

## RADIATION THERAPY Information for Owners



Here are some things that you need to know regarding your pet's radiation therapy treatments and what to expect.

### How does radiation therapy work?

Radiation therapy is based on the principle that radiation affects the cells ability to grow and divide. The DNA contained in the cell is damaged and it interferes with the cell's ability to divide and the cell dies. The slower growth rate and ultimate death of the cancer cells causes the tumour to shrink over time. Radiation affects both normal and cancer cells, but the radiation treatment is designed to produce the maximum effect on the tumour and minimize the effect on normal tissue. Radiation therapy is typically applied to one site in an attempt to provide loco- regional therapy (primary tumour and regional lymph nodes) of a cancer but is not efficacious against metastatic cancer.

### How will radiation therapy help my pet?

When choosing radiation therapy for any patient, we have to consider what the goals of therapy are – are we trying to "cure" or eradicate all local tumour cells, or are we trying to shrink a cancer to make it operable, or are we simply trying to make pain control easier? Depending on your pet's cancer, his general health and your possibility of commitment, we will design a protocol that will be optimal for our goals.

### Type of protocols

Full course treatments (curative) Radiation therapy is delivered to a total dose of between 42-57 Gray for most types of cancer. This dose is more than 500 times what a diagnostic x-ray (radiograph) would be so it cannot be tolerated by any normal tissue as a single dose. We divide up that dose into many "fractions" which are then delivered on a Monday-Friday basis until the total dose needed for that cancer's control has been given. Between 10 – 19 treatments are administered over a 3-4 week time period depending on the type of tumour, the normal tissues within the treatment field, and the patient's condition.

Coarse fractionation treatment (palliative) Radiation therapy can also be used in a palliative fashion to try to slow an aggressive/non- resectable tumour's growth, to shrink an oral tumour, decrease the vascularity of a cancer, or to kill pain associated with a cancer and to increase quality of life. Typically, palliative radiation therapy is given as a bigger dose per fraction and fewer fractions total (usually between 1-5) depending on the patient characteristics.

## What will my pet needs prior to starting radiation?

Patients for radiation therapy must first be seen by the oncologist and or the radiation oncologist to discuss treatment options, prognosis, and overall state of health. Imaging for treatment planning would be accomplished next so that a detailed treatment plan can be designed. The imaging could be a simple radiograph, a measurement by ultrasound or a CT scan. Depending of the complexity of the treatment planning, a delay of some days to a week can be expected. Once the treatment planning is complete, radiation therapy would typically begin on a Monday (for full course treatments) – although schedules can be adjusted to meet patient needs. Clients can either drop their pets off early on the morning for the day, or leave the patient for the entire treatment period. Pets must be fasted for at least 12 hours prior to their radiation therapy (due to anaesthesia needs).

## A Typical Treatment

On daily admission a nurse will admit your pet; please let them know if you have any concerns, if you need more medication or if your pet has been unwell, so they can discuss this with the Radiation Oncologist. All radiation therapy requires perfect positioning of patients to avoid side effects to portions of the body that should not be in the treatment field! That means that each patient will have to be anesthetized for each therapy. Radiation therapy anaesthesia protocols are designed for safety in repetitive use in an elderly patient population. The treatment field may be shaved and marks placed on the skin during the first imaging session to be certain that the treatment field stays the same with each treatment.

Once your pet is sedated and sleeping quietly on the treatment table, we place them in the required treatment position and secure them with sand bag, tape or the moulage. The treatment position must be precise and easily repeatable to insure the optimal dose of radiation to the affected area. To successfully treat a tumour, the positioning must be as close to 100% repeatable as possible. Once your pet is correctly positioned, a camera is aimed at the patient. This is to allow the veterinary nurse and technician to closely watch the patient during the treatment to observe respiration and movement as no one is allowed in the therapy suite while the radiation machine is operating. The actual treatment times will vary depending on the dosage required but usually take between 5 and 15 minutes.

Once the radiation is finished, the patient will recover from anaesthesia rapidly and they are returned to their cage or run.

## What are the side effects?

Radiation therapy cannot tell the difference between normal and cancer tissues – it simply kills cells as they divide. Since most cancers divide much faster than normal tissues, we get a selective effect on the cancer cells. We expect, however, to see side effects of radiation therapy. Acute (or short term) effects include loss of hair, moist desquamation of skin/mucus membranes (radiation burn like a blistering sunburn), and corneal irritation – if these tissues are in the treatment field. Common late side effects of radiation therapy include permanent hair loss, permanent hair colour change, cataracts, retinal degeneration, keratoconjunctivitis sicca – again only if these tissues are in the treatment field. Some organs have more difficulties with radiation than

others – eyes are clearly sensitive, but tubular organs (oesophagus, colon, rectum, and urethra) can also be – they could heal from acute radiation effects by scarring (stricture). The heart and lungs can only tolerate a limited amount of radiation therapy – so we try to avoid these structures. Because we want to minimize side effects, imaging and treatment planning are essential for most patients.

### **What can I do for the side effects?**

Dogs and cats getting full course radiation therapy WILL develop acute side effects. Palliative or short course radiation therapy rarely causes acute side effects other than the hair loss needed in order to shave/mark the treatment field. Dogs with moist desquamation (cats more commonly get dry desquamation with dry flaky skin and itchiness) need to have their treatment sites kept clean and dry (with water – not other products). We try NOT to bandage as we don't want dirt and moisture to build up – that means that E-collars are often necessary as a dog's licking will only make the side effects worse. If a pet is scratching, sometimes T-shirts, socks or hobbles must be used to prevent self-trauma. Anti-inflammatories and rarely narcotics can be used to help through this time period. Typically, these radiation burns form in the second to third week of full course therapy, and then form crusts, and then the skin heals under the crusts. The whole process takes about 2-3 weeks.

Mucositis is seen when the gums, tongue, cheeks, throat or other mucus membrane-lined tissue is in the treatment field (often with nasal or oral tumours). The mucosa will get very red, and may ulcerate or blister during the second week of full course radiation therapy. Bad smell to the breath (halitosis), drooling, and difficulty eating can occur. Some cats and small dogs could require a temporary feeding tube if a large portion of their mouths are in the treatment field. Mucosa heals quickly following the conclusion of radiation therapy.

Ocular side effects are of concern if the eyes are in the treatment field. Acute side effects include dry eye and corneal irritation – so artificial tears and ointments are often needed. Eyes are checked for corneal ulcer formation at least weekly if they are in the treatment field – but let your oncology nurse know right away if your pet is squinting, or if the eyes look abnormal to you at home. Late side effects of radiation (permanent keratoconjunctivitis sicca or dry eye, cataracts, and retinal degeneration can be irreversible side effects of radiation therapy if the eye gets full dose or even scatter radiation. It takes between 6-12 months for cataracts to form following radiation therapy – cataract surgery could be considered if the tumour is under control. Certain types of delayed side effects are very dangerous or deadly (spinal cord malacia, kidney fibrosis or scarring, lung fibrosis, death of bone) so every effort to avoid late side effects is made in full course radiation therapy – the risks of developing these problems is small (5 %). The multiple fractions of radiation therapy as well as careful treatment planning are the ways that we attempt to avoid late side effects.

### **What to expect if I take my pet home during therapy?**

When you pick up your pet to take him home, they may still be a little sleepy. It takes a while for the drugs to be cleared through the body. If your pet is receiving daily treatment, you may expect them to be somewhat less active than normal. Overweight animals will take longer to metabolize the drugs and be sleepy longer. Most pets return to their normal activity level after completing the course of radiation treatments.

## Feeding

You will be instructed not to feed your pet after 10 pm on the night before a radiation therapy treatment. Water is allowed up to the time of the treatment. This is very important for your pet's well being. Please don't think you are depriving them because they will be offered something to eat shortly after the recovery from anesthesia. Being fed prior to sedation may cause your pet to vomit. The patient could aspirate (breath in) some of the vomit while they are in a relax state and this could cause aspiration pneumonia. If you forget or accidentally feed your pet on the morning of the treatment, just let us know and we will postpone the treatment for a few hours. This will allow time for the food to be digested.

If you are taking your pet home after each treatment (outpatient), you may notice a lack of appetite. This is expected after treatment due to anesthesia. You might want to give them a little extra time to eat, feed them later in the day, warm their food (this makes it smell better) or offer treat food in moderation to stimulate their appetite. Many patients will lose a little weight during their course of treatment. This is normal, but should be monitored to prevent too much weight loss.

## E-collar

During the course of radiation therapy, your pet may need to wear an E-collar. E-collar must be worn by the patient to keep them from irritating the treatment area. Any irritation (rubbing, licking and picking at scabs) will prolong healing in the treatment field, possibly for months after the treatment ends. Pets can cause tremendous damage to the radiation field within just a few minutes. Left alone overnight without the E collar, the result can be devastating. We want your pet to recover from radiation side effects as quickly and painlessly as possible. The E collar is a temporary nuisance for the long term good of your pet. Please keep the E-collar on at all times.

## Catheter

We induce anesthesia through a venous access that we have with a catheter. Catheters can be kept in place for 48 hours. It is possible that we send your pet home with a catheter under a bandage. Please keep your pet from chewing on it and if it makes him uncomfortable, we will remove the catheter after each session and put a new one prior to each anesthesia.

## Marking the treatment field

Sometimes it is necessary to use a nontoxic marker or paint on the animal's coat or skin to indicate the area being irradiated. We may also clip some of the hair around the area to give us better visualization of the treatment field. Please avoid removing/washing the markings as they help us with your pet's treatments.

Hopefully this information will help you know what to expect and make things a little less scary. If you have any questions, please ask we are here to help you and your pet.

## Financing treatment for your pet

BVSC understands that surgical treatments are both unexpected and costly. To assist you, access to third party external finance companies are available. These companies require a detailed application & credit check. BVSC is not an agent for these companies and may request a deposit to allow treatment to proceed if finance approval is pending.

## Where is BVSC and how do I make an appointment for my pet?

BVSC is located on Brisbane's north side on the corner of Old Northern & Keong Roads, Albany Creek 4035.

To make an appointment for your pet you will be required to have a referral from your vet, to get a referral contact your veterinarian and request referral to BVSC then contact our friendly reception staff on **(07) 3264 9400**.

We hope this information is helpful. If you have any questions, please ask us. We are here to help you and your pet.

