



## Radiation Therapist Overview

The Field - Preparation - Day in the Life - Earnings -  
Employment - Career Path Forecast - Professional Organizations

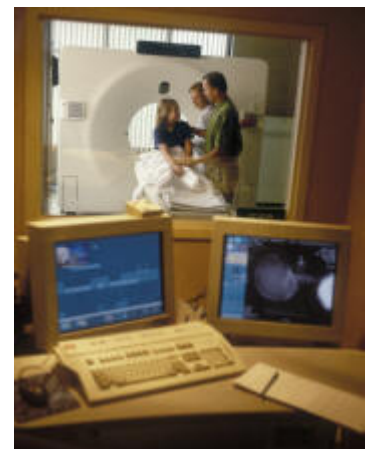
### The Field

Treating cancer in the human body is the principal use of radiation therapy. As part of a medical radiation oncology team, radiation therapists use machines -- called linear accelerators -- to administer radiation treatment to patients. Linear accelerators, used in a procedure called external beam therapy, project high-energy x rays at targeted cancer cells. As the x rays collide with human tissue, they produce highly energized ions that can shrink and eliminate cancerous tumors. Radiation therapy is sometimes used as the sole treatment for cancer, but is usually used in conjunction with chemotherapy or surgery.



The first step in the radiation therapy process is simulation. During simulation, the radiation therapist uses an x-ray imaging machine or computer tomography (CT) scan to pinpoint the location of the tumor. The therapist then positions the patient and adjusts the linear accelerator so that, when treatment begins, radiation exposure is concentrated on the tumor cells. The radiation therapist then develops a treatment plan in conjunction with a radiation oncologist (a physician who specializes in therapeutic radiology), and a dosimetrist (a technician who calculates the dose of radiation that will be used for treatment). The therapist later explains the treatment plan to the patient and answers any questions that the patient may have.

The next step in the process is treatment. To begin, the radiation therapist positions the patient and adjusts the linear accelerator according to the guidelines established in simulation. Then, from a separate room that is protected from the x-ray radiation, the therapist operates the linear accelerator and monitors the patient's condition through a TV monitor and an intercom system. Treatment can take anywhere from 10 to 30 minutes and is usually administered once a day, 5 days a week, for 2 to 9 weeks.



During the treatment phase, the radiation therapist monitors the patient's physical condition to determine if any adverse side effects are taking place. The therapist must also be aware of the patient's emotional wellbeing. Because many patients are under stress and are emotionally fragile, it is important for the therapist to maintain a positive attitude and provide emotional support.

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Prepared as part of the Sloan Career Cornerstone Center ([www.careercornerstone.org](http://www.careercornerstone.org))

Note: Some resources in this section are provided by the US Department of Labor, Bureau of Labor Statistics.

Radiation therapists keep detailed records of their patients' treatments. These records include information such as the dose of radiation used for each treatment, the total amount of radiation used to date, the area treated, and the patient's reactions. Radiation oncologists and dosimetrists review these records to ensure that the treatment plan is working, to monitor the amount of radiation exposure that the patient has received, and to keep side effects to a minimum.

Radiation therapists also assist medical radiation physicists, workers who monitor and adjust the linear accelerator. Because radiation therapists often work alone during the treatment phase, they need to be able to check the linear accelerator for problems and make any adjustments that are needed. Therapists also may assist dosimetrists with routine aspects of dosimetry, the process used to calculate radiation dosages.

## Preparation

A bachelor's degree, associate degree, or certificate in radiation therapy generally is required. Many States also require radiation therapists to be licensed. With experience, therapists can advance to managerial positions.

Employers usually require applicants to complete an associate or a bachelor's degree program in radiation therapy. Individuals also may become qualified by completing an associate or a bachelor's degree program in radiography, which is the study of radiological imaging, and then completing a 12-month certificate program in radiation therapy. Radiation therapy programs include core courses on radiation therapy procedures and the scientific theories behind them.

In addition, such programs often include courses on human anatomy and physiology, physics, algebra, precalculus, writing, public speaking, computer science, and research methodology. In the United States, radiation therapy programs are accredited by the American Registry of Radiologic Technologists (ARRT). The following is a current list of accredited programs:



ST	University/College	Academic Degree
AL	University of Alabama at Birmingham	Certificate, Bachelor of Science
AL	University of South Alabama	Certificate, Bachelor of Science
AR	Central Arkansas Radiation Therapy Institute	Certificate
AR	Arkansas State University	Bachelor of Science
AZ	GateWay Community College	Certificate
CA	City of Hope National Medical Center	Certificate
CA	Loma Linda University	Certificate
CA	California State University, Long Beach	Bachelor of Science
CA	Kaiser Permanente School of Allied Health Sciences/Kaiser MC - Richmond	Certificate
CA	City College of San Francisco	Associate in Science
CT	Hartford Hospital	Certificate
CT	Gateway Community College	Associate in Science
DC	Howard University	Bachelor of Science
FL	21st Century Oncology, Inc. School for Radiation Therapy Technology	Certificate
FL	Halifax Medical Center	Certificate

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FL	Miami Dade College (Medical Center Campus)	Certificate, Associate in Science
FL	Hillsborough Community College	Certificate, Associate in Science
GA	Grady Memorial Hospital/Grady Health System	Certificate
GA	Institute of Allied Medical Professions	Certificate
GA	Medical College of Georgia	Bachelor of Science
GA	Coosa Valley Technical College	Associate in Applied Science, Certificate
GA	Armstrong Atlantic State University	Certificate, Bachelor of Science
IA	University of Iowa Hospitals & Clinics	Certificate
IL	Northwestern Memorial Hospital	Certificate
IL	Swedish American Hospital	Certificate
IN	Ivy Tech Community College-Bloomington	Associate in Science
IN	Indiana University Northwest College of Health and Human Services	Bachelor of Science
IN	Indiana University School of Medicine, Department of Radiation Oncology	Bachelor of Science
KY	University of Kentucky Chandler Medical Center	Certificate
KY	James Graham Brown Cancer Center/ University of Louisville Hospital	Certificate
LA	Delgado Community College	Certificate
MA	Caritas Laboure College	Associate in Science
MA	Massachusetts College of Pharmacy & Health Sciences	Bachelor of Science
MA	Suffolk University	Certificate (Post-Baccalaureate), Bachelor of Science
MA	UMass Memorial Medical Center	Certificate
MD	Community College of Baltimore County	Certificate, Associate in Applied Science
ME	Southern Maine Community College	Associate in Science
MI	Wayne State University	Bachelor of Science
MI	University of Michigan - Flint	Bachelor of Science
MI	Grand Valley State University	Bachelor of Science
MI	Baker College of Jackson	Bachelor of Science
MI	William Beaumont Hospital	Certificate
MN	Argosy University - Twin Cities	Associate in Science
MN	University of Minnesota Medical Center/ Fairview Corporation	Certificate
MN	Mayo School of Health Sciences	Certificate
MO	Lester E. Cox Medical Center South	Certificate
MO	Saint Louis University, Doisy College of Health Sciences	Bachelor of Science
NC	University of North Carolina Hospitals	Certificate
NC	Pitt Community College	Certificate
NC	Forsyth Technical Community College	Associate in Applied Science
NE	University of Nebraska Medical Center	Bachelor of Science
NH	New Hampshire Technical Institute	Associate Degree, Certificate
NJ	Cooper University Hospital	Certificate
NJ	St. Barnabas Medical Center	Certificate
NJ	Muhlenberg Regional Medical Center, Inc.	Certificate
NV	College of Southern Nevada	Associate in Applied Science
NY	New York Methodist Hospital Center for Allied Health Education	Certificate
NY	Erie Community College (City Campus)	Associate in Applied Science
NY	Nassau Community College	Associate in Applied Science
NY	Memorial Sloan-Kettering Cancer Center	Certificate
NY	S.U.N.Y. Upstate Medical University	Bachelor of Science

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OH	Raymond Walters College of the University of Cincinnati	Certificate, Associate in Applied Science
OH	Cleveland Clinic	Certificate
OH	Arthur G. James Cancer Hospital and Richard J. Solove Research Institute	Certificate
OH	Kent State University/Salem Campus	Bachelor of Rad. & Imaging Sciences
OK	University of Oklahoma Health Sciences Center	Bachelor of Science
OR	Oregon Health Sciences University	Bachelor of Science
PA	Gwynedd-Mercy College	Certificate, Bachelor of Science
PA	Thomas Jefferson University	Bachelor of Science
PA	Community College of Allegheny County (Allegheny Campus)	Certificate, Associate in Science
SC	Spartanburg Community College	Certificate
TN	Chattanooga State Technical Community College	Certificate
TN	Baptist College of Health Sciences	Bachelor of Health Science
TN	Vanderbilt Center for Radiation Oncology	Certificate
TX	Amarillo College	Associate in Applied Science
TX	Galveston College	Certificate, Associate in Applied Science
TX	The University of Texas M.D. Anderson Cancer Center	Certificate, Bachelor of Science
TX	Texas State University-San Marcos	Bachelor of Science
VA	University of Virginia Medical Center/ University of Virginia Health System	Certificate
VA	Virginia Commonwealth University	Bachelor of Science
VA	Virginia Western Community College	Certificate
WA	Bellevue Community College	Associate in Arts
WI	University of Wisconsin-LaCrosse	Bachelor of Science
WV	West Virginia University Hospitals, Inc.	Certificate

## Licensing and Certification

In 2007, 32 States required radiation therapists to be licensed by a State accrediting board. Licensing requirements vary by State, but many States require applicants to pass the ARRT certification examination. Further information is available from individual State licensing offices. Some States, as well as many employers, require that radiation therapists be certified by ARRT. To become ARRT-certified, an applicant must complete an accredited radiation therapy program, adhere to ARRT ethical standards, and pass the ARRT certification examination. The examination and accredited academic programs cover radiation protection and quality assurance, clinical concepts in radiation oncology, treatment planning, treatment delivery, and patient care and education. Candidates also must demonstrate competency in several clinical practices including patient care activities; simulation procedures; dosimetry calculations; fabrication of beam modification devices; low-volume, high-risk procedures, and the application of radiation.

ARRT certification is valid for 1 year, after which therapists must renew their certification. Requirements for renewal include abiding by the ARRT ethical standards, paying annual dues, and satisfying continuing education requirements. Continuing education requirements must be met every 2 years and include either the completion of 24 credits of radiation therapy-related courses or the attainment of ARRT certification in a discipline other than radiation therapy. Certification renewal, however, may not be required by all States or employers that require initial certification.

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All radiation therapists need good communication skills because their work involves a great deal of patient interaction. Individuals interested in becoming radiation therapists should be psychologically capable of working with cancer patients. They should be caring and empathetic because they work with patients who are ill and under stress. They should be able to keep accurate, detailed records. They also should be physically fit because they work on their feet for long periods and lift and move disabled patients.

Experienced radiation therapists may advance to manage radiation therapy programs in treatment centers or other health care facilities. Managers generally continue to treat patients while taking on management responsibilities. Other advancement opportunities include teaching, technical sales, and research. With additional training and certification, therapists also can become dosimetrists, who use complex mathematical formulas to calculate proper radiation doses.

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## Day in the Life

Radiation therapists work in hospitals or in cancer treatment centers. These places are clean, well lighted, and well ventilated. Therapists do a considerable amount of lifting and must be able to help disabled patients get on and off treatment tables. They spend most of their time on their feet.

Radiation therapists generally work 40 hours a week, and unlike those in other health care occupations, they normally work only during the day. However, because radiation therapy emergencies do occur, some therapists are required to be on call and may have to work outside of their normal hours.



Working with cancer patients can be stressful, but many radiation therapists also find it rewarding. Because they work around radioactive materials, radiation therapists take great care to ensure that they are not exposed to dangerous levels of radiation. Following standard safety procedures can prevent overexposure.

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## Earnings

According to the U.S. Department of Labor, Bureau of Labor Statistics, the median annual earnings of wage-and-salary radiation therapists is about \$66,170 in the United States. The middle 50 percent earn between \$54,170 and \$78,550. The lowest 10 percent earn less than \$44,840, and the highest 10 percent earn more than \$92,110. Median annual earnings in the industries that employ the largest numbers of radiation therapists are as follows:

Outpatient care centers	\$73,810
Offices of physicians	\$70,050
General medical and surgical hospitals	\$63,580

Some employers also reimburse their employees for the cost of continuing education.

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## Employment

According to the U.S. Department of Labor, Bureau of Labor Statistics, radiation therapists held about 15,000 jobs in 2006.

About 73 percent worked in hospitals, and about 17 percent worked in the offices of physicians. A small proportion worked in outpatient care centers.

Because hospitals are located throughout the country, job opportunities for radiation therapists are not restricted to one geographic area. It is likely, however, that most jobs will be in larger cities.



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## Career Path Forecast

According to the U.S. Department of Labor, Bureau of Labor Statistics, employment of radiation therapists is expected to increase much faster than the average from 2006 to 2016. Employment of radiation therapists is projected to grow by 25 percent between 2006 and 2016, which is much faster than the average for all occupations. As the U.S. population grows and an increasing share of it is in the older age groups, the number of people needing treatment is expected to increase and to spur demand for radiation therapists. In addition, as radiation technology advances and is able to treat more types of cancer, radiation therapy will be prescribed more often.



Job prospects are expected to be good. Job openings will result from employment growth and from the need to replace workers who retire or leave the occupation for other reasons. Applicants who are certified should have the best opportunities.

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## Professional Organizations

Professional societies provide an excellent means of keeping current and in touch with other professionals in the field. These groups can play a key role in your development and keep you abreast of what is happening in your field. Associations promote the interests of their members and provide a network of contacts that can help you find jobs and move your career forward. They can offer a variety of services including job referral services, continuing education courses, insurance, travel benefits, periodicals, and meeting and conference opportunities. The following is a partial list of professional associations serving radiation therapists.



- ▶ **American Registry of Radiologic Technologists ([www.arrt.org](http://www.arrt.org))**
- ▶ **American Society of Radiologic Technologists ([www.asrt.org](http://www.asrt.org))**
- ▶ **Joint Review Committee on Education in Radiologic Technology ([www.jrcert.org](http://www.jrcert.org))**

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