



Radiography Program

student manual

2023-2025

Kellogg Community College

Student Manual

Radiography Program



2023-25

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Section A: General Information

Welcome

KELLOGG COMMUNITY COLLEGE'S Radiography Program

Much of the education of a radiographer is accomplished through hands-on clinical education in the diagnostic imaging department of several area hospitals affiliated with KCC's radiography program. Therefore, your goal of joining the medical imaging profession as a radiographer begins the day you start the radiography program, as does your professional reputation which will remain with you upon completion of the program.

James A. Morgan, R.T. wrote a book entitled, "The Art and Science of Medical Radiography", published through the Catholic Hospital Association. It's interesting that Mr. Morgan views radiography as both an art and a science. Classroom lectures and textbook assignments will provide the necessary scientific knowledge base, but it is clinical education that offers the student radiographer an opportunity to develop "artistic" skills in medical imaging. Just as a photographer takes many photographs to develop his skills to an art form, so must the student radiographer take many radiographs to develop their own skill to the levels required to be a successful radiographer.

This manual serves as an informational document listing the policies and processes you will be subject to during both the didactic and clinical phases of your career training. It is not a complete document covering all situations, therefore, should a situation occur not addressed in this manual, it'll be addressed and added to this document as a supplement.

Kellogg Community College
Radiography Program
Mission, Goals, and Outcomes

The KCC radiography program is guided by the following mission statement. Every activity in the program is designed to accomplish one or more of the accompanying goals.

Mission: *Building upon the mission, visions, and values of Kellogg Community College, the mission of the KCC Radiography Program is to provide a comprehensive curriculum that will graduate competent entry-level radiographers. Graduates of the program will demonstrate critical thinking, professionalism, effective communication, patient safety, and ethical behavior thereby enhancing the healthcare experience of patients.*

Goal 1:

Graduates will demonstrate the knowledge and skills necessary for competency as an entry level radiographer.

Outcomes

- 1.1 Student will apply knowledge of anatomy, physiology, and positioning to accurately demonstrate anatomical structures on image receptors.
- 1.2 Students will apply the principles of radiation protection to patients, self, and others.
- 1.3 Students will provide age-appropriate patient care, safety, and comfort.

Goal 2:

Graduates will exhibit professional growth and development through the values, attitudes, and behaviors necessary of an entry-level radiographer.

Outcomes

- 2.1 Students will demonstrate positive work ethics with respect to policies and procedures within the clinical setting.
- 2.2 Students will demonstrate a commitment to their career in medical imaging.
- 2.3 Students will demonstrate the ability to work as a team player through cooperation and initiative.

Goal 3:

To prepare graduates to demonstrate the ability to apply critical thinking skills and problem solving in their field.

Outcomes

- 3.1 Students will apply knowledge of technical factor selection and geometrical properties of the x-ray beam to accurately demonstrate anatomical structures on image receptors.
- 3.2 Students will demonstrate critical thinking with regard to decision-making and judgment in the clinical environment.

Goal 4:

To prepare graduates to communicate effectively and professionally.

Outcomes

- 4.1 Students will communicate effectively with patients, patient's family, staff, administration, and physicians.
- 4.2 Students will demonstrate effective written communication skills.

Message from the Program Director

Some thoughts I hope you'll remember as you participate in your clinical education

- your professional reputation is something you will carry on with you throughout your career and it begins with your first day of clinical education
- a lot of good radiography is just common sense
- RTs have earned their position in the field . . . they are the experts in imaging . . . listen to their suggestions . . . and their “tricks-of-the-trade” . . . you can learn something from every physician, every technologist, every patient, every exam . . . ask lots of questions!!
- RTs are imaging specialists first and teachers second! They have had training in imaging. . . they haven't had training in teaching. They are trying to help you the best they can, so don't take their style or criticisms personal.
- Each of our clinical sites is outstanding and recognized by the Joint Commission on Education in Radiologic Technology, however, each hospital is different and provides the student educational opportunities unique to that site, therefore clinical education will not be 100% equivocal from site to site. . . . don't expect it to be.
- you will see many variations of ways to accomplish the same exam . . . that's o.k. . . . just remember the radiographer's goal . . . “highest possible quality at lowest possible dose”
- protect yourself and your patients. . . use good safety practices with regards to moving and lifting. . . disease transmission . . . and radiation protection!
- be an active learner. . . a participant . . . the techs and physicians are more eager to “help those who help themselves”!!
- even the “stickiest” situation can be managed by practicing tact and good manners!!
- always ask yourself the following two questions when facing a “what to do”:
 - If I or a cherished friend or family member were the patient, what decision and/or action would I want the tech to follow?
 - can I defend my decision and/or action with logic, common sense, and scientific support, instead of ignorance or excuses?
- always follow the program policies . . . if challenged by someone in an authoritative position. . . smile . . . be polite. . . and blame it on me!!
- enjoy this time. the majority of technologists remember their program with fond memories!!!!

Section B: Program Policies

General Policies / Information

The Radiography Program adheres to the Kellogg Community College (KCC) policies and procedures identified in the current KCC Student Handbook (<http://catalog.kellogg.edu/>). Program-specific policies and procedures are outlined in this manual. In addition, each course syllabi will identify course-specific policies and procedures. Each academic year, a revised KCC Handbook, and Radiography Program Student Manual is published.

The radiography program at KCC is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT). Upon successful completion of program requirements, students receive an Associates of Applied Science (AAS) degree from Kellogg Community College and are eligible to take the national certification exam administered by the American Registry of Radiologic Technology (ARRT). Students who successfully complete the exam are awarded the credentials of RT(R) to designate Registered Technologist (Radiography).

Complaint Policy: Non-Compliance of Accreditation Standards

If a student feels that the KCC radiography program is in non-compliance with the standards set forth by the Joint Review Committee on Education in Radiologic Technology, he/she has a right to file a complaint with the JRCERT, <https://www.jrcert.org/>. The JRCERT will review the complaints that relate to program compliance with accreditation standards. The JRCERT is interested in the sustained quality and continued improvement of radiography programs and does not intervene on behalf of individuals or act as a court of appeals for individuals in matters of admission, or dismissal of faculty, staff, or students.

A copy of the accreditation standards and/or the JRCERT's policy and procedure for submission of complaints may be obtained by contacting the JRCERT at 20 North Wacker Dr., Suite 2850, Chicago, IL 60606-3182, calling (312) 704-5300 or <https://www.jrcert.org/>

Complaint Policy: Grade and Non-Grade Appeals

The KCC Complaint Policy for Grade and Non-Grade Appeals can be found in the KCC Student Handbook under Policies, Procedures, and Other Regulations. The KCC Student Handbook and Academic Catalogue can be accessed at catalog.kellogg.edu.

Academic Conditions

For a student to graduate from the radiography program, he/she must achieve a "C", or 2.0 in both radiography courses and general education courses. Further, because of the sequential nature of the radiography curriculum, the student must not fail any radiography (RADI) courses. If a student receives below a "C" or 2.0 in any RADI course, they will be withdrawn from the program. A final course grade of less than a "C" indicates the student has not mastered a majority of the information required in that course curriculum. Additionally, achieving lower than a "C" demonstrates that the student is not adequately prepared to pass the national certification exam administered by the American Registry of Radiologic Technologists (ARRT).

Kellogg Community College Radiography Program Grading Scale:

Percentage	Grade	GPA
100 – 93.00	A	4.00
92.99 – 90.00	A-	3.67
89.99 – 87.00	B+	3.33
86.99 – 83.00	B	3.00
82.99 – 80.00	B-	2.67
79.99 – 77.00	C+	2.33
76.99 – 70.00	C	2.00
69.99 – 67.00	C-	1.67
66.99 – 63.00	D+	1.33
62.99 – 60.00	D	1.00
--	D-	0.67
59.99 – 0.00	F	0.00

Graduation Conditions

KCC graduation requirements must be met to be eligible to receive the Associates of Applied Science degree. KCC graduation requirements are listed in the college catalog and are inherent within the program curriculum, <http://catalog.kellogg.edu>. Students will be responsible to meet the KCC graduation requirements from the current catalog upon entrance into the program. Example: if a student enters the program in the fall semester 2023, they will be held to the graduation requirements listed in the 2023-25 catalog.

Eligibility to take the national certification exam is contingent upon completing all the requirements of an accredited program. This means that the student must meet the KCC graduation requirements to graduate, as well as the program requirements to be eligible to complete the national certification exam. Example: according to KCC requirements, a student who earns less than a “C” in a general education course could still graduate and be awarded the degree. However, because the program requirements state a “C” or above must be earned in all courses, the student would not be eligible to take the national certification exam until they successfully completed the course with a “C” or above.

Students are strongly encouraged to complete general education courses according to the radiography program course sequence outlined in the catalog <http://catalog.kellogg.edu>. Failure to do so could result in a course not being available at a time compatible with other program courses. The clinical education schedule will not be altered to accommodate a course due to the student completing it out of sequence or because the student failed the course and must repeat it. **Therefore, failing to successfully complete courses according to the course sequence could create a delay in graduation or completion of the ARRT national certification exam.**

Remediation

Students maintain the primary responsibility of recognizing their own academic or clinical deficiencies. The student has many resources available for self-evaluation and recognizing the need for individual help in the radiography classroom or hospital. These resources include but are not limited to the student's progress as evidenced by test, quiz, and assignment scores, skill competency and final skill competency evaluations and scores, professional behavior competency evaluations, and attendance. The faculty and administration expect that the responsible and serious student will seek out assistance as needed from his/her didactic instructor, clinical preceptor, program director, or KCC counseling staff.

In the event that a student fails to recognize the potential for academic or clinical failure, the student will be notified of the potential for failure by the didactic/clinical preceptor. The need for remediation will be determined by the individual instructor. The purpose of instructor intervention is to assist the student achieve academic and/or clinical success.

For academic remediation, the student will be referred to counseling for academic advising. Tutoring and/or study skill workshops are available to all KCC students. The instructor may also offer individual tutoring sessions to be conducted at the college or hospital dependent upon the time availability of the instructor. To request general academic support or tutoring, the student should reach out to instructors and may contact the Center for Student Success (CSS) at css@kellogg.edu, 269-660-2296 or 269-965-4150. The CSS may also be accessed through the KCC Homepage > Current Students > Center for Student Success.

Clinical Assignment Policy

Students will rotate through two clinical assignments during the five semester Radiography program. The first rotation will occur during the first three semesters of the program (Fall 1, Spring 1 and Summer). Students will switch to their second clinical rotation for the last two semesters (Fall 2 and Spring 2).

First and foremost, assignments are made with consideration given to the educational opportunities offered by each facility to provide equitable educational experiences. Secondary, consideration to the location of student residences as identified on the program acceptance form in relation to the location of affiliating clinical facilities is given. The residence criteria are based on the class as a whole, rather than individuals. Accreditation standards and clinical facilities limit the number of students that can be assigned to a facility per day. Once clinical education assignments have been determined, change will only be considered at the discretion of the clinical coordination team.

Medical/Health Requirements Policy

All radiography students must complete a physical examination to include specific laboratory testing and immunizations prior to entering their clinical education setting.

Students are made aware in orientation, if a clinical site requests any of their clinical access documentation the college will provide that information to them. By signing the signature page for this clinical manual, this authorizes the college to follow through with this request of the clinical site.

Therefore, the physical exam, along with proof of any required vaccination, and laboratory test results must be received according to dates and times provided to the student during program orientation.

It is the student's responsibility to secure the continuation of their HEP B vaccination series, annual TB tests, and American Heart Association Basic Life Saving for Health Care Providers (AHA-BLS-HCP) and provide the Program Director and Clinical Coordinator with the supporting documentation by the due date provided to the student.

Failure to adhere to the medical requirements and submission of supporting documents will result in clinical suspension and will affect the student's grade, as well as course and program completion. Suspension will be in effect from the first day of non-compliance and absences applied appropriately.

The cost and scheduling of the physical examination, TB tests, CPR certification, vaccines, and laboratory testing is the responsibility of the student.

Students' medical documents must be submitted by depositing in the black lockbox located outside the clinical coordinator's office, Roll 405 E, or delivered directly to the clinical coordinator. In the event it is after hours and the door to Roll 405 is locked, you can deposit medical documents in the gray lockbox located outside Roll 405 but please notify the clinical coordinator via email.

Documents submitted must be legible and contain all the information required or will be considered non-compliant.

******STUDENTS MUST KEEP COPIES OF ALL DOCUMENTS SUBMITTED FOR THEIR OWN RECORDS.**

COVID-19

KCC is committed to providing a learning environment that is safe for students and employees and compliant with practices advised or ordered by local, state, and federal health agencies.

Kellogg Community College's policies and procedures pertaining to COVID-19 can be found at <https://kellogg.edu/about/coronavirus/>.

Drug Screen Policy

Applicants who earn admission into a health science program must complete a drug screen test. This test checks for the presence of ten substances which are as follows: Marijuana, amphetamines, barbiturates, benzodiazepines, cocaine, methadone, methaqualone, opiates, phencyclidine, and propoxyphene.

College policy prohibits the possession or use of alcohol, controlled substances, or illegal drugs while participating in college activities. Violation of this policy may lead to disciplinary actions, including dismissal from the program. See the Kellogg Community College Student Handbook for a full explanation of the student code of conduct at <http://catalog.kellogg.edu/>.

Clinical sites require a pre-placement drug screen. Students will be required to complete a drug-screen prior to each clinical rotation. The clinical coordinator will advise the student where and when to have the drug screen completed to ensure compliance.

Some clinical sites require a drug screen based on behavior exhibited by the student while at the site. When requested by officials at the site, a student must provide a drug screen according to the specific standards the clinical site has defined. A student referred for a drug screen will be temporarily suspended from clinical until the results of the drug screen are reported. The program director will advise the student where and when to have the drug screen completed to ensure compliance. The cost of the drug screen is the responsibility of the student.

Positive Drug Screen Statement

Students with a positive drug screen will be deemed ineligible to participate in clinical education. Furthermore, as clinical education is a critical requirement of nursing, allied health, and emergency medical services programs, the student will be dismissed from their current program of study. Students who would like to be considered for readmission should refer to their program's policy of readmission and direct questions to the program director.

CPR –Policy

Maintenance of the CPR certification throughout the duration of the program is the responsibility of the student. **American Heart Association BLS Provider CPR certification must be maintained at all times.** Continued certification can be maintained through KCC's EMT-C305 AHA BLS HC Provider Renewal course. Initial CPR certification can be obtained through KCC's EMT-C300 AHA BLS Certification course. Plan ahead to avoid last minute course cancellations, full courses, or student emergencies preventing the student from obtaining the necessary certification by the deadline. In other words, do not wait until the final hour to sign up for a course.

Failure to maintain CPR at any time throughout the program will result in clinical suspension, affecting the student's grade, as well as course and program completion. Failure to provide required documentation of current certification will result in clinical suspension, affecting the student's grade, as well as course and program completion.

Criminal Background Check Policy

Upon acceptance into the radiography program, any student with a felony or misdemeanor conviction will be required to complete the pre-application process with the American Registry of Radiologic Technologists (ARRT) and submit a copy of the determination letter to the program director prior to placement in the clinical education facility.

Some clinical education facilities require pre-placement criminal background checks to be run on students assigned to their facility. Students assigned to clinical education facilities requiring background checks will be required to complete the necessary process and assume the cost for the background check to be completed. Should a misdemeanor or felony conviction present, the college will refer to the pre-application determination letter issued by the American Registry of Radiologic Technologists (ARRT) as support for placing a student in a clinical education facility, in the absence of criteria set forth by the clinical facility for placement determination. Regardless of the ARRT determination status, a clinical facility has the right to refuse access to a student with a misdemeanor or felony conviction.

It should also be noted that misdemeanor or felony convictions could present issues with obtaining employment upon graduation from the program.

Attendance Policy

Attendance is mandatory in both the didactic (classroom) and clinical components of the program. Students are expected to arrive on time and stay for the duration of the scheduled didactic or clinical course. Arriving late and leaving early is unacceptable. The student must be aware that the Radiography program schedule is in place to encourage competence as well as safe practice. The Radiography schedule is to take precedence over any other course schedule, work schedule, or personal appointments. The specific clinical attendance policy can be found in this manual under “*Clinical Attendance Policy*”. The specific didactic attendance policy is defined in each course syllabi. Failure to adhere to the didactic and clinical attendance policies will result in reduction of grade, disciplinary action, or program dismissal.

Long-Term Absence Policy

Any student who is absent from either the didactic or clinical component of the program due to confirmed illness/injury, personal, family, employment, or military obligations for a period greater than the program or course policies allow, must inform the program director in writing of the circumstances.

The student must indicate in writing their desire to return to the program after the circumstances have subsided.

In an effort to protect the student’s academic record by avoiding an “F” grade, the student will be advised to withdraw from the program courses. Any student withdrawing from the Radiography program under the Long-Term Absence policy will be readmitted on the basis of the following:

1. Didactic standing throughout the program and at the time of withdrawal.
2. Clinical standing throughout the program and at the time of withdrawal.
3. Evidence of positive professional attitudes, values, and behaviors throughout the program and at the time of withdrawal.
4. Clinical education availability within the program.

Re-Admission Policy

Written application for re-admission is required. For several decision of significant importance to the student, and described in this manual, a committee must determine if a student may continue in the radiography program. The committee will be made up of the radiography program director; all full-time faculty members, at least one clinical preceptor, if the situation relates to clinical remediation attempts, and the director of allied health. The duty of the committee is to review the documented attempts by the faculty and student to bring the student into compliance with all program guidelines. Once the documentation is reviewed, the committee must determine if the student can successfully complete the radiography program within all program policies and institutional guidelines. Some, if not all of the medical/health, drug screen, and criminal background requirements may require repeating upon readmission.

Following is a non-exhaustive list of those cases where the committee will be involved in a decision related to program continuance:

- Request for Academic probation
- Dismissal from the program
- Excessive Absence without notice of medical or extenuating circumstances in writing.
- Request to continue within the same semester after long-term illness/injury/pregnancy.
- Academic/ethical misconduct

When a clinical education assignment is available, and only after the committee has deemed acceptable, those students who have demonstrated dedication and commitment to their education through acceptable didactic exam grades (avg. overall exam grades in each course of a “C” or above), positive clinical evaluations, good attendance, and punctuality in both the didactic and clinical components, and having maintained positive professional attitudes, values, and behaviors throughout the program will be re- admitted. Those with poor didactic exam grades, (avg. overall exam grades in each course of a “C” or below) reports of clinical misconduct, or suspension, poor attendance, and punctuality in class or clinical and, lacking evidence of professional growth through appropriate attitudes, values and behaviors will not be re-admitted.

To determine the point of readmission, the student may be required to complete a comprehensive exam and/or demonstrate skill competency. Each student’s circumstance will be considered on an individual basis.

Out of concern for competency and safe practice, a student will not be eligible for automatic re-admission if they have been away from the program longer than one year. However, they are welcome to re-apply to the program and if accepted, will be required to complete the program from the beginning.

Depending on the student's standing when they left the program, changes in the curriculum, and length of time the student has been away from the program, prerequisite and radiography courses may be required to be repeated. Each re-admission request will be evaluated individually, and determination will be made by the committee. A written educational plan will be drafted and must be mutually agreed upon by the student and the program director prior to re-admission.

Bereavement Leave

Any student who is absent from either the didactic or clinical component of the program due to a death of an immediate family member must inform the program director in writing of the circumstances. When a death occurs in a student's immediate family, they may take up to five (5) consecutive days off to attend the funeral or make funeral arrangements. Immediate family member is defined as spouse, parents, stepparents, siblings, children, stepchildren, grandparent, father-in-law, mother-in-law, or grandchild. Upon notification of the death, the Program Director will work with the student and the clinical setting to arrange an opportunity to re-coop the clinical time missed. The student will work with the radiography instructor to follow up on missed classroom assignments and exams.

Jury Duty Policy

Any clinical or didactic time missed for documented jury duty will not be counted as an absence in the grading process. The student must notify the program director, didactic faculty, and clinical instructor, and is required to follow the clinical call-in policy each day they are to serve the court. If the student's service is only for a half day, they will be required to report to clinical in the afternoon. The student must submit documentation to the program director from the court proving their service time. The student will be scheduled by the clinical instructor to make up the missed clinical opportunity and is responsible for maintaining their didactic coursework. If the student is unable to meet all the clinical and course requirements by the end of the semester, they will be given an "incomplete" and allowed to finish the work prior to the start of the next semester. If the students' service prevents the student from finishing coursework prior to the start of the following semester, the Long-Term Absence policy will be applied.

Pregnancy Policy

Should a student become pregnant during enrollment in the KCC radiography program, the student has the option to notify any program officials of their pregnancy. If the student chooses to declare pregnancy, it must be in writing to the program director. In the absence of this voluntary, written disclosure, a student will not be considered pregnant. The form provided on the following page must be completed and submitted to the program director to declare pregnancy.

Should the student choose to disclose their pregnancy, the student will have the option to continue their educational program without modification or interruption. Other alternatives include modification of clinical assignments or withdrawing from the program. All program requirements must be met for

completion of the program, even if modifications in clinical assignments are made. Modification of clinical assignment is defined as assignment to areas within the department of minimal radiation exposure. There is no additional time off incorporated for pregnancy or delivery. The student will be held to the same attendance policy as all other students. Should the student request modifications of their clinical assignments, a written plan must be devised by the program director, clinical coordinator, clinical preceptor, and the student to ensure that despite modifications in clinical assignments, the student will still meet all program requirements.

Upon notification of a pregnancy, the clinical coordinator and clinical preceptor will be notified. The student will have a meeting with the clinical site's radiation safety officer to counsel and advise the student with any concerns regarding their pregnancy and exposure to ionizing radiation. An additional dosimeter will be issued to monitor fetal exposure.

In accordance with the Nuclear Regulatory Commission's regulation for Declared Pregnant Worker (10 CFR Part 20), the dose shall not exceed 0.5 rem or 5 millisievert (mSv) during gestation period, and .05 rem or 0.50 millisievert (mSv) per month.

Opting not to disclose pregnancy shall absolve both the college and clinical facility of any responsibility for harm that could result from student assignments.

The student may also opt to withdraw their declaration of pregnancy at any time. If the student chooses to withdraw their declaration of pregnancy, it must be in writing to the program director.

Any student who chooses to withdraw from the radiography program due to pregnancy will be readmitted based on the programs re-admittance policy, academic standing at the time of withdrawal, and the availability of space within the program. Written application for re-admission is required.

For your convenience, a "Declaration of Pregnancy" form has been included in this Student Manual or can be obtained from the program director.

DECLARATION OF PREGNANCY

TO: Mindi Snyder, MA, Ed, R.T. (R)
Kellogg Community College
Radiography Program Director/Professor

In accordance with the NRC's regulations at 10 CFR 20.1208, "Dose to an Embryo/Fetus," I am declaring that I am pregnant. I believe I became pregnant in _____ (only the month and year need be provided).

I understand the radiation dose to my embryo/fetus during my entire pregnancy will not be allowed to exceed 0.5 rem or 5 mSv (unless that dose has already been exceeded between the time of conception and submitting this letter). I also understand that meeting the lower dose limit may require a change in clinical rotation during my pregnancy.

I choose the following course of action: (please initial)

- _____ 1. Continue educational program without interruption or modification.
- _____ 2. Continue radiography program with modification in clinical assignments.
- _____ 3. Withdraw from the program under the Long-Term Absence Policy

(Your Signature)

(Your Name Printed)

(Date)

_____ I wish to withdraw my declaration of pregnancy.
(Please initial above and date and sign below)

(Your signature and Date)

Personal Cell Phones and Electronic Devices Policy

The use of personal cell phones and electronic devices are prohibited while in the college classroom or clinical education facility. Personal cell phones and electronic devices are never to be in patient areas or work areas. They must be left in the student's vehicle or in the student's locker should one be provided. Cell phones are only to be used on the student's personal time, outside the clinical work area. Refer to **Disciplinary Process (Group II)** in this manual regarding violations of the cell phone policy.

Honesty and Integrity Policy

Therefore, if it is discovered that a student is lying, cheating, or falsifying information in any form, whether that be verbal or written, they will be subject to disciplinary action. An example could include but is not limited to a student calling in absent to their clinical department citing illness as a reason, when in fact they are using the day for reasons other than those listed as acceptable for clinical absenteeism.

Academic/Ethical Misconduct

Honesty and integrity are necessary, required, and expected of every student participating in this program with every aspect of this program, didactic and clinical. Violation(s) of the Student Code of conduct, as defined in the KCC Student Handbook, may lead to permanent dismissal from the radiography program, without opportunity to reenter.

Any acts of ethical misconduct related to patient treatment, or jeopardizing the health or privacy of patients, faculty or other students will be cause for immediate dismissal from the clinical portion of the course. At that point, the program director, clinical coordinator, clinical preceptor, and allied health director will review evidence and determine whether the student will be dismissed from the program, without opportunity to reenter.

Pre-Clinical Placement Education Policy

All students beginning a new clinical assignment must receive education on the policies and procedures of the specific clinical facility prior to participating in clinical education. Policies and procedures that must be provided to the student include, but are not limited to confidentiality (HIPAA), radiation/MRI/patient safety, and professional conduct. The clinical preceptor will facilitate this instruction to take place within the first two weeks of the clinical assignment by referring to the **Clinical Orientation Checklist**. The student will be responsible for submitting the checklist to the program director within the first two weeks of a new clinical assignment. The clinical preceptor is responsible for keeping the student abreast of any new or revised policies and procedures that may arise during their assignment with the clinical facility. Some clinical facilities require students to participate in their "New Employee Orientation" program. Often these orientation programs are scheduled outside of the KCC radiography program schedule, however, students assigned to the facility will be required to participate.

Clinical Supervision Policy

It is the responsibility of the student to secure proper supervision for completing an exam or procedure. Inability to secure proper supervision will result in the student not completing the exam or procedure.

Students who find it difficult to secure proper supervision must discuss the problem with the clinical preceptor immediately.

Students completing exams listed on the ARRT competency list, in the clinical setting, prior to achieving final competency status will be under the **direct supervision** of a registered radiologic technologist.

Upon successfully achieving final competency of an exam listed on the ARRT competency list, a student may perform that exam under **indirect supervision** of a registered radiologic technologist.

Students completing exams or procedures not listed on the ARRT competency list must be under the **direct** supervision of a registered radiologic technologist.

Venipuncture is not to be practiced in the clinical setting until final competency has been achieved through the didactic portion of the program. After achieving final competency, venipuncture is only to be practiced under **direct** supervision.

All surgical and mobile studies, including mobile fluoroscopic procedures must be practiced under **direct** supervision regardless of level of competency.

All digital imaging post-processing must be under **direct** supervision. A student is not allowed to adjust window level and width or apply filtering of images unless the supervising technologist directs the process with the student. Post-processing images can result in limiting information available to the radiologist for diagnosis.

All repeated images must be under the **direct** supervision of a registered radiologic technologist, regardless of level of competency.

"Direct Supervision" can be defined as a supervising registered radiologic technologist in the physical presence of the student performing medical imaging exams. The technologist must supervise and direct the practicing student by being able to hear and see all student actions and efforts. This applies to all areas where ionizing radiation equipment is in use.

"Indirect Supervision" can be defined as the supervising registered technologist immediately available to assist students regardless of the level of student competency. The supervising technologist must maintain a physical presence adjacent to the room or location where a procedure is being performed. The physical distance of the technologist must be conducive to the student verbally summoning assistance. This applies to all areas where ionizing radiation equipment is in use.

To ensure patient safety, students are not allowed to facilitate patient transfers or the handling of medical devices without prior clinical instruction and technologist supervised practice.

All images and associated paperwork completed by a student regardless of level of competency or check-off status must be reviewed and initiated by a registered technologist. In other words, a technologist must assume the responsibility for all images and paperwork.

Radiation Monitoring Policy

Each student will be provided two radiation dosimeters bimonthly: one body dosimeter and one collar dosimeter. Dosimeters must be worn at all times and in the proper manner while in the clinical area. Students reporting to the clinical site without their dosimeters will be sent home for that day or assigned to a non-radiation area at the discretion of the clinical preceptor.

Dosimeters must be turned in bi-monthly according to course syllabi. Academic credit is assigned for timely dosimeter return. Failure to turn in exposed dosimeters by the designated date, can affect the final grade.

Any mishandling of the dosimeter must be reported in writing at the time the dosimeter is turned in to help ensure accurate readings.

Radiation exposure reports: Radiation Detection Company reports are available bi-monthly at <http://myradcare.redetco.com/dosecheck> and will be posted to each clinical course in Moodle for students to review.

Bi-monthly review of dosimeter reports are done by the Program Director.

The expected annual dose for first year students is not to exceed 50 mrem or 0.5 mSv.

The expected annual dose for second year students is not to exceed 100 mrem or 1 mSv.

In the event the dose reported exceeds the limit above, the student will be notified, and a Radiation Monitoring Exposure Report will be completed. The Program Director will meet with the student to determine the potential reason behind the dose level reported and advise the student accordingly.

Should a student's dosimeters be worn outside of routine clinical practice such as during student technologist jobs, the annual dose limit remains the same and thus must not exceed 100 mrem or 1 mSv.

Upon leaving the program, each student will receive an "exit report" of the total dose recorded while in the program. The report will be emailed to the student.



Radiation Monitoring Exposure Report

Date: _____

Radiation monitoring badges reports indicate your exposure to ionizing radiation while interning in your clinical environment. The level of your exposure is a good indication of the radiation protection environment of the internship clinic. The exposure level is also a good indicator of your radiation protection habits.

In an effort to keep you informed of potential over exposure we are issuing you a warning report.

This is not a report of over exposure. It is merely a warning. Please make sure your radiation protection habits are sound and consistent and if you have concerns about the radiation protection environment at the clinic site please notify the Program Director.

Your exposure level is _____ mrem.

Student signature

Date

Program Director

Date

Radiation Safety Policy

Each student is required to follow the **written** radiation safety policies and procedures of the clinical education facility to which they are assigned. The policies are included on the Clinical Orientation Checklist and are provided to the student by the clinical facility during the student's orientation to their assigned facility. In accordance with JRCERT standards, students are prohibited from holding patients during image acquisition. Non-compliance of the radiation safety policy should be immediately brought to the attention of the clinical preceptor, clinical coordinator and/or program director.

Name Identification Badge Policy

Each student must wear a KCC name identification badge at all times while at the clinical site. This identification badge is a Kellogg Community College picture ID and **must be visible** and in good condition at all times while the student is in the clinical environment. The badge is to be worn at chest level making it clearly visible to staff and patients. Any hospital-issued badges are to be worn in addition to the KCC badge and are not to obscure its visibility. The KCC badge can be obtained in the college's student service center. All hospital issued badges are required to be surrendered to the program director upon the completion of clinical education at a clinical site. The KCC clinical ID badges are required to be surrendered to the program director upon leaving the radiography program.

Anatomic Marker Policy

Students are required to use anatomic markers on all images. Should an anatomic marker become lost in the course of a clinical day, the student must obtain a temporary loan KCC marker from the program director the next day and order a new set of markers.

1. Phone Kalamazoo X-ray Sales and Service at 1 800 732 9199 or can be ordered elsewhere online
2. **For Kalamazoo X-ray Sales Order the following: CAT#TA-1 3 initial ¼" Identifier Markers**
3. Cost approx. \$25.00
4. Allow approx. 2 weeks for delivery
5. Upon receipt of your new markers, return the temporary loan markers to the program coordinator.

Internet Usage Policy

Using hospital computers to access the internet is prohibited. Should a student wish to access an internet site or send an email relevant to their radiography studies, permission must be obtained from the clinical preceptor for each incident.

Confidentiality Policy

Students will receive training on confidentiality and federal law HIPAA requirements for the health care setting in the following courses: RADI 123, RADI 133, RADI 224, RADI 233 and RADI 243. **Maintaining confidentiality is strictly enforced and is required at all times.** This is to include both inside and outside the clinical education setting. Students are to access patient information only as directed by a supervising technologist and only on a “need to know” basis for providing quality patient care and imaging procedures. **Students are not to access information on any patient for any reason other than for the “need to know” basis for the patient exam they are involved with as stated above.** This includes accessing the student’s own medical information or, that of a family member, friend, or acquaintance. Should a student want access to their own medical record or, that of their minor child, they must go through the medical records department and adhere to the hospital policy on obtaining medical records. **There is zero tolerance for violation of the confidentiality policy.**

Lunch and Break Policy

Breaks and meal schedules during clinical education time will be assigned by the clinical preceptor or managing technologist. Each student is expected to adhere to the policies of the affiliate. Students must punch-out or be signed out by a designated technologist if leaving the hospital campus for lunch or breaks.

Personal Appearance Policy

The personal appearance and demeanor of radiography students attending Kellogg Community College Radiography program reflect the commitment and professionalism of the individual student, as well the high standards for education set forth by the program and the college. In addition, the appearance policy exists out of concern for safety and infection control.

The appearance policy is one mutually agreed upon by the Kellogg Community College Radiography Program and the clinical education facilities. The purchase and cost of uniforms and shoes is the responsibility of the student. The program will provide specific uniform requirements and locations for purchase to the students.

- “**Khaki**” is the color of uniform to be worn. Pants, scrub top, and scrub jacket are required.
- Uniform must be clean, pressed, in good repair, and well fitting.
- Pants must not drag on the floor.
- Shoes must be white, leather covering the top of the foot. If clogs are the chosen style, they must have back straps securing the heel. Shoes must be chosen with safety and comfort as priorities. Shoes must always be clean and in good repair.
- Surgery scrubs provided by the hospital will be worn only during the performance of surgery or similar assignments.
- Jewelry is limited to a watch, wedding ring and small, post-type earrings. No earrings that

dangle are to be worn.

- Good personal hygiene is required. Perfumes, colognes, and other scented products such as lotions are prohibited.
- Make-up must be subtle and natural looking.
- Fingernails are to be kept short and natural.
- Hair is to be kept clean and away from face. Hairstyle and hair color must be modest.
 - ***Bronson Appearance Standards:*** Students attending clinical at Bronson Methodist Hospital or Bronson Battle Creek Hospital are always required to have their hair up off their shoulders or secured away from their face.
- Facial hair must be kept short and well groomed. Men without a beard or mustache must be clean shaven. “Stubble” is prohibited.
- Acrylic fingernails, visible tattoos that are offensive or inappropriate, and excessive facial piercings, including tongue piercings are prohibited.
- Embellishments to the required uniform and shoes, such as pins, shoelaces, etc. are prohibited.

During all clinical education participation, the program dress code and appearance standards must be maintained. Any additional dress code, or appearance standards imposed by the individual clinical site, beyond the program standards listed, must also be adhered to by the student.

Any student reporting to clinical education in violation of the defined program and/or clinical education facility standards will be sent home by the clinical instructor and the absence documented.

Please refer to the Professional Growth objectives pertaining to professional appearance standards and evaluation.

Course and Clinical Confidentiality Agreement

A. I, _____, acknowledge that any and all information related to the treatment of patients at the clinical site I am assigned to during the Radiography program shall be kept in **strictest confidence** as required. I agree not to disclose, either during my clinical rotations, or after my rotation has been completed, any information received while involved in patient care and treatment, to others not directly involved in the patient's treatment, unless required by law. Information covered by this agreement includes patient identity, lists, patient files, records and reports, diagnosis or treatment or other related information learned while providing direct patient care.

B. I further agree that during the period described above, I shall not use, take, retain, or copy any information about the clinical sites' patient records, fee schedules, files, provision of health services, business records, financial condition, or other activities. I acknowledge that this information is confidential and is the exclusive property of the clinical sites.

C. I understand that any patient information that is used for homework assignments or class activities must be approved by the clinical site prior to use. All patient identifiers must be removed from any images or information used.

D. I understand that a breach of confidentiality is a serious matter and could result in both legal action by the patient or clinical site, and academic sanctions up to and including dismissal from the Radiography program.

E. I further agree to maintain confidentiality with regard to all examinations, including lab evaluations, I take during the Radiography program.

Signature

Print Name

Date

Transportation Policy

Each student is responsible for his/her transportation to didactic courses and to their assigned clinical education facility.

Health Insurance Policy

Each student is responsible for providing his/her own health insurance. It is strongly encouraged that students maintain health care insurance coverage while participating in the radiography program.

Clinical Illness/Injury Policy

A student must report any injury or possible illness directly obtained during participation of their clinical education immediately to their clinical preceptor and/or supervising technologist. The clinical preceptor or supervising technologist will assist the student in completing the hospital's incident report. The program director, or other designated college staff must be notified by the clinical preceptor as soon as possible. The student must complete an incident report with the college security department the day of the incident or as soon as reasonably possible. Students participating in clinical education are not covered by "Worker's Compensation" policies. It is the student's choice to seek medical attention for an injury or illness obtained during the course of their educational pursuits and is the student's financial responsibility.

TB Exposure Policy

Occasionally a student comes into contact with a patient who is later diagnosed with active TB. When this occurs, the clinical education facility notifies the program director. The student will be required to obtain a TB test within a specified range of time. The cost of the TB test is incurred by the student and can be obtained through their personal physician or the County Health Department. The test results must be submitted to the program director by the designated date to continue participation in clinical education.

Clinical Participation Fitness Policy

The following is a list of essential job functions taken from the radiographer job description of our clinical education providers. A student must be able to meet the abilities listed to actively participate in clinical education. Should an illness or injury inhibit a student's ability, the student will be suspended from clinical education until they resume the ability. The Clinical Attendance Policy and/or Long-Term Absence Policy will apply depending on the number of days a student is absent. A physician release to return to active clinical participation may be required. Should a student know in advance that they will be undergoing a medical procedure that could inhibit their ability to be "fit for clinical participation", they are to notify the clinical preceptor and program director in writing.

- Ability to perform repetitive tasks
- Ability to reach above shoulder level
- High degree of manual dexterity
- Ability to grip
- Ability to bend at knee
- Ability to stand for long periods of time
- Ability to maneuver (pushing/pulling/lifting) the weight of patients
- Ability to lift 50 pounds
- Ability to walk the equivalent of 2 miles per day
- Ability to sit for periods of time
- Ability to perform CPR
- Ability to visually see structures both close and far away.
- Ability to read faces, dials, monitors, gauges, doses on syringes, vials, and ampules.
- Ability to hear normal sounds with background noise from equipment generators, computers, and other equipment.
- Ability to cope with high levels of stress
- Ability to handle multiple priorities in a stressful situation
- Ability to make quick decisions under pressure
- Ability to cope with the anger/fear/hostility of others in a calm manner
- Ability to concentrate
- Ability to be flexible
- Ability to assist with problem resolution
- Ability to work alone
- Ability to demonstrate a high degree of patience

Clinical Attendance Policy

When a student is absent from their clinical education course, they are sacrificing valuable experience, and it is through much experience of performing numerous imaging exams of various types on numerous patients under various conditions that a solid knowledge base, skill set, professional judgment, and competent practice can be achieved. One missed clinical day translates into approximately 8-20 missed clinical experiences. **Therefore, clinical attendance is mandatory and should be valued as necessary experience by the committed radiography student.**

Students are expected to practice the same exemplary work ethic with regard to clinical education as they would if it were their employment post-graduation. Clinical education is an opportunity and a privilege, and a unique component of radiography education. Besides being crucial in developing the necessary knowledge, skill, judgment, and competence of the successful radiographer, clinical education offers the student an opportunity to display their clinical abilities, as well as a favorable work ethic to potential employers.

Students are expected to report to clinical education on the scheduled days and time and remain for the duration. In other words, arriving late and/or leaving early constitutes absenteeism. **Therefore, students are expected to plan ahead, be prepared, and make good judgment to avoid missing time from their clinical education.**

Clinical education provides opportunity for the following:

- develop a sound knowledge base
- develop high skill competence
- develop sound judgment
- build confidence
- gain experience working with actual patients in a modern-day medical imaging department
- experience professional growth with regards to developing the attitudes, values, and behaviors necessary of the successful radiographer
- demonstrate abilities to potential employer

Absenteeism most often results in one or more of the following:

- limited knowledge of important information with regard to patient care and quality imaging
- limited skill of important tasks with regard to patient care and quality imaging.
- lost clinical experiences and valuable class time with clinical instructor, technologists, physicians, etc.
- limited confidence
- risk to the patient, self, clinical education facility, and to the college
- demonstration of a lack of commitment and responsibility in the desire to develop as a highly knowledgeable, highly competent, professional radiologic technologist
- damage to one's professional reputation among peers, mentors, and potential employers
- failure of the course and dismissal from the program.

Students are expected to plan ahead, be prepared, and make good judgment to avoid missing clinical education but, while clinical attendance is mandatory, there are times when it is unsafe, unhealthy, or impossible for a student to report to their clinical assignment.

It is expected that students understand and consider the potential consequences as listed above when making decisions regarding attendance.

While the list offered here may not be all-inclusive, it represents examples that may warrant clinical absence:

- illness or injury of the student
- emergent situation of the student
- non-routine or emergent medical/dental appointments of the student
- subpoenaed legal appearances of the student or Jury Duty
- unsafe travel conditions for the student due to inclement weather

****Documentation of the above reasons may be requested.**

In the event that the MAIN CAMPUS of the college is closed due to inclement weather, the student will not report to the clinical setting.

While the following list is not all-inclusive, it defines examples that would NOT be considered acceptable reasons for clinical absence:

- vacation days
- personal days
- class-related activities outside the radiography curriculum
- hunting season
- children's school activities
- routine medical/dental appointments
- "snow day" for the K-12 schools, although safe travel conditions for the student to and from clinical
- Childcare issues

****** SOUND JUDGEMENT OF THE ADULT STUDENT IS EXPECTED IN MAKING DECISIONS WITH REGARD TO CLINICAL ABSENCE.**

It must be noted that should a student report to clinical education, yet the clinical preceptor determines it unsafe or unhealthy to either the student or to others, for the student to participate in clinical education, the preceptor has the authority to send the student home. The preceptor will notify the program director and the absence will be documented. Absences that are considered acceptable as described above can be recouped. The program director, clinical preceptor, and student must be in agreement as to when and how the days can be recouped.

Students are required to use the KCC-provided time clocks or time sheets to document attendance and punctuality. When time sheets are used in place of time clocks, the student must be "signed-in" by a technologist designated by the clinical instructor. Self-reporting is not an acceptable means of time tracking and will not be considered valid.

- Students leaving the hospital campus for any reason including lunch and breaks, must punch-out, or sign-out upon departure and, punch-in or sign-in upon return, again under the direction of a designated technologist as determined by the clinical preceptor.

Students are to report to clinical according to scheduled days and time as defined in the syllabus.

- Clinical time cannot be “banked” or “stored up” in anticipation of absenteeism.
- Students cannot report to clinical for “extra time”

Please refer to the specific clinical course syllabus the effect of absenteeism on the final clinical course grade earned.

Call-In Policy

If a student must be absent from clinical education on short notice, they are required to contact their clinical preceptor and KCC clinical coordinator prior to the beginning of their assigned start time. Each clinical preceptor will have directions as to the call-in procedure for a specific clinical site. Failure to adhere to this policy will result in disciplinary action as defined in this manual and is reflected in the professional growth evaluation and the final grade. **“No call-no show” is a serious violation of policy and will have serious consequences.**

Bronson-Battle Creek:	Jessica Burki/Janna McNeil	(269) 245-8137 (269) 245-5945
Bronson Methodist	Brenda Brooks/Erin Zellers	(269) 341-8353 (269) 341-7548 (Charge tech)
Oaklawn Hospital	Julie Hackworth	(269) 789-3917 Ext.3429
Promedica Coldwater	Chris Frazee/Sarah Robinson	(517) 279-5416
Ascension Borgess	Meredith Wheeler/Samantha Cahoon	(269) 226-6717
VA	Angela Hamilton/Michelle Lutzke /Mike King	(269) 966-5600 Ext. 31968
Corewell Health Pennock	Lindsey Hobbs/Brandy Bush	(269) 798-6812

Weekend and Evening Shift Policy

Weekend, evening, and holiday shift rotations are not allowed. According to the JRCERT, any rotation outside the regular scheduled clinical day must provide the student with educational experiences not offered during usual assigned days and hours. The educational experiences must be able to be

documented. *“Working with greater independence”* is not an acceptable educational experience for weekend, evening, and holiday shift rotations.

Case Study Confidentiality Policy

Students are encouraged to bring case studies to the classroom to share for educational purposes. Prior to taking cases from the hospital, students must secure the permission of their clinical preceptor to make copies or burn a CD of the images for use in the classroom. All patient identification must be removed from the films prior to taking them from the radiology department. Complete patient confidentiality must be maintained at all times or will be considered a breach and dealt with according to the appropriate disciplinary action as defined in this manual. Case studies are to go directly from the hospital to the classroom and not shared with anyone except the preceptor and fellow classmates in the classroom setting.

Violation of the guidelines described would be considered a breach of confidentiality and dealt with appropriately.

Specialized Modalities Policy

Clinical observation in specialized modalities may be available to students. Specialized modalities available include MRI, Bone Densitometry, Mammography, Computerized Tomography, Ultrasound, Nuclear Medicine, Radiation Therapy, and Cardiovascular/Interventional imaging. Advanced modalities are considered beyond the requirements of the radiography program, so, it is imperative that the student has met and mastered all the requirements of the radiography program before consideration is given to advanced modalities.

Prior to modality rotations in MRI, students must complete a MRI department specific orientation and screening according to current American College of Radiology (ACR) MR safety guidelines.

Assignments to advanced modalities will be based on the following:

- Number of required ARRT competencies a student has completed.
- Mastery and confidence of all required ARRT required skills.
- Mastery and confidence with regard to patient care.
- Attendance and punctuality throughout the program.
- Professional growth with regard to attitude, values, and behaviors demonstrated throughout the program.
- Initiative demonstrated throughout the program.

Clinical observations are left to the combined discretion of the clinical preceptor and clinical coordinator in collaboration with the program director.

Disciplinary Process

The following offenses represent situations that are intolerable in the clinical environment. Violations of the following offenses will result in appropriate action.

Blatant disregard of any of the offenses listed in either group, or of any program and/or hospital policies may be considered as grounds for instant program dismissal.

Group I

ANY OFFENSE IN THIS GROUP RESULTS IN PERMANENT DISCHARGE FROM THE CLINICAL SITE AND MOST LIKELY, THE PROGRAM.

1. Obtaining, possessing, or using marijuana, narcotics, amphetamines, hallucinogenic substances, or alcohol on the hospital premises, or reporting to the clinical assignment under the influence of any of these substances.
2. Theft, abuse, misuse or destruction of the property or equipment of any patient, visitor, student, hospital employee, or of the hospital itself.
3. Disclosing confidential information about any patient, student, or hospital employee without proper authorization.
4. Immoral, indecent, illegal, or unethical conduct on hospital premises.
5. Possession of weapons, wielding or threatening to use firearms, knives etc. on hospital property.
6. Assault or threat on any patient, visitor, student, or hospital employee.
7. Misuse of patient, student, or official hospital records.
8. Removal of patient, student, or official hospital records without proper authorization.
9. Altering one's own timecard, another's timecard or inducing any student or employee to do so.
10. Insubordination and refusal to obey directions.

GROUP II

1st Offense: A three-day suspension from the clinical assignment allowing the student time to reflect and refocus on their commitment to their education. The missed time will be considered as clinical absence. The student will be given the opportunity to make-up the three days. An "incomplete" will be documented with the time scheduled as the first three days following the end of the semester. Upon completion, the "incomplete" will be changed to the grade earned.

2nd Offense: Permanent discharge from the clinical assignment and most likely, from the program.

1. Failure to adhere to any hospital and/or program policies and procedures.
2. Engaging in disorderly conduct.

3. Leaving the hospital premises during assigned clinical hours without proper authorization.
4. Sleeping during scheduled clinical hours.
5. Restricting or impeding clinical procedure output.
6. Clinical absence without prior notification.
7. Violation of safety rules, regulations, or policies. Failure to use safety equipment and/or radiation monitoring devices provided.
8. Violation of the personal cell phone and pager policy.
9. Violation of the internet usage policy.
10. Violation of the clinical supervision policy.
11. Using equipment and supplies without proper authorization.
12. Smoking in restricted areas.
13. Posting, removing, or tampering with bulletin board notices without proper authorization.
14. Soliciting, vending, or distributing without proper authorization.
15. Individual acceptance of gratuities from patients.
16. Inappropriate dress or appearance based upon program and department policy.
17. Inappropriate or offensive comments, conversation, or language

Disciplinary Reporting Procedure

1. A written disciplinary report stating the alleged offense and disciplinary action shall be issued to the student for each violation of an alleged offense no later than three (3) clinical days following the determination of the alleged offense. The student must sign the disciplinary report. This signature does not signify admission of guilt. It merely signifies receipt of the disciplinary report.
2. The student is encouraged to discuss the alleged offense and disciplinary action with the clinical preceptor, clinical coordinator, and program director.
3. Students desiring to contest the alleged offense and disciplinary action must submit to the program director a written statement of intent to contest. This statement must be submitted within three (3) clinical days following receipt of the disciplinary report.
4. Within three (3) clinical days following receipt of the student's written intent to contest, the program director shall contact college administration to review the matter at the earliest possible time. Both the student and the clinical coordinator shall have the opportunity to provide evidence and witnesses deemed pertinent by the college administrative members and shall be permitted to question the evidence and witnesses.
5. Based strictly on the evidence of record, the college administration representatives shall render a decision in writing within five (5) working days after review of all the evidence is complete. The student shall be notified of the decision immediately and shall also be mailed a written copy of the decision without delay.

Consideration and final determination regarding any and all policies and procedures of the KCC radiography program is the responsibility of the program administration in accordance with college standards and policies, those of our affiliating hospitals, and the accreditation standards set forth by the JRCERT.

Section C:
Checkoffs
(Skill Competencies)

Skill Competency Policy

The skills that a student must master are defined by the American Registry of Radiologic Technologists (ARRT). The list can be found in this **Student Manual**.

Competencies, “check-offs” as they are commonly referred to must be secured through the following sequence:

1. Classroom lecture and discussion of the skill facilitated by the course instructor.
 2. Clinical instruction and practice of the skill facilitated by the clinical preceptor and/or clinical coordinator.
 3. Observation of a technologist performing the skill with a patient.
 4. Practice of the skill on a patient under direct supervision of a radiographer.
 5. Practice competency evaluation of the skill on a patient by a **registered** radiographer.
 6. Final competency evaluation of the skill by the clinical preceptor and/or clinical coordinator.
- Student competencies are achieved at two levels; practice competency evaluations completed by a register radiographer, and final competency evaluations completed by the clinical preceptor and/or clinical coordinator.
 - A copy of the form used for both competency and final competency can be found in this manual.
 - **It is the student’s responsibility to facilitate securing competencies.**
After instruction and practice, it is the student’s responsibility to notify a radiographer that they would like to attempt a competency. The radiographer will observe and evaluate the student as they perform the skill (exam) unassisted on a patient in its entirety by the objectives described on the *Competency Evaluation Form*. The student may perform as many competency evaluations as they’d like until a comfort level is reached to attempt the **Final Competency Evaluation**.
 - When a student has developed the confidence and competence to attempt a **Final Competency Evaluation**, they must notify their clinical preceptor to arrange a time to complete the evaluation. The student must complete all objectives as defined on the *Competency Evaluation Form* to the satisfaction of the clinical preceptor and/or clinical coordinator.
 - **Competency Evaluations** of students may only be completed by a radiographer who is registered with the ARRT.
 - **Final Competency Evaluations** of students may only be completed by the clinical preceptor and/or clinical coordinator, or a program approved designated individual.
 - Upon satisfactory completion of a final competency, a student may perform the skill under indirect supervision of a technologist. The definition of indirect supervision can be found in the **Student Manual** under program policies.
 - **All images must be checked by a registered radiologic technologist prior to releasing a patient and submitting the images for diagnostic interpretation, regardless of the student’s level of competency.**

- All imaging exams must contain the supervising radiographer's identification as the responsible party along with the student's identification, regardless of the student's level of competency.
- All repeat imaging must be done under the direct supervision of a radiographer, regardless of the student's level of competency.
- Students must maintain their competency. If it becomes apparent that a student is struggling with an exam after they have received their final competency, the clinical preceptor may suspend the competency. The student would then be allowed to complete the exam only under direct supervision until they can again demonstrate competency by passing the final competency evaluation.
- The clinical preceptor may at any time request a student complete a continued competency evaluation. This is done to ensure the students continued mastery of the exam.
- The ARRT requires venipuncture competency to be completed by the didactic instructor in the classroom setting. Venipuncture must not be practiced by the student in the clinical setting until completing the final competency in the classroom. Upon completion of the final competency, venipuncture must not be performed by a student without direct supervision.
- The ARRT required competencies in performing CPR, and obtaining vital signs, are completed through successful completion of Nursing Assistant Training Program, NURS 105, or an equivalent course.
- The ARRT required competency on sterile and aseptic technique can be earned simultaneously with an exam.

Ex: The sterile technique competency can be earned with the completion of a myelogram or arthrogram. **It must be a study that requires the set-up and maintenance of a sterile tray and field.** Competency cannot be earned with the practice of medical aseptic technique only, as medical asepsis does not necessarily require sterile technique. When completing the practice competency form, it must be noted that the exam is for "*myelogram and sterile technique*" and competency must be demonstrated for both.

- The ARRT required competencies on **transfer of patients** and **care of patient medical equipment** can be achieved simultaneously with an exam EX: When completing the practice competency form, it must be noted that the exam is for "*port chest and chest tube*" and competency must be demonstrated for both.
- Competency of sterile technique, transfer of patients and care of patient medical devices must also be confirmed and documented by the clinical preceptor through the **Final Competency Evaluation** process.
- There are a required number of competencies a student must master each semester to proceed in the program. The schedule is as follows:

RADI 123 – Clinical Practice 1
(112 clinical hours)
Clinical Orientation checklist
3 Final Clinical Competency Evaluations

RADI 133 –Clinical Practice 2
(360 clinical hours)
14 Final Clinical Competency Evaluations

RADI 224 - Clinical Practice 3
(320 clinical hours)
14 Final Clinical Competency Evaluations

RADI 233 – Comprehensive Clinical Experience
(360 clinical hours)
Clinical Orientation checklist
13 Final Clinical Competency Evaluations

RADI 243 – Comprehensive Clinical Experience 2
(240 clinical hours)
10 Final Competency Evaluations

3 mandatory patient care activities
36 mandatory procedures
15 elective procedures
54 Total competencies
(1392 total clinical hours)

Clinical Skill Competency Evaluation Process

The clinical skill competency evaluation process of the radiography program is designed to ensure that student is prepared to function as an entry-level radiographer upon completion of the program. The list of competencies, or checkoffs as they have been historically referred to, are determined by the American Registry of Radiologic Technologists (ARRT). A list of these required competencies can be found in this **Student Manual**.

The ***Practice Competency Evaluation*** gives the student the opportunity to practice their skills, for which they are provided feedback by a registered technologist. This part of the process is very important in helping a student develop as a technologist. It allows them the opportunity to learn from many knowledgeable, qualified individuals, as well as provides confirmation to the clinical preceptor that the student can in fact successfully perform the examination or procedure.

The ***Final Competency Evaluation*** is conducted by the student's clinical preceptor. While the student's ability to successfully perform an exam or procedure has been confirmed through the practice evaluation process, the *final evaluation* tests the student's knowledge and critical thinking skills regarding each exam. This is accomplished through an oral evaluation, or an interview-like process however, the clinical preceptor may require the student to simulate the exam in addition to the oral evaluation.

Practice Competency Evaluation
(Check-off) Objectives for the Technologist and the Student

For each of the identified competency tasks, the student receives a rating of the following:

- 4 exceeds expectations
- 3 meets expectation
- 2 missing some component that would meet the expectation
- 1 expectations not met
- N/A non-applicable

A “1 or 2” in any category results in a failure of the competency. Remember, these are only practice competencies in preparation for the final competency. They are meant to be a learning tool for the student. Should a student receive a 1 or a 2 on a competency evaluation, the only consequence is that they must repeat the evaluation process when the exam presents again.

It is the student’s responsibility to coordinate a competency evaluation with a technologist. The technologist must observe the student’s performance in each of the listed tasks. The student must successfully complete each task independent of technologist input. The technologist must only intervene when exam quality and/or patient safety is at risk.

A student may request a practice competency evaluation after they have received instruction and practice on the exam and feel ready to successfully complete the evaluation process.

Following is an explanation of the objectives of each competency task:

Room Prepared:

The student is to prepare the exam room appropriately including making sure it is clean and setting up any necessary supplies, linen, and equipment. This would include the set up and maintenance of a sterile environment if necessary.

Patient Greeting:

The student must introduce themselves and their supervising technologist to the patient and confirm the patient’s identification by checking the arm band, chart, exam requisition and asking the patient identifying information.

Patient Transfer:

The student must effectively assess the patient to determine the best mode of patient transfer. The student shall include patient condition, ability, and medical devices in their assessment. The student must then secure the necessary personnel and/or transfer equipment to safely transfer the patient along with any medical devices. The student must facilitate the transfer, maintaining safety and comfort.

Patient Preparation:

The student must prepare the patient appropriately by giving clear instructions regarding removal of

clothing, jewelry etc., and providing them with a gown, blankets or whatever necessary to maintain the patient's safety, comfort, and modesty. The student must also secure the patients belongings.

The student must prepare the patient with a clear and appropriate explanation of the examination about to be performed, with consideration to patient condition, ability, age, and diversity concerns.

History Documented:

The student must obtain a complete and appropriate history for the exam to be performed and clearly document the history using legible writing with proper medical terminology and spelling.

The student must gather the necessary information by reviewing the exam requisition and the patient's chart. In addition, the student must question the patient, caregiver, nurse, etc. to ensure complete information.

Contrast Media:

If required for the exam, the student must accurately complete a pre-contrast injection form and review it with the radiologist.

The student must select and prepare the correct contrast media as directed by the radiologist and according to department policies and procedures.

The student must administer the contrast media as directed by the radiologist and according to department policies and procedures.

The student must monitor and assess patient for any adverse reaction, re-act appropriately, and document accurately.

This competency includes exams utilizing both barium and iodinated contrast medias.

Image Receptor Selection:

The student must choose the proper image receptor size and sensitivity. The student orients and divides the image receptor appropriately and according to system requirements and department standards with regards to the exam performed.

Radiation Protection:

The student demonstrates appropriate radiation protection methods for the patient, themselves, and others that may be within the area of exposure according to department policy. The student follows ALARA principles and demonstrates the three keys of radiation protection: time, distance, and shielding.

The student must also demonstrate appropriate beam collimation and technique selection for each projection.

Positioning:

The student must properly position both the patient, as well as the equipment, for each projection. This is to include angulation of the patient's anatomy, angulation of the tube, SID and OID, as well as

the proper alignment of the beam, to the anatomy of interest and to the image receptor.

Exposure Selection:

The student must select the appropriate exposure factors according to patient status and department standards whether manual or automatic (mAs, kVp, focal spot, AEC cell etc.).

Repeated Images:

The student will critique the image for quality and determine if it is within department imaging standards.

For a successful competency, the student must not have to repeat an image due to positioning or technical errors.

Acceptable repeats include equipment malfunction or a patient cooperation error. If a repeat is necessary due to an equipment failure or patient cooperation error, the student will be able to identify the cause for the repeat and be able to successfully rectify the error to complete the competency.

Image Identification:

The student must confirm proper placement of the lead anatomic marker prior to exposure, as well as confirm complete and legible hospital and patient identification on each image. Anatomic markers applied after exposure are not viable.

Image Processing and Display:

The student must be able to select the proper settings from the menu for digital processing and display. The student must critique the images properly for exposure using exposure index guidelines as well as critique the image for positioning quality and anatomy inclusion.

Efficiency:

The student will complete the exam in an appropriate and reasonable amount of time with consideration to exam quality and patient care.

Patient Release:

The student will discharge the patient appropriately giving clear instructions including but not limited to, re-dressing, leaving the facility, and obtaining the exam results from their physician. If the patient is an inpatient or ER patient, the student will ensure the patient is returned to their room safely according to hospital policy and notify the receiving staff of the patients return.

Post-Exam Follow -Through:

The student will make sure the room is clean and readied for the next patient, the paperwork is complete and correct, and forward images for interpretation as defined by department policy and procedure

Final Competency Evaluation

(Check-off) Guidelines for the Clinical Instructor and the Student

Only after the student has successfully completed several practice competencies as well as the didactic instruction of the exam, will they meet with their clinical preceptor to complete the final competency evaluation. It is the responsibility of the student to coordinate the evaluation with the preceptor.

The number of practice competencies a student must complete is dependent upon the level of difficulty of the exam and is left to the judgment of the clinical preceptor.

Students must successfully complete several practice competencies. The number of practice competencies to be completed is dependent upon the level of difficulty of the exam and left to the judgment of the clinical preceptor.

Students must coordinate their final evaluation with their preceptor after the student has successfully completed the practice competencies as determined by their preceptor and completed the didactic instruction of the exam they will meet with their clinical preceptor to complete the final competency of the evaluation.

A final competency evaluation is not considered “simulated” if the student has successfully completed at least one practice competency evaluation on an actual patient with a technologist evaluation.

In an effort to evaluate the level of knowledge and the critical thinking skills a student employs, the final competency is completed as an oral evaluation, however, the clinical preceptor may require the student to demonstrate the exam on an actual patient or simulate it on a fellow student or department staff member.

To encourage continuous competency, the clinical preceptor, clinical coordinator, and/or program director may re-evaluate the student on a competency already completed. This re-evaluation can be done at any time throughout the program.

Following is an explanation of the objectives of each competency task:

Radiographic Anatomy/Pathology:

The student will be able to identify anatomy and common pathology as seen demonstrated on the medical image. The student will be able to identify other modalities that may further evaluate pathologic areas of concern as seen on the medical image.

Routine Projections:

The student will be able to describe the routine projection obtained for an exam and discuss how both the patient and equipment are positioned to obtain each projection.

Supplementary Projections:

The student will be able to discuss the supplementary projections for an exam and why the projections might be necessary to aid in diagnosis. The student will be able to describe how both the patient and the equipment are positioned for each projection.

Abnormal Conditions and Trauma:

When given a scenario by the instructor, the student will be able to describe how they might alter the exam to fit the conditions of the situation presented. Areas for discussion may include but not be limited to room set-up, patient care, patient communication, diversity issues, special medical devices, patient transfer methods, patient positioning, equipment manipulation, exposure factors, radiation protection, and image quality standards.

Appropriate History Questions:

The student will be able to identify pertinent history questions for the exam being performed. They will be able to discuss in detail the language and methods they would use to obtain the history from the patient and how they would document the information for the physician.

Environment Preparation:

The student will be able to describe any necessary procedure preparation. Discussion shall include room set-up, aseptic technique, sterile technique, necessary supplies, linen, and equipment.

Patient Preparation:

The student will be able to identify and discuss the physical requirements for the exam including how the patient must be dressed for the procedure, and if there are any dietary or pharmaceutical preparations for the exam. The student will be able to identify common medical devices, their purpose, care, and the safe manipulation and/or transfer of the device. In addition, the student will be able to discuss the criteria for assessment in determining the safe transfer of the patient. They will describe various transfer modes and transfer equipment. The student will also describe in detail how they will prepare the patient by explaining the exam using appropriate language and demonstrations.

Radiation Protection:

The student will describe the appropriate shielding for the patient, as well as themselves and any others who may need to be within the area during exposure. The student will be able to identify possible ways in which dose could be reduced, (i.e., patient positioning, technical factor selection, image receptor sensitivity, use of film holders, positioning aids, immobilizers etc.). The student will also be able to describe the appropriate collimation for each projection obtained.

Technique Selection:

The student will be able to describe how the control panel must be set for each projection for both a manual and automatic technique. Areas for discussion should include but not be limited to, mAs, kVp, focal spot size, AEC chambers, and SID. The student will be able to identify when AEC may not be an appropriate choice for technique selection or how they might use the density controls to supplement the exposure.

Image Receptor Selection:

The student will be able to identify and discuss the rationale for the sensitivity, size, division, and orientation of the image reception system utilized.

Contrast Media:

The student will be able to identify and discuss the rationale for the questions asked on a pre-contrast injection history form. They will be able to identify possible contraindications, (i.e., BUN, Creatinine levels, Glucophage use, previous allergic reactions etc.)

The student will be able to identify the appropriate type, amount, preparation, and method of administration of the contrast media for an examination. The student will be able to describe how the patient is monitored post injection. They will be able to identify contrast media side effects and reactions, including mild, moderate, and severe. The student will be able to discuss the appropriate response to each side effect and reaction.

Clinical Orientation Checklist

Student _____ Clinical Site _____

The student is to receive instruction/experience with each item on the list.

A.) Health & Safety:

1. _____ Hospital Tour
2. _____ Diagnostic Imaging Department Tour
3. _____ Phone System:

- Answering
- Holding
- Transferring
- Paging

4. _____ Code System:

- Cardiac/Respiratory Arrest
- Fire
- Tornado
- Bomb
- Help or Threat

5. _____ Cardiac/Respiratory Arrest Procedure

- Reporting
- Crash Cart Locations

6. _____ Fire Procedure

- Maintaining human safety
- Reporting
- Containing
- Location of extinguishers
- Use of extinguishers

7. _____ Tornado Procedure

- Maintaining human safety
- Reporting

8. _____ Medical Asepsis
 - Location of clean linen
 - Location of disinfectant for equip. cleaning
 - hand washing
9. _____ Hazardous Waste
 - Clean-up and disposal of blood and body fluids
 - “dirty” utility room
10. _____ Hazardous Materials
 - “Employee Right to Know”
 - SDS sheets
11. _____ Standard Precautions Tier 1 & 2
 - Location of personal protection devices, gloves, gowns, masks
 - Exposure process
12. _____ Back Safety
 - Lifting patients
 - Transferring Patients
 - Assistants - slide boards, gait belts, e-z lifts, etc.

B.) Equipment

1. _____ Radiographic Table
 - Tabletop movement - horizontal, vertical, floating
 - Table movement - tilt upright, Trendelenburg
 - Attachments, footrest, shoulder braces
 - Bucky tray, movement control and lock
 - Upright Bucky tray
 - AEC chambers
2. _____ Tube
 - Movement controls and locks (detent)
 - Anode side vs. Cathode side
 - Centering light
 - Collimation, PBL and override
3. _____ Fluoro Tower
 - Movement control and locks
4. _____ Image Reception System
 - CR (Imaging plates)
 - DR

5. _____ Processing
 - Selecting exam from LUT menu, EI #'s, DI values, etc.
 - Reader - CR
6. _____ Identification of the Image
 - Pt. name, date, exam
 - Anatomical marker
7. _____ Oxygen
 - Location - in rooms and mobile tanks
 - Cannula
 - O2 administration (with physician order only)
8. _____ Suction
 - Location
 - "Hook-up"
 - Uses (with physician/nurse direction)
9. _____ Other common medical devices
 - I-meds / I-vacs, cardiac monitors, Foleys, telemetry, NG tubes etc.

C.) Radiation and MRI Safety and Protection

1. _____ Devices
 - Aprons
 - Gloves
 - Collars
 - Proper wear
 - Proper storage
2. _____ Dosimeters (Radiation Badges)
 - Proper wear
 - Proper storage
 - Location of reports
3. _____ Shielding – Department Policy
 - Patients
 - Self / staff / family members
4. _____ Radiation Safety Officer
 - Identification of RSO/Name of the person _____
 - Location
5. _____ MRI Department safety education/review completed.
6. _____ MRI Safety Screening Form

D.) Miscellaneous

1. _____ Hospital/Department Rules, Regulations, and Policies

- HIPAA – confidentiality statement
- Misconduct
- Appearance
- Sign for and receive copies of policies

2. _____ JC Accreditation

3. _____ Student Call-in Procedure

I have received instruction/practice on all items included on this checklist.

Student

Clinical Preceptor

Date

Clinical Site

Medical Device Competency

Objectives

Purpose:

P = Pass	Student is able to correctly describe the purpose for the device
----------	--

Common Names:

P = Pass	Student is able to identify common names of the device (i.e., central lines PIC, Swans Ganz, Port-a-Cath)
N/A	Not applicable. No specific types used (i.e.: telemetry, pulse ox, vent. etc.)

Identify in a medical image:

P = Pass	Student is able to identify the device in an image
N/A	Not applicable. Device not seen in radiograph (i.e.: pulse ox, oxygen, etc.)

Transfer Pt. with Device:

P = Patient	Student successfully transferred a patient with the device
S = Simulated	Student is able to correctly describe how a transfer of a patient with the device
N/A	Patient with such device is not transferred (i.e.: vent)

Discontinue/Re-Establish:

P = Pass	Student is able to discontinue and/or re-establish device in the radiology department (i.e.; oxygen, IV with pump etc.)
N/A	Not applicable. Device does not require discontinuation/re-establishment (i.e.: telemetry, pulse ox. central line etc.)

Displace for Imaging:

P = Pass	Student is able to displace device from imaging field as much as possible for exposure (i.e.: cardiac leads, telemetry unit, oxygen cannula, NG tube etc.)
N/A	Not applicable. Device not within imaging field, or is unable to be displaced (i.e.: central line, Foley cath., pulse Ox, IV with pump)



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Radiography Program Medical Device Competency

Medical Device	Purpose	Common Names	Identify in Radiograph	Transfer Patient w/ Device	Discontinue & Re-establish	Displace for Imaging
Foley Catheter						
Cardiac Monitor with Leads						
IV with Pump						
Oxygen						
Suction						
Telemetry						
Chest Tube w/ Drainage System						
NG Tube / Feeding Tube						
Pulse Oximeter						
Central Line Catheter						
Ventilator / ET Tube / Tracheostomy Tube						
Name _____ Instructor _____ Date _____						

Practice Competency Evaluation

PRACTICE	1	2	3	4
Patient Identity Verified Name, DOB, ID wristband, student/tech introduced				
Exam Order Verified Doctor's order corresponds with patients complaint(s)				
Patient Assessment Appropriate patient history obtained from patient, mode of transfer determined				
Equipment Operation Movement, alignment, collimation, tube angle, distance (SID), proper IR selection				
Technique Selection Manual or AEC mAs, kVp, focal spot size, correct APR, exposure index or "S" number within range				
Patient Positioning Appropriate, modesty, maintained, patient, condition, comfort and safety considered, routine, supplemental and trauma projections utilized, minimal OID, time/efficiency				
Radiation Safety Collimation, shielding, exposure factor, selection (high kV and low mAs) and no repeats				
Image processing Proper LUT selection, correct patient				
Image Evaluation Exposure, anatomy, proper, central ray and IR alignment, pathology and/or abnormal conditions identified, anatomical R or L marker present and property placed				
RT's Initials Must be ARRT registered				

EXAM _____

HOW TO EVALUATE

- 4 exceeded expectation
- 3 meet expectation
- 2 lacking some components
- 1 failed/expectations not met

TECH COMMENTS:

FINAL COMPETENCY

STUDENT NAME _____ **EXAM** _____

Criteria	Acceptable	Unacceptable	Comments:
Patient Identity Verified Name, DOB, ID wristband, student/tech introduced			
Exam Order Verified Doctor's order corresponds with patient's complaint(s)			
Patient Assessment Appropriate patient history obtained from patient, mode of transfer determined			
Room Preparation Room is clean, equipment prepared, aseptic technique, sterile technique, supplies, clean linen, positioning aids, equipment necessary for procedure			
Patient Preparation Exam explained, attire, medical devices, pt, education, lab values, contrast selection and follow-up instructions			
Equipment Operation Movement, alignment, collimation, tube angle, distance (SID), proper IR selection			
Technique Selection Manual or AEC mAs, kVp, focal spot size, correct APR, exposure index or "S" number within range			
Patient Positioning Appropriate, modesty, maintained, patient, condition, comfort and safety considered, routine, supplemental and trauma projections utilized, minimal OID, time/efficiency			
Radiation Safety Collimation, shielding, exposure factor, selection (high kV and low mAs) and no repeats			
Image processing Proper LUT selection, correct patient			
Image Evaluation Exposure, anatomy, proper, central ray, and IR alignment, pathology and/or abnormal conditions identified, anatomical R or L marker present and property placed			

Simulated (no practices): Yes No

Instructor _____ Date _____ Hospital _____

C-ARM PRACTICE COMPETENCY EVALUATION

NAME _____

“P” = Pass – acceptable

“F” = Fail – needs improvement

EXAM _____

“N/A” = Not Applicable

	1	2	3	4	5
C-arm Set Up: *monitor and c-arm properly connected and turned on					
C-arm Placement In Room: *c-arm correctly place in room for specific procedure and *monitor correctly placed to be easily seen by physician					
Patient Information: *patient and exam information correctly entered and displayed					
C-arm Function: *proper functions selected for procedure, cine, sub, road map, digital fluoro, etc.					
Radiation Protection: *collimation, pulsed fluoro, low dose, OID, use of remote, shielding, minimal fluoro time, etc.					
Anatomical Orientation: *area of interest properly displayed on monitor in correct orientation					
Equipment Operation: *location and proper use of locks *proper equipment movement and operation: angulation, tilt, rotate, up/down, side-to-side, etc.					
Followed Directions: *accurately followed physician's orders/instructions *accurately located anatomical area of interest					
Sterile Technique: *maneuvered equipment while maintaining sterile field *c-arm properly draped					
Efficiency: *acceptable time to set up, perform, and remove c-arm from room					
Post Exam Follow-Through: *sorting and sending images for interpretation *documentation complete and accurate *equipment cleaned and ready for next procedure					
RT's initial ** Must be registered by ARRT					



RADIOGRAPHY PROGRAM

C-ARM FINAL COMPETENCY

NAME _____

EXAM _____

Knowledge of proper c-arm set up and placement			
Image Identification: *patient information			
Knowledge of c-arm operations, movements, and functions			
Radiation Protection: *collimation, shielding, low dose, pulsed fluoro, use of remote, OID, etc.			
Radiographic Anatomy Identified: *accurate anatomical orientation			
Effective Communication: *followed instructions given by physician			
Sterile Technique: *c-arm properly draped *sterile field maintained *c-arm cleaned for next procedure			
Image Acquisition for Interpretation: *documentation complete and accurate			

Simulated: Yes No

1st Attempt

Continued Competency: Yes No

2nd Attempt

3rd Attempt

Clinical Preceptor _____ Hospital _____

Date _____

ARRT CLINICAL COMPETENCY REQUIREMENTS

Radiologic Procedures	Mandatory or Elective	Date Completed	Eligible for Simulation?	Patient or Simulated	Competence Verified By
Chest and Thorax					
Chest Routine	M				
Chest AP (Wheelchair or Stretcher)	M				
Ribs	M		✓		
Chest Lateral Decubitus	E		✓		
Sternum	E		✓		
Upper Airway (Soft-Tissue Neck)	E		✓		
Sternoclavicular (SC) Joints	E		✓		
Upper Extremity					
Thumb or Finger	M		✓		
Hand	M				
Wrist	M				
Forearm	M				
Elbow	M				
Humerus	M		✓		
Shoulder	M				
Clavicle	M		✓		
Scapula	E		✓		
AC Joints	E		✓		
Trauma Shoulder (Scapular Y, Transthoracic or Axillary)*	M				
Trauma: Upper Extremity (Non Shoulder)*	M				
Lower Extremity					
Toes	E		✓		
Foot	M				
Ankle	M				
Knee	M				
Tibia-Fibula	M		✓		
Femur	M		✓		
Patella	E		✓		
Calcaneus (Os Calcis)	E		✓		
Trauma: Lower Extremity *	M				
Head Candidates must select at least one elective procedure from this section.					
Skull	E		✓		
Facial Bones	E		✓		
Mandible (Panorex acceptable)	E		✓		
Temporomandibular Joints (TMJs)	E		✓		
Nasal Bones	E		✓		
Orbits	E		✓		
Paranasal Sinuses	E		✓		

Radiologic Procedures	Mandatory or Elective	Date Completed	Eligible for Simulation?	Patient or Simulated	Competence Verified By
Spine and Pelvis					
Cervical Spine	M				
Thoracic Spine	M		✓		
Lumbrosacral Spine	M				
Cross-Table Lateral Spine (Horizontal Beam, Patient Recumbent)	M		✓		
Pelvis	M				
Hip	M				
Cross-Table Lateral Hip (Horizontal Beam, Patient Recumbent)	M		✓		
Sacrum and/or Coccyx	E		✓		
Scoliosis Series	E		✓		
Sacroiliac Joints	E		✓		
Abdomen					
Abdomen Supine	M				
Abdomen Upright	M		✓		
Abdomen Decubitus	E		✓		
Intravenous Urography	E				
Fluoroscopy Studies Candidates must select two procedures from this section and perform per site protocol.					
Upper GI Series (Single or Double Contrast)	E				
Contrast Enema (Single or Double Contrast)	E				
Small Bowel Series	E				
Esophagus (NOT Swallowing Dysfunction Study)	E				
Cystography/Cystourethrography	E				
ERCP	E				
Myelography	E				
Arthrography	E				
Hysterosalpingography (HSG)	E				
Surgical Studies					
C-Arm Procedure (Requiring Manipulation to Obtain More Than One Projection)	M		✓		
Surgical C-Arm Procedure (Requiring Manipulation Around a Sterile Field)	M		✓		
Mobile Studies					
Chest	M				
Abdomen	M				
Upper or Lower Extremity	M				

Radiologic Procedures	Mandatory or Elective	Date Completed	Eligible for Simulation?	Patient or Simulated	Competence Verified By
Pediatric Patient (age 6 or younger)					
Chest Routine	M		✓		
Upper or Lower Extremity	E		✓		
Abdomen	E		✓		
Mobile Study	E		✓		
Geriatric Patient (At Least 65 Years Old and Physically or Cognitively Impaired as a Result of Aging)					
Chest Routine	M				
Upper or Lower Extremity	M				
Hip or Spine	E				

General Patient Care	Mandatory or Elective	Date Completed	Competence Verified By
CPR	M		
Sterile and Aseptic Technique	M		
Vital Signs (blood pressure, pulse, respiration, temperature)	M		
Venipuncture	M		
Transfer of patient	M		
Care of patient medical equipment (oxygen tank, IV tubing)	M		

- Ten mandatory general patient care activities
- 36 mandatory imaging procedures
- 15 elective imaging procedures selected from a list of 34 procedures
 - One elective must come from the head section
 - Two other electives must come from the fluoroscope section and of those two, one must be either UGI or contrast enema.

SECTION D:
PROFESSIONAL GROWTH

Professional Growth Evaluation Process

Professional growth, as in values, attitudes and behaviors which are conducive to successful employment in a healthcare environment are just as important as the development of technical skills. Therefore, the Radiologic program is committed to helping a student develop the values, attitudes and behaviors that will lead to a rewarding career as a professional radiologic technologist.

- Students are made aware of the required professional behaviors by way of the, as well as the **Professional Growth Objectives**. Both documents are found in this **Student Manual** and explained by the program director upon entering the program.
- It is the responsibility of the program director, clinical coordinator, and clinical preceptor to monitor, advise, and evaluate the student's professional growth. Should the program director, clinical coordinator and/or clinical preceptor feel that a student is submitting to behaviors contrary to professional growth which may lead to a reduced or failing grade, the program director, clinical coordinator, and/or clinical preceptor will advise the student and help them develop alternatives to their behavior so that success in the program can be realized. The **Advisement Form** will be utilized to document that a discussion/advisement with the student has taken place. A copy of the form will be provided to the program director at the time of advisement and included with the Professional **Growth Evaluation Form** at the end of the course. A copy of the **Advisement Form** can be found in this **Student Manual**. While it is the responsibility of the program director, clinical coordinator and clinical preceptors to advise the student, it is ultimately the student's responsibility to demonstrate the values, attitudes, and behaviors necessary for success in the program and in the career.
- To assist the clinical preceptor in evaluating the professional growth of a student, two to three technologists can be asked to complete a **Professional Growth Evaluation - Technologist Form**. A copy of the form can be found in this **Student Manual**.
- A mid-term conference will be held with the clinical preceptor and will include discussion of the student's professional growth status. The results of this conference will be documented and forwarded to the program director.
- Just prior to the semester end, a second conference will be held with the student by the clinical preceptor and will include discussion of the professional growth progress of the student for that semester. The results of this conference will be documented on **Professional Growth Evaluation Form** and forwarded to the program director. The score earned through professional growth will be factored into the final grade of the course.

Professional Growth Objectives

Besides the required skill competencies, there are certain behavioral characteristics that help a student become a successful radiographer. Students will be evaluated each semester by their clinical preceptor on several professional behaviors that have been identified as necessary traits of the successful radiographer. The following list provides a description of those traits and is utilized in conjunction with the **PROFESSIONAL BEHAVIOR/SKILL COMPETENCY EVALUATION**.

Punctuality:

- The student is at their assigned work site and ready to begin work at the assigned time.

Attendance:

- The student reports to their clinical facility on assigned days according to the program schedule

Appearance:

- The student maintains a neat, clean appearance at all times.
- The student wears clean and pressed uniforms of the required color and style.
- The student wears safe, appropriate, and clean shoes.
- The student practices modest use of perfumes or other scents.
- The student practices good personal hygiene.
- The student is conservative with regard to make-up, hairstyle, fingernails, jewelry, and body art.
- The student respects and adheres to the appearance policy of their specific clinical site.
- The student wears his/her name badge properly at all times.

Cooperation:

- The student demonstrates a willingness to assist with the workflow by seeking out or recognizing tasks needing done.
- The student readily assists when asked.
- The student demonstrates “flexibility”
- The student demonstrates a “team-player” attitude.
- The student takes “ownership” for the success of the department.

Professionalism:

- The student is always aware of his/her surroundings and behaves both physically and verbally in the appropriate manner
- The student takes his/her role and responsibility on the health care team very seriously.
- The student demonstrates respect to people, property, and policy.

Judgment:

- The student is consistently clear and rational in his/her decisions and actions.
- The student bases his/her decisions on common sense, scientific support, and proven practice.
- The student responds to urgent or emergent situations in the appropriate manner.
- The student exercises discretion in conversation with patients, technologists, and others.
- The student maintains patient confidentiality and the “need-to-know” policy at all times, both inside the hospital and out.

Efficiency:

- The student recalls information readily and does not have to be reminded or “re-taught” how to do things.
- The student performs his/her work in a logical sequence.
- The student performs quality work in a timely manner, without sacrificing patient care or comfort.
- The student completes tasks started including preparing a room for the next technologist and patient to enter.

Communication:

- The student documents and verbalizes appropriate, accurate, and thorough medical histories and messages.
- The student demonstrates the ability to recognize important information and relays it to appropriate people in a timely manner.
- The student practices the “call-in” policy at all times.

Confidence:

- The student consistently demonstrates confidence in his/her decisions and abilities.
- The student readily accepts new challenges and situations.
- The student can be relied upon to perform as expected.

Initiative:

- The student demonstrates the desire to learn and master practices and procedures

Professional Growth Evaluation - Final

Student Name: _____ Date: _____

Course/Semester: _____ Evaluator/Clinical Site: _____

Absences: _____ Tardies/Leaving Early: _____

Score Key:

- 5 meets expectations consistently
- 4 meets expectations most of the time
- 3 needs to improve
- 2 performs below expectations frequently
- 1 fails to meet expectations consistently

**** A "2" or below requires an Advisement Form to accompany evaluation defining specific objectives for success.**

Appearance:

- The student respects and adheres to the professional appearance policies and requirements of both the program and the clinical site.
- The student maintains an overall neat and clean appearance.
- The student wears clean, pressed, and well-fitting uniforms of the required color.
- The student wears safe, appropriate, and clean white leather shoes.
- The student practices good personal hygiene.
- The student practices modest use of perfumes and other scents.
- The student is conservative with regard to make-up, hairstyle, hair color, facial hair, fingernails, jewelry, and body art.
- The student wears his/her KCC clinical name badge in addition to hospital-issued badges at chest level and visible to others at all times.

5 4 3 2 1

Professionalism:

- The student demonstrates respect to people, property, and policy.
- The student takes his/her role and responsibility on the healthcare team very seriously.
- The student is always aware of his/her surroundings and behaves both physically and verbally in the appropriate manner.
- The student demonstrates both accountability and responsibility.
- On time and in attendance as scheduled in the clinical setting

5 4 3 2 1

Communication:

- The student uses both written skills and verbal skills to communicate appropriate, accurate and thorough information to others involved with the patient's care.
- The student documents clear, appropriate, accurate and thorough medical histories and other information important to the patient's care and to the medical chart.
- The student demonstrates the ability to recognize important information and relays it appropriately in a timely manner.
- The student demonstrates appropriate non-verbal communication through their appearance and body language.
- The student demonstrates the ability to communicate effectively with patients using therapeutic communication techniques to secure important information, and to provide education, safety, and comfort.

5 4 3 2 1

Judgment:

- The student is consistently clear and rational in his/her decisions and actions.
- The student basis his/her decisions and actions on common sense, scientific support, and proven practice.
- The student responds to urgent or emergent situations in an appropriate manner.
- The student exercises discretion in conversations with patients, technologists, and others.
- The student maintains patient confidentiality and the “need-to-know” policy at all times, both inside and outside the hospital setting.

5 4 3 2 1

Efficiency:

- The student recalls information readily and does not have to be reminded or “re-taught” how to do things.
- The student performs his/her work in a logical sequence.
- The student performs quality work in a timely manner, without sacrificing patient care or comfort.
- The student follows through on all tasks started including preparing the exam room so that it is ready for the next technologist and patient to enter.

5 4 3 2 1

Cooperation:

- The student demonstrates a willingness to assist with the workflow by seeking out or recognizing tasks that need to be done.
- The student readily assists when asked.
- The student demonstrates “flexibility”.
- The student demonstrates a “team-player” attitude.
- The student takes “ownership” for the success of the department.

5 4 3 2 1

Initiative:

- The student demonstrates the desire to learn and master new practices and procedures.
- The student demonstrates the desire to practice and perfect those exams for which they have secured final competency on.
- The student consistently strives to perform beyond the “bare minimum” requirements.

5 4 3 2 1

Confidence:

- The student consistently demonstrates confidence in his/her decisions and abilities.
- The student readily accepts new challenges and situations.
- The student can be relied on to perform as expected.

5 4 3 2 1

Total Points Possible: 40

Total Points Earned: _____

Signatures confirm that this document was discussed.

Student: _____ Evaluator: _____

Date: _____



Comments:

Student Name _____ Date _____

Incident / Concern:

Remediation Plan:

Potential Consequences:

Student: _____

Evaluator: _____

Date: _____

STUDENT AGREEMENT FORM

In consideration of my enrollment and acceptance, I, intending to be legally bound, hereby, for myself, my executors, administrators, and heirs, waive KCC, their agents, representatives, committees, members and affiliating clinical education providers of any and all claims or rights to damages from injuries or losses suffered by me directly or indirectly, while attending, completing and fulfilling both my off-campus and on-campus didactic course and clinical education requirements

I agree to abide by the policies and procedures set forth by the KCC Radiography Program officials/student manual and the affiliating clinical education providers governing my conduct throughout my enrollment in the Radiography program.

Student Signature

Date

Print Name

CONFIDENTIALITY/HIPAA STATEMENT

I have received, read, and understand the Confidentiality/HIPAA Policy defined by the Radiography Program officials and the information contained within this 2023-2024 Student Handbook. I understand and agree that any patient information acquired during my participation in clinical education must forever and always be held in the strictest confidence. I understand that any violation of the policy could result in immediate dismissal from the program.

Student Signature

Date

Print Name

Photo/Video/Audio/Interview Comment Release

I hereby grant permission to Kellogg Community College, to use my image and/or voice in photograph(s), video or audio recording in any of its publications, on any of its instructional inline websites, online websites utilized by the College including social media, and in any or all other media without further consideration. I acknowledge that Kellogg Community College may choose not to use my photo or video image, comments, or audio recordings at this time, but may do so as its own discretion at a later date. I understand that my images and/or voice in photograph(s), video or audio recordings will be used with the respect and consideration to which I am entitled.

I also grant permission to Kellogg Community College to interview me and use my comments in any of its publications, on any of its instructional online sites and in any or all other media without further consideration. I hereby waive any right to inspect or approve the finished photograph, video or audio recordings, or printed text that may be used in conjunction with said photography, video, audio, or electronic matter.

I understand I will not be compensated for my image, voice, or comments. I will make no monetary or other claim against KCC for the use of the interview, photos, video, or audio. I agree that KCC owns the images, voice recordings, and all rights related to them. All negatives, positives, digital files, together with the prints shall remain the colleges' property, solely, and completely.

PRINT NAME

SIGNATURE

DATE

PHONE NUMBER

Clinical Infection Control Compliance Statement for Nursing and Allied Health Programs

I, _____, (print full name)

- understand participation in Clinical Education carries inherent risk of exposure to infectious diseases, which may include, but are not limited to, seasonal flu, Covid-19, Tuberculosis (TB), Methicillin-resistant Staphylococcus aureus (MRSA), and clostridium difficile (C-diff).
- understand clinical education is an essential component of my professional education that cannot be replaced with laboratory experiences, virtual simulations, or other remote experiences.
- will have completed instruction in infection control practices and the use of PPE prior to clinical placement.
- agree to follow safe infection control practices in the clinical setting and to adhere to any additional Safety Guidelines, Policies and Procedures instituted by my clinical site and my professional program. I understand that failure to follow these guidelines may result in dismissal from the clinical site.
- understand following these procedures and guidelines does not eliminate the risk of contracting these diseases, only reduces the probability of transmission to myself and others.
- agree to being placed into clinical settings.

Student signature _____

Date _____

MRI Safety Form

WARNING: Certain implants, devices, or objects may be hazardous to you and/or may interfere with the MRI procedure. If you have any question or concern regarding an implant, device, or object please contact Mindi Snyder (269) 660-7755 or snyderm@kellogg.edu

Date ____/____/____ Student ID Number _____

Name _____

Address _____ Telephone (home) (____) ____-_____

City _____ Telephone (work) (____) ____-_____

State _____ Zip Code _____

Please answer the following MRI safety screening questions:

1. Have you had prior surgery or an operation (e.g., arthroscopy, endoscopy, etc.) of any kind?
☐ No ☐ Yes

If yes, please indicate the date and type of surgery(s):

2. Have you experienced any problem related to a previous MRI examination or MR procedure? ☐ No ☐ Yes

If yes, please describe: _____

3. Have you had an injury to the eye involving a metallic object or fragment (e.g., metallic slivers, shavings, foreign body, etc.)? ☐ No ☐ Yes

If yes, was an orbit x-ray completed? When and where?

4. Have you ever been injured by a metallic object or foreign body (e.g., BB, bullet, shrapnel, etc.)? ☐ No ☐ Yes

If yes, was a diagnostic imaging study or examination performed (MRI, CT, Ultrasound, X-ray, etc.):

5. Are you currently taking taken any medication that requires patches?
☐ No ☐ Yes

If yes, please list: _____

6. Do you have a history of asthma, allergic reaction, respiratory disease, or reaction to a contrast medium or dye used for an MRI, CT, or X-ray examination? ☐ No ☐ Yes

Please indicate if you have any of the following:

- | | |
|--|--|
| <input type="radio"/> No <input type="radio"/> Yes | No Aneurysm clip(s) |
| <input type="radio"/> No <input type="radio"/> Yes | Cardiac pacemaker |
| <input type="radio"/> No <input type="radio"/> Yes | Implanted cardioverter defibrillator (ICD) |
| <input type="radio"/> No <input type="radio"/> Yes | Electronic implant or device |
| <input type="radio"/> No <input type="radio"/> Yes | Magnetically-activated implant or device |
| <input type="radio"/> No <input type="radio"/> Yes | Neurostimulation system |

- ☐ No ☐ Yes Spinal cord stimulator
☐ No ☐ Yes Internal electrodes or wires
☐ No ☐ Yes Bone growth/bone fusion stimulator
☐ No ☐ Yes Cochlear, otologic, or other ear implant
☐ No ☐ Yes Insulin or other infusion pump
☐ No ☐ Yes Implanted drug infusion device
☐ No ☐ Yes Any type of prosthesis (eye, penile, etc.)
☐ No ☐ Yes Heart valve prosthesis
☐ No ☐ Yes Eyelid spring or wire
☐ No ☐ Yes Artificial or prosthetic limb
☐ No ☐ Yes Metallic stent, filter, or coil
☐ No ☐ Yes Shunt (spinal or intraventricular)
☐ No ☐ Yes Vascular access port and/or catheter
☐ No ☐ Yes Radiation seeds or implants
☐ No ☐ Yes Swan-Ganz or thermodilution catheter
☐ No ☐ Yes Medication patch (Nicotine, Nitroglycerine)
☐ No ☐ Yes Any metallic fragment or foreign body
☐ No ☐ Yes Wire mesh implant
☐ No ☐ Yes Tissue expander (e.g., breast)
☐ No ☐ Yes Surgical staples, clips, or metallic sutures
☐ No ☐ Yes Joint replacement (hip, knee, etc.)
☐ No ☐ Yes Bone/joint pin, screw, nail, wire, plate, etc.
☐ No ☐ Yes IUD, diaphragm, or pessary
☐ No ☐ Yes Tattoo or permanent makeup
☐ No ☐ Yes Body piercing jewelry
☐ No ☐ Yes Hearing aid (Remove before entering MR system room)
☐ No ☐ Yes Other implant _____
☐ No ☐ Yes Breathing problem or motion disorder

I attest that the above information is correct to the best of my knowledge. I read and understand the contents of this form and will direct any questions and updates regarding the information on this form to Mindi Snyder snyderm@kellogg.edu

Signature of Person Completing Form: _____ **Date** ____/____/____

As the Kellogg Community College Radiography Program Director, I have reviewed the student's screening form and the student:

_____ is cleared _____ is not cleared (See explanation)

Explanation: _____

Signature of Program Official _____ **Date** ____/____/____

SECTION E: REFERENCE MATERIAL



Radiography

The purpose of the exam is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of the staff technologist at entry into the profession. The tasks typically performed were determined by administering a comprehensive practice analysis survey to a nationwide sample of radiographers.¹ An advisory committee then determined the knowledge and cognitive skills needed to perform the tasks on the task inventory and these are organized into the content categories within this document. Every content category can be linked to one or more tasks on the task inventory. The document is used to develop the examination. The *Task Inventory for Radiography* may be found on the ARRT's website (www.arrt.org).

The ARRT avoids content when there are multiple resources with conflicting perspectives. Educational programs accredited by a mechanism acceptable to ARRT offer education and experience beyond the minimum requirements specified in the content specifications and clinical competency requirements documents.

This document is not intended to serve as a curriculum guide. Although ARRT programs for certification and registration and educational programs may have related purposes, their functions are clearly different. Educational programs are generally broader in scope and address the subject matter that is included in these content specifications, but do not limit themselves to only this content.

The table below presents the major content categories and subcategories covered on the examination. The number of test questions in each category are listed in bold and the number of test questions in each subcategory in parentheses. Specific topics within each category are addressed in the content outline, which makes up the remaining pages of this document.

Content Category	Number of Scored Questions²
Patient Care	33
<i>Patient Interactions and Management (33)</i>	
Safety	50
<i>Radiation Physics and Radiobiology³ (21)</i>	
<i>Radiation Protection (29)</i>	
Image Production	51
<i>Image Acquisition and Evaluation (26)</i>	
<i>Equipment Operation and Quality Assurance (25)</i>	
Procedures	66
<i>Head, Spine and Pelvis Procedures (18)</i>	
<i>Thorax and Abdomen Procedures (20)</i>	
<i>Extremity Procedures (28)</i>	
Total	200

¹ A special debt of gratitude is due to the hundreds of professionals participating in this project as committee members, survey respondents, and reviewers.

² Each exam includes an additional 30 unscored (pilot) questions.

³ SI units are the primary (principle) units of radiation measurement used on the radiography examination.



Patient Care

1. Patient Interactions and Management

A. Ethical and Legal Aspects

1. patients' rights
 - a. consent (*e.g., informed, oral, implied)
 - b. confidentiality (HIPAA)
 - c. American Hospital Association (AHA) Patient Care Partnership (Patients' Bill of Rights)
 1. privacy
 2. extent of care (e.g., DNR)
 3. access to information
 4. living will, health care proxy, advanced directives
 5. research participation
2. legal issues
 - a. verification (e.g., patient identification, compare order to clinical indication)
 - b. common terminology (e.g., battery, negligence, malpractice, beneficence)
 - c. legal doctrines (e.g., respondeat superior, res ipsa loquitur)
 - d. restraints versus positioning aids used to eliminate motion artifact
 - e. manipulation of electronic data (e.g., exposure indicator, processing algorithm, brightness and contrast, cropping or masking off anatomy)
 - f. documentation (e.g., changes to order, medical event)
3. ARRT Standards of Ethics

B. Interpersonal Communication

1. modes of communication
 - a. verbal/written
 - b. nonverbal (e.g., eye contact, touching)
2. challenges in communication
 - a. interactions with others
 1. language barriers
 2. cultural and social factors
 3. physical, sensory, or cognitive impairments
 4. age
 5. emotional status, acceptance of condition (e.g., stage of grief)
 - b. explanation of medical terms
 - c. strategies to improve understanding
3. patient education
 - a. explanation of current procedure (e.g., purpose, length of time, radiation dose)

- b. pre- and post-examination instructions (e.g., preparation, diet, medications and discharge instructions)
- c. respond to inquiries about other imaging modalities (e.g., dose differences, types of radiation, patient preps)

C. Ergonomics and Monitoring

1. body mechanics (e.g., balance, alignment, movement)
 - a. patient transfer techniques
 - b. safe patient handling devices (e.g., transfer board, Hoyer lift, gait belt)
2. assisting patients with medical equipment
 - a. infusion catheters and pumps
 - b. oxygen delivery systems
 - c. other (e.g., nasogastric tubes, urinary catheters, tracheostomy tubes)
3. patient monitoring and documentation
 - a. vital signs
 - b. physical signs and symptoms (e.g., motor control, severity of injury)
 - c. fall prevention

D. Medical Emergencies

1. non-contrast allergic reactions (e.g., latex)
2. cardiac/respiratory arrest (e.g., CPR, AED)
3. physical injury or trauma
4. other medical disorders (e.g., seizures, diabetic reactions)

*The abbreviation "e.g.," is used to indicate that examples are listed in parentheses, but that it is not a complete list of all possibilities.
(Patient Care continues on the following page.)



Patient Care (continued)

E. Infection Control

1. chain of infection (cycle of infection)
 - a. pathogen
 - b. reservoir
 - c. portal of exit
 - d. mode of transmission
 1. direct
 - a. droplet
 - b. direct contact
 2. indirect
 - a. airborne
 - b. vehicle borne (fomite)
 - c. vector borne (mechanical or biological)
 - e. portal of entry
 - f. susceptible host
2. asepsis
 - a. equipment disinfection
 - b. equipment sterilization
 - c. medical aseptic technique
 - d. sterile technique
3. CDC Standard Precautions
 - a. hand hygiene
 - b. use of personal protective equipment (e.g., gloves, gowns, masks)
 - c. safe handling of contaminated equipment/surfaces
 - d. disposal of contaminated materials
 1. linens
 2. needles
 3. patient supplies
 4. blood and body fluids
 - e. safe injection practices
4. transmission-based precautions
 - a. contact
 - b. droplet
 - c. airborne
5. additional precautions
 - a. neutropenic precautions (reverse isolation)
 - b. healthcare-associated (nosocomial) infections

F. Handling and Disposal of Toxic or Hazardous Material

1. types of materials
 - a. chemicals
 - b. chemotherapy
2. safety data sheet (material safety data sheet)

G. Pharmacology

1. patient history
 - a. medication reconciliation (current medications)
 - b. premedications
 - c. contraindications
 - d. scheduling and sequencing examinations
2. administration
 - a. routes (e.g., IV, oral)
 - b. supplies (e.g., enema kits, needles)
 - c. procedural technique (e.g., venipuncture)
 - d. contrast media dose calculation
3. contrast media types and properties (e.g., iodinated, water soluble, barium, ionic versus non-ionic)
4. appropriateness of contrast media to examination
 - a. patient condition (e.g., perforated bowel)
 - b. patient age and weight
 - c. laboratory values (e.g., BUN, creatinine, eGFR)
5. complications/reactions
 - a. local effects (e.g., extravasation/infiltration, phlebitis)
 - b. systemic effects
 1. mild
 2. moderate
 3. severe
 - c. emergency medications
 - d. radiographer's response and documentation



Safety

1. Radiation Physics and Radiobiology

- A. Principles of Radiation Physics
 - 1. x-ray production
 - a. source of free electrons (e.g., thermionic emission)
 - b. acceleration of electrons
 - c. focusing of electrons
 - d. deceleration of electrons
 - 2. target interactions
 - a. bremsstrahlung
 - b. characteristic
 - 3. x-ray beam
 - a. frequency and wavelength
 - b. beam characteristics
 - 1. quality
 - 2. quantity
 - 3. primary versus remnant (exit)
 - c. inverse square law
 - d. fundamental properties (e.g., travel in straight lines, ionize matter)
 - 4. photon interactions with matter
 - a. photoelectric
 - b. Compton
 - c. coherent (classical)
 - d. attenuation by various tissues
 - 1. thickness of body part
 - 2. type of tissue (atomic number)

- B. Biological Effects of Radiation
 - 1. SI units of measurement (NCRP #160)
 - a. absorbed dose (Gy)
 - b. dose equivalent (Sv)
 - c. exposure (C/kg)
 - d. effective dose (Sv)
 - e. air kerma (Gy)
 - 2. radiosensitivity
 - a. dose-response relationships
 - b. relative tissue radiosensitivities (e.g., LET, RBE)
 - c. cell survival and recovery (LD₅₀)
 - d. oxygen effect
 - 3. somatic effects
 - a. cells
 - b. tissue (e.g., eye, thyroid, breast, skin, marrow, gonad)
 - c. embryo and fetus
 - d. carcinogenesis
 - e. early versus late or acute versus chronic
 - f. deterministic (tissue reactions) versus stochastic
 - g. short-term versus long-term exposure
 - h. acute radiation syndromes
 - 1. hemopoietic
 - 2. gastrointestinal (GI)
 - 3. central nervous system (CNS)

(Safety continues on the following page.)



Safety (continued)

2. Radiation Protection

A. Minimizing Patient Exposure

1. exposure factors
 - a. kVp
 - b. mAs
 - c. automatic exposure control (AEC)
2. beam restriction
 - a. purpose of primary beam restriction
 - b. types (e.g., collimators)
3. patient considerations
 - a. positioning
 - b. communication
 - c. pediatric
 - d. morbid obesity
4. filtration
 - a. effect on skin and organ exposure
 - b. effect on average beam energy
 - c. NCRP recommendations (NCRP #102, minimum filtration in useful beam)
5. radiographic dose documentation
6. image receptors
7. grids
8. fluoroscopy
 - a. pulsed
 - b. exposure factors
 - c. grids
 - d. positioning
 - e. fluoroscopy time
 - f. automatic brightness control (ABC) or automatic exposure rate control (AERC)
 - g. receptor positioning
 - h. magnification mode
 - i. air kerma display
 - j. last image hold
 - k. dose or time documentation
 - l. minimum source-to-skin distance (21 CFR)
9. dose area product (DAP) meter

B. Personnel Protection (ALARA)*

1. sources of radiation exposure
 - a. primary x-ray beam
 - b. secondary radiation
 1. scatter
 2. leakage
 - c. patient as source
2. basic methods of protection
 - a. time
 - b. distance
 - c. shielding
3. protective devices
 - a. types (e.g., aprons, barriers)
 - b. attenuation properties
 - c. minimum lead equivalent (NCRP #102)
4. special considerations
 - a. mobile units
 - b. fluoroscopy
 1. protective drapes
 2. protective Bucky slot cover
 3. cumulative timer
 4. remote-controlled fluoroscopy
 - c. guidelines for fluoroscopy and mobile units (NCRP #102, 21 CFR)
 1. fluoroscopy exposure rates (normal and high-level control)
 2. exposure switch guidelines
5. radiation exposure and monitoring
 - a. dosimeters
 1. types
 2. proper use
 - b. NCRP recommendations for personnel monitoring (NCRP #116)
 1. occupational exposure
 2. public exposure
 3. embryo/fetus exposure
 4. dose equivalent limits
 5. evaluation and maintenance of personnel dosimetry records
6. handling and disposal of radioactive material

* (August 24, 2016) Note: Although it is the radiographer's responsibility to apply radiation protection principles to minimize bioeffects for both patients and personnel, the ALARA concept is specific to personnel protection and is listed only for that section.



Image Production

1. Image Acquisition and Evaluation

A. Factors Affecting Radiographic Quality

(X indicates topics covered on the examination.)

	1. Receptor Exposure	2. Spatial Resolution	3. Distortion
a. mAs	X		
b. kVp	X		
c. OID		X	X
d. SID	X	X	X
e. focal spot size		X	
f. grids*	X		
g. tube filtration	X		
h. beam restriction	X		
i. motion		X	
j. anode heel effect	X		
k. patient factors (size, pathology)	X	X	X
l. angle (tube, part, or receptor)		X	X

* Includes conversion factors for grids

B. Technique Charts

1. anatomically programmed technique
2. fixed versus variable kVp
3. special considerations
 - a. casts
 - b. pathologic factors
 - c. age (e.g., pediatric, geriatric)
 - d. body mass index (BMI)
 - e. contrast media
 - f. grids
 - g. OID

C. Automatic Exposure Control (AEC)

1. effects of changing exposure factors on radiographic quality
2. detector selection
3. anatomic alignment
4. exposure adjustment
(e.g., density, +1 or -1)

D. Digital Imaging Characteristics

1. spatial resolution
 - a. pixel characteristics
(e.g., size, pitch)
 - b. detector element (DEL)
(e.g., size, pitch, fill factor)
CCD, CMOS (e.g., size, pitch)
 - c. sampling frequency (CR)

d. matrix size

e. modulation transfer function (MTF)

2. contrast resolution

- a. bit depth
 - b. detective quantum efficiency (DQE)
 - c. grids
- #### 3. image signal
- a. dynamic range
 - b. quantum noise (quantum mottle)
 - c. signal to noise ratio (SNR)

E. Image Identification

1. methods (e.g., radiographic, electronic)
2. legal considerations
(e.g., patient data, examination data)

F. Criteria for Image Evaluation

1. exposure indicator
2. quantum noise (quantum mottle)
3. gross exposure error
(e.g., loss of contrast, saturation)
4. contrast
5. spatial resolution
6. distortion (e.g., size, shape)
7. identification markers
(e.g., anatomical side, patient, date)
8. image artifacts
9. radiation fog (CR)



Image Production (continued)

2. Equipment Operation and Quality Assurance

A. Imaging Equipment

1. x-ray generator, transformers and rectification system
 - a. basic principles
 - b. phase, pulse and frequency
 - c. tube loading
2. components of radiographic unit (fixed or mobile)
 - a. operating console
 - b. x-ray tube construction
 1. electron source
 2. target materials
 3. induction motor
 4. filtration
 - c. automatic exposure control (AEC)
 1. radiation detectors
 2. back-up timer
 3. exposure adjustment (e.g., density, +1 or -1)
 4. minimum response time
 - d. manual exposure controls
 - e. image receptors
 1. computed radiography (CR)
 - a. plate (e.g., photo-stimulable phosphor (PSP))
 - b. plate reader
 2. digital radiography (DR)
 - a. direct conversion
 - b. indirect conversion
 1. amorphous silicon (a-Si)
 2. charge coupled device (CCD)
 3. complementary metal oxide semiconductor (CMOS)
 - f. beam restriction
3. components of fluoroscopic unit (fixed or mobile)
 - a. image receptors
 1. image intensifier
 2. flat panel
 - b. viewing systems
 - c. recording systems
 - d. automatic brightness control (ABC) or automatic exposure rate control (AERC)
 - e. magnification mode
 - f. table

4. accessories

- a. stationary grids
- b. Bucky assembly
- c. compensating filters

B. Image Processing and Display

1. raw data (pre-processing)
 - a. analog-to-digital converter (ADC)
 - b. quantization
 - c. corrections (e.g., rescaling, flat fielding, dead pixel correction)
 - d. histogram
2. corrected data for processing
 - a. grayscale
 - b. edge enhancement
 - c. equalization
 - d. smoothing
3. data for display
 - a. values of interest (VOI)
 - b. look-up table (LUT)
4. post-processing
 - a. brightness
 - b. contrast
 - c. region of interest (ROI)
 - d. electronic cropping or masking
 - e. stitching
5. display monitors
 - a. viewing conditions (e.g., viewing angle, ambient lighting)
 - b. spatial resolution (e.g., pixel size, pixel pitch)
 - c. brightness and contrast
6. imaging informatics
 - a. information systems, (e.g., HIS, RIS, EMR, EHR)
 - b. networking
 1. PACS
 2. DICOM
 - c. downtime procedures



Image Production (continued)

- C. Quality Control of Imaging Equipment and Accessories
 - 1. beam restriction
 - a. light field to radiation field alignment
 - b. central ray alignment
 - 2. recognition and reporting of malfunctions
 - 3. digital imaging receptor systems
 - a. maintenance (e.g., detector calibration, plate reader calibration)
 - b. QC tests (e.g., erasure thoroughness, plate uniformity, spatial resolution)
 - c. display monitor quality assurance (e.g., grayscale standard display function, luminance)
 - 4. shielding accessories (e.g., testing lead apron, gloves)



Procedures

This section addresses imaging procedures for the anatomic regions listed below. Questions will cover the following topics:

1. Positioning (e.g., topographic landmarks, body positions, path of central ray, positioning aids, respiration).
2. Anatomy (e.g., including physiology, basic pathology, related medical terminology).
3. Procedure adaptation (e.g., body habitus, body mass index, trauma, pathology, age, limited mobility).
4. Evaluation of displayed anatomical structures (e.g., patient positioning, tube-part-image receptor alignment).

The specific radiographic positions and projections within each anatomic region that may be covered on the examination are listed in *Attachment A*. A guide to positioning terminology appears in *Attachment B*.

1. Head, Spine and Pelvis Procedures

A. Head

1. skull
2. facial bones
3. mandible
4. temporomandibular joints
5. nasal bones
6. orbits
7. paranasal sinuses

B. Spine and Pelvis

1. cervical spine
2. thoracic spine
3. scoliosis series
4. lumbar spine
5. sacrum and coccyx
6. myelography
7. sacroiliac joints
8. pelvis and hip

2. Thorax and Abdomen Procedures

A. Thorax

1. chest
2. ribs
3. sternum
4. soft tissue neck
5. sternoclavicular joints

B. Abdomen and GI Studies

1. abdomen
2. esophagus
3. swallowing dysfunction study
4. upper GI series, single or double contrast
5. small bowel series
6. contrast enema, single or double contrast
7. surgical cholangiography
8. ERCP

C. GU Studies

1. cystography
2. cystourethrography
3. intravenous urography
4. retrograde urography
5. hysterosalpingography

3. Extremity Procedures

A. Upper Extremities

1. fingers
2. hand
3. wrist
4. forearm
5. elbow
6. humerus
7. shoulder
8. scapula
9. clavicle
10. acromioclavicular joints

B. Lower Extremities

1. toes
2. foot
3. calcaneus
4. ankle
5. tibia/fibula
6. knee/patella
7. femur
8. long bone measurement

C. Other

1. bone age
2. bone survey (e.g., metastatic, non-accidental trauma)
3. arthrography



Attachment A

Radiographic Positions and Projections

1. Head, Spine and Pelvis

A. Head

1. Skull
 - a. AP axial (Towne)
 - b. lateral
 - c. PA axial (Caldwell)
 - d. PA
 - e. submentovertex (full basal)
 - f. trauma cross-table (horizontal beam) lateral
 - g. trauma AP axial (reverse Caldwell)
 - h. trauma AP
 - i. trauma AP axial (Towne)
2. Facial Bones
 - a. lateral
 - b. parietoacanthial (Waters)
 - c. PA axial (Caldwell)
 - d. modified parietoacanthial (modified Waters)
3. Mandible
 - a. axiolateral oblique
 - b. PA
 - c. AP axial (Towne)
 - d. PA axial
 - e. PA (modified Waters)
 - f. submentovertex (full basal)
4. Temporomandibular Joints
 - a. axiolateral oblique (modified Law)
 - b. axiolateral (modified Schuller)
 - c. AP axial (modified Towne)
5. Nasal Bones
 - a. parietoacanthial (Waters)
 - b. lateral
 - c. PA axial (Caldwell)
6. Orbits
 - a. parietoacanthial (Waters)
 - b. lateral
 - c. PA axial (Caldwell)
 - d. modified parietoacanthial (modified Waters)
7. Paranasal Sinuses
 - a. lateral, horizontal beam
 - b. PA axial (Caldwell), horizontal beam
 - c. parietoacanthial (Waters), horizontal beam
 - d. submentovertex (full basal), horizontal beam

B. Spine and Pelvis

1. Cervical Spine
 - a. AP axial
 - b. AP open mouth
 - c. lateral
 - d. cross-table (horizontal beam) lateral
 - e. PA axial obliques
 - f. AP axial obliques
 - g. lateral swimmers

- h. lateral flexion and extension
- i. AP dens (Fuchs)
2. Thoracic Spine
 - a. AP
 - b. lateral, breathing
 - c. lateral, expiration
3. Scoliosis Series
 - a. AP or PA
 - b. lateral
4. Lumbar Spine
 - a. AP
 - b. PA
 - c. lateral
 - d. L5-S1 lateral spot
 - e. posterior oblique
 - f. anterior oblique
 - g. AP axial L5-S1
 - h. AP right and left bending
 - i. lateral flexion and extension
5. Sacrum and Coccyx
 - a. AP axial sacrum
 - b. AP axial coccyx
 - c. lateral sacrum and coccyx, combined
 - d. lateral sacrum or coccyx, separate
6. Myelography
7. Sacroiliac Joints
 - a. AP axial
 - b. posterior oblique
 - c. anterior oblique
8. Pelvis and Hip
 - a. AP hip only
 - b. cross-table (horizontal beam) lateral hip
 - c. unilateral frog-leg, non-trauma
 - d. axiolateral inferosuperior, trauma (Clements-Nakayama)
 - e. AP pelvis
 - f. AP pelvis, bilateral frog-leg
 - g. AP pelvis, axial anterior pelvic bones (inlet, outlet)
 - h. posterior oblique pelvis, acetabulum (Judet)

2. Thorax and Abdomen

A. Thorax

1. Chest
 - a. PA or AP upright
 - b. lateral upright
 - c. AP lordotic
 - d. AP supine
 - e. lateral decubitus
2. Ribs
 - a. AP and PA, above and below diaphragm
 - b. anterior and posterior obliques

3. Sternum
 - a. lateral
 - b. RAO
4. Soft Tissue Neck
 - a. AP upper airway
 - b. lateral upper airway
5. Sternoclavicular joints
 - a. PA
 - b. LAO and RAO

B. Abdomen and GI Studies

1. Abdomen
 - a. AP supine
 - b. AP upright
 - c. lateral decubitus
 - d. dorsal decubitus
2. Esophagus
 - a. RAO
 - b. left lateral
 - c. AP
 - d. PA
 - e. LAO
3. Swallowing Dysfunction Study
4. Upper GI series*
 - a. AP or PA scout
 - b. RAO
 - c. PA
 - d. right lateral
 - e. LPO
 - f. AP
5. Small Bowel Series
 - a. PA scout
 - b. PA (follow through)
 - c. ileocecal spots
6. Contrast Enema*
 - a. left lateral rectum
 - b. left lateral decubitus
 - c. right lateral decubitus
 - d. LPO and RPO
 - e. PA
 - f. RAO and LAO
 - g. AP axial (sigmoid)
 - h. PA axial (sigmoid)
 - i. PA or AP post-evacuation
7. Surgical Cholangiography
8. ERCP

*single or double contrast



C. GU Studies

1. Cystography
 - a. AP
 - b. LPO and RPO
 - c. lateral
 - d. AP axial
2. Cystourethrography
 - a. AP voiding
cystourethrogram female
 - b. RPO voiding
cystourethrogram male
3. Intravenous Urography
 - a. AP, scout, and series
 - b. RPO and LPO
 - c. post-void
4. Retrograde Urography
 - a. AP scout
 - b. AP pyelogram
 - c. AP ureterogram
5. Hysterosalpingography

3. Extremities

A. Upper Extremities

1. Fingers
 - a. PA entire hand
 - b. PA finger only
 - c. lateral
 - d. medial and/or lateral oblique
 - e. AP thumb
 - f. medial oblique thumb
 - g. lateral thumb
2. Hand
 - a. PA
 - b. lateral
 - c. lateral oblique
3. Wrist
 - a. PA
 - b. lateral oblique
 - c. lateral
 - d. PA–ulnar deviation
 - e. PA axial (Stecher)
 - f. tangential carpal canal (Gaynor-Hart)
4. Forearm
 - a. AP
 - b. lateral
5. Elbow
 - a. AP
 - b. lateral
 - c. lateral oblique
 - d. medial oblique
 - e. AP partial flexion
 - f. trauma axial laterals (Coyle)
6. Humerus
 - a. AP
 - b. lateral
 - c. neutral
 - d. transthoracic lateral

7. Shoulder

- a. AP internal and external rotation
- b. inferosuperior axial (Lawrence)
- c. posterior oblique (Grashey)
- d. AP neutral
- e. PA oblique (scapular Y)
- f. supraspinatus outlet (Neer)

8. Scapula

- a. AP
- b. lateral

9. Clavicle

- a. AP or PA
- b. AP axial
- c. PA axial

10. Acromioclavicular Joints – AP
bilateral with and without weights

B. Lower Extremities

1. Toes

- a. AP, entire forefoot
- b. AP or AP axial toe
- c. oblique toe
- d. lateral toe
- e. sesamoids, tangential

2. Foot

- a. AP axial
- b. medial oblique
- c. lateral oblique
- d. lateral
- e. AP axial weight bearing
- f. lateral weight bearing

3. Calcaneus

- a. lateral
- b. plantodorsal, axial
- c. dorsoplantar, axial

4. Ankle

- a. AP
- b. mortise
- c. lateral
- d. medial oblique
- e. AP stress
- f. AP weight bearing
- g. lateral weight bearing

5. Tibia/Fibula

- a. AP
- b. lateral

6. Knee/patella

- a. AP
- b. lateral
- c. AP weight bearing
- d. lateral oblique
- e. medial oblique
- f. PA axial–intercondylar fossa (Holmblad)
- g. PA axial–intercondylar fossa (Camp Coventry)
- h. AP axial–intercondylar fossa (Béclère)
- i. PA patella
- j. tangential (Merchant)
- k. tangential (Settegast)

7. Femur

- a. AP
- b. lateral

8. Long Bone Measurement

C. Other

1. Bone Age
2. Bone Survey
3. Arthrography



Attachment B

Standard Terminology for Positioning and Projection

Radiographic View: Describes the body part as seen by the image receptor. Restricted to the discussion of a *radiograph* or *image*.

Radiographic Position: Refers to a specific body position, such as supine, prone, recumbent, erect or Trendelenburg. Restricted to the discussion of the *patient's physical position*.

Radiographic Projection: Restricted to the discussion of the *path of the central ray*.

POSITIONING TERMINOLOGY

A. Lying Down

1. *supine* – lying on the back
2. *prone* – lying face downward
3. *decubitus* – lying down with a horizontal x-ray beam
4. *recumbent* – lying down in any position

B. Erect or Upright

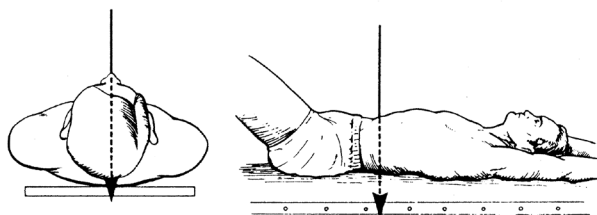
1. *anterior position* – facing the image receptor
2. *posterior position* – facing the radiographic tube

C. Either Upright or Recumbent

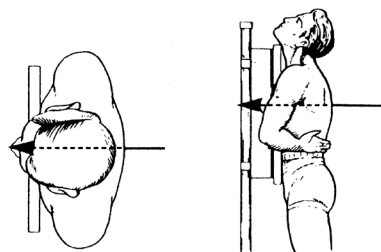
1. oblique torso positions
 - a. anterior oblique (facing the image receptor)
 - i. *left anterior oblique (LAO)* body rotated with the left anterior portion closest to the image receptor
 - ii. *right anterior oblique (RAO)* body rotated with the right anterior portion closest to the image receptor
 - b. posterior oblique (facing the radiographic tube)
 - i. *left posterior oblique (LPO)* body rotated with the left posterior portion closest to the image receptor
 - ii. *right posterior oblique (RPO)* body rotated with the right posterior portion closest to the image receptor
2. oblique extremity positions
 - a. lateral (external) rotation from either prone or supine, outward rotation of the extremity
 - b. medial (internal) rotation from either prone or supine, inward rotation of the extremity



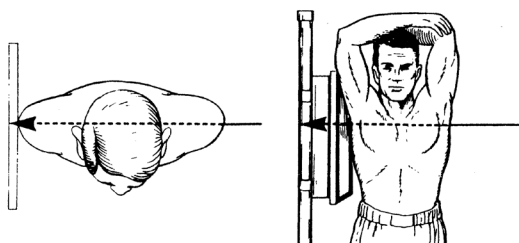
Anteroposterior Projection



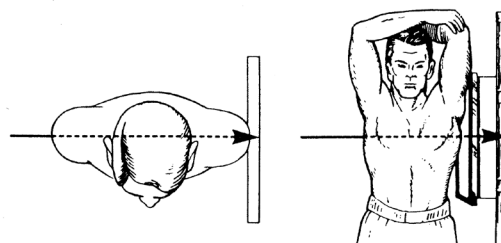
Posteroanterior Projection



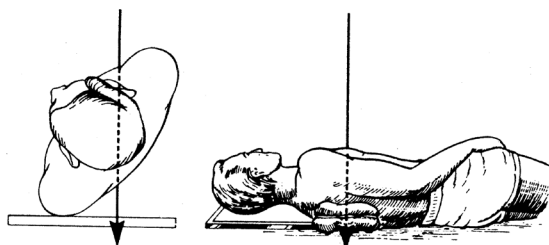
Right Lateral Position



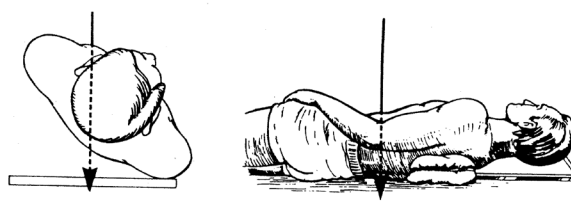
Left Lateral Position



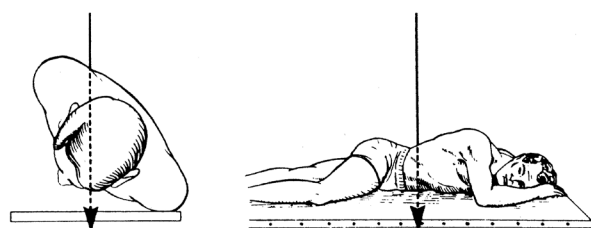
Left Posterior Oblique Position



Right Posterior Oblique Position



Left Anterior Oblique Position



Right Anterior Oblique Position

