect. Chemotherapy involves commitment and dedication, as it may need daily, weekly or monthly administration of medication, with no guarantee of success. During treatment, several crisis points can occur. There may be failure to respond, recurrence of the growth or complications of the cancer or treatment. Thus, it is understandable if some owners to elect euthanasia when their pet is diagnosed with cancer.

We are constantly in touch with you throughout this difficult time, our priority is you and your pet. We aim to keep continuity of care as much as possible and a dedicated vet team will be allocated to you will help guide you through. Remember, there is no such thing as a silly question; no matter how small, please feel free to ask!

How much does chemotherapy cost?

The cost of chemotherapy depends on the protocol that has been recommended. We will try to give you individual estimates for the cost of treating your pets' cancer. It can vary significantly depending on the length of the protocol and the drugs used. At McMaster and Heap, we work alongside with Veterinary Oncology Consultants in Sydney where required, to help you decide on the best chemotherapy protocol for your pet.

How do I know when it is time?

Your pets' quality of life is the primary concern very throughout and after treatment. There are often further treatment options available if there are problems. Decreased quality of life may be manifested in many ways, and animals can be good at hiding their discomfort. Your pet may show a lack of interest in eating and going for walks, or may struggle to breath, get comfortable or sleep. For many it is their pets' inability to acknowledge their owner that helps make the final decision.

Please feel free to contact any member of our team if you have any trouble making this decision or have any concerns.