



Linnet Way  
Brickhill  
Bedford  
MK41 7HN  
T: 01234 261 839 E:

## **Treating lymphoma with chemotherapy**

### What is lymphoma?

Lymphoma is a type of cancer involving the white blood cells. It can be seen in both cats and dogs of any age.

### Which parts of the body are affected by lymphoma?

Because white blood cells travel around the body, the cancer can develop in a variety of places. Some of the more common places to see lymphoma include:

- In the lymph nodes ('glands') in the neck, in front of the shoulders, in the groin and behind the knees. One or all of the glands may be affected. These glands are usually difficult to feel but when they are enlarged with the lymphoma they are much more prominent. This type of lymphoma is most common in the dog.
- In the intestines - your vet may be able to feel a mass in the intestine which is an accumulation of these cancer cells. This type of cancer is most common in the cat.
- In the nose, causing sneezing and sometimes discharge from the nose.

However, lymphoma has been reported in many places such as the eye, skin, larynx, lungs, and liver.

### What are the signs of lymphoma?

Often, lymphoma causes vague signs such as reduced appetite, weight loss, raised temperature and lethargy.

Other signs are related to the body parts in which the lymphoma has developed. For example, pets with lymphoma in the nose may show sneezing; pets with lymphoma in the intestine may have vomiting and diarrhoea; pets with lymphoma in the throat may have noisy breathing or voice change.

Occasionally an owner or veterinary surgeon will detect the enlarged glands in the neck, or a mass in the abdomen before the dog or cat is showing any other signs of illness.

### How is lymphoma diagnosed?

In people, specific blood tests are available to diagnose lymphoma, but these are not very helpful in dogs and cats.

We usually diagnose lymphoma by taking a needle cell sample from the abnormal mass. For example, if the patient presents with enlarged lymph nodes, we take the needle sample from the lymph nodes; if the patient presents with a mass on the intestines, we take the needle sample from this mass.

This needle sample can usually be taken from dogs or cats in a few minutes, without any sedation, particularly if the mass is easily accessible. Sedation or anaesthesia may be required if the mass is more difficult to get to (for example, some masses in the abdomen or inside the nose or chest). We can usually look at the cell sample in the laboratory at Acorn House on the same day that we take it.

Looking at the cells usually gives us a very good idea that we are looking at lymphoma. However, to be absolutely sure of the diagnosis, and to find out more about what type of lymphoma we are dealing with, we need a biopsy. A biopsy is an actual piece of tissue, collected via a surgical procedure, rather than just the cells collected in the needle sample. Biopsies usually require the dog or cat to be under general anaesthetic. For lymph node masses, it is best to remove the entire lymph node and send it for analysis at the lab. For other masses it is usually sufficient to take one small block of tissue (around 0.5-1cm) and to close the wound with stitches. The biopsy has to be sent to the external lab and processed before the laboratory vets can examine it. This usually takes 5- 10 days.

#### The cell sample is suggestive of lymphoma. Should my pet have a biopsy as well?

This decision is made on a case-by-case basis by the veterinary surgeon and owner together.

The benefits of performing a biopsy are that it is good to have the diagnosis absolutely confirmed. The biopsy will also further categorise the lymphoma into a group that gives us more information about how aggressive it is, and how likely it is to respond to chemotherapy (the biopsy can tell us if the lymphoma is large or small cell lymphoma; low, intermediate or high grade lymphoma; and, if additional laboratory tests are carried out, which type of white blood cells (T or B cells) are affected). All of this information gives a better idea of the long term outcome for your pet.

The disadvantages of performing a biopsy are that it involves an anaesthetic and surgical procedure for the patient, which in turn increases costs for the owner. Occasionally, complications may develop at the biopsy site, such as infection or wound breakdown. Waiting for the biopsy results represents a delay before treatment can be given. Although finding out more about the exact type of lymphoma might give us more information as to how well your pet is likely to respond to treatment, the actual treatment given tends to be the same for all cases. For this reason, some clients decide that they will proceed with treatment for lymphoma without having a biopsy taken.

#### How is lymphoma treated?

Although lymphoma often presents as a solid mass that we can feel, surgically removing the mass is very rarely suggested because lymphoma is a blood cell cancer, and there will be other cancerous cells floating around the bloodstream.

Fortunately, lymphoma often responds well to treatment with medication to suppress the cancer cells. Treating cancer with medication in this way is also known as chemotherapy.

#### Is chemotherapy in animals the same as in people?

Many of the drugs that we use to treat cancer in pets are 'borrowed' from human medicine, where there has been much more research. However, in people, chemotherapy is usually used at aggressively high doses and frequencies, in an effort to permanently cure the cancer. It is not ethical for us to make dogs and cats feel very ill with chemotherapy, in the hope that they will benefit later on - they would not understand why they felt so bad and certainly cannot give us permission to do this to them! For this reason, the chemotherapy that we use in dogs and cats is given at lower doses and frequencies so that the risk of side effects is no greater than many of the other medications that we use routinely in our pets. This means that most pets having chemotherapy will have no side effects, or mild side effects (such as an upset tummy). We do not expect pets to lose their fur, although patches of fur shaved off for blood tests may take a long time to grow back. Unfortunately, the lower doses mean that we do not usually completely cure pets of their cancer - they often go into remission for a period of time (the cancer is no longer detectable) but eventually the cancer will return.

#### What is the expected outcome when treating lymphoma with chemotherapy?

All animals respond differently to chemotherapy and your vet will be able to give you a more specific outlook for your pet's individual case. However, in general, we expect approximately 75% of pets with lymphoma to respond to chemotherapy. This means that after the first 1 or 2 doses, the masses will disappear and the dog or cat will stop showing the symptoms of ill health that led to them coming to see the vet in the first place. Unfortunately, the other 25% of cases have a lymphoma that is not sensitive to the chemotherapy that we are using. If the masses have not shrunk after the second dose of chemotherapy we would not usually continue the treatment and alternatives would be considered.

Of the 75% patients that do respond to the chemotherapy, most stay in remission for a period of between 6 and 24 months. If and when the cancer eventually returns, alternative treatments can be considered.

Whilst the patient is receiving chemotherapy, they will need to take tablets regularly at home and visit the surgery regularly for blood tests and injections. In many cases, treatment is continued for 12 months in total.

#### Exactly what type of chemotherapy is used?

There are two types of chemotherapy that can be used initially to treat pets with lymphoma. These are known as the 'COP protocol' or the 'CHOP protocol'.

The COP protocol is made up of three drugs - steroid tablets that are given by the owner at home, cyclophosphamide tablets that are given either by the owner at home (dogs) or the vet at the surgery (cats), and vincristine injections that are given at the veterinary surgery.

The CHOP protocol is exactly the same as the COP protocol except that an additional drug, doxorubicin is given. Doxorubicin is a medication that comes as a powder and has to be mixed with water to make an injection, just before dosing. For health and safety reasons, only specialist veterinary centres with a special license and extracted-air preparation cupboard, can use doxorubicin.

The COP protocol is less likely to cause side effects, but on average, the remission rates and times are likely to be lower than with the CHOP protocol. Animals on the COP protocol can be treated at home and at Acorn House and do not need to go elsewhere.

The CHOP protocol is more likely to cause side effects, including a risk of heart problems, but is likely to achieve higher remission rates and longer remission times. Animals on the CHOP protocol will need to go to a licensed specialist centre to receive their doxorubicin injections. Our nearest clinic is Davies Veterinary Specialists, near to Barton-le-Clay, and most patients would need to visit this centre every 3-5 weeks.

Your veterinary surgeon will give you specific information for your pet, but a typical COP protocol for a dog or cat with lymphoma will be:

First 2 months - visit Acorn House once a week, for approximately 45 minutes. During this time, a blood test is checked and the vincristine injection (and the cyclophosphamide tablet, for cats) is given. You will give steroid tablets every 1-2 days at home.

Next 6 months - as above, but the visits to Acorn for blood tests and injections are every 2 weeks rather than every week.

Next 4 months - as above, but these visits reduce to every 3 weeks

12 months after starting treatment - in most cases, treatment then stops.

#### How much does chemotherapy cost?

Each visit (blood test, intravenous cannula, administration of chemotherapy) usually costs between £159 and £205. This includes the protective equipment required to administer the chemotherapy and its safe disposal.

The steroid tablets, cyclophosphamide tablets and the vincristine injections usually cost around £330 per year on top of the ongoing charges for a cat; or £330 – 2,627 (depending on size) for a dog.

For the CHOP protocol, an initial appointment with the specialist oncologist at Davies Veterinary Specialists is required. The cost of this initial appointment is £324 and ongoing treatment plans and costs would be discussed at that time.

What happens if/when my pet does not respond to the chemotherapy or comes out of remission?

If the masses do not shrink after the first one or two doses of chemotherapy, your pet's lymphoma is not sensitive to these drugs and it is not sensible to continue down this route. These pets can be referred to the oncology service at Davies Veterinary Service to pursue other types of chemotherapy (such as the CHOP protocol, or an alternative tablet known as 'lomustine').

If your pet's lymphoma does go into remission, but then recurs again whilst your pet is still on the COP protocol, a referral to the oncology service for one of these additional treatments can be offered as above.

If your pet's lymphoma goes into remission and then recurs more than 12 months later when the COP protocol is finished, COP can be restarted.

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Registered office: 4 Royal College Street, London NW1 0TU

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