

# Radiation Oncology Residency

## [Objectives](#)

### ***Training Program Director***

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### ***Program Faculty***

## [Clinical](#)

## [Resources](#)

Amy F. Pruitt, DVM, PhD, DACVR (RO)

## [Facilities & Clinic](#)

Donald E. Thrall, DVM, PhD, DACVR (Rad, RO)

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### ***Objectives***

## [Program](#)

## [Structure](#)

The objectives of this program are to provide graduate veterinarians with advanced clinical training in radiation oncology in accord with the requirements for a radiation oncology residency as defined by the American College of Veterinary Radiology (ACVR). Candidates must have completed a one-year rotating internship or equivalent as required by the ACVR.

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The Faculty Committee on House Officer Programs oversees all House Officer Training programs at the College. Administration of the radiation oncology program, assignment of clinic duty, and coordination of course work will be done by the residency training supervisor. The radiation oncology residency is a two-year program. The resident(s) will be under the guidance of senior faculty at all times and will be expected to participate in all aspects of the professional program.

## [Prior Trainees](#)

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The radiation oncology training program has been structured to ensure that all aspects of the ACVR requirements are met. Supervised Clinical Training, Independent Study and various didactic courses and seminars provide the required training. Each resident will have a committee to supervise the program. It is expected that a prospective investigational project will be completed. Residents will be expected to identify their project within the first 6 months of the program. All data should be collected before the end of the first year of the program, and a

scientific article submitted by October of the second year.

Clinical training in this program will be gained by providing supervised services in radiation oncology to the teaching hospital. Within the framework of faculty oncologists and radiologists, and residents in oncology and radiology, direct communication in terms of consultation, observation, demonstration, and constructive criticism will contribute to the resident's education. The resident will also be expected to pursue independent study with special emphasis on current oncology literature. General oncology rounds will be held daily. Residents will participate in topic discussions. Oncology Grand Rounds are also held weekly where patients are reviewed, follow-up information is presented, and treatment decisions are made. Oncology journal club is held weekly. One presentation per year in the House Officer Seminar Series is required.

The program at North Carolina State University will allow the trainee to have a thorough understanding of:

- the therapeutic use of ionizing radiation;
- radiation biology and physics;
- the biologic behavior and response to therapy of various types of animal cancer;
- imaging techniques which are a critical part of state-of-the-art radiation therapy.

### ***Affiliation Agreement***

The primary institution is the College of Veterinary Medicine at North Carolina State University. Additional training in radiation biology and the physics of radiation oncology will take place at the Schools of Medicine at the University of North Carolina and Duke University Medical Center. Letters attesting to this Affiliation are available.

### ***Clinical Resources***

There is an active clinical oncology program in the College of Veterinary Medicine at North Carolina State University. The faculty who regularly participate in this service are:

1. Marlene L. Hauck, DVM, PhD, Diplomate ACVIM, Oncology
2. Paul Hess, DVM, PhD, Diplomate ACVIM, Internal Medicine, Oncology
3. Amy F. Pruitt, DVM, Diplomate ACVR, Radiation Oncology
4. Steven Suter, DVM, PhD, Diplomate ACVIM, Oncology
5. Donald E. Thrall, DVM, PhD, Diplomate ACVR (Radiology, Radiation Oncology)
6. Laurel Williams, DVM, Diplomate ACVIM, Oncology

There are three medical oncology residents.

### ***Facilities and Clinic Operation***

Medical oncologists submit a request for radiation therapy when irradiation has been deemed to be appropriate. In most patients the selection of a treatment modality is made by the medical oncologists; this selection is based on prior group discussions regarding standardization of treatment for certain tumor types and locations. At other times there is discussion of treatment options on an individual patient basis. The radiation oncology trainee has the opportunity to participate in the decision-making process.

There are two full-time radiation therapy technologists.

Treatment planning is either manual, or based on CT or MR images. All tumors except for incisions located on extremities or in the rostral oral cavity, or mass lesions located on the manus/pes or rostral oral cavity undergo planning based on CT or MR images. If CT-based or MR-based planning is to be performed, the trainee will be involved with obtaining CT or MR images for treatment planning. Being directly involved with patient positioning during CT and MR imaging is critical to implementing the optimal treatment plan. The CT scanner is a Siemens Somatom 16 scanner that acquires 16 slices simultaneously. The MR scanner is a Siemens 1.5T unit made available through the IAMS Pet Imaging Center. Images are sent to the 3-D treatment planning computer via the hospital computer network

CT-based or MR-based treatment planning is primarily accomplished on a PC computer using PPlanUNC, developed at the University of North Carolina, Chapel Hill

Once the treatment plan has been completed, it will be reviewed with the program director, or other radiation oncology faculty. The

trainee and radiation therapy technologist will set-up the patient on the first treatment day. Port films are made of any photon field. The setup and port films are reviewed with the radiation oncologist. Port films are also made on treatment day #7 to assure that the original plan is being implemented. The quality assurance port films will also be reviewed with the radiation oncologist.

The radiation therapy unit is a Varian Clinic 1800 linear accelerator capable of delivering 6MV photons and electrons of 5 energies. Patients are anesthetized for each radiation therapy treatment using either isoflurane or halothane administered via mask followed by orotracheal intubation. Custom electron cutouts are made for most electron treatments.

Equine brachytherapy using  $^{192}\text{Ir}$  ribbons placed into afterloading catheters is available. Computerized brachytherapy planning is available in PAnUNC.

The Veterinary Teaching Hospital at North Carolina State University is a fully equipped medical/surgical facility, with board certified specialists in anesthesiology, cardiology, clinical pharmacology, dermatology, emergency and critical care medicine, laboratory animal medicine, internal medicine, neurology, pathology, clinical pathology, ophthalmology, radiology, radiation oncology, surgery, toxicology, theriogenology, and zoological medicine. These specialists are available for consultation with radiation oncology trainees as needed.

### ***Follow-up Information***

There is a detailed follow-up system in place. Data regarding all patients receiving radiation therapy is archived in a computer database. The database generates follow-up letters for all patients where contact has not been made within the past 6 months. The follow-up letter, which is sent to the owner of the patient, is accompanied by a questionnaire regarding the status of the animal. If these questionnaires are not returned by the owner in a timely fashion, the owner is contacted by telephone. This follow-up information is used in the generation of manuscripts and in assessing the response of various tumor types to currently-used protocols.

### ***Research Environment***

There is an ongoing and active investigational component to the

oncology area at North Carolina State University. Current areas of radiation therapy-related investigation include the combination of radiation and hyperthermia, and assessment of factors such as proliferation and hypoxia which may limit the response of tumors to radiation. This investigational activity involves collaboration with Duke University Medical Center and the University of North Carolina

### ***Conferences***

The following conferences are attended regularly by trainees in radiation oncology:

1. Daily oncology ward rounds where progress and toxicities of current patients are reviewed - treatment options are also discussed at this meeting;
2. Weekly oncology grand rounds where all current oncology patients are discussed, recent port films are scrutinized, and treatment plans for new patients are considered - follow-up information is also reviewed at this meeting;
3. Weekly oncology journal club.

The following conferences are available for attendance by trainees in radiation oncology:

1. Weekly NCSU house-officer seminar - presentations on various topics by house officers;
2. Special seminars at Duke University Medical Center and the University of North Carolina;
3. Morning radiology rounds attended by two board certified radiologists and three radiology residents;
4. Weekly gross pathology rounds, given by the duty pathologist and resident.

### ***Literature Resources***

The library in the College of Veterinary Medicine subscribes to a large number of journals dealing with veterinary medicine as well as human disease. Titles not in the collection at the Veterinary College can be readily obtained from the medical school libraries at Duke University Medical Center and the University of North Carolina.

### ***Evaluation of Trainees***

All clinical trainees at North Carolina State University are evaluated

two times each year; by Dec 1 and Apr 1. There is a standard evaluation form. A copy of the form is submitted to the Associate Dean for Academic Affairs and one is placed in the trainee's file.

### ***Training Period***

The length of training will be 24 months. This training period may be a part of a training program in another discipline, but 24 months of training will be devoted to radiation oncology.

### ***Prior Trainees***

The following individuals have received training in radiation oncology at North Carolina State University and are board certified in radiation oncology by the ACVR attesting to the program being able to provide training of high quality:

1. Deborah M. Prescott, DVM, PhD, Diplomate ACVR (Radiation Oncology)
2. Margaret McEntee, DVM, Diplomate ACVIM (Oncology), Diplomate ACVR (Radiation Oncology)
3. Sheri Siegel, DVM, Diplomate ACVR (Radiation Oncology)
4. Chieko Azuma, DVM, PhD, Diplomate ACVR (Radiation Oncology)
5. Amy F. Pruitt, DVM, PhD, Diplomate ACVR (Radiation Oncology)
6. Miriam Kleiter, DVM, Diplomate ACVR (Radiation Oncology)
7. Jayme Looper, DVM, Diplomate ACVR (Radiation Oncology)
8. David Proulx, DVM, Diplomate ACVR (Radiation Oncology), ACVIM (Oncology)
9. Jarred Lyons, DVM, Diplomate ACVR (Radiation Oncology)
10. Keijiro Shiomitsu, DVM, Diplomate ACVR (Radiation Oncology)

### ***Application Process***

This residency participates in the American Association of Veterinary Clinicians' (AAVC) Veterinary Internship and Residency Matching Program (VIRMP) when a position is available.

Application information and procedures are available at

[www.virmp.org](http://www.virmp.org)

It is expected that the NCSU Radiation Oncology program will receive a large number of applications from candidates with a wide range of experiences. To assist candidates in preparing their application, they should consider their strengths in the various

areas outlined below.

Aspects of an application that are considered in the selection process include (but are not limited to):

- DVM GPA / Class Rank
- Awards and Honors related to Oncology
- Completion of a rotating medicine/surgery internship or similar post-graduate experience
- Ability of the letter of intent to convey the candidates interest in the position and future goals
- References from Diplomates of ACVIM or ACVR and other specialty Colleges that attest to your abilities

General questions pertaining to the residency program should be directed to:

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