



Radiation Therapy for Bone Cancer

Does my pet have bone cancer (osteosarcoma)?

- Osteosarcoma most commonly occurs on the limbs of large breed dogs. But it can occur in any breed, in any location of the body, and at any age.
- Common symptoms include pain, lameness (limping) and swelling.
- The diagnosis is often made with X-rays. Sometimes, blood testing, fine needle aspirates and/or biopsies will be used to help confirm the diagnosis, or rule-out diseases that cause similar symptoms.

What is the prognosis?

- Osteosarcoma is rarely curable. Even if the visible tumor can be effectively treated, this kind of cancer has a high probability of spreading to other parts of the body.
- Without treatment, dogs rarely survive more than a month or two. Most dogs are euthanized due to intractable pain or limb fracture.
- Surgery alone is effective at controlling pain, but is not associated with long-term survival. The story is similar for palliative-intent radiation therapy (pRT).
- The best prognosis is usually associated with a combination of surgery (amputation for most osteosarcomas on the limb) and a course of injectable chemotherapy. The average survival time after this type of treatment is about 10 months. Alternatives to amputation include:
 - Limb-sparing surgery
 - Stereotactic radiation therapy (SRT)

Facts about radiation therapy

Performed on an outpatient basis. Patients typically arrive at the hospital in the morning. Families are called and come pick their pet up after they have received that day's treatment. This is often in the afternoon.

Painless. Pets are anesthetized for each radiation treatment. Anesthesia is not used to prevent pain. Instead, it is used to make sure the patient remains perfectly still while being treated. This ensures that the highly focused radiation beams hit and destroy the tumor, rather than adjacent tissues.

Radiation therapy is safe for families. The types of radiation therapy used for treating osteosarcoma do not make your pet radioactive. There is no danger for you or your family to interact with your pet after they have received radiation therapy for osteosarcoma.

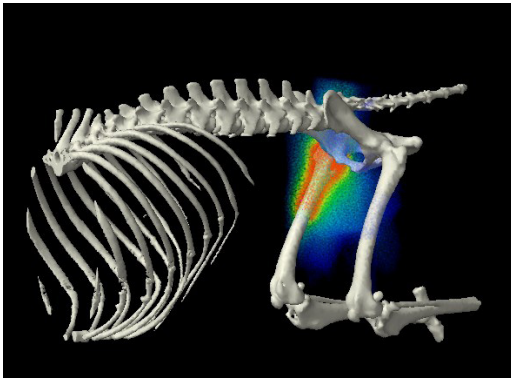


Image from an SRT plan, showing treatment (high dose RT in orange/red) of a bone tumor near right the hip.

Navigating the radiation options

SRT: Also commonly referred to SRS (stereotactic radiosurgery), GammaKnife® or CyberKnife® treatment. Uses accurate and precise techniques to deliver high doses of radiation to a tumor in a very short period of time.

pRT: A low intensity treatment that is not intended to provide as good a long term prognosis as SRT, but is very effective at improving comfort.

	SRT	pRT
<i>Schedule</i>	3 treatments, given on consecutive days	1 - 4 treatments, given on consecutive days, or once weekly.
<i>Cost*</i>	\$4,700 - 5,300	\$500 - 1,000
<i>Prognosis</i>	Most dogs will have improved comfort. Average survival time of 10 months when combined with chemotherapy.	About 80% of dogs will have improved comfort that lasts an average of 2 - 4 months.

**Cost estimates include a radiation oncology consultation, CT scan (for SRT only), radiation therapy planning, quality assurance testing, anesthesia and radiation treatments.*

Side effects of radiation therapy

- After either pRT or SRT, some dogs will have hair loss and change in coat color in the area directly surrounding the tumor.
- More severe side effects are uncommon, but can include skin ulcers with subsequent infections that develop months after SRT.
- Broken bones are a common problem with this type of tumor.
- Somewhere between 20 and 40% of dogs treated with SRT for osteosarcoma will develop a broken bone (aka, pathologic fracture) at some point after treatment. This is not necessarily a result of the treatment, but instead, is more often a result of the fact that the tumor itself weakens the bone.

- There are some things that can be done that we think may lessen the risk of a fracture, including administration of a medicine called a bisphosphonate before giving SRT. We can also have ways to manage fractures if they do occur. Your radiation oncologist will review this in more detail.
- Doctors have some ways to predict the risk of a fracture; they can use this information to help you figure out which treatment options are most ideal for your pet.

Follow-up after radiation therapy

pRT: We usually recommend a recheck exam 2 and 4 weeks after pRT. You can also consider combining pRT with a bisphosphonate medication and/or chemotherapy. The pain-relief from pRT is not permanent, but if needed, the treatment can be repeated.

SRT: Your pet will usually have already had a bisphosphonate before SRT; they will also have started chemotherapy. Frequent recheck exams will be needed for bloodwork, chemotherapy, and follow-up for the tumor (X-rays of the limb and chest, performed every few months).

About us and getting started

Board-Certified Radiation Oncologists: Veterinarians on faculty at NC State College of Veterinary Medicine who have extensive training in cancer diagnosis/management, and radiation therapy. The radiation oncologists directly oversee all activities relating to your pet's cancer care.

Radiation Oncology Residents: Veterinarians who are training to become radiation oncologists.

Medical Physicists: Physicists who assure the safe and effective delivery of radiation to patients.

Radiation Therapists: Allied health professionals who operate radiation therapy equipment and deliver treatments.

Nursing Staff: Licensed veterinary technicians assist the radiation oncologists and therapists in almost aspects of your pets cancer care, and are a vital part of the team.

Anesthesiology Staff: Our anesthetists are licensed veterinary technicians who work with board-certified veterinary anesthesiologists to make sure your pet is as safe as possible while anesthetized for radiation therapy.

Hours: 7:30am to 4:30pm, Monday through Friday

Consultations: Call (919.513.6690) or visit our reception desk to make an appointment.

Scheduling: Your radiation oncology team will work with you to develop a plan, but we generally ask that

- Dropped off between 7:30 and 8:30am
(except Wednesdays, when it is 7:30am - 8:05am, or 9:15am - 9:45am)
- Picked up by 4:30pm