

Defining Roles of the Clinical Preceptor in Radiography Programs

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Clinical preceptors (formerly clinical instructors) are appointed to radiography programs and recognized by the Joint Review Committee on Education in Radiologic Technology (JRCERT) to mentor and supervise students in the clinical setting. Preceptors need to be professionals who remain current with what JRCERT monitors in radiography programs and the American Registry of Radiologic Technologists (ARRT) clinical requirements for students.

Brief History of Radiography Education

From the discovery of x-rays in 1895 until 2023, radiography as a profession has grown in size and diversity. After Wilhelm Roentgen discovered the x-ray, he shared this information with colleagues. The first people to use this technology were photographers, chemists, engineers, and electricians—more for show than for medicine.¹

By 1910, physicians started using this technology in their practices.¹ The technology was improving, which meant more of the physicians' time was being used for keeping current with advances in equipment and technique and less on patients. Therefore, the office assistant became responsible for operating the radiography equipment but without education on radiation protection or methodology. These are some important dates in the radiography profession's history:

- In 1920, the American Society of X-ray Technicians (ASXT) was founded by Ed

Jerman and a group of technologists.¹ The basis of the society was to share ideas and unify the profession.

- The first registry exams were offered in 1922 through the American Registry of X-ray Technicians (ARXT).²
- According to JRCERT, there were approximately 125 radiography programs in 1950.³
- In 1952, the ASXT proposed the first standardized radiography curriculum.¹ Radiography curriculum oversight at this time fell to the American College of Radiology's Commission on Technologists Affairs Committee on Technologists Training.³
- In 1964, the ASXT changed its name to the American Society of Radiologic Technologists (ASRT).¹ The ASRT has spearheaded many efforts to improve the profession further and is linked to the ARRT (formerly ARXT).
- The ARRT has more than 345 000 registered technologists in disciplines such as nuclear medicine, mammography, radiation therapy, and more.²

Radiography Education Today

Most radiography programs in the United States are accredited by JRCERT. Established in 1969, JRCERT is an agency recognized by the U.S. Department of Education.³ According to the U.S. Department of Education:

Short Report

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To ensure a basic level of quality, the practice of accreditation arose in the United States as a means of conducting nongovernmental, peer evaluation of educational institutions and programs. With the passage of the HEA (Higher Education Act) in 1965, Congress expanded the role of accrediting agencies by entrusting them with ensuring academic quality of the educational institutions at which federal student aid funds may be used subject to oversight by the federal government through the recognition process.⁴

Thus, more than 700 radiography programs accredited by JRCERT have standards that must be followed. Periodically, these radiography programs undergo review. Every 5 to 8 years, a program submits a self-study, which is followed by a site visit from a JRCERT reviewer. A site visit consists of 2 trained individuals who represent the JRCERT on a volunteer basis and are likely educators, essentially validating the school's self-study. The site visit usually is a 2-day process involving interviews of college faculty, staff, students, and clinical site preceptors. The results of this review are made public by the JRCERT and the program itself. Although radiography programs might differ in teaching methodologies and schedules, they are similar in that they all have 6 requirements or standards. Portions of these standards that clinical preceptors have a direct role in maintaining include:

- Standard 1.4 – students' education records must be handled in a confidential manner.⁵ A clinical preceptor adhering to this standard will make sure student evaluations and other graded assessments are kept private. This confidentiality also is required by the Family Educational Rights and Privacy Act of 1974. The act broadly defines who has a legitimate educational interest.⁶ Clinical preceptors, under the guidance of radiography program officials and faculty, need to have student grade information to perform the tasks required.
- Standard 3.1 – a clinical setting requires 1 preceptor for every 10 students.⁵
- Standard 3.2 – preceptors must have 2 years of radiography experience and be current with their license (if state required) and in good standing with ARRT.⁵

- Standard 3.3 – preceptors must be knowledgeable about the radiography program.⁵ At a minimum, a clinical preceptor needs to understand clinical objectives, the clinical evaluation system, and assessment of students' clinical competence.
- Standard 4.3 – all clinical settings must be JRCERT approved.⁵ A setting might be used as a rotation site rather than a stand-alone site based on what it offers students.
- Standard 4.4 – student to staff ratio must be at least 1:1, with rare exception, and be limited to fewer than 10 hours per day.⁵ This ratio ensures enough supervision of students and enough cases for students to participate in.
- Standard 5.3 – students will not hold patients for exposures.⁵ There should be alternatives to student holding. The rationale is they will get plenty of experience and exposure holding patients in their careers.
- Standard 5.4 – students must be supervised, either directly during learning, mobile examinations, surgery, and repeat examinations or indirectly after they have proven competency. Direct supervision is being present physically, reviewing and approving the procedure and image with regard to the student's achievement, and assessing patient condition with regard to the student's knowledge.⁵

Clinical Preceptor Selection Process

Radiography programs acquire clinical preceptors through various means. Sometimes technologists volunteer to be a clinical preceptor. Other times, students, departmental supervisors, or program faculty suggest a technologist for the role. Usually, a combination of people makes the decision. For example, the author surveyed 8 radiography programs in Wisconsin about how they select clinical preceptors. These programs were of similar size, accepting between 10 to 20 students per year. Most areas in Wisconsin, aside from Milwaukee, have similar sized radiography departments. Most of these programs (75%) indicated that the selection is made by a combination of individuals, including the department supervisor and program faculty members; 13% indicated that program faculty made the decision, and 12% responded that the department

supervisor selected clinical preceptors. According to the survey, most programs have 1 to 2 clinical preceptors at a site, although some programs have 3. Clinical preceptor turnover is like technologist turnover. Because 1 role a clinical preceptor has is student assessment, best practice is to have seasoned clinical preceptors. Seasoned or experienced clinical preceptors learn how to be great mentors through trial and error as well as hands-on knowledge of the assessment process.

Registry Examination Clinical Requirements for Students

The ARRT exam assesses students' knowledge of radiography procedures, anatomy and physiology, physics, and more. Most hospitals and clinics in the United States require ARRT certification and registration for employment as a radiographer for many reasons. According to the ARRT website, 75% of states in the United States also require licensure, and this licensure is usually associated with the ARRT test.⁷ For a student to sit for the ARRT exam, they must have successfully completed the requirements of an ARRT recognized radiography program. The radiography program director approves when a student meets all the requirements. The clinical requirements are where clinical preceptors are needed most.

Per the ARRT Radiography Didactic and Clinical Competency Requirements effective January 2022, "Demonstration of clinical competence means the candidate has performed the procedure independently, consistently and effectively during the course of his or her formal education."⁸ Students need to demonstrate competence on live patients for 36 mandatory procedures and 15 out of 35 electives for a total of 51 exams. If necessary, 10 of these can be simulated in a fashion that mimics a live patient experience.⁸

Every radiography program likely will have a different layout of clinical competency test-out forms. However, all of them have the same minimum criteria such as verifying the patient's identity and technique selection.

Mentoring Tips for Clinical Preceptors

Another facet of the clinical preceptor's role is to mentor students. A mentor differs from a supervisor,

parent, or friend; a mentor is defined as a trusted counselor, guide, tutor, or a coach.⁹ There are basic points that clinical preceptors should follow.

Praise Publicly, Reprimand Privately

One of the most difficult roles a preceptor has is correcting student behavior. Ideally, students are made aware of guidelines, rules, and routines before clinical instruction begins; however, a student might need to be redirected. This redirection should never be performed in front of patients, other students, or staff if possible. When patients see their caregiver being corrected, the patient might feel they are not getting the best care and give a poor review or elect to receive care elsewhere. Staff or other students witnessing the negative feedback is unfair to the student and uncomfortable to witnesses. Best practice with positive feedback is to do the opposite; positive reinforcement given publicly is good for the organization and the student.

Recognizing the Needs and Preferences of Adult Learners

According to Michelle Boyle at Learnkit, adults learn differently from children in 5 key ways¹⁰:

- Adults have life experiences to draw from. A good clinical preceptor sees their radiography students as such adults.
- Adults are not used to taking direction in education like children. The phrase, "because I said so" might be acceptable to a child, but it is not acceptable to a radiography student. Adults need to see the relevance for information to process.
- Adults reflect on information less publicly. Children in classroom settings will talk about their learning, whereas adults need to be given an opportunity to process. A way to do this with radiography students is to take some time after cases to discuss outcomes.
- Adults have preconceived notions about education, learning styles, and subject matter. Whereas children still are determining their likes and preferences, adults can be set in their ways. A clinical preceptor needs to be aware that not everybody learns the same way (or positions patients the way they do).

- No one of any age likes failure; however, children are beginners in everything and sometimes act as such, trying new things regardless of the outcome. A way for a clinical preceptor to encourage radiography students to try new things is to take smaller steps in the process. For example, have the student set the control panel for 1 case, then add steps during upcoming days and weeks.

Understanding Students' Learning Styles

Various learning styles have been identified in academia. Four common learning styles are visual, auditory, reading and writing, and kinesthetic.¹¹ To summarize, visual learners like images and graphics; auditory learners like listening, repetition, and mnemonics (sayings that rhyme) to learn new material; read and write learners take a lot of notes and are avid readers; kinesthetic learners understand new concepts through hands-on activities.

Although catering to different learning styles is easier in the classroom, a clinical preceptor's acknowledgment that not all students learn the same way they did is helpful. Radiographs and the process of obtaining them is visual and kinesthetic by nature, but clinical preceptors can accommodate other learning styles. For example, there will be teaching moments during clinical rotations when a clinical preceptor might give directions ahead of time or write down instructions to appeal to those who also learn through listening (ie, auditory learners) or the read and write learning style.

Building Critical-Thinking Skills

The word *critical* is defined as exercising or involving careful judgment or judicious evaluation.¹² Critiquing medical images and knowing how to obtain the best quality is the main role of the technologist. Helping students critically think through this process is a challenge unique to clinical preceptors. Knowing when to step in or step aside during examinations involving a student can be challenging. Stepping in too early or taking over can limit students' learning and lower motivation. Stepping in too late risks repeats or patient and radiologist dissatisfaction.

A best practice clinical preceptors can use is to get to know students and work with them often. This practice allows clinical preceptors to know how students think.

The first couple of weeks of working with a student gives a clinical preceptor an understanding of where the student is regarding concept mastery. A student who knows and respects their clinical preceptor will feel more confident attempting examinations on their own and accepting feedback before, during, and after cases.

One of the simplest things a clinical preceptor can do during a case is to put their hand over the exposure button and ask the student, "Are you sure you want to shoot that?" This prevents unnecessary exposure and allows the student to think through the process away from the patient.

Another simple teaching method is to practice patient positioning in the examination room with a student or students during a slow afternoon. This method allows practice without inducing test anxiety around patients. Techniques can be discussed, positioning tips can be given, and the preceptor and student can get to know each other.

Conclusion

Working with students is a challenging and rewarding experience. Before starting, clinical preceptors must understand their role in maintaining radiography program accreditation compliance. They need to know the ARRT's clinical requirements for taking the certification exam. Clinical preceptors are the students' daily guide through radiology. They can look on the students they have mentored with the same satisfaction as the medical images they acquire and send them onward.

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