

# RADIATION THERAPY IN COMPANION ANIMALS



## What To Expect

### Overview

Radiation therapy is a medical treatment that utilizes high-energy radiation to control, cure, or alleviate symptoms of certain cancers and severe inflammatory conditions in pets. Virginia Veterinary Centers is among the select facilities in the region offering this advanced treatment option for companion animals. This document aims to provide a comprehensive introduction to radiation therapy for pets. However, it should not replace direct consultation with your pet's veterinary team.

### Understanding Radiation Therapy

Radiation therapy involves the use of high-energy X-rays or electrons to target and destroy cancerous cells. Importantly, pets undergoing this treatment do not become radioactive at any point during the therapy.

### Types of Radiation Therapy

There are several forms of radiation therapy utilized in veterinary medicine:

- **External Beam Radiation Therapy (EBRT):** The most common method, where a machine called a linear accelerator directs radiation precisely at the tumor.
- **Stereotactic Radiation Therapy (SRT):** A highly precise form of radiation that delivers high doses in fewer sessions, often used for tumors in sensitive or hard-to-reach areas.
- **Brachytherapy:** Involves placing radioactive material directly inside or near the tumor. This method is less common in veterinary practice.
- **Radioisotope Therapy:** Uses radioactive substances that are ingested or injected, such as radioactive iodine for treating hyperthyroidism in cats.

### Treatment Planning and Delivery

Before initiating radiation therapy, a thorough planning process is essential:

- **Consultation:** A veterinary oncologist will assess your pet's condition, review diagnostic tests, and discuss treatment options.
- **Imaging:** Advanced imaging techniques like CT or MRI scans are used to determine the exact location and size of the tumor.
- **Simulation:** Your pet is positioned in the exact way they will be during treatment, and immobilization devices may be created to ensure consistency.
- **Treatment Plan:** A customized plan is developed to deliver the appropriate radiation dose while sparing healthy tissues.
- **Treatment Sessions:** Depending on the protocol, your pet may receive radiation daily (Monday through Friday) over several weeks. Each session typically lasts 30-60 minutes, and anesthesia is used to keep your pet still during the procedure.

### Goals of Radiation Therapy

Radiation therapy can serve different purposes:

- **Curative Intent:** Aims to eliminate the tumor entirely, often used when the cancer is localized.
- **Palliative Care:** Focuses on relieving symptoms and improving quality of life, especially in advanced cancer stages.
- **Adjuvant Therapy:** Used in conjunction with surgery or chemotherapy to enhance overall treatment effectiveness.

### Administration of Radiation Therapy

The equipment used to deliver radiation is known as a linear accelerator (LINAC). This machine is housed in a specially designed room that safeguards both the environment and the operators from radiation exposure. The radiation dose administered during therapy is significantly higher—approximately 1,000 times—than that used for diagnostic imaging, making it highly effective in destroying cancer cells.

A veterinary radiation oncologist prescribes the total radiation dose for each patient. Rather than delivering the entire dose in a single session, it is divided into multiple smaller doses called "fractions". Typically, one fraction is administered daily, although in some cases, two fractions may be given per day, spaced at least six hours apart. This fractionated approach allows healthy tissues time to repair between sessions, while cancer cells, which are less efficient at healing, are progressively destroyed. The number of fractions required varies based on the individual needs of each patient.

### Initial Treatment Session: Simulation

The first session, known as a simulation, involves anesthetizing the patient and positioning them as they would be during actual treatment. Specialized laser positioning tools ensure that the prescribed radiation dose targets the precise area intended. Often, non-toxic skin markings are applied to guide subsequent treatments. In some instances, the first radiation fraction is administered immediately following the simulation. The simulation process may take 1-2 hours, depending on the complexity of the treatment plan.

If advanced imaging and computer-assisted planning are necessary, a CT scan is performed during the simulation. In such cases, the first radiation treatment typically begins a few days after the scan. Subsequent treatment sessions, or fractions, are scheduled according to the treatment plan and require light anesthesia to immobilize and accurately position the patient. Each of these sessions generally takes 30-60 minutes to complete.

### Potential Side Effects of Radiation Therapy

While radiation therapy is generally well-tolerated, some side effects may occur, typically confined to the area that receives treatment. These effects are most often caused by inflammation of the skin or surrounding tissues due to the radiation exposure.

- **Skin Changes:** Pets may develop redness, moist skin irritation, itchiness, or hair loss in the treated area. These changes are similar to a sunburn. Hair may grow back a different color or texture, and in some cases, may not return at all in the treated region. Most skin-related side effects resolve within about three weeks after the last treatment.
- **Oral Discomfort:** When the mouth or nearby regions are treated, pets may show signs of mucositis, including drooling, oral odor, reluctance to eat, or visible sores in the mouth.
- **Eye Irritation:** Treatments involving areas near the eyes may result in conjunctivitis, dry eye, or other signs of ocular discomfort.
- **Gastrointestinal Issues:** If the abdominal area is included in the radiation field, some pets may develop temporary diarrhea or nausea.
- **Fatigue:** Some animals may appear more tired or less active than usual throughout the course of treatment, although this typically resolves quickly once therapy ends.

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Occasionally, organs located near the radiation field may experience side effects. These complications can range from mild and temporary to, in rare cases, permanent changes in function, depending on the sensitivity of the tissue and the radiation dose received. Some of these effects may not become apparent until weeks or even months after treatment is completed.

These potential risks will be thoroughly discussed with you during the treatment planning phase so that you can make an informed decision about your pet's care. Throughout the course of therapy, your veterinary team will carefully monitor your pet and provide individualized recommendations to manage or minimize any side effects. Most complications are mild and resolve with time, and our goal is to keep your pet as comfortable and healthy as possible throughout the treatment process.

### Cost Considerations

Radiation therapy requires specialized equipment and a skilled team, which makes it a costly treatment. The total cost depends on the tumor type and complexity of the treatment plan.

### What to Expect During the Treatment Course

#### Anesthesia

Each radiation treatment requires your pet to be anesthetized to ensure precise and consistent delivery of radiation to the targeted tissues. Anesthesia protocols are tailored to your pet's specific needs, using a combination of drugs to minimize side effects. Our in-house anesthesiologist is consulted if there are any concerns about your pet's anesthesia status. We monitor the level of anesthesia daily and adjust the protocol as needed to use the smallest effective dose. Radiation delivery itself is not painful; anesthesia is used solely to keep your pet still during the procedure. After each treatment, your pet typically wakes up gently within 15 to 30 minutes and can return home the same day.

#### At Home

After treatment, your pet may feel drowsy for a few hours. They may be less active during the course of treatment, but usually return to normal once therapy ends.

#### Home Care During Treatment

Supporting your pet at home is an important part of the treatment process:

- **Diet:** Follow your veterinary team's instructions regarding your pet's daily diet and routine. Avoid introducing new treats or making dietary changes during radiation therapy unless approved by your care team, as stable nutrition can support better recovery and minimize digestive issues.
- **Activity:** Some pets may feel a bit tired during treatment. Allow them to rest and recover at their own pace. Avoid strenuous exercise unless specifically approved by your veterinarian.
- **Medication:** Administer any prescribed medications as directed. These may be used to manage inflammation, pain, or other side effects, and they play a key role in maintaining your pet's comfort.
- **Observation:** Monitor the treatment area daily for any signs of redness, swelling, discharge, or excessive licking. Report any concerns promptly to your veterinary team so they can be addressed quickly.

Caring for your pet at home with attentiveness and consistency will contribute to a smoother and more successful recovery throughout the course of radiation therapy.

### Feeding Guidelines

You will be instructed not to feed your pet within 8 hours of the scheduled treatment. Water is allowed up until 2 hours prior to the appointment. These precautions are vital to your pet's safety while under anesthesia. Feeding beforehand increases the risk of vomiting, which, if it occurs while your pet is anesthetized, can lead to aspiration pneumonia if vomit is inhaled into the lungs. If you accidentally feed your pet on the morning of their treatment, please contact us as soon as possible so we can reschedule for later that day or another time.

### Supplements and Diet

If your pet is receiving supplements, or you feed a raw or holistic diet, please inform us. Certain ingredients or compounds may interfere with the effects of radiation therapy, and your veterinary team may need to temporarily adjust your pet's regimen during the course of treatment.

### E-Collars and Pro-Collars

To protect the treatment area, your pet may need to wear an Elizabethan collar (E-collar), a Pro-collar, or a snug-fitting recovery onesie during the course of therapy. These devices help prevent your pet from licking, scratching, or rubbing the treatment site—behaviors that can delay healing and cause further irritation. Because self-trauma can occur very quickly, consistent use of these protective tools is essential. Although they may seem inconvenient, they are a short-term necessity that plays a crucial role in ensuring a smooth and comfortable recovery.

### Treatment Site Markings

During treatment planning and delivery, we may use non-toxic ink or paint to mark the area being treated. In some cases, a small portion of your pet's fur may be shaved to ensure visibility and accuracy. These markings help our team precisely align the radiation field each day. Please avoid washing or removing the markings during the course of therapy, as they are essential for consistency and accuracy in treatment.

### After Treatment

Following the completion of your pet's radiation therapy, they will need to return for follow-up appointments. These visits are crucial for evaluating how well the treatment worked and for identifying any delayed side effects. Your veterinary team may recommend physical exams, follow-up imaging, or additional bloodwork depending on your pet's specific condition.

Maintaining open communication with your veterinary care team is essential throughout the recovery process. If you observe any new or concerning symptoms—such as persistent fatigue, changes in appetite, swelling, or discomfort—please notify your care team so they can provide timely support.

We understand that radiation therapy can feel overwhelming. Our team is here to guide and support you and your pet through every step of treatment and recovery. Don't hesitate to reach out if you have questions or need assistance. We're here to ensure the best possible outcome for your pet.



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