



Radiation Therapy for Bladder and Prostate Cancer in Dogs

Does my pet have bladder or prostate cancer?

- Common symptoms include pain or abnormal posturing during urination, poor urine stream, and/or discolored or bloody urine.
- Diagnosis of bladder and prostate cancer can be challenging, and may involve a variety of tests, including X-rays, abdominal ultrasound, urinalysis, cytology, biopsy with histopathology, and sometimes even surgery.
- Almost all bladder tumors in dogs are a type of cancer called “transitional cell carcinoma” (TCC).
- These tumors grow from the lining of the bladder and/or urethra, and can spread throughout the lower urinary tract.
- Prostate cancer may be either TCC or prostatic carcinoma (PC). Unlike TCC, PC generally remains confined to the prostate, so may be more amenable (than TCC) to focused treatments like surgery or stereotactic radiation therapy (SRT).
- Unfortunately, it is impossible to distinguish between TCC and PC using cytology or histopathology. Doctors can use a combination of tests (ultrasound, cystoscopy, cytology, etc.) to get a better handle on whether a patient has TCC or PC.
- Both TCC and PC can spread outside of the urinary tract (through a process called “metastasis”). Common sites of spread include lymph nodes, bones and lung.

What are the treatment options?

The prognosis for bladder and prostate cancers varies widely between patients, and can be very difficult to predict for an individual dog. This section provides some general information about average prognoses associated with various treatments.

Surgery: a useful treatment for some bladder and prostate tumors. It is best if surgery can be combined with drug treatments (see below; drug treatments address microscopic bits of tumor left behind at surgery, and can slow the spread of cancer to other organs).

NSAIDs: drugs like piroxicam, Deramaxx® and Previcox™ have been shown to have anti-cancer effects. Your veterinarian may choose to use similar drugs, like carprofen or meloxicam. *Average survival times with this treatment are about 6 months.*

NSAIDs plus chemotherapy: The most common treatment for bladder and prostate cancer is a combination of an NSAID with injectible chemotherapy. Most of these chemotherapy drugs are well-tolerated by dogs, and given through an IV, once every 3 weeks. *Average survival times with this treatment are about 10 - 11 months.*

NSAIDs plus chemotherapy plus radiation therapy: Radiation therapy (IM/IGRT) is a new and exciting treatment available for bladder and prostate tumors. *The average survival time in dogs treated with an NSAID plus chemotherapy and IM/IGRT is in excess of 20 months.*

Other options: some dogs with lower urinary tract tumors may benefit from procedures such as stenting, laser ablation, SRT or palliative-intent radiation therapy.

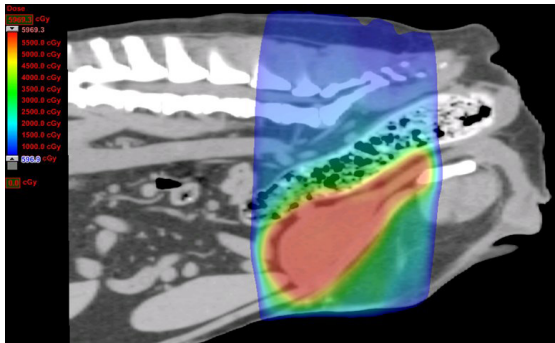


Image of an IMRT plan for a bladder tumor, showing how the high dose of RT (red/orange) is restricted to the bladder, while nearby normal tissues (colon, intestine, etc.) are only exposed to low doses of RT (blue/green).

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. If you're coming from a distance, talk with our nursing staff to discuss the logistics of having your pet board at the hospital during radiation therapy.

Short-term side effects are usually mild and temporary. New radiation technologies and techniques have revolutionized treatment of bladder and prostate cancers, allowing for effective cancer treatment with few, if any, short term side effects. Some of the possible side effects of radiation therapy can cause temporary discomfort, but the doctors and nursing staff will make sure your pet is as comfortable as possible during and after treatment.

Long-term side effects are possible, but quality of life is usually very good. Moderate to severe, progressive side effects can develop months to years after finishing RT. About 90% of pet owners report that their pet's quality of life is stable or improved after finishing IMRT for bladder and prostate cancer. In fact, years after finishing RT, a large majority of pet owners report that they would still have opted to treat their pet's tumor with radiation.

Types of radiation therapy

IM/IGRT: We deliver full-course radiation therapy using a relatively new technique called IM/IGRT (intensity-modulated and image-guided radiation therapy). 5 treatments per week are given for 4 weeks, with fewer side effects than possible using more conventional techniques. This treatment, in combination with NSAIDs and chemotherapy is currently considered the best possible treatment in most cases of bladder and prostate cancer.

SRT: Also commonly referred to SRS (stereotactic radiosurgery), GammaKnife® or CyberKnife® treatment is the newest and most convenient treatment available for cancers of the urinary tract. Unfortunately, SRT is not appropriate for many dogs with cancers of the bladder, urethra and prostate. If you're interested, be sure to ask your radiation oncologist whether they think SRT could be a safe and effective option for your pet.

pRT: Palliative-intent radiation therapy can be a good option for pet owners who would like to pursue a treatment that will make their pet feel better, but cannot afford IMRT or SRT.

Navigating the radiation options

	IM/IGRT	SRT	pRT
Schedule	20 treatments, given once daily, 5 days a week (M - F)	3 - 6 treatments, usually given every other day	4 - 6 treatments given either daily or once weekly
Cost*	\$5,500 - 6,000	\$5,000 - 5,500	\$1,500 - 3,000
Commonly used to treat	TCC of the bladder, prostate and/or urethral tumors	Prostatic carcinoma	Bladder, prostate and/or urethral tumors
Goal of treatment	Induce a strong remission, and provide best possible prognosis	Similar to IM/IGRT	Improve quality of life
Short-term side effects	Uncommon, but can include hair loss over the abdomen, bloody diarrhea, and/or discomfort during urination/defecation		
Long--term side effects	Up to 30% of patients may experience long term side effects such as pain or difficulty when urinating or defecating. These types of side effects typically develop months to years after RT, and can be difficult to manage		

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

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