Introduction

Radiologic technologists, also called diagnostic imaging technologists and radiographers, are healthcare personnel who work under the direction of radiologists, physicians who interpret radiographic images. Radiologic technologists take X-ray films, or radiographs, of patients’ bodies to diagnose medical problems. They also administer non-radioactive materials into patients’ bloodstreams for diagnostic purposes. Radiologic technologists prepare patients for imaging procedures, and position radiographic equipment and patients to ensure proper radiography. Radiologic technologists also develop the X-ray film and/or retain a digital image for medical diagnosis. They may be involved with patient education related to radiography.

More complex radiologic procedures include CT scanning, CAT scanning, MRIs, mammograms, fluoroscopies, ultrasound technology, nuclear medicine, and angiography, and often require experienced radiologic technologists who have additional training and certification to perform these procedures.

Nature of the Work

At the request of physicians, radiologic technologists prepare, take, and process internal images of patients for diagnostic purposes. They set up examination rooms and make sure diagnostic equipment is ready. Radiologic technologists calculate exposure factors of time, distance, voltage, and current and make appropriate adjustments to equipment settings. They write up medical histories, prepare patients for examinations by explaining procedures to them, position patients with X-ray film, and use radiation protection devices. Radiologic technologists must realign patients and make adjustments to the equipment to ensure the best image. Radiologic technologists may perform 30 or 40 procedures per day, often in differing modalities. Radiologic technologists are responsible for protecting themselves, their coworkers, and patients to prevent excessive or unnecessary exposure to X-rays. They must monitor patients’ conditions constantly and take necessary action.

Full-time radiologic technologists work approximately 40 hours per week, during the day, evening, and weekends. In medical facilities with emergency rooms, radiologic technologists may work on call and on holidays. Part-time and per diem work is also fairly common.

The majority of radiologic technologists work in acute care hospitals, while others work in doctors’ offices, diagnostic imaging centers, outpatient clinics, and research centers. Medical departments in which radiologic technologists work include radiology, surgery, emergency, and cardiac catheterization laboratories. Complex testing primarily occurs in hospital settings, and simpler procedures are handled by diagnostic imaging centers. For the most part, radiologic technologists in medical facilities work in examination rooms at diagnostic machines, but they also perform some procedures at patients’ bedsides. Some radiologic technologists work as educators or in marketing or sales for diagnostic imaging manufacturers.

Job Requirements

Skills/Characteristics

Radiologic technologists have quite a bit to juggle—not only must they follow physicians’ precise orders for imaging specific areas of patients’ bodies, they must also address the physical needs and emotional concerns of their patients. This work is highly cognitive and detailed and radiologic technologists must understand the scientific principles necessary for each modality. Radiologic technologists must be comfortable working with computers and state-of-the-art medical imagining equipment and have critical thinking and problem-solving abilities.
Much of diagnostic imaging work is done independently, so radiologic technologists must be motivated and self-directed. At the same time, radiologic technologists work with others as part of a larger healthcare provider team. Because many diagnostic imaging needs are immediate, radiologic technologists must be able to efficiently multitask their work in a stressful environment.

Patients often require diagnostic imaging when they are at their most vulnerable. Some have suffered traumatic accidents, are extremely ill or are in pain, or have significant health concerns. Radiologic technologists must be sympathetic to their patients’ physical state and fears while also maintaining professional distance and exercising good judgment. For many imaging procedures, radiologic technologists must position their patients in a manner that will be properly suited to the imaging equipment. This can be physically uncomfortable for patients, and while radiologic technologists must understand patients’ physical limits, they must also be assertive so that the best possible radiographic image is produced. Radiologic technologists must have good social, interpersonal and communication skills so that they can clearly explain procedures to their patients and provide the comfort they need. At all times, radiologic technologists must adhere to a high standard of professional and medical ethics and be respectful of patients, ensuring their dignity and privacy.

Training/Experience

Radiologic technology programs can be found in vocational schools, community colleges, universities, and some hospitals. Programs range from one to four years and result in a certificate, associate of science degree, or bachelor of science degree, with two-year AS degree programs in radiologic technology most prevalent.

A 22- to 24-month radiologic technology training program includes classroom learning in multiple subjects, laboratory work, and clinical experience. Course subjects include radiologic technology, radiographic physics, radiation biology, radiation protection, radiographic positioning, film production, anatomy and physiology, psychology, law and ethics, venipuncture, fluoroscopy, mammography, and imaging equipment use. The clinical portion of training—approximately 2,000 hours, akin to one year of full-time work—includes hands-on training at one to four medical facilities, so that students can learn about radiology in different settings.
Program prerequisites may include a high school diploma or equivalent and introductory math and science courses. In order to pursue clinical internships, students must pass a background check and receive a drug test, physical examination, and immunizations.

Radiologic technology training programs are considered to be difficult and students are advised to approach their education with the diligence and commitment they would for a job. A challenge that a few students encounter is the practical application of theoretical knowledge they have received. Because the training is intensive, students are strongly encouraged not to work full time.

Local radiologic technology training programs are heavily impacted, so those who have completed prerequisites with strong grades will have a better chance at entering, though some programs have a small percentage of students who enter on a lottery system.

**Employment**

*Recruitment/Hiring*

It is expected that there will be sustained growth of openings for radiologic technologists for several years. California is undergoing a severe shortage of radiologic technologists—there are fewer graduates per capita in California than in any of the seven other most populated states. As a result, the demand for radiologic technologists will create opportunities for stable employment, a wealth of specialty areas, and potential for advancement.

Not only will the growth of the aging population result in more medical examinations, many current radiologic technologists are nearing retirement age, resulting in a greater need for those in this occupation. Also, due to advances in medical science and diagnostic imaging technology, physicians increasingly order imaging procedures for diagnosis in order to cut down on invasive patient procedures.

Many radiologic technologists are hired by one of the medical facilities in which they received their clinical training. One of the benefits of receiving training in multiple facilities is the opportunity to learn about the radiology department at each facility, which helps graduates make an informed decision about the kind of setting in which they would like to work. Other candidates find jobs online, through professional radiology organizations, word of mouth, or through the school where they received their training.

Radiologic technologists who are registered by the American Registry of Radiologic Technologists (ARRT) are often preferable candidates for employers. Those who have gained training and certification in a specialty area will have greater opportunities for salary and responsibility increases.

**Licensure/Certification**

Federal legislation requires that those who operate radiologic equipment have current licenses and/or certification. Once an AS in radiologic technology is gained, students are qualified and expected to take the California licensing exam and the certification exam given by the American Registry of Radiologic Technologists. Radiologic technologists must be certified in diagnostic, mammographic, or therapeutic radiologic technology by the ARRT. Once certification is gained, a radiologic technologist can choose to gain an ARRT credential as a Registered Technologist (RT). Radiologic Technology certification must be renewed every two years with either 24 hours of continuing education or successful completion of a certification examination in an additional discipline. Active radiologic technologists must have current CPR certification.

**Benefits & Challenges**

Physical stamina and strength are important elements for success in this occupation. Radiologic technologists stand for much of the day and do a great deal of walking and moving equipment. With assistance of co-workers, radiologic technologists must lift and help patients onto the imaging equipment so that they can be properly positioned for radiology. Other challenges include having to administer barium enemas for some patients, cleaning up after patients, and having to work with those who are sometimes difficult.

Radiation hazards and excessive radiation are potential health threats for those in this occupation. However, radiologic technologists follow strict guidelines by using the proper protective
gear and following protocols in place for optimum safety and reduced exposure levels. Radiologic technologists wear badges that monitor radiation levels in the radiation area, and facilities contain instruments for monitoring radiation exposure. Detailed records are kept of radiologic technologists’ cumulative lifetime exposure.

Because of the shortage of radiologic technologists, diagnostic imaging caseloads are sometimes quite heavy, which can ultimately impact patient care. Another consequence of staff shortages is a risk to workplace safety, particularly in a hospital setting. Without the assistance radiologic technologists are supposed to receive from their colleagues to help lift and position patients, they are subject to increased chances of physical strain and injury. The radiography team may experience decreased morale and increased potential for exhaustion and burnout. Fortunately, many employers have progressive practices in place that support their employees, such as time and stress management workshops, and employee assistance programs. A positive impact of the shortage is that salaries for radiologic technologists and those with specialty areas are fairly high. Many employers offer sign-on bonuses and pay their diagnostic imaging staff substantial wages to retain them.

**Career Ladders & Lattices**

With experience, radiologic technologists may organize staff work schedules, coordinate and evaluate equipment purchases, perform quality assurance evaluations, and supervise other radiologic technologists. They may advance to become chief radiologic technologist, clinical coordinator, or manage a radiology department. It is sometimes necessary for those in management and administrative positions to have a bachelor’s or master’s degree in one of the specialized areas of radiologic technology, business management, or health administration. Some healthcare employers require that those who have management positions be Certified Radiology Administrators (CRA).

Those who would like to specialize in complex procedures, such as CT scanning and MRIs, can gain the specific training to perform these functions, which often results in an increase in pay. Not all specialty areas require formal training, as on-the-job experience may be sufficient in some radiology facilities.

Other opportunities within radiologic technology include archiving diagnostic images and radiology research. Some, particularly with bachelor’s or master’s degrees, become educators of radiologic technology training programs or clinical instructors at medical facilities that offer clinical rotations for radiologic technology students. Those who no longer want to practice as radiologic technologists may become technical representatives, consultants, or equipment instructors for manufacturers of imaging equipment.
1. Please tell us about your current position and how you arrived there.

I am a diagnostic imaging technologist at a local hospital. I have been doing multiple-modality imaging, such as general radiography, mammography, and CAT (computerized axial tomography) scans, for six years, and for the last three years I have also been a clinical instructor for first-year radiologic technology students doing their clinical rotations.

This is a second career for me. I used to be in food service for hotels, doing catering and banquets. I decided that I wanted to be in a medical profession, in part because my mom is a registered nurse who also works for an orthopedic surgeon. I went back to school for health-care training, with the idea of either doing nursing or radiologic technology. I chose radiology because it was more diverse for me and there are so many things you can do with one license. I chose to work for this particular hospital, because I wanted to perform multiple modalities.

2. Please describe your typical workday so that a job seeker might get a sense of what you actually do.

Primarily, I am a clinical instructor. I see where the students are in their learning and help them prepare for their exams. They shadow me in my imaging work and I teach them about radiation protection, the views needed for the best images, and how to use the imaging equipment. I grade students and report their progress back to the school's instructor.

I make sure all areas are covered, so that DITs (diagnostic imaging technologists) are ready to cover needs in the emergency room, the operating room, and other areas. I also help lead technolo-

3. Which aspects of your education and/or training made you more capable or marketable in this field?

I transferred my prerequisites from Evergreen Valley College to Foothill's radiologic technology program, which I completed in 1999. The program is awesome—it provides great preparation so that once you've graduated, you're ready to work. They have their students complete clinical rotations at four different facilities to see the different work settings that exist, such as the fast pace of a trauma hospital, the slower pace of a clinic, etc. This exposure really prepares you to work in any setting.

Through my training and rotations, I have seen that this is not just a "young person's career." I meet lots of people in my work setting and think it's great how people still love their jobs after such a long time.

4. What are the most exciting aspects of your job? What do you like most about your job?

I love teaching, but the thing I love most about my job is working in trauma and the adrenaline rush of such a large team of doctors, nurses, and others working together. The teamwork of so many people is like a dance and everyone has a step of their own to save a life. There is great rapport—everyone gives everyone else room and help each other.

I really like the challenge of getting great images without causing harm or pain to my patients. The types of patients that we see are so different; I like that I can help lots of people and do many different exams. Being in a county hospital, we see such a diverse group of people. There is instant gratification in helping people.

The work is very physical. I have lots of energy and like to keep moving, so it works very well for me.
5. What do you dislike or find challenging about your job?

I dislike working in the operating room, because the equipment and setting are different and I don't feel very comfortable. Outside of this, there is nothing else that I find challenging. I really like everything else about my job.

6. What advice would you give to a person seeking a job in your field?

I would advise those interested in radiology to visit a hospital where you can observe the work and see what is actually done. Make sure you see the blood and pain to get a realistic perspective, and keep in mind that we have to do some things that people think are gross, such as barium enemas and cleaning up after seeing each patient. I would recommend spending time in a hospital or clinic, doing some job shadowing, and inquiring about the occupation. This is a career, not a job.

7. What qualities make someone a star performer in this occupation?

Someone who has a lot of energy, an aggressive learner who always wants to accomplish more. It's important to have a willingness to learn something different. Being a “people person” is really helpful because the job is very hands on. Shy people can do the work, but it can sometimes be challenging for them, because of the nature of the work. This can also be very humbling work; people have to be open to their own errors. This work can change one's perspective.
Report Evaluation

http://www.novaworks.org/lmi/roots/