

Radiation Therapists

Professional Activities

Radiation therapy is used to treat cancer in the human body. As part of a medical radiation oncology team, radiation therapists use machines called linear accelerators to administer radiation treatment to patients. Linear accelerators are most commonly used in a procedure called external beam therapy, which projects 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 it is usually used in conjunction with chemotherapy or surgery.

Before treatment can begin, the oncology team has to develop a treatment plan. To create this plan, the radiation therapist must first use an X-ray imaging machine or computer tomography (CT) scan to pinpoint the location of the tumor. Then, a radiation oncologist (a physician who specializes in therapeutic radiology) and a radiation physicist (a worker who calibrates the linear accelerator) determine the best way to administer treatment. The therapist completes the plan by positioning the patient and adjusting the linear accelerator to the specifications developed by the team, recording the details so that these conditions can be replicated during 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 each treatment session, the radiation therapist uses the guidelines developed during the planning phase to position the patient and adjust the linear accelerator. 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.

During the treatment phase, the radiation therapist monitors the patient's physical condition to determine whether the patient is having any adverse reactions to the treatment. The therapist must also be aware of the patient's emotional well-being. 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.

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 (technicians who calculate the dose of radiation that will be used for treatment) 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. Therapists also may assist dosimetrists with routine aspects of dosimetry, the process used to calculate radiation dosages.

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 workers in some other healthcare 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. By following standard safety procedures, radiation therapists can prevent overexposure.

Educational Requirements

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 by 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 2009, according to the American Registry of Radiologic Technologists (ARRT), there were 102 accredited radiation therapy programs in the U.S.

In 2009, 33 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 radiation therapists to 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 covers 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 course credits related to radiation therapy 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.

All radiation therapists need good communication skills because their work involves a great deal of interaction with patients. 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 healthcare 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.

Academic Programs

[Benedictine University](#)

[College Of DuPage](#)

[Lewis University](#)

[North Central College](#)

[Rush University](#)

[Southern Illinois University Carbondale](#)

[University of St Francis](#)

Employment/Salary Outlook

The growing elderly population is expected to cause an increase in the number of people needing treatment. In addition, as radiation technology becomes safer and more effective, it will be prescribed more often, leading to an increased demand for radiation therapists. Growth is likely to be rapid across all practice settings, including hospitals, physicians' offices, and outpatient centers.

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 with a bachelor's degree and related work experience may have the best opportunities.

State and National Wages

Location	Pay Period	2021		
		Low	Median	High
United States	Hourly	\$29.34	\$39.80	\$61.80
	Annual	\$61,030	\$82,790	\$128,550
Illinois	Hourly	\$29.71	\$38.82	\$48.91
	Annual	\$61,790	\$80,740	\$101,740

State and National Trends

United States	Employment		Percent Change	Job Openings ¹
	2021	2031		
Radiation Therapists	16,400	17,500	6%	800
Illinois	Employment		Percent Change	Job Openings ¹
	2020	2030		
Radiation Therapists	610	640	5%	40

¹Job Openings refers to the average annual job openings due to growth and net replacement.

Professional Organizations

American Registry of Radiologic Technologists (arrt.org)

References

Occupational Outlook Handbook, U.S. Department of Labor, Bureau of Labor Statistics
(<http://www.bls.gov/ooh/healthcare/radiation-therapists.htm>)

O*NET OnLine (<http://online.onetcenter.org/link/summary/29-1124.00>)

Date Last Modified November 11, 2022