RADIOLOGIC TECHNOLOGY PROGRAM

STUDENT HANDBOOK

and

POLICY MANUAL

December 15, 2014

Endorsed by the Radiologic Technology Advisory Board

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Forward

This handbook is designed to be used as a quick reference concerning your responsibilities as a student in the Radiologic Technology Program. It also provides space to record your day-to-day clinical activities and includes your clinical labs.

This handbook will also serve as a supplement to the College Student handbook which is located on the college's web site @https://www.middlesex.mass.edu/deanofstudents/studhand2.aspx. You are encouraged to study these handbooks and be completely familiar with each. These handbooks will assist you with answers to the many questions that arise each year relative to the policies of the college, the program, and clinical affiliates.

Mission Statement

The mission of the Radiologic Technology program is to provide a high quality learning environment, which will prepare Radiographers for the evolving workforce. Through clinical partnerships, students will provide the highest level of quality patient care, employ ALARA standards, perform a variety of diagnostic procedures and participate in professional activities.

Program Goals

1. Students will be clinically competent.
2. Students will engage in professional activities.
3. Students will demonstrate effective communication skills.
4. Students will demonstrate effective critical thinking skills.

Student Learning Outcomes

1. Students will position patients accurately.
2. Students will provide quality patient care.
3. Students will practice radiation safety following ALARA standards.
4. Students will exhibit professional behaviors.
5. Students will demonstrate leadership skills.
6. Students will demonstrate effective written skills.
7. Students will demonstrate effective verbal communication skills.
8. Students will perform non-routine exams effectively.
9. Students will modify technical factors.

COLLEGE POLICIES

The following policies are to be observed while attending the academic portion of the program.

ATTENDANCE:

The course professor establishes attendance requirements.

EXAMINATION:

1. Examination dates are indicated on the course syllabus for each semester and in addition will be announced one week in advance. In case of inclement weather or other unforeseen circumstances, the examination will be held on the next class day.
2. Make-up exams are given at the discretion of the course professor.

ACADEMIC INTEGRITY

1. Cheating: anyone caught cheating on an examination, will receive a zero for that examination. Cheating may result in expulsion from the program.
2. Falsifying Clinical documents will result in expulsion from the program.

GRADING:

A grade of 2.0 = (C) = 73% in all "RAD" didactic courses must be maintained. Those students with below a "C" average will receive a mid-semester warning. Failure to bring up the RAD course grade by semester end will mean expulsion from the program. Consult your college handbook for the letter grading system.

All Clinical courses are graded on a pass/fail basis. A passing grade of 85% or greater must be maintained. Failure to receive a grade of 85% or greater (passing) could mean expulsion from the program.

CREDIT HOURS:

The Radiologic Technology Program calculates credit hours using the formula below:

1. 15 contact hours/semester=1 credit.
2. 1 classroom hour=1 contact hour.
3. 2 lab hours= 1 contact hour
4. 5 clinical hours = 1 contact hour.

Example 1:
Radiologic Positioning I, 3 credit course.
15 week course, 3 contact hours/week.
15x3=45 hours.
45/15=3credits for course.

Example 2:
Clinical Practicum I, 3 credit course.
15 week course, 15 contact hours/week.
15x15=225 hours.
225/5 (ratio of clinic to contact) =45 contact hours/15 (ratio of contact to credit)=3 credit course.

STUDENT RIGHTS:

1. The right to review a student's records and deny continuation in the program due to the student's performance lies with the College and clinical agencies.
2. All official student records are open to the student for inspection.
3. All evaluations conducted in the clinical area are to be signed by the student. This signature signifies that the student has read the evaluation and has received an explanation of the evaluation.

SMOKING:

Middlesex Community College is smoke free.

PROBLEMS:

Recognizing that the College and Hospital Affiliates conduct a joint effort in the education of Radiographers; any problem which may arise within the hospital area, must be discussed with hospital officials before involving the college. Failure to satisfactorily resolve the issue will require a further investigation into the problem by the College faculty in conjunction with hospital personnel.

JRCERT STANDARDS OF COMPLIANCE POLICY:

All complaints regarding allegations that the Radiologic Technology program is in non-compliance of the **STANDARDS FOR AN ACCREDITED EDUCATIONAL PROGRAM IN RADIOLOGIC TECHNOLOGY** can be directed to:

JRCERT
20. N. Wacker Drive
Suite 2850
Chicago, Il 60606-3182
Phone: (312) 704-5300
Fax: (312) 704-5304
mail@jrecert.org or www.jrcert.org

Upon notification from the JRCERT that the program is in non-compliance the program director will meet with the Clinical Coordinators and Clinical Instructors within one week and devise a plan to bring the program into compliance.

STANDARDS FOR AN ACCREDITED PROGRAM IN RAD SCIENCES

Standard One: Integrity

The program demonstrates integrity in the following: representations to communities of interest and the public, pursuit of fair and equitable academic practices, and treatment of, and respect for, students, faculty, and staff.

Standard Two: Resources

The program has sufficient resources to support the quality and effectiveness of the educational process.

Standard Three: Curriculum and Academic Practices

The program's curriculum and academic practices prepare students for professional practice.

Standard Four: Health and Safety

The program's policies and procedures promote the health, safety, and optimal use of radiation for students, patients, and the general public.

Standard Five: Assessment

The program develops and implements a system of planning and evaluation of student learning and program effectiveness outcomes in support of its mission.

Standard Six: Institutional/Programmatic Data

The program complies with JRCERT policies, procedures, and STANDARDS to achieve and maintain specialized accreditation.

HARRASSMENT POLICY:

Students effected by or involved with any form of harassment from or towards any fellow student, faculty, clinical staff, patients or any other individual associated with the Radiologic Technology program are unacceptable, impermissible and intolerable. The accepted definition is that which is published in the college Student Handbook. Allegations of harassment within the clinical setting shall be brought to the attention of the clinical education coordinator and forwarded to the program director for action within the policies of both the clinical education setting and college.

COLLEGE ACTIVITIES:

We do recommend that you become actively involved in college activities, such as the Radiography Club, whenever possible.

STORM DAYS

If college classes are cancelled due to inclement weather, students will not attend the clinical portion of the program. Storm days may require make-up days, at the discretion of the clinical instructor.

COMMUNICABLE DISEASE POLICY

Students will be admitted to the health programs without regard for the presence of communicable disease. Students who have illnesses may continue to participate in the activities of the college as long as they meet acceptable performance standards and medical evidence indicates that their condition is not a threat to themselves, other students or to their patients.

Students who are immunologically compromised will be excused from institutional requirements for certain vaccinations, notable measles and rubella, as these vaccinations may lead to serious consequences in those with poorly functioning immune systems.

BUCKLEY AMENDMENT & STUDENT ACCESS TO RECORDS:

The Family Education Rights and Privacy Act referred to, as The Buckley Amendment, in this policy is to provide the student with a right to privacy and access to his/her school records. Middlesex Community College Radiologic Technology Program will comply with this amendment outlined in the procedure below.

PROCEDURE

Students enrolled in the Radiologic Technology Program will have the following records kept on them:

1. Completed Enrollment Application Form
2. High School Transcripts
3. Letters of Recommendation
4. Placement Examination
5. Transcripts
6. Clinical Competency Evaluations
7. Performance Evaluations
8. Attendance
9. Didactic Examination Scores

The following people will have the responsibility of maintaining and keeping all program related records. These individuals are also authorized to have access to all the aforementioned records.

1. Program Director, Radiologic Technology Program
2. Clinical Coordinator, Radiologic Technology Program
3. Clinical Instructors, Radiologic Technology Program

The members of a site visitation team performed by the Joint Review Committee on Education in Radiologic Technology (for the purpose of accreditation only) will have temporary access to all records only during the actual visitation.

Students wishing to view their records may do so by requesting access from the program director. If there are documents in which the student has waived the right to view, they will be removed from the folder before being given to the student.

After the student has completed viewing the folder, any documents removed will be returned and the file is then returned to the central file.
Records will not be shown to anyone else or mailed to any other institution without the written consent of the student.

CERTIFICATION EXAMINATION

The American Registry of Radiologic Technologists offers its examination on a computer based testing format. See Examinee Handbook for details. An application fee is required. The application is filled out by the student and endorsed by the Radiologic Technology Program Director.

Individuals convicted of a crime may not be eligible for the American Registry of Radiologic Technologist certification examination.

PROFESSIONAL SOCIETY MEMBERSHIP

Membership in the American Society of Radiologic Technologist and membership in the Massachusetts Society of Radiologic Technologist is encouraged. Applications will be distributed during department orientation.

CPR CERTIFICATION

Students enrolled in the Radiography program will be required to obtain CPR certification at the health care provider level. A copy of your CPR card will be kept on file at the college.

HEALTH PROGRAMS HEALTH REQUIREMENTS

MIDDLESEX COMMUNITY COLLEGE
HEALTH & STEM DIVISION

Students accepted to Health Programs will complete the following Immunization and Health Requirements in order to participate in a field placement or clinical experience. **Students who are not in compliance with these policies will not be allowed to participate in clinical experiences**.

Health Record Requirements

Completion of:

1. Personal Health History form.
2. Physical examination and evaluation form by the student's health care provider.
3. Testing for Color Deficiency. (This may be done at the Center for Health & Wellness).
4. Two-step test for Tuberculosis, done within three months of entering the program and updated annually. (A negative chest x-ray report is required of all students who are known positive reactors to the Mantoux test).

Immunization Requirements:

Documentation of:

1. Tdap vaccination (one lifetime dose given after 2005).

2. Two doses of MMR vaccine, give at least one month apart on/or after 12 months of age and after 1968, **OR** a positive Titer report for all three - (1) Rubeola, (2) Mumps, (3) Rubella , **OR** documentation of one **MMR and** supporting immunity laboratory reports.

3. Completion of the 3 dose Hepatitis B (HBV) vaccine series, **OR** a positive Hepatitis B Antibody Titer report.

4. A positive Varicella Titer, **OR** if not immune, two doses of Varicella vaccine given one month apart.

Note: The annual Flu vaccine is strongly recommended for all students enrolled in a health program. Some clinical sites may require students to be immunized annually with the flu vaccine in order to participate in clinical at that site.

OSHA Requirements:

1. Color Deficiency testing.
2. Education for OSHA Blood-borne Pathogen Standard and Universal Precautions for all health program students prior to clinical placement.

Malpractice Insurance

Malpractice/Liability Coverage of one million dollars per incident and three million dollar aggregate is maintained for all students in health programs. This insurance only addresses a claim arising from activities required by the student's program.

Student Health and Medical Insurance:

All students enrolled in Health Programs are required to carry health insurance because of the potential of exposure to a variety of communicable/infectious diseases as well as contractual requirements of some affiliating agencies. The period of coverage must be current throughout students' enrollment in the Health Program.

Health Record Clearance for Participation in the Clinical Area:

All enrolled Health Program students, new and returning, will be expected to have completed the Health, Immunizations and OSHA (Color Deficiency Testing) requirements prior to participation in any clinical course.

All students should submit records to the Center for Health & Wellness as soon as possible after acceptance. The records will be reviewed and depending upon completeness of the record, the program coordinator will be notified regarding medical clearance status for students enrolled in their specific programs.

Medical Clearance for Return to Class/Clinical after Illness/Injury:

1. Students are responsible to notify their course faculty/clinical instructor and the appropriate Assistant Dean* within 24 hours of any change in health status, including but not limited to:
    - exposure to a reportable disease requiring isolation/quarantine
    - symptoms/disease
    - accident/injury
    - any condition that may change health status

    *students in the Nursing Program should notify the Assistant Dean of Nursing, all other health program students should notify the Assistant Dean of Health.

2. The Assistant Dean will provide the student with a copy of a clinical clearance form to submit to the student's health care provider.

3. Students will not be permitted to return to classes or the clinical area until documentation from the health care provider is returned to the appropriate Assistant Dean and the student is cleared to return.

4. The Assistant Dean will notify the appropriate course faculty/clinical instructor that the student is cleared to return, and send the original of the clinical clearance form to the Center for Health & Wellness.

LABORATORY POLICY

Students will adhere to the laboratory policy when practicing with each other during open labs, performing assessments, and or conducting phantom radiography.

- Students must wear radiation monitors when at their clinical affiliate and at the college when using the energized lab.
- The radiation monitors are to be worn at the collar.
- Students must be supervised by a licensed Radiographer or the x-ray tube needs to be deactivated when using the energized lab at the college.
- Any student not wearing a radiation monitor will not be allowed to use the lab.
- Students will never hold a phantom or image receptor during a procedure while ionizing radiation is in use.
- There will be no eating or drinking in the lab.
- The students will bring a positioning partner with him/her during open lab.
- The lab will be cleaned after each use.

HOSPITAL AND PROGRAM POLICIES

CLINICAL AFFILIATION

Following is a list of hospitals that have, through formal agreements, agreed to act as the clinical agencies for our program. In order that we maintain continuity in your clinical education, students will rotate to at least two clinical sites. A copy of the agreement between Middlesex and its affiliate hospitals is kept on file in the College faculty office and the Radiology department.

Emerson Hospital-Concord, MA

David Rose, MD	Chief Radiologist
Pat Sousa	Director of Radiology
Marianne Green, RTR	Clinical Instructor

Lahey Hospital and Medical Center Burlington, MA

Dr. Curtis W. Bakal	Chairman of Radiology
Patricia Doyle,MBA,CRA,RTR, MR	Director of Radiology
Elaine McHugh, RTR	Clinical Instructor

Newton-Wellesley Hospital – Newton, MA

Steven Miller, M.D.	Chief Radiologist
Laura Chapman, RTR	Department Manager
Sheila Lenihan, RTR	Clinical Instructor
Kathy Gerrish, RTRM	Clinical Instructor

Lowell General Hospital, Saints Campus – Lowell, MA

Dr. Scott Abele	Chief Radiologist
Susan Kalil, RTR	Department Manager
Karen Brunelle, RTR	Clinical Instructor

Winchester Hospital – Winchester, MA

Robert Fortunato, MD	Chief Radiologist
Steve Re, RTR	Administrative Director
Julie Dalton, RTR	Clinical Instructor

Newton-Wellesley Hospital – Waltham Urgent Care

Steven Miller, M.D.	Chief Radiologist
Laura Chapman, RTR	Department Manager
Sheila Lenihan, RTR	Clinical Instructor
Suzanne Morash, RTR	Clinical Instructor

CLINICAL ASSIGNMENTS

Students will be assigned to at least two of the clinical agencies listed above during their two years in the Radiology Program. Students must be willing to commute to be successful in the Program.

CLINIC/CLASSROOM HOURS

The Joint Review Committee on Education in Radiologic Technology recommends that a combination of clinic experience and classroom hours not exceed 40 hours per week. Under our present system, the student is below the requirement of the 40 hours per week.

Clinic Rotation will be as follows:
Freshmen.....Tuesday and Thursday - Both semesters 7:30-3:30
Summer Practicum - Monday thru Friday 7:30-3:30 for 10 weeks
Seniors.....Monday, Wednesday, and Friday 7:30-3:30.

ATTENDANCE

As a professional, we have a responsibility to the patient and hospital staff to arrive at the clinic on assigned time. Therefore, clinic punctuality is a must.
(See attendance sheets)

TARDINESS

First incident per practicum - informal verbal warning.
Second incident per practicum - formal written warning.
Third incident per practicum - written warning to include a "last chance" notice.
Fourth incident per practicum - Dismissal from clinical practicum.
Each incident and action must be documented.

ABSENCE

Students will be required to attend all clinical days. Any absence that occurs must be made up before the end of the semester in which the absence occurred at the discretion of program faculty.

EXTENDED LEAVE

An extended leave of absence may be granted for extraordinary circumstances. This leave time will be made-up and granted at the discretion of the Clinical Instructor and Program Director

HOSPITAL POLICIES & PROCEDURES

Follow the rules and regulations of your own hospital and department as established and explained by your clinical supervisors.

PATIENT CONFIDENTIALITY POLICY (HIPAA)

Students in the Radiologic Technology Program will have access to patient and hospital information. This information may contain data that is confidential such as technical, non-technical, medical records and other information that is not available to the public. This information is the property of the clinical site that the student is assigned. Maintaining confidentiality is essential in the student's access to and use of this information.

Students will be required to sign a statement of confidentiality to be kept on file at the college. The clinical sites will also ask the students to sign a statement of confidentiality.

Any student violating the confidentiality policy will be subject to disciplinary action up to and including dismissal from the clinical site and/or the Radiology Program.

GRIEVANCE

Any problem that may arise between the student and the department and/or its personnel must be discussed FIRST with clinical instructor. If there is no mutually satisfactory resolution, then a request for college faculty to participate in the discussion may be initiated by either party, with advance written notification to ALL parties concerned. An Instructor – Student Conference form will be filled out for all meetings between students and their Instructors. See college handbook for additional information regarding the grievance policy.

PERSONAL APPEARANCE

Students will follow the uniform policy listed below. Failure to follow these policies will result in the student being sent home and making up the day at a later time.

Wear clean, appropriate footwear, no clogs. Foot must be enclosed in the shoe.
Jewelry may be worn. (in accordance with hospital policy)
Have neat hairstyle. Both men and women with long hair must tie it back or pin it up.
Moderate make-up may be worn.
Oral and personal hygiene is a must.
Name tags and radiation monitor badges must be worn at all times. (See Clinical Instructor)
Beards must be kept neat, trimmed and clean at all times
Hunter Green pants to match Green top, optional lab coat.
Imaging patch to be worn on left sleeve
Artificial nails are forbidden in the clinical area

STIPENDS

No stipend will be paid to the student at any time during the program.

VACATION

No modification or substitutions are to be made for vacations during the academic year.

TRANSFERS

Transfer to other clinical affiliations occurs only as a final option. If a clinical transfer does take place, the student will undergo a three-month probation period at the new hospital. No more than two clinical placements will be allowed.

Requests for transfers must be submitted in writing by the student to the Program Director

The Program reserves the right to transfer students as needed.

SICK TIME (calling in)

Students must phone their clinical instructors according to hospital policy if they will be out sick.

SMOKING

All of our Clinical sites are smoke free.

RADIATION SAFETY and MONITOR POLICY

IT IS REQUIRED BY LAW THAT ALL PERSONS WORKING WITH OR AROUND X-RAY EQUIPMENT AND/OR RADIOACTIVE MATERIALS WEAR CURRENT RADIATION MONITORS.

Radiation monitors are furnished to students in accordance with existing state and federal regulations, which require that students wear them when working in areas where potential radiation exposure may occur. The reports regarding your exposure become a part of your permanent record and are open for your inspection. When you leave this institution, be sure to request a copy of your exposure record to either take with you or to have sent to your employer.

In order to utilize the radiation monitor most effectively and to have the most accurate records possible, the following regulations must be observed:

- Students must wear radiation monitors when at their clinical affiliate and at the college when using the energized lab.
- Students must be supervised by a licensed Radiographer or the x-ray tube needs to be deactivated when using the energized lab at the college.
- The radiation monitors are to be worn as follows: At the collar, outside the apron.
- Any student not wearing a radiation monitor will not be allowed in radiation areas, and the time missed will be considered a clinical absence.
- Students will be required to wear a lead apron and thyroid shield during procedures such as: fluoroscopy, C-arm procedures, and portable radiography
- Students will never hold a patient or image receptor during a procedure while ionizing radiation is in use.
- Students will never take an exposure while a Radiographer is holding a patient and or an Image receptor.
- Students will properly shield all patients while performing procedures. Failure to do so will result in a 15 point deduction from the student's grade if failure to shield occurs during a competency exam.

Notice: Students will be instructed in the as low as reasonably achievable (ALARA) philosophy. The Program Director, Clinical faculty, Chief Radiologist, Radiation Safety Officer, Radiation Physicist, or all five, will investigate all instances in which dose limits are exceeded. The student will then be counseled as to the appropriate course of action and review of radiation safety practices. Actual dose limit is <u>any single quarterly reading of 80 mrem or above</u>. "Accidental" exposures due to badges left on aprons, etc., will be documented where proven.

Notice: failure to adhere to this policy may result in dismissal from the program.

PERSONAL MEDICAL INSURANCE

Clinical sites, by contractual agreement, will NOT pay for injuries/illness incurred on site. Students will be provided appropriate medical care (on site) but the student's personal medical insurance will be billed. All students are required to carry medical insurance while attending the program.

COMMUNICABLE DISEASE POLICY

Students in the health programs are expected to deliver care without prejudice to all patients. The only exception to the above would be in consideration of personal risk factors, such as in cases of immunosuppression.

Students are required to follow the policies governing caring for patients with communicable diseases that are written at each of the clinical agencies. Students must also follow the agency policies on caring for patients when the caregiver has a communicable disease.

Students in the health programs must realize that they have an ethical and legal responsibility to the individual for whom they provide care to maintain a high standard of health.

BLOOD and BODY FLUIDS EXPOSURE GUIDELINES

POLICY:
Any injury which results in an exposure (of mucous membranes, open skin lesions, sharp instruments or needle sticks) to blood or other body fluids at on-campus clinics or laboratories should be reported to the College Health Service at the time of the exposure. The following guidelines should be used to protect the student (or employee) and provide immediate assistance. The referral for an exposure should be to a hospital emergency facility.

Report Exposure Incident / First Aid:
Inform Clinical Instructor or Supervisor of the exposure immediately before continuing any further patient procedures.
Initiate first aid by cleansing affected areas well: mucus membrane, open skin lesions, site of needle stick or sharp instrument puncture, etc.

Exposure Counseling:
The Clinical Instructor or Supervisor should discuss with student and source patient:
a.The importance of testing immediately for HIV, HBV, and HCV (CDC notice 4/98).
b.Confidentiality of testing and reporting (written permission required for both at the testing site.)

Cost of Testing:
Testing for the source patient should be billed to the College Health Service.

Student's insurance will be billed for the testing (and chemoprophylaxis if warranted). Any special insurance notification should be completed at this time.
Employees will be covered by Workers' Compensation Insurance (contact College Health Service Office within 24 hours to initiate claim).

Referral:
Student (or employee) and source patient should be referred immediately to a hospital emergency facility.
Call ahead to the emergency facility to notify of arrival.
If student or source patient chooses to use own personal physician, the Supervisor should inform the physician's office of the nature of the exposure and request testing as soon as possible within two hours. (If this is the primary care physician and the patient is unable to be seen quickly, ask to which hospital emergency unit the student may be referred.)
As a source of information for decision-making at the testing site, a copy of the Accident Report should be sent with the student. Include last Tetanus-diphtheria date and Hepatitis B vaccine status.

Accident Report:
Complete the **Accident Report: Blood and Body Fluid Exposure** form.
Notify Director of Health Services and forward original Accident Report to the Lowell Campus Health Service Office with copies to:
a. Program Coordinator

Refusal of Evaluation:
The student has the right to refuse testing and evaluation. In this case, the student should sign the Declination of Testing and/or Follow-up Procedures statement on the Accident Report form.

Exposure Follow-up:
The Director of Health Services will work with the student/employee regarding post-exposure follow-up testing.

CLINICAL DIFFERENCES

It is the intent and objective of the Radiologic Technology Program (College and Affiliate Hospitals) to be as uniform as possible with regard to activities for all students. Unfortunately, all hospitals are individual and unique institutions and for this reason there will be different policies and responsibilities at each clinical facility. Any questions which may arise concerning these differences will be gladly answered by College Faculty or Clinical Instructors. Students will be required to rotate to at least two affiliate hospitals.

TREATMENT OF PATIENTS

All patients with whom the student comes into contact will be treated with respect and dignity. Casual conversation to explain the examination will help relieve the patient of any unnecessary anxiety and is a must. Treat every patient as if you were the one being radiographed.

STUDENTS CLINICAL RECORD OF WORK

During your clinic time all procedures performed by you must be recorded. There must be some record of what you do each day in clinic from the first clinic day to the last.

The student's daily activity log is a day-to-day record of the different activities and procedures performed by you in the hospital clinic. Keep this record up-to-date, as it will be checked from time to time by college and hospital faculty.

At the end of each month the Student's Summary Activity form is to be completed.

EVALUATIONS

COMPETENCY EVALUATION SYSTEM

There are core clinical competencies that all students must demonstrate to establish eligibility for ARRT certification. The Competency Evaluation System is a standardized method of evaluating the performance and progress of students performing radiographic exams. Students must demonstrate competency in all 36 of the mandatory procedures and at least 15 of the elective procedures.

At a time elected by the student and clinical instructor, within each semester, the student must demonstrate his/her skill and competency in a particular unit of radiographic examinations. To be rated competent, the student must perform with a 85% accuracy rate for those examinations within the particular unit being evaluated and up to three retention evaluations from the previous Clinical Practicum. Before progressing to the next practicum, the student must demonstrate competency in the preceding areas.
Process:

The clinical evaluation will be declared by the student or clinical instructor prior to the examination. The student cannot refer to protocol or positioning books during the evaluation.

If a student fails to perform with at least an 85% accuracy rate he/she shall be required to follow the System for Failure as outlined below:

Notice:

1. Repeat images will result in a deduction of 15 points on clinical competency evaluations.

2. Intervention by the Clinical Instructor or Staff Radiographer, for reasons such as failure to properly shield, failure to set proper technical factors, or improper positioning, will result in a deduction of 15 points on clinical competency evaluations.

System for First and Second Failures:

Clinical instructor and student will discuss reason (s) for failure.
Student will review the text, and appropriate course notes pertinent to that practicum.
The student will be re-assigned to that particular area to practice and gain additional experience.
The student will then be re-evaluated by the clinical instructor and in this evaluation must perform with at least a 90% accuracy rate to be rated competent.

Third Failure:

The program director at Middlesex Community College shall be advised of this situation. Overall academic and clinical status of the student shall be assessed jointly by the College's Program Director and the Hospital's Clinical Instructor and a decision made as to the advisability of the student's continuing within the program.

MONTHLY EVALUATION SYSTEM

This is a structured evaluation process that has been designed to evaluate the student's clinical performance. At the end of every month the student will complete a self-evaluation. When the self-evaluation is complete, the clinical instructor will complete the evaluation, and review it with the student. The evaluation is to help the student by providing an overview of their attributes and weaknesses. These evaluations will be graded and used towards determining the student's semester grade. The student will be evaluated on the following areas:

Patient Care and Communication
Collegiality and Professionalism
Physical Safety
Radiation Safety
Quality of work and performance

STUDENT COMPETENCY EVALUATION AND LEVEL OF SUPERVISION

Until students achieve the program's required competency in a given procedure, all clinical assignments should be carried out under the direct supervision of qualified Radiographers. Following are the parameters of **direct supervision:**

1. A qualified Radiographer reviews the request for examination in relation to the student's achievement.

2. A qualified Radiographer evaluates the condition of the patient in relation to the student's knowledge.

3. A qualified Radiographer is present during the conduct of the examination.

4. A qualified Radiographer reviews and approves the radiographs.

After demonstrating competency, students may perform procedures with **indirect supervision.**

Indirect supervision is defined as supervision provided by a qualified Radiographer **immediately** available to assist students regardless of the level of student achievement.

Immediately Available is interpreted as the presence of a qualified Radiographer adjacent to the room or location when a radiographic procedure is being performed. This availability applies to all areas where ionizing radiation equipment is in use.

1. In support of professional responsibility for provision of quality patient care and radiation protection, **unsatisfactory radiographs shall be repeated only in the presence of a qualified Radiographer**, regardless of the student's level of competency.

2. In support of professional responsibility for provision of quality patient care and radiation protections, **all finished radiographs shall be reviewed and approved by a qualified Radiographer prior to dismissing the patient**, regardless of the student's level of competency.

REPEAT RADIOGRAPH POLICY

In support of professional responsibility for provision of quality patient care and radiation protection, **unsatisfactory radiographs shall be repeated only in the presence of a qualified Radiographer**, regardless of the student's level of competency.

1. Student and qualified radiographer review the radiograph, identify unacceptable factors and needed corrections.
2. Student identifies how corrections will be implemented.
3. If student's correction plan is unacceptable return to steps 1 and 2. If plan is satisfactory to the radiographer, continue to step 4.
4. Student implements corrections and makes exposure in the presence of, and with the approval of, the qualified radiographer after the qualified Radiographer has checked the console for appropriate technical factors and entered the exam room to recheck equipment manipulation and patient positioning.
5. Student is required to secure radiographer's signature who supervised repeat on Daily Log Sheet.
6. Student is required to record repeat and reason for repeat on Daily Log Sheet.
7. Prior to deleting an image, consult Registered Technologist.

Notice: Failure to adhere to this policy may result in dismissal from the program.

CRITICAL CLINICAL OBJECTIVES

Critical Clinical Objectives evaluate those affective and cognitive skills that are necessary for success in the Radiologic Technology profession. The student must successfully meet each Critical Clinical Objective to pass the practicum.

CLINICAL GRADING PROCESS

Clinical grades will be given five times during the 21-month program (December, May and August of the freshman year, December and May of the sophomore year). This grade will be determined by evaluating performance in the following two areas:

Clinical Competency Exams - 60 points.
Monthly Evaluations - 40 points.

PROCEDURE
During the semester, each area (Clinical Competency Exams and Monthly Evaluations) will be evaluated and points deducted according to the explanations given below. At the end of each semester, these points are totaled and a grade is given.

1. Clinical Competency Exams - 60 points

During the semester, Clinical Competency Exams are given. Prior to this, a series of steps must be followed.

Example:
Positioning of the Upper Extremity Presentation will occur in class. The following week, role-play positioning a fellow student for radiographs of the upper extremity will occur at the college.

At the clinic, you will be told ahead of time which positions you are responsible for and they will be reviewed with you. You are graded according to a checklist of steps that must be completed for each position. You will be given a list of the general requirements for each Competency Exam to review.

For each section, the points will be totaled and a number grade given. At the end of the Semester, these grades will be averaged. This average will account for 60% of your final clinical grade.

Example:

Chest	88
KUB	94
Thumb	96
Hand	82
Wrist	98
Forearm	+100

558 / 6 = 93 average
x 60%
56 points awarded for this section

2. Monthly Evaluations - 40 points

At the end of each month, the clinical instructor will fill out an evaluation. The points will be totaled and a number grade given to this evaluation. At the end of the semester, these grades will be averaged. This average will account for 40% of your final clinical grade.

Example:

September	92
October	98
November	94
December	+100

384 / 4 = 96 average
x 40%
38 points awarded for this section

Semester average for student used in examples:

Clinical Competency Exams.....56
Monthly Evaluations.....……..38

SEMESTER CLINICAL GRADE...94%

CODE - P = 85 - 100%
F = below 85%

A clinical grade below 85% is considered failure.

CLINICAL GRADE SHEET

Grade sheets will be maintained by your Clinical Instructor and a copy mailed to the college. These grades will be based on your clinical competency evaluations. For transcript purposes, the grade will be recorded as a Pass/Fail.

RADIATION PROTECTION GUIDELINES FOR PREGNANT STUDENTS AND FACULTY

Should a student or faculty member become pregnant while employed / enrolled in the Radiography Program, she is under **NO** requirement to declare her pregnancy status to any individual associated with the program. Should she voluntarily elect to declare her pregnancy status, she may do so by using the "*Form letter for Declaring Pregnancy*", and submitting it to the Program Director. At any time after she declares should she wish to reverse that decision she may do so by submitting her intention in writing to the program director. At that time her status will revert to that in effect before her declaration.

Should she elect NOT to declare her pregnancy status, or reverse her declaration, it is understood that the program is under no requirement to afford any measures with regard to radiation safety other than those, which are routinely afforded to all radiography students and faculty.
Should she declare and submit the declaration form to the Program Director, the following measures will become effective for the duration of her pregnancy or declaration, while she is enrolled within or employed by the program:

1. The Program Director or Clinical Instructor will initiate the use of the form entitled "Radiation Received During Gestational Period".

2. The student will be counseled by the Program Director, Clinical Instructor, Chief Radiologist, Radiation Safety Officer, Radiation Physicist, or all five, regarding methods to protect herself from ionizing radiation, and she will be asked to read the previously distributed Regulatory Guide 8.13, and or NCRP Report No. 54 and the Technical Bulletin Radiation Safety Considerations for the Declared Pregnant Worker.

3. The student must wear a radiation monitor at all times when working with ionizing radiation. An additional badge will be worn at waist level and must not leave the hospital property at any time except when being sent out for processing and reading.

4. Students will have the option to continue their clinical education without modification,
during the entire gestational period.

5. Rotations evaluations, and/or clinic time missed because of pregnancy must be made up. The student will assume the responsibility of meeting with the Program Director and Clinical Instructor to plan this make-up time.

6. Under no circumstance will a pregnant or any student hold or assist in holding a patient or image receptor during a radiographic exposure.

7. The student must bring to the Program Director, as soon as possible, written permission from her physician permitting her to continue her clinical assignments.

7. The student will not be permitted to receive a cumulative radiation dose exceeding 0.5 rem (500 millirems) during the gestation period. The following will be done to ensure that the limit is not exceeded:

a. The radiation monitor reports will be carefully monitored during the gestation period noting averages and trends that may cause the cumulative exposure to exceed the limit. The results will be shared with the student following receipt of each exposure report.

b. The student will be counseled by the Program Director, Clinical Instructor, Chief Radiologist, Radiation Safety Officer, Radiation Physicist, or all five, if and when the cumulative radiation dose during the gestation period reaches 250 mrem.

NRC Report and Regulatory Guide 8.13 will be followed.

Revision 3 NRC Report

JUNE 1999

REGULATORY GUIDE 8.13

(Draft was issued as DG-8014)

INSTRUCTION CONCERNING PRENATAL RADIATION EXPOSURE

A. INTRODUCTION
The Code of Federal Regulations in 10 CFR Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations," in Section 19.12, "Instructions to Workers," requires instruction in "the health protection problems associated with exposure to radiation and/or radioactive material, in precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed." The instructions must be "commensurate with potential radiological health protection problems present in the work place."

The Nuclear Regulatory Commission's (NRC's) regulations on radiation protection are specified in 10 CFR Part 20, "Standards for Protection Against Radiation"; and 10 CFR 20.1208, "Dose to an Embryo/Fetus," requires licensees to "ensure that the dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 0.5 rem (5 mSv)." Section 20.1208 also requires licensees to "make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman." A declared pregnant woman is defined in 10 CFR 20.1003 as a woman who has voluntarily informed her employer, in writing, of her pregnancy and the estimated date of conception.

This regulatory guide is intended to provide information to pregnant women, and other personnel, to help them make decisions regarding radiation exposure during pregnancy. This Regulatory Guide 8.13 supplements Regulatory Guide 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure" (Ref. 1), which contains a broad discussion of the risks from exposure to ionizing radiation.

Other sections of the NRC's regulations also specify requirements for monitoring external and internal occupational dose to a declared pregnant woman. In 10 CFR 20.1502, “Conditions Requiring Individual Monitoring of External and Internal Occupational Dose,” licensees are required to monitor the occupational dose to a declared pregnant woman, using an individual monitoring device, if it is likely that the declared pregnant woman will receive, from external sources, a deep dose equivalent in excess of 0.1 rem (1 mSv). According to
Paragraph (e) of 10 CFR 20.2106, “Records of Individual Monitoring Results,” the licensee must maintain 8.13-8.13-1 records of dose to an embryo/fetus if monitoring was required, and the records of dose to the embryo/fetus must be kept with the records of dose to the declared pregnant woman. The declaration of pregnancy must be kept on file, but may be maintained separately from the dose records. The licensee must retain the required form or record until the Commission terminates each pertinent license requiring the record.

The information collections in this regulatory guide are covered by the requirements of 10 CFR Parts 19 or 20, which were approved by the Office of Management and Budget, approval numbers 3150-0044 and 3150-0014, respectively. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

B. DISCUSSION

As discussed in Regulatory Guide 8.29 (Ref. 1), exposure to any level of radiation is assumed to carry with it a certain amount of risk. In the absence of scientific certainty regarding the relationship between low dose exposure and health effects, and as a conservative assumption for radiation protection purposes, the scientific community generally assumes that any exposure to ionizing radiation may cause undesirable biological effects and that the likelihood of these effects increases as the dose increases. At the occupational dose limit for the whole body of 5 rem (50 mSv) per year, the risk is believed to be very low.

The magnitude of risk of childhood cancer following in-utero exposure is uncertain in that both negative and positive studies have been reported. The data from these studies “are consistent with a lifetime cancer risk resulting from exposure during gestation which is two to three times that for the adult” (NCRP Report No. 116, Ref. 2). The NRC has reviewed the available scientific literature and has concluded that the 0.5 rem (5 mSv) limit specified in 10 CFR 20.1208 provides an adequate margin of protection for the embryo/fetus. This dose limit reflects the desire to limit the total lifetime risk of leukemia and other cancers associated with radiation exposure during pregnancy.

In order for a pregnant worker to take advantage of the lower exposure limit and dose monitoring provisions specified in 10 CFR Part 20, the woman must declare her pregnancy in writing to the licensee. A form letter for declaring pregnancy is provided in this guide or the licensee may use its own form letter for declaring pregnancy. A separate written declaration should be submitted for each pregnancy.

C. REGULATORY POSITION

1. Who Should Receive Instruction

Female workers who require training under 10 CFR 19.12 should be provided with the information contained in this guide. In addition to the information contained in Regulatory Guide 8.29 (Ref. 1), this information may be included as part of the training required under 10 CFR 19.12.

2. Providing Instruction

The occupational worker may be given a copy of this guide with its Appendix, an explanation of the 8.13-8.13-2 contents of the guide, and an opportunity to ask questions and request additional information. The information in this guide and Appendix should also be provided to any worker or supervisor who may be affected by a declaration of pregnancy or who may have to take some action in response to such a declaration.

Classroom instruction may supplement the written information. If the licensee provides classroom instruction, the instructor should have some knowledge of the biological effects of radiation to be able to answer questions that may go beyond the information provided in this guide. Videotaped presentations may be used for classroom instruction. Regardless of whether the licensee provides classroom training, the licensee should give workers the opportunity to ask questions about information contained in this Regulatory Guide 8.13. The licensee may take credit for instruction that the worker has received within the past year at other licensed facilities or in other courses or training.

3. Licensee's Policy on Declared Pregnant Women

The instruction provided should describe the licensee's specific policy on declared pregnant women, including how those policies may affect a woman's work situation. In particular, the instruction should include a description of the licensee's policies, if any, that may affect the declared pregnant woman's work situation after she has filed a written declaration of pregnancy consistent with 10 CFR 20.1208.

The instruction should also identify who to contact for additional information as well as identify who should receive the written declaration of pregnancy. The recipient of the woman's declaration may be identified by name (e.g., John Smith), position (e.g., immediate supervisor, the radiation safety officer), or department (e.g., the personnel department).

4. Duration of Lower Dose Limits for the Embryo/Fetus

The lower dose limit for the embryo/fetus should remain in effect until the woman withdraws the declaration in writing or the woman is no longer pregnant. If a declaration of pregnancy is withdrawn, the dose limit for the embryo/fetus would apply only to the time from the estimated date of conception until the time the declaration is withdrawn. If the declaration is not withdrawn, the written declaration may be considered expired one year after submission.

5. Substantial Variations above a Uniform Monthly Dose Rate

According to 10 CFR 20.1208(b), “The licensee shall make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman so as to satisfy the limit in paragraph (a) of this section,” that is, 0.5 rem (5 mSv) to the embryo/fetus. The National Council on Radiation Protection and Measurements (NCRP) recommends a monthly equivalent dose limit of 0.05 rem (0.5 mSv) to the embryo/fetus once the pregnancy is known (Ref. 2). In view of the NCRP recommendation, any monthly dose of less than 0.1 rem (1 mSv) may be considered as not a substantial variation above a uniform monthly dose rate and as such will not require licensee justification. However, a monthly dose greater than 0.1 rem (1 mSv) should be justified by the licensee.
8.13-8.13-3

IMPLEMENTATION
The purpose of this section is to provide information to licensees and applicants regarding the NRC staff's plans for using this regulatory guide.

Unless a licensee or an applicant proposes an acceptable alternative method for complying with the specified portions of the NRC's regulations, the methods described in this guide will be used by the NRC staff in the evaluation of instructions to workers on the radiation exposure of pregnant women.

REFERENCES

1. USNRC, “Instruction Concerning Risks from Occupational Radiation Exposure,” Regulatory Guide 8.29, Revision 1, February 1996.

2. National Council on Radiation Protection and Measurements, Limitation of Exposure to Ionizing Radiation, NCRP Report No. 116, Bethesda, MD, 1993.
8.13-8.13-4
APPENDIX

QUESTIONS AND ANSWERS CONCERNING PRENATAL RADIATION EXPOSURE

1.Why am I receiving this information?
The NRC's regulations (in 10 CFR 19.12, “Instructions to Workers”) require that licensees instruct individuals working with licensed radioactive materials in radiation protection as appropriate for the situation. The instruction below describes information that occupational workers and their supervisors should know about the radiation exposure of the embryo/fetus of pregnant women.
The regulations allow a pregnant woman to decide whether she wants to formally declare her pregnancy to take advantage of lower dose limits for the embryo/fetus. This instruction provides information to help women make an informed decision whether to declare a pregnancy.

2. If I become pregnant, am I required to declare my pregnancy?
No. The choice whether to declare your pregnancy is completely voluntary. If you choose to declare your pregnancy, you must do so in writing and a lower radiation dose limit will apply to your embryo/fetus. If you choose not to declare your pregnancy, you and your embryo/fetus will continue to be subject to the same radiation dose limits that apply to other occupational workers.

3. If I declare my pregnancy in writing, what happens? If you choose to declare your pregnancy in writing, the licensee must take measures to limit the dose to your embryo/fetus to 0.5 rem (5 millisievert) during the entire pregnancy. This is one-tenth of the dose that an occupational worker may receive in a year. If you have already received a dose exceeding 0.5 rem (5 mSv) in the period between conception and the declaration of your pregnancy, an additional dose of 0.05 rem (0.5 mSv) is allowed during the remainder of the pregnancy. In addition, 10 CFR 20.1208, “Dose to an Embryo/Fetus,” requires licensees to make efforts to avoid substantial variation above a uniform monthly dose rate so that all the 0.5 rem (5 mSv) allowed dose does not occur in a short period during the pregnancy. This may mean that, if you declare your pregnancy, the licensee may not permit you to do some of your normal job functions if those functions would have allowed you to receive more than 0.5 rem, and you may not be able to have some emergency response responsibilities.

4. Why do the regulations have a lower dose limit for the embryo/fetus of a declared pregnant woman than for a pregnant worker who has not declared? A lower dose limit for the embryo/fetus of a declared pregnant woman is based on a consideration of greater sensitivity to radiation of the embryo/fetus and the involuntary nature of the exposure. Several scientific advisory groups have recommended (References 1 and 2) that the dose to the embryo/fetus be limited to a fraction of the occupational dose limit. 8.13-8.13-5

5. What are the potentially harmful effects of radiation exposure to my embryo/fetus? The occurrence and severity of health effects caused by ionizing radiation are dependent upon the type and total dose of radiation received, as well as the time period over which the exposure was received. See Regulatory Guide 8.29, “Instruction Concerning Risks from Occupational Exposure” (Ref. 3), for more information. The main concern is embryo/fetal susceptibility to the harmful effects of radiation such as cancer.

6. Are there any risks of genetic defects? Although radiation injury has been induced experimentally in rodents and insects, and in the experiments was transmitted and became manifest as hereditary disorders in their offspring, radiation has not been identified as a cause of such effect in humans. Therefore, the risk of genetic effects attributable to radiation exposure is speculative. For example, no genetic effects have been documented in any of the Japanese atomic bomb survivors, their children, or their grandchildren.

7. What if I decide that I do not want any radiation exposure at all during my pregnancy? You may ask your employer for a job that does not involve any exposure at all to occupational radiation dose, but your employer is not obligated to provide you with a job involving no radiation exposure. Even if you receive no occupational exposure at all, your embryo/fetus will receive some radiation dose (on average 75 mrem (0.75 mSv)) during your pregnancy from natural background radiation. The NRC has reviewed the available scientific literature and concluded that the 0.5 rem (5 mSv) limit provides an adequate margin of protection for the embryo/fetus. This dose limit reflects the desire to limit the total lifetime risk of leukemia and other cancers. If this dose limit is exceeded, the total lifetime risk of cancer to the embryo/fetus may increase incrementally. However, the decision on what level of risk to accept is yours. More detailed information on potential risk to the embryo/fetus from radiation exposure can be found in References 2-10.

8. What effect will formally declaring my pregnancy have on my job status? Only the licensee can tell you what effect a written declaration of pregnancy will have on your job status. As part of your radiation safety training, the licensee should tell you the company's policies with respect to the job status of declared pregnant women. In addition, before you declare your pregnancy, you may want to talk to your supervisor or your radiation safety officer and ask what a declaration of pregnancy would mean specifically for you and your job status.

In many cases you can continue in your present job with no change and still meet the dose limit for the embryo/fetus. For example, most commercial power reactor workers (approximately 93%) receive, in 12 months, occupational radiation doses that are less than 0.5 rem (5 mSv) (Ref. 11). The licensee may also consider the likelihood of increased radiation exposures from accidents and abnormal events before making a decision to allow you to continue in your present job. 8.13-8.13-6

If your current work might cause the dose to your embryo/fetus to exceed 0.5 rem (5 mSv), the licensee has various options. It is possible that the licensee can and will make a reasonable accommodation that will allow you to continue performing your current job, for example, by having another qualified employee do a small part of the job that accounts for some of your radiation exposure.

9. What information must I provide in my written declaration of pregnancy? You should provide, in writing, your name, a declaration that you are pregnant, the estimated date of conception (only the month and year need be given), and the date that you give the letter to the licensee. A form letter that you can use is included at the end of these questions and answers. You may use that letter, use a form letter the licensee has provided to you, or write your own letter.

10. To declare my pregnancy, do I have to have documented medical proof that I am pregnant? NRC regulations do not require that you provide medical proof of your pregnancy. However, NRC regulations do not preclude the licensee from requesting medical documentation of your pregnancy, especially if a change in your duties is necessary in order to comply with the 0.5 rem (5 mSv) dose limit.

11. Can I tell the licensee orally rather than in writing that I am pregnant? No. The regulations require that the declaration must be in writing.

12. If I have not declared my pregnancy in writing, but the licensee suspects that I am pregnant, do the lower dose limits apply?

No. The lower dose limits for pregnant women apply only if you have declared your pregnancy in writing. The United States Supreme Court has ruled (in United Automobile Workers International Union v. Johnson Controls, Inc., 1991) that "Decisions about the welfare of future children must be left to the parents who conceive, bear, support, and raise them rather than to the employers who hire those parents" (Reference 7). The Supreme Court also ruled that your employer may not restrict you from a specific job "because of concerns about the next generation." Thus, the lower limits apply only if you choose to declare your pregnancy in writing.

13. If I am planning to become pregnant but am not yet pregnant and I inform the licensee of that in writing, do the lower dose limits apply?
No. The requirement for lower limits applies only if you declare in writing that you are already pregnant.

14. What if I have a miscarriage or find out that I am not pregnant?
If you have declared your pregnancy in writing, you should promptly inform the licensee in writing that you are no longer pregnant. However, if you have not formally declared your pregnancy in writing, you need not inform the licensee of your non pregnant status.

15. How long is the lower dose limit in effect? The dose to the embryo/fetus must be limited until you withdraw your declaration in writing or you inform the licensee in writing that you are no longer pregnant. If the declaration is not withdrawn, the written declaration may be considered expired one year after submission.

16. If I have declared my pregnancy in writing, can I revoke my declaration of pregnancy even if I am still pregnant?
Yes, you may. The choice is entirely yours. If you revoke your declaration of pregnancy, the lower dose limit for the embryo/fetus no longer applies.

17. What if I work under contract at a licensed facility? The regulations state that you should formally declare your pregnancy to the licensee in writing. The licensee has the responsibility to limit the dose to the embryo/fetus.

18. Where can I get additional information? The references to this Appendix contain helpful information, especially Reference 3, NRC's
Regulatory Guide 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure," for general information on radiation risks. The licensee should be able to give this document to you.

For information on legal aspects, see Reference 7, "The Rock and the Hard Place: Employer Liability to Fertile or Pregnant Employees and Their Unborn Children—What Can the Employer Do?" which is an article
in the journal Radiation Protection Management.

You may telephone the NRC Headquarters at (301) 415-7000. Legal questions should be directed to the Office of the General Counsel, and technical questions should be directed to the Division of Industrial and
Medical Nuclear Safety.

You may also telephone the NRC Regional Offices at the following numbers: Region I, (610) 337-5000; Region II, (404) 562-4400; Region III, (630) 829-9500; and Region IV, (817) 860-8100. Legal questions should be directed to the Regional Counsel, and technical questions should be directed to the Division of Nuclear Materials Safety. 8.13-8.13-8

REFERENCES FOR APPENDIX

1. National Council on Radiation Protection and Measurements, Limitation of Exposure to Ionizing Radiation, NCRP Report No. 116, Bethesda, MD, 1993.

2. International Commission on Radiological Protection, 1990 Recommendations of the International Commission on Radiological Protection, ICRP Publication 60, Ann. ICRP 21: No. 1-3, Pergamon Press, Oxford, UK, 1991.
3.
USNRC, "Instruction Concerning Risks from Occupational Radiation Exposure," Regulatory Guide 8.29, Revision 1, February 1996.11 (Electronically available at www.nrc.gov/NRC/RG/index.html)
4. Committee on the Biological Effects of Ionizing Radiations, National Research Council, Health Effects of Exposure to Low Levels of Ionizing Radiation (BEIR V), National Academy Press, Washington, DC,
1990.
5. United Nations Scientific Committee on the Effects of Atomic Radiation, Sources and Effects of Ionizing Radiation, United Nations, New York, 1993.
6. R. Doll and R. Wakeford, "Risk of Childhood Cancer from Fetal Irradiation," The British Journal of Radiology, 70, 130-139, 1997.
7. David Wiedis, Donald E. Jose, and Timm O. Phoebe, "The Rock and the Hard Place: Employer Liability to Fertile or Pregnant Employees and Their Unborn Children—What Can the Employer Do?" Radiation
Protection Management, 11, 41-49, January/February 1994.
8. National Council on Radiation Protection and Measurements, Considerations Regarding the Unintended Radiation Exposure of the Embryo, Fetus, or Nursing Child, NCRP Commentary No. 9, Bethesda,
MD, 1994.
9. National Council on Radiation Protection and Measurements, Risk Estimates for Radiation Protection, NCRP Report No. 115, Bethesda, MD, 1993. 1Single copies of regulatory guides, both active and draft, and draft NUREG documents may be obtained free of charge by writing the Reproduction and Distribution Services Section, OCIO, USNRC, Washington, DC 20555-0001, or by fax to (301)415-2289, or by email to <DISTRIBUTION@NRC.GOV>. Active guides may also be purchased from the National Technical Information Service on a standing order basis. Details on this service may be obtained by writing NTIS, 5285 Port Royal Road, Springfield, VA 22161. Copies of active and draft guides are available for inspection or copying for a fee from the NRC Public Document Room at 2120 L Street NW., Washington, DC; the PDR's mailing address is Mail Stop LL-6, Washington, DC 20555;
telephone (202)634-3273; fax (202)634-3343. 8.13-8.13-9

10. National Radiological Protection Board, Advice on Exposure to Ionizing Radiation During Pregnancy, National Radiological Protection Board, Chilton, Didcot, UK, 1998.
11. M.L. Thomas and D. Hagemeyer, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities, 1996," Twenty-Ninth Annual Report, NUREG-0713, Vol. 18, USNRC,
1998.22 2Copies are available at current rates from the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20402-9328 (telephone (202)512-1800); or from the National Technical Information Service by writing NTIS at 5285 Port Royal Road, Springfield, VA 22161. Copies are available for inspection or copying for a fee from the NRC Public Document Room at 2120 L Street NW., Washington, DC; the PDR's mailing address is Mail Stop LL-6, Washington, DC 20555; telephone (202)634-3273; fax (202)634-3343. 8.13-8.13-10

REGULATORY ANALYSIS

A separate regulatory analysis was not prepared for this regulatory guide. A regulatory analysis prepared for 10 CFR Part 20, "Standards for Protection Against Radiation" (56 FR 23360), provides the regulatory basis for this guide and examines the costs and benefits of the rule as implemented by the guide. A copy of the "Regulatory Analysis for the Revision of 10 CFR Part 20" (PNL-6712, November 1988) is available for inspection and copying for a fee at the NRC Public Document Room, 2120 L Street NW, Washington, DC, as an enclosure to Part 20 (56 FR 23360). 8.13-8.13-12

United States Department of Agriculture
Office of Human Resources Management – Safety and Health Management Division

Radiation Safety Staff

Technical Bulletin
Radiation Safety Considerations for the

Declared Pregnant Woman

Background

As part of its radioactive materials license, the U. S. Department of Agriculture (USDA) has committed to a safe environment for all individuals working with radioactive materials or x-ray producing equipment.

The Nuclear Regulatory Commission's (NRC) Standards for Protection against Radiation (10 CFR Part 20) require that the dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 0.5 rem (5 mSv). This dose is ten times lower than the occupational dose allowed for a radiation worker. This document describes how to implement a program that satisfies this safety requirement.

In This Document

This document covers the following topics:

Approved: By:

Date: 9/6/96

John T. Jensen /S/
Director, Radiation Safety Staff

What is a Declared Pregnant Woman?

Definition: A declared pregnant woman is defined in the NRC regulations as a woman who has voluntarily informed her employer, in writing, of her pregnancy and the estimated date of conception.

Purpose of Declaration The purpose of making the declaration is to have the employer take steps to assure that:

The embryo/fetus is monitored for radiation exposure during the pregnancy; and
The radiation dose is within the regulatory limits.

USDA Program

Overview Regulations require that licensees instruct individuals working with radioactive materials in radiation protection as appropriate for the situation. In particular, radiation protection regulations allow a pregnant woman to decide whether she wants to formally declare her pregnancy to her employer, thereby taking advantage of the special dose limits provided to protect the developing embryo/fetus.

Federal safety regulations are gender neutral and it is inappropriate for facility management to arbitrarily place additional restrictions on a woman who appears to be pregnant.

By training, women who become pregnant should be aware of the additional safety precautions available to them to assure a low radiation exposure during the gestation period. However, they may be satisfied with their current work situation, and believe that existing precautions and procedures provide an adequate measure of safety during their pregnancy. It is for this reason that the program is voluntary.

Training Instruction concerning prenatal radiation exposure and its risks to the embryo/fetus will be provided to radiation workers before they will be allowed to work in a restricted area. Each supervisor of a female worker, who will receive an occupational dose in a restricted area or a Permit Holder supervising a female Associate User, should also receive this instruction.

Attendance records, indicating the date of training, and the individuals trained (including their signature) must be maintained by the facility.

Type of Training

The training should be presented both orally and in written form. Copies of the Frequently Asked Questions and Steps to Lower Radiation Dose (or this entire Technical Bulleting) should be included. Workers should be given the opportunity to ask questions.

Duration of Lower Dose Limits

The lower dose limit of 0.5 rem is in effect until the declared pregnant woman:
Is known to have given birth;
Informs the facility that she is no longer pregnant; or
Informs the facility that she no longer wants to be considered a declared pregnant woman
Twelve months after the declaration is submitted, the declaration will expire.

Additional Consultation

After declaring her pregnancy, the woman should discuss her work situation with her supervisor, the Permit Holder, the Location Radiation Protection Officer (LRPO), or other management representative. The purpose of this consultation is to review past radiation exposures in the facility, determine the type of changes in work practices, if any, that are to be made, etc.

Any agreed to changes, or an acknowledgment that no changes are necessary, should be written and signed by all parties.

Facility Management Responsibilities

Each USDA facility should review this guidance and determine how the information will be incorporated into their personnel management system.

Typically, these declarations are placed in the individual's official personnel file, along with a signed statement from the declared pregnant woman that she has received additional training (such as a review of the Frequently Asked Questions) and consultation regarding her work situation. The LRPO, Permit Holder, supervisor, personnel officer, or other appropriate individual should also sign any other consulting or training documentation.

Note: The Frequently Asked Questions, How to Officially Declare a Pregnancy, Steps to Lower Radiation Dose and the Form Letter that follow are taken directly from the NRC's regulatory guide on Instruction Concerning Prenatal Radiation Exposure.

Frequently Asked Questions

1. If I become pregnant, am I required to inform my employer of my pregnancy?

No. It is your choice whether to declare your pregnancy to your employer. IF you choose to declare your pregnancy, a lower radiation dose limit will apply to you. If you choose not to declare your pregnancy, you will continue to be subject to the same radiation dose limits that apply to non pregnant workers even if you are visibly pregnant.

2. If I inform my employer in writing of my pregnancy, what happens?

The amount of radiation that you will be allowed to receive will decrease because there is a lower dose limit for the embryo/fetus of female workers who have formally declared their pregnancy in writing. Ordinarily, the radiation dose limit for a worker is 5 rems (50 millisieverts) in a year. But if you declare in writing that you are pregnant, the dose to the embryo/fetus is generally limited to 0.5 rem (5 millisieverts) during the 9-month pregnancy, which is one-tenth of the dose limit that an adult worker may receive in a year. In addition, licensees must make efforts to avoid substantial variation above a uniform monthly dose rate so that all the dose received does not occur during a particular time of the pregnancy. This may mean that, if you declare your pregnancy, you may not be permitted to perform some of your normal job functions and you may not be able to have emergency response responsibilities.

3. Why do the regulations have a lower dose limit for a woman who has declared her pregnancy than for a normal worker?

The purpose of the lower limit is to protect her unborn child. Scientific advisory groups recommend (References 1 and 2) that the dose before birth be limited to about 0.5 rem rather than the 5-rem (50 millisievert) occupational annual dose limit because of the sensitivity of the embryo/fetus to radiation. Possible effects include deficiencies in the child's development, especially the child's neurological development, and an increase in the likelihood of cancer.

4. What effects on development can be caused by radiation exposure?

The effects of large doses of radiation on human development are quite evident and easily measurable, whereas at low doses the effects are not evident or measurable and therefore must be inferred.

For example, studies of the effects of radiation on animals and humans demonstrate clearly and conclusively that large doses of radiation – such as 100 rems (1 sievert) – cause serious developmental defects in many of the body's organs when the radiation is delivered during the period of rapid organ development (References 2,3, 4, and 5).

The developing human brain has been shown to be especially sensitive to radiation. Mental retardation has been observed in the survivors of the atomic bombings in Japan exposed *in utero* during sensitive periods.

Additionally, some other groups exposed to radiation *in utero* have shown lower than average intelligence scores and poor performance in school (Reference 4).

The sensitivity of the brain undoubtedly reflects its structural complexity and its long developmental period (and hence long sensitive period); the most sensitive period is during about the 8^{th} to 15^{th} weeks of gestation followed by a substantially less sensitive period for the two months after the 15^{th} week (Reference 4). There is no known effect on the child's developing brain during the first two months of pregnancy or the last three months of pregnancy (Reference 4).

No developmental effects caused by radiation have been observed in human groups at doses at or below the 5-rem (50 millisiervert) occupational dose limit. Scientists are uncertain whether there are developmental effects at doses below 5-rems (50 millisierverts). It may be that the effects are present but are too mild to measure because of the normal variability from one person to the next and because the tools to measure the effects are not sensitive enough. Or, it may be that there is some threshold dose below which there are no developmental effects whatsoever.

In view of the possibility of developmental effects, even if very mild, at doses below 5-rems (50 millisieverts), scientific advisory groups consider it prudent to limit the dose to the embryo/fetus to 0.5 rem (5 millisieverts) (References 1 and 2. At doses greater than 5 rems (50 millisierverts), such as might be received during an accident or during emergency response activities, the possibility of developmental effects increases.

5. How much will the likelihood of cancer be increased?

Radiation exposure has been found to increase the likelihood of cancer in many studies of adult human and animal groups. At doses below the occupational dose limit, an increase in cancer incidence has not been proven, but is presumed to exist even if it is too small to be measured. The question here is whether the embryo/fetus is more sensitive to radiation than an adult.

While the evidence for increased sensitivity of the embryo/fetus to cancer induction from radiation exposure is inconclusive, it is prudent to assume that there is some increased sensitivity. Scientific advisory groups assume that radiation exposure before birth may be 2 or 3 times more likely to cause cancer over a person's lifetime than the same amount of radiation received as an adult (Reference 1). If this is true, there would be 1 radiation-induced cancer death in 200 people expose *in utero* at the occupational dose limit of 5 rems (50 millisievert) (Reference 1). Scientific advisory groups have considered this risk to be too high and have thus recommended that the radiation dose to the embryo/fetus be limited to a maximum of 0.5 rem (5 millisieverts). At that dose, there would be 1 radiation-induced cancer death per 2000 people. This would be in addition to the 400 cancer deaths from all causes that one would normally expect in a group of 2000 people.

6. How does the risk to the embryo/fetus from occupational radiation exposure compare to other avoidable risks?

The risk to the embryo/fetus from 0.5 rem or even 5 rems of radiation exposure is relatively small compared to some other avoidable risks.

Of particular concern is excessive consumption of alcohol during pregnancy. The U.S. Public Health Service has concluded that heavy alcohol consumption during pregnancy (three drinks per day and above) is the leading known cause of mental retardation (Reference 6). Children whose mothers drank heavily during pregnancy may exhibit developmental problems such as hyperactivity, distractibility, short attention spans, language difficulties, and delayed maturation, even when their intelligence is normal.

In studies tracking the development of children born to light or moderate drinkers, researchers have also correlated their mothers' drinking patterns during pregnancy with low birth weight, decreased attention spans, delayed reaction times, and lower IQ scores at age four years. Youngsters whose mothers averaged three drinks per day during pregnancy were likely to have IQs averaging five points lower than normal.

Cigarette smoking may also harm the unborn (Reference 6). There is a direct correlation between the amount of smoking during pregnancy and the frequency of spontaneous abortion and fetal death. Children of mothers who smoke while pregnant are more likely to have impaired intellectual and physical growth. Maternal smoking has also been associated with such behavioral problems in offspring as lack of self-control, irritability, hyperactivity, and disinterest. Long-term studies indicate that these children perform less well than matched youngsters of nonsmokers on tests of cognitive, psychomotor, language, and general academic functioning.

Alcohol and smoking are only examples of other risks in pregnancy. Many other toxic agents and drugs also present risk. In addition, many factors that cannot be controlled present risk. There is an increased risk in pregnancy with increasing maternal age. Maternal disease may be an important risk factor. Malnutrition, toxemia, and congenital rubella may be associated with birth defects. Maternal diabetes and high blood pressure have been associated with problems in the newborn. In addition, many birth defects and developmental problems occur without an obvious cause and without any obvious risk factors. For example, viruses that we may not even be aware of can cause defects, and defects can arise from spontaneous random errors in cell reproduction. But these are things that we can't do anything about.

In summary, you are advised to keep radiation exposure of your unborn child below 0-.5 rem, but you should also remember that alcohol consumption, cigarette smoking, and the use of other drugs can do a great deal of harm.

7. What if I decide that I do not want any radiation exposure at all during my pregnancy?

You may ask your employer for a job that does not involve any exposure to occupational radiation at all, but your employer may not have such a position or may not be willing to provide you with a job involving no radiation exposure. Even if you receive no occupational exposure at all, you will receive a dose typically about 0.3 rem (3 millisieverts) from unavoidable natural background radiation Reference 7).

8. What effect will formally declaring my pregnancy have on my job status?

Only your employer can tell you what effect a declaration of pregnancy will have on your job status. As part of your radiation safety training, your employer should tell you its policies with respect to the job status of declared pregnant women. In addition, we recommend that, before you declare your pregnancy, you talk to your employer and ask what a declaration of pregnancy would mean specifically for you and your job status. However, if you do not declare your pregnancy, the lower exposure limit of 0.5 rem (5-millisieverts) does not apply.

It is most likely that your employer will tell you that you can continue to perform your job with no changes and still meet the NRC's limit for exposure to declared pregnant women. No USDA employees have received, in nine months, occupational radiation doses that are above the 0.5-rem (5-millisievert) limit for a declared pregnant woman.

If the dose you currently receive is above the 0.5-rem (5-millisievert) dose allowed for a declared pregnant woman, it is quite likely that your employer can and will make a reasonable accommodation that will allow you to continue performing your current job, for example, by having another qualified employee perform a small part of the job that accounts for much of the radiation exposure.

On the other hand, it is possible, although not common, that your employer will conclude that there is no reasonable accommodation that can be made without undue hardship that would allow you to do your job and remain within the dose limits for a declared pregnant woman. In these few instances, your employer may conclude that you can no longer be permitted to do your current job, that you must be removed from your job, and that there is no other job available for someone with your training and job skills.

If your employer concludes that you must be removed from your current job in order to comply with the lower dose limits for declared pregnant women, you may be concerned about what will happen to you and your job. The answer to that depends on your particular situation. That is why you should talk to your employer about your particular situation. In addition, telephone numbers that may be useful for obtaining information are listed in the Sources of Additional Information.

How to Officially Declare a Pregnancy

1. What information must I provide in my declaration of pregnancy?

You must provide your name, a declaration that you are pregnant, the estimated date of conception (only the month and year need be given), and the date that you give the letter to your employer. A sample form letter that you can use is included at the end of this bulletin. You may use that letter or write your own letter.

2. To declare my pregnancy, do I have to have documented medical proof that I am pregnant?

No. No proof is necessary.

3. Can I tell my employer orally rather than in writing that I am pregnant?

No, the declaration must be in writing. As far as the regulations are concerned, an oral declaration or statement is the same as not telling your employer that you are pregnant.

4. If I have not declared my pregnancy in writing, but my employer notices that I am pregnant, do the lower dose limits apply?

No. The lower dose limits for pregnant women apply only if you have declared your pregnancy in writing. The choice of whether to declare your pregnancy and thereby work under the lower dose limits is your choice, not your employer's. Your employer may not remove you from a specific job because you appear pregnant.

5. If I am planning to become pregnant but am not yet pregnant, and I inform my employer of that in writing, do the lower dose limits apply?

No. the lower limits apply only if you declare that you are already pregnant.

6. What if I have a miscarriage or find out I am not pregnant?

If you have declared your pregnancy in writing, you should promptly inform your employer that you are no longer pregnant. The regulations do not require that the revocation of a declaration be in writing, but we recommend that you revoke the declaration in writing to avoid confusion. Also, your employer may insist upon a written revocation for its own protection. If you have not declared your pregnancy, there is no need to inform your employer of your new, non pregnant status.

If you have a miscarriage and become pregnant again before you have revoked your original declaration of pregnancy, you should submit a new declaration of pregnancy because the date of conception has changed.

7. How long is the lower dose limit in effect?

The dose to the embryo/fetus must be limited until:

1. Your employer knows you have given birth,
2. You inform your employer that you are no longer pregnant, or
3. You inform your employer that you no longer wish to be considered pregnant.

8. If I have declared my pregnancy in writing, can I revoke my declaration of pregnancy even if I am still pregnant?

Yes, you may. The choice is entirely yours. If you revoke your declaration of pregnancy, the lower dose limits no longer apply.

9. What if I work under contract at the licensed facility and my employer is not the licensee?

The regulations state that you should formally declare your pregnancy to your employer in writing. You can ask your employer to give a copy of your declaration to the licensee, or you may give a copy of your written declaration directly to the licensee.

10. Can I tell my employer I am pregnant when I know I am not in order to work under the lower dose limits?

The purpose of the NRC regulations is allowing a pregnant woman to choose a heightened level of protection from radiation exposure for the embryo/fetus during her pregnancy. That purpose would not be served by intentionally declaring yourself to be a pregnant woman when you know you are not pregnant. There are no NRC regulatory requirements specifically addressing the actions your employer might take if you provide a false declaration. However, nothing in NRC regulations would prevent your employer from taking action against you for deliberately lying.

Steps to Lower Radiation Dose

Your employer should already have explained how to keep radiation doses low as part of the instructions that are given to all workers. However, you should ask your supervisor or the LRPO whether any additional steps can be taken.

The general principles for maintaining exposure to radiation as low as reasonable achievable are summarized below. You should already be applying these principles to your job, but now is a good time to review them.

External Radiation Exposure: External radiation is radiation you receive from radiation sources or radioactive materials that are outside your body. The basic principles for reducing external radiation exposure are time, distance, and shielding – decrease your time near radiation sources, increase your distance from radiation sources, and increase the shielding between yourself and the radiation source. You should work quickly and efficiently in a radiation area so that you are not exposed to the radiation any longer than necessary. As the distance is increased from the source of radiation, the dose decreases. When possible, you should work behind shielding. The shielding will absorb some of the radiation, thus reducing the amount that reaches you.

Internal Radiation Exposure: Internal radiation is radiation you receive from radioactive materials that have gotten into your body, generally entering with the air you breathe, the food you eat, or the water you drink. Your employer will have specific procedures to minimize internal radiation exposure. Those procedures probably incorporate the following general precautions that should be taken when you are working with radioactive materials that are not encapsulated:

1. Wear lab coats or other protective clothing if there is a possibility of spills.
2. Use gloves while handling unencapsulated radioactive materials.
3. Wash hands after working with unencapsulated radioactive materials.
4. Do not eat, drink, smoke, or apply cosmetics in areas with unencapsulated radioactive material.
5. Do not pipette radioactive solutions by mouth.

These basic principles should be incorporated into the specific methods and procedures for doing your individual work. Your employer should have trained you in those specific rules and procedures. If you become pregnant, it is a good time to review the training materials on the methods and procedures that you were provided in your training. You can also talk to your supervisor about getting refresher training on how to keep radiation doses as low as reasonably achievable.

Sources of Additional Information

The USDA's Radiation Safety Handbook contains specific information regarding the types and amounts of radioactive materials and radiation sources used within the Department. The overall Radiation Safety Program is also described.

You can find additional information on the risks of radiation in NRC's Regulatory Guide 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure."

You can also telephone the NRC Regional Offices at the following numbers:

Region 1 (800) 432-1156;

Region II (800) 577-8510

Region III (800) 522-3025; and

Region IV (800) 952-9677.

These regions are described on NRC Form-3 "Notice to Employees", which should be posted at your workplace.

Legal questions should be directed to the Regional Counsel, and technical questions should be directed to the Division of Radiation Safety and Safeguards.

If you believe you have been discriminated against, you should contact the U. S. Equal Employment Opportunity Commission (EEOC), 1801 L Street NW, Washington, DC 20507, or an EEOC Field Office by calling (800) 669-4000 or (800) 669-EEOC.

For individuals with hearing impairments, the EEOC's TDD number is (800) 800-3302.

Specific References

1. Limitation of Exposure to Ionizing Radiation, Report No. 116, National Council on Radiological Protection and Measurements, Bethesda, MD, 1993 [The National Council on Radiological Protection and Measurements (NCRP) is a nonprofit corporation chartered by Congress in 1964 to collect information and make recommendations on protection against radiation. This publication, on pages 37-39, summarizes the conclusions of the NCRP with respect to protection of the human embryo/fetus against radiation. This publication should be available through most good public library systems and most good university libraries. Your employer may also have a copy.]

2. 1990 Recommendations of the International Commission on Radiological Protection, Ann. ICRP 21: No. 1-3, Pergamon Press, 1991. [This publication, on pages 146-149, summarizes the conclusions of the ICRP on the effects of radiation on the human embryo/fetus.]

3. Health Effects of Exposure to Low Levels of Ionizing Radiation (BEIR V), Committee on the Biological Effects of Ionizing Radiation, National Research Council, National Academy Press, Washington, DC, 1990.

4. United Nations Scientific Committee on the Effects of Atomic Radiation, Sources and Effects of Ionizing Radiation, United Nations, New York, 1993.

5. Considerations Regarding the Unintended Radiation Exposure of the Embryo, Fetus, or Nursing child, NCRP Commentary No. 9, National Council on Radiation Protection and Measurements, Bethesda, MD, 1994.

6. Alcohol, Tobacco, and Other Drugs May Harm the Unborn, U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, DHHS Publication No. (ADM) 92-1711, Rockville, Maryland, 1990.

7. Exposure of the Population in the United States and Canada from natural Background Radiation, Report No. 94, National Council on Radiological Protection and Measurements, Bethesda, MD, 1987.

8. Instruction Concerning Prenatal Radiation Exposure, U. S. Nuclear Regulatory Commission Regulatory Guide 8.13, December, 1987.

Questions Regarding this Bulletin

If there are any questions regarding the USDA radioactive waste management program, contact:

USDA radiation Safety Staff
5601 Sunnyside Avenue
Mail Stop 5510

Beltsville, MD 20705-5000
Phone: (301) 734-4945
FAX: (301) 734-5050

Form Letter for Declaring Pregnancy

This form letter is provided for your convenience. To make your declaration of pregnancy, you may fill in the blanks in this form letter and give it to your employer or you may write your own letter.

Declaration of Pregnancy

To:

(Name of the facility LRPO, your supervisor or other employer representative)

Radiation Safety for the Declared Pregnant Worker

I am declaring that I am pregnant. I believe I became pregnant in _____, (only the month and year need be provided).

I understand that my occupational radiation dose during my entire pregnancy will not be allowed to exceed 0.5 rem (5 millisieverts) (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 job or job responsibilities during my pregnancy.

If I find out that I am not pregnant, if my pregnancy is terminated, or wish to undeclared my pregnancy for any reason, I will promptly inform you in writing that my pregnancy has ended.

(Your signature)

(Your name printed) (Date)

See College handbook for additional information regarding student pregnancy.

CLINCAL LABS

HOSPITAL TOUR LAB

The student will locate the following:
Hospital Departments

1	Library	
2	Clinical Lab & Pathology	
3	Respiratory Therapy	
4	Physical Therapy	
5	Pharmacy	
6	Ultrasound	
7	Nuclear Medicine	
8	MRI	
9	Radiation Therapy	
10	Special Intensive Care	
11	Neo Natal Care	
12	Trauma/Emergency Room	
13	Admitting	
14	Business Office	

Areas within the Radiology Department

1	Diagnostic & Fluoroscopic Rooms			
2	Special Procedures Room			
3	Interventional Radiology			
4	CT			
5	Outpatient Admitting			
6	Radiologists Offices or Reading Rooms			
7	Radiology Managers Office			
8	Radiology Supervisors Office			
9	Classroom & Clinical Instructors Office			
10	Radiology Supplies & Laundry			
11	Staff Lounge			

Student_____ Date: _____

Clinical Site: _____Clinical Instructor: _____

PATIENT SCHEDULING & HIPPA LAB

The student will demonstrate the:

		YES	NO
1	Answer and receive telephone messages using the appropriate greeting determined by departmental policy.		
2	Fill out patient requisitions with appropriate information.		
3	Use the computer for required data/patient information.		
4	Describe the procedure to follow related to dismissing outpatients and inpatients when radiologic procedures are completed.		
5	Give directions to patients who need to be changed into a hospital gown for preparation of diagnostic procedures.		
6	Properly assist patients with disabilities with gowning for preparation of diagnostic procedures.		
7	Follow the procedures used for patient identification for both inpatients and outpatients.		
8	Follow HIPPA guidelines at all times.		

Student: _____ Date: _____

Clinical Site: _____ Clinical Instructor: _____

SYSTEMATIC APPROACH TO PERFORMING EXAMS

The student was given information related to a systematic approach for performing radiographic examinations.

I.	**Preparation for the Radiographic Examination**	**YES**	**NO**
1.	Determine the part to be radiographed and the required views by reading the requisition.		
2	Locate, identify, and prepare the patient for proper gowning if necessary.		
3	Determine image receptor size, number, and have available outside of radiographic room.		
4	Locate and prepare the necessary equipment such as, sponges, grids, and contrast media.		
II.	**X-Ray Control Panel**		
1	Turn x-ray machine on, adjust bucky if appropriate.		
2	Check and adjust voltage compensator if necessary.		
3	Set kVp (Autotransformer).		
4	Set timer.		
5.	Set desired milliamperage (mA).		
6	Set milliamperage per second (mAs).		
III.	**Patient Communication**		
1	Escort the patient to the appropriate radiographic room., check patient ID, date of birth, have patient spell their last name		
2	Explain the procedure to the patient giving basic information and instruction.		
3	Ask patient if they have any questions or concerns.		
4	Make the patient comfortable and SAFE.		
5	Obtain pertinent clinical history and record as required.		
6.	Communicate relevant information to others such as: Supervisor ,MD, RN		
IV.	**Positioning and Exam Procedure**		
1	Place image receptor in bucky tray or on table and place proper identification markers on the film.		
2	Place patient in the appropriate radiographic position, checking for alignment and rotation.		
3	Measure body part thickness.		
4	Give clear instructions regarding respiration if applicable.		
5	Align x-ray tube and image receptor		
6	Immobilize patient if required.		
7	Collimate the radiographic beam and use gonadal shielding when possible.		
V.	**Final Instructions Before Exposure**		
1	Review radiographic technique and adjust if needed.		
2	Give the patient instructions regarding motion and respiration when appropriate.		
3	Watch patient and make exposure.		
4	Instruct patient to breathe, remove tube from over patient, release immobilization and make patient comfortable.		
5	If no more images are to be taken, assist the patient to the waiting area and explain that the images must be reviewed before they leave the department.		

6	Check patient identification on all images and take to the proper area for processing.		
7	Record exams performed in Daily Log.		

VI.	**Image Critique and Release of Patient**		
1	Review radiographic images for:		
	A. Appropriate positioning.		
	B. Required anatomic structures demonstrated.		
	C. Correct exposure factors, S values or exposure index		
	D. Visible patient demographics		
	E. Visible right or left marker.		
	F. Visible evidence of collimation.		
	G. Correct image size.		
	H. Correct mode of respiration.		
	I. Evidence of gonadal shielding when applicable.		
	J. Image Quality.		
2	Release patient to go home or back to the appropriate area of the hospital.		
3	Send images to PACS / radiologist		

Student: _____ Date: _____

Clinical Site: _____Clinical Instructor/ Appropriate Supervisor: _____

FLUOROSCOPIC ROOM SET UP & CONTRAST MEDIA PREPARATION LAB

The student will demonstrate the:

		YES	NO
1	Identify and prepare Barium for Upper GI Series.		
2	Identify and prepare Barium for Large Bowel Examination.		
3	Stock and clean area used for Contrast preparation.		
4	Move the diagnostic x-ray tube into the appropriate location when preparing the room for fluoroscopic procedures.		
5	Mount the footstool and/or shoulder rest onto the x-ray table.		
6	Move radiographic table and bucky tray into appropriate position.		
7	Move image intensifier into appropriate position for fluoroscopy.		
8	Set up T.V. monitor and video system.		
9	Set up fluoroscopy tower.		

		YES	NO
1	Adjust control panel for appropriate technique for fluoroscopy.		
2	Set fluoroscopic timer switch.		
3	Set Bucky switch to appropriate position if applicable.		
4	Supply each fluoroscopic room with accessory equipment which may be used for patient comfort, tissues, emesis basin, and smelling salts.		
5	Disinfect radiographic equipment following use by each patient.		

Student: _____ Date: _____

Clinical Site: _____ Clinical Instructor: _____

FIRE AND GENERAL SAFETY LAB

The student will demonstrate the:

		YES	NO
1	Describe the procedure to follow for reporting a fire.		
2	Locate and use the fire alarms.		
3	Locate and use the fire extinguishers.		
4.	Describe the code used for reporting a fire.		
5	Describe the procedure for patient evacuation.		
6	Describe the procedure for containing a fire.		

General Safety

7	Describe the documentation procedure to follow in the event a patient gets injured in the Radiology Department.		
8	Describe the documentation procedure to follow in the event a student gets injured in the Radiology Department.		

Student: _____ Date: _____

Clinical Site: _____ Clinical Instructor: _____

RADIATIONPROTECTION – LAB

The student will demonstrate the:

		YES	NO
1	Proper location for wearing Radiation Monitoring Device.		
2	Area for storage of Radiation Monitoring Device.		
3	Location of monthly radiation exposure reports.		
4	Location of exit port of Diagnostic X-Ray Tube.		
5	Location of the Fluoroscopic X-Ray Tube.		
6	Location and use of the timing device used during fluoroscopic procedures.		
7	Appropriate location for Radiographers when assisting with fluoroscopic procedures.		
8.	Location and use of lead aprons and gloves when assisting with fluoroscopic procedures.		
9	Location and use of lead shielding devices used to protect patients during procedures.		
10	Location of policies related to radiation protection to patients within the Radiology Department.		
11	Procedure to be followed regarding documentation of patient's possible pregnancy.		
12	Ability to operate the x-ray tube collimators for beam limitation.		
13	Ability to set exposure techniques.		
14	Ability to use a technique chart when assisting and setting exposure techniques.		
15	Areas identified as Primary Protective Barriers.		
16.	Areas that use lead lining or lead glass as shielding barriers.		

Student: _____ Date: _____

Clinical Site: _____ Clinical Instructor: _____

MEDICAL INFUSION AND DRAINAGE DEVICES

The student will demonstrate:

Infusion Devices:	**YES**	**NO**
1. Locate and demonstrate the various parts to a standard IV drip set – up and proper adjustment of the flow rate.		
2. Describe the various parts of an automatic infusion pump.		
3. Describe and demonstrate the proper procedures to follow when transferring / moving a patient who is attached to an IV.		
4. Describe a "Central Line" component and proper handling of a patient with a Central Line in place.		

Drainage Devices, Describe the following devices:	**YES**	**NO**
Chest tubes		
Naso-gastric tube		
Biliary Tube		
Foley Catheter		
Describe proper patient handling techniques for a patient with each device.		

Student: _____ Date: _____

Clinical Site: _____ Instructor: _____

MEDICAL EMERGENCY IN RADIOLOGY LAB

The student will demonstrate the:

	YES	**NO**
1. Assist the fainting patient and notify a Radiographer or Radiologist		
2. Locate and use smelling salts.		
3. Assist the patient with nosebleed.		
4. Assist the patient having seizure, notify Radiographer or Radiologist and assist in reporting of the incident.		
5. Call for a Radiographer and/or Radiologist to assess the patient in an emergency situation.		
Call a code for the Emergency Team when directed **Number**		
7. Locate and retrieve crash cart, stethoscope and blood pressure cuff.		
8. Locate eye wash stations.		
9. Notify appropriate personnel of adverse events such as: patient falls, wrong exam ordered, or wrong body part or patient imaged.		

Student: _____ Date: _____

Clinical Site: _____ Clinical Instructor: _____

PATIENT TRANSFER TECHNIQUES

The Student will demonstrate proper wheelchair and cart transfer techniques:

Standby Assist Wheelchair Transfer	**YES**	**NO**
1. Position the wheelchair at a 45 degree angle to the table		
2. Move the wheelchair footrests out of the way and be sure that the wheelchair is locked.		
3. Instruct the patient to sit on the edge of the wheelchair seat.		
4. Instruct the patient to push down on the arms of the chair to assist in rising and then stand up slowly.		
5. Direct the patient to reach out and hold onto the table with the hand closest to the table and then turn slowly until he or she feels the table behind him or her.		
6. Instruct the patient to hold the table with both hands and then sit down.		

Assisted Standing Pivot Wheelchair Transfer	**YES**	**NO**
1. Position the wheelchair at a 45-degree angle to the table with the patient's strongest side closest to the table. If the patient has loose-fitting clothes, place a transfer belt around the patient's waist.		
2. Move the wheelchair footrests out of the way and be sure that the wheelchair is locked.		
3. Direct the patient to sit on the edge of the wheelchair seat, providing assistance as needed.		
4. Instruct the patient to push down on the arms of the wheelchair to assist in rising.		
Bend at the knees, keeping the back stationary, and grasp the transfer belt with both hands. Block the patient's feet and knees to provide stability, especially for paraplegic and hemiplegic patients.		
Assist the patient in rising to a standing position.		
Ask the patient whether he or she is feeling all right. If the patient reports any feelings of dizziness or exhibits any of the other signs of orthostatic hypotension, let him or her stand for a moment until the feeling subsides.		
Pivot the patient toward the table until the patient can feel the table against the back of the thighs.		
Ask the patient to support himself on the table with both hands and sit down, assisting as necessary.		

Two-Person Wheelchair Lift	YES	NO
1. Plan for the lift by locating an assistant who will lift the patient's feet as you lift the patient's torso.		
2. Lock the wheelchair, remove the armrests, swing away or remove the leg rests, and direct the patient to cross his or her arms over the chest.		
3. Stand behind the patient, reach under the patient's axillae, and grasp the patient's crossed forearms.		
4. On command, lift the patient to clear the wheelchair and move the patient as a unit to the desired place.		

Stretcher Transfer With a Moving Device	YES	NO
1. Move the stretcher alongside the table, preferably on the patient's strong or less affected side. Place it as close to the table as possible, and then secure it by depressing the wheel locks. In addition, place sandbags or other devices on the floor to block the wheels satisfactorily.		
2. Place the patient at an oblique angle away from the table while the moving device is placed to the midpoint of the back.		
3. Return the patient to a supine position so that he or she is halfway onto the moving device.		
4. Grab the draw sheet, and use it to move the patient slowly onto the table.		
5. Remove the moving device, turning the patient obliquely if necessary.		

Stretcher Transfer Without a Moving Device	YES	NO
1. Move the stretcher alongside the table, preferably on the patient's strong or less affected side. Place it as close to the table as possible, and then secure it by depressing the wheel locks. In addition, place sandbags or other devices on the floor to block wheels satisfactorily.		
2. Begin by rolling up the draw sheet on both sides of the patient. Be sure that the draw sheet is completely under the patient and straightened before the transfer.		
3. Support the patient's head and upper body from the far side of the radiographic table. Direct a second assistant to support the patient's pelvic girdle from the cart side and a third assistant to support the patient's legs from the table side.		
4. Cross the patient's arms over the chest to avoid injury or interfering with a smooth transfer.		
5. Direct the second assistant supporting the pelvic girdle to stand on the opposite side of the stretcher, and make sure that the stretcher does not move away from the table during the transfer.		
6. On command, grasp the rolled up draw sheet and slowly pull the patient to the edge of the stretcher. On a second command, slowly lift and pull the patient onto the table.		

Student: _____ Date: _____

Clinical Site: _____ Clinical Instructor: _____

STERILE GLOVING TECHNIQUE

The Student will demonstrate proper sterile technique for the closed and open methods of self-gloving and for gloving another person:

Self-Gloving: Closed Method	**YES**	**NO**
1. Have an assistant open the glove package so that the right glove is on his or her right side.		
2. Keep the hands and fingers covered by the sterile gown when grasping the gloves.		
3. Pick up the glove of the dominant hand with the nondominant hand.		
4. Place the palm of the glove on the palm of the dominant hand with the fingers of the glove facing the elbow.		
5. Grasp the bottom part of the cuff with the fingers of the dominant hand. With the nondominant hand, grasp the top part of the cuff and pull it over the dominant hand.		
6. Pick up the other glove with the gloved hand.		
7. With the ungloved hand, hold the cuff through the sterile gown.		
8. Using the gloved hand, pull the other hand into the glove.		
9. Adjust the fingers until comfortable.		

Self-Gloving: Open Method	**YES**	**NO**
1. With the hands pushed through the sleeves of the sterile gown, pick up the cuff of the dominant hand glove with the nondominant hand, being sure not to touch the outside surface of the glove.		
2. Slip the dominant hand into the glove and pull the glove on by the nondominant hand.		
3. Pick up the other glove by reaching under the cuff with the gloved (and now sterile) dominant hand, being sure to touch only the outside surface of the glove with the sterile gloved hand.		
4. Pull the glove onto the nondominant hand without touching the inside surface of the glove (which is actually the outside surface of the folded cuff).		

Student: _____ Date: _____

Clinical Site: _____ Instructor: _____

STERILE GOWNING TECHNIQUE

The Student will demonstrate the proper technique for self-gowning and for gowning another person:

Self-Gowning	**YES**	**NO**
1. Stand about 12 inches from the sterile area, pick up the gown by the folded edges, and lift it directly up from the package.		
2. Step back from the table, making sure no objects are near the gown. Grasp the gown at the neck band, hold it at arm's length, unfold it, and gently shake it.		
3. Face the inside of the gown and, holding it by the shoulder seams, raise the arms up and slip them into the sleeves.		
4. Direct an unsterile assistant to stand behind and reach inside the sleeves, grasp the sleeves, and pull them gently to adjust the gown.		
5. For the open method of gloving, the sleeves are pulled over the hands. For the closed method of gloving, the sleeves are pulled so that only the fingertips are visible.		
6. Direct an assistant to fasten the back and waistband of the gown.		

Gowning Another	**YES**	**NO**
1. After gowning and gloving using sterile technique, pick up the sterile gown by the neck band, hold it at arm's length, and allow it to unfold.		
2. Hold the gown by the shoulder seams with the outside facing you.		
3. Protect the sterile gloves by placing both hands under the back panel of the gown at the top shoulder seam.		
4. Direct the person being gowned to slip the arms into the sleeves in a downward motion until the hands emerge from the sleeves.		
5. Direct the person to pull the gown over the arms and shoulders and fasten the back and waistband of the gown.		

Student: _____ Date: _____

Clinical Site: _____ Instructor: _____

OPENING A STERILE PACKAGE

The Student will demonstrate the proper technique for opening a sterile package:

Open a Sterile Package on a Table	**YES**	**NO**
1. Place the package on the center of the surface with the top flap of the wrapper set to open away from him or her.		
2. Pinch the first flap on the outside of the wrapper between the thumb and index finger by reaching around (not over) the package. Pull the flap open and lay it flat on the far surface.		
3. Use the right hand to open the right flap and the left hand to open the left flap.		
4. Grasp the turned down corner and pull the fourth and final flap down, being sure not to touch the inner surface of any of the package with an unsterile object such as a sleeve.		

Open a Sterile Package While Holding It	**YES**	**NO**
1. Hold the package in one hand with the top flap opening away from you.		
2. Pull the top flap well back, and hold it away from both the contents of the package and the sterile field.		
3. Drop the contents gently onto the sterile field from about 6 inches above the field and at a slight angle, making sure that the package wrapping does not touch the sterile field at any time.		

Student: _____ Date: _____

Clinical Site: _____ Instructor: _____

STANDARD PRECAUTIONS LAB

The student will demonstrate the:

	YES	NO
1. Disinfect radiographic table and all accessory equipment.		
2. Change pillowcases and sheets after each patient.		
3. Locate, use, and dispose of examination gloves properly.		
4. Locate, use, and dispose of gowns and masks used in unsterile procedures.		
5. Recognize and use biohazard bags properly.		
6. Follow environmental protection standards for handling and disposing of biohazard materials such as: Blood and body fluids and sharps		
7. Dispose of contaminated linen in appropriate bags.		
8. Properly wash hands between each patient.		
9. Properly use gowns, gloves, and masks for isolation and reverse isolation patients.		
10. Apply standard precautions when performing and assisting during all procedures.		

Handling Sterile Syringes and Needles	YES	NO
1. Locate and properly handle sterile syringes and needles.		
2. Locate and use vials, ampules and bottles of contrast media and/or other solutions.		
3. Locate equipment and set up for a drip-infusion procedure.		
4. Locate, properly use and dispose of, sharp containers.		

Student: _____ Date: _____

Clinical Site: _____ Instructor: _____

MONITORING PATIENT'S VITAL SIGNS

The Student will demonstrate and measure a patient's vital signs of temperature, pulse, respiration, and blood pressure:

Temperature – Oral Method	**YES**	**NO**
1. Place the oral thermometer under the patient's tongue.		
2. Ensure that the thermometer is kept in place until a stable reading is obtained.		
3. Read the oral thermometer and record the reading.		

Respiration:	**YES**	**NO**
1. Measure a patient's respiration by observing the patient's chest or abdomen for a 60-second period.		
2. Record the number of respirations per minute.		

Pulse:	**YES**	**NO**
1. Measure a patient's pulse rate at the radial artery near the wrist for a 60-second period.		
2. Record the patient's pulse rate per minute.		

Blood Pressure	**YES**	**NO**
1. Obtain a sphygmomanometer and stethoscope.		
2. Place the cuff of the sphygmomanometer on the patient's upper arm midway between the elbow and shoulder.		
3. Inflate the cuff above the systolic pressure to stop flow to the arm.		
4. With the stethoscope placed over the brachial artery in the antecubital fossa of the elbow, slowly release the cuff of the sphygmomanometer.		
5. When the first sound of blood flow is heard through the stethoscope, record the systolic pressure reading.		
6. When the sound of blood flowing through the arm ceases, record the diastolic pressure reading.		

Student: _____ Date: _____

Clinical Site: _____ Instructor: _____

OXYGEN THERAPY LAB

The Student will demonstrate:

	YES	NO
1. Proper location of oxygen equipment: oxygen tank, connecting tubing and devices to deliver oxygen.		
2. Ability to operate various parts of oxygen tank: pressure gauge, regulator, flow rate gauge and tubing attachment.		
3. Proper application to a patient two of the most common oxygen delivery devices: nasal cannula and oxygen masks.		
4. Knowledge of potential risks in an environment where oxygen is being administered and preventive steps to reduce the risks.		

Student: _____ Date: _____

Clinical Site: _____ Instructor: _____

VENIPUNCTURE AND INTRAVENOUS DRUG INJECTION

The Student will demonstrate:	**YES**	**NO**
1. Wash hand thoroughly.		
2. Check the patient's identification.		
3. Explain the procedure to the patient.		
4. Assemble all needed supplies, and prepare the drug for administration.		
5. Put on disposable gloves.		
6. Once an appropriate site for venipuncture has been selected, cleanse it with an alcohol swab using a circular motion while moving from the center to the outside.		
7. Apply a tourniquet above the site using sufficient tension to impede the flow of blood in the vein. Ask the patient to open and close the fist to distend the vein fully. When the vein has been identified, ask the patient to hold the fist in a clenched position.		
8. To stabilize the vein, place the thumb on the tissue just below the site and gently pull the skin and vein toward the hand.		
9. Hold the needle with the bevel facing upward. Pinch the wings of the butterfly needle together tightly.		
10. Insert the needle next to the vein at a 15 degree angle, and gently advance it into the vein. Blood will flow back into the tubing when the needle is correctly positioned.		
11. If the tubing of the butterfly needle has not previously been filled with solution, allow the blood to flow from the hub before attaching the syringe to ensure that no air bubbles are contained in the system.		
12. Remove the tourniquet and inject the drug.		
13. Unless otherwise instructed, remove the needle and apply gentle pressure to the site with an alcohol swab.		
14. Dispose of the syringe and needle properly.		
15. Chart all relevant information.		
16. Recognize abnormal lab values relative to the exam being performed.		

Student: _____Date:_____

Clinical Site: _____Clinical Instructor: _____

ADVANCED MODALITY ASSESSMENTS

COMPUTED TOMOGRAPHY

Principles of CT
Rad 205 Spring Semester
Assessment of rotation in CT

Name:
Clinical Site:
Date:

Define Computed Tomography (CT).
Compare CT with Conventional Radiography.
Define "generation" in relation to CT scanners.
List and briefly describe the major components of a CT scanner.
Describe the layout and equipment of the CT room.
Are there multiple Scanners in the facility? What brands of CT Scanners are used? Please include scanner slice.
Define volume (aka helical or spiral) scanning. List the advantages of this type of CT.
List 3 common cases you observed while rotating through CT scan. Please include the indication (signs and symptoms) and rule out for each exam.
List the types of contrast media used in CT and what exams they are typically used for.
Name some possible risk factors for the administration of IV contrast in CT.
Did you observe any positive studies? i.e. positive for appendicitis, or positive for head bleed? If so what protocol was used to diagnose this pt.? i.e. was contrast media used?
What did you like/dislike about CT?
Overall do you think your experience in CT gave you a better idea of whether this modality is something you would be interested in following graduation?

MAGNETIC RESONANCE IMAGING

Middlesex Community College
Magnetic Resonance Imaging Rotation
Objectives / Outcomes

Name:

Date:

To participate in this rotation, you will need to be screened for metal objects in your body. Please complete the Middlesex Community College MRI screening document and any additional documents that are required at your MRI rotation.

Read "Magnetic Resonance Imaging" Chapter in Merrill's Atlas of Radiographic Positions and Radiologic Procedures before you go to your MRI observation. Upon completion of a rotation through MRI and reading the assigned Chapter, the student will answer the following questions:

Define magnetic resonance.

Define magnetic resonance imaging.

Discuss the role of the element Hydrogen in MR Imaging.

List and discuss the 3 properties of matter that are the basis of MR image production.

Name and describe the intravenous contrast agent routinely used in MR imaging.

Name and describe some clinical examinations that you saw during your MRI observation.

List the patient types that would be unable to participate in MR imaging and describe the reasons that would prevent their participation.

MAGNETIC RESONANCE IMAGING SREENING DOCUMENT

Middlesex Community College

MRI OBSERVATION SCREENING DOCUMENT

You have chosen to observe in the MRI department. By entering the MRI suite, you are placing yourself within a magnetic field. Everyone entering the *MRI Room* must be screened for metal that might be in their body or to disclose any removable metal object or electronic devices.

PLEASE ANSWER THESE QUESTIONS TO THE BEST OF YOUR ABILITY:

1	Pacemaker	Yes	No
2	Aneurysm Clips	Yes	No
3	Heart Valve	Yes	No
4	Joint Replacements	Yes	No
5	Shrapnel	Yes	No
6	Metal in Eyes	Yes	No
7	Pregnancy	Yes	No
8	Inner Ear/Eye Surgery	Yes	No
9	Programmable/Electronic Devices? Internally/Externally	Yes	No

Please list previous surgeries:

_____

_____

Please lock up all jewelry, watches, credit cards, coins, keys, and all loose metal objects.

To the best of my knowledge, I DO NOT have within me any metal or devices as described above.

_____ _____

Student Signature Date

_____ _____

Tech Signature Date

NUCLEAR MEDICINE

Middlesex Community College

Nuclear Medicine Rotation

Objectives / Outcomes

Name:

Date:

Read "Nuclear Medicine", in Merrill's. Upon completion of rotation through Nuclear Medicine and reading of the assigned chapter, the student will be able to:

Define 'radioisotope".

Define "collimator" and state its function

Define "half-life".

Define "scintillation".

State the difference in the utilization of radiation between radiology and nuclear medicine.

State and define the basic unit of radioactivity.

Define "tracers" and state the two (2) types.

State two (2) principal types of instruments for detecting radiation.

State how organ function is determined.

State two (2) basic types of imaging detectors.

State three (3) ways of maintaining personal radiation protection.

Middlesex Community College
Interventional Radiography
Objectives / Outcomes

Name_____

Date_____

Read the "Digital Angiography and Digital Spot Imaging" and "Circulatory System" Chapters in Merrill's Atlas.
Upon completion of a rotation through the Angio department, and reading the assigned chapter, the student will be able to answer the following:

Define angiography

Define digital subtraction angiography

Define landmarking

Define road mapping

Explain patient care techniques unique to angiographic and interventional procedures

List and briefly describe the major components of a Digital Angio suite

Describe the Seldinger technique

List and explain 4 interventional procedures

List 2 types of catheters and the vessels for which they are designed

Discuss indications and contraindications for various angiographic procedures

EVENING SHIFT ROTATION

Middlesex Community College
Optional Evening Shift Rotation
Objectives / Outcomes

Name:

Date:

Supervising Technologist:

Answer the questions below.
After rotating through the X-ray department from 2:00pm to 10:00pm the student will be able to:

List the exams that technologists frequently perform during the evening shift.
List the exams that are most frequently done during a designated trauma. List the cassette sizes and grid sizes that you must bring to a trauma and protocol of image sequence.
List duties that evening technologists perform that may not be applicable to the day shift technologists.

STUDENTS DAILY LOGS

ATTENDANCE

MIDDLESEX COMMUNITY COLLEGE
PROGRAM IN RADIOLOGY TECHNOLOGY

Present (P)
Late (L)
Vacation (V)
Absent (A)

HOSPITAL: _____
ADDRESS: _____

ATTENDANCE RECORD

Student Name: _____

ACADEMIC YEAR: _____

Make-up

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Sept																															
Oct																															
Nov																															
Dec																															
Jan																															
Feb																															
Mar																															
Apr																															
May																															
Jun																															
Jul																															
Aug																															

STUDENT DAILY LOG SHEET

Student Daily Log Sheet

Middlesex Community College **Clinical Site: _____**

Student: _____ **Room/Area Assigned** _____

Record every exam/case which you observed, helped or performed

ate:		PT/Case Type I, II, III			Obs/Asst As tech Perf			Perf as Tech Obs/Asst			Student Solo			Exp Index	Technique	Repeats	Tech Initials	T C s
se #	Exam Type	a	b	c	a	b	c	a	b	c	a	b	c		mAs/kVp	# of repeats and reason for repeat		
mmative Totals:																		

Patient/Case Type:

I. Ambulatory Adult Cooperative Uncomplicated Single exam	II. Stretcher, Mobility impaired Pedi 6 – 10 Simple multiple exams	III. Trauma Pedi under 5 Multiple complex exams	Repeat Reasons A. Artifact B. Improper Positioning C. Improper technique D. Misalignment of tube E. Other

Category Descriptions:

"= Chests (all), abdomen (all), extremities ll), Shoulder Girdle, Bone age	"b"= hips and pelvis, Boney Thorax (all), All spines – C, T, L, S and SI jts, Barium Swallow, UGI, Small Bowel	"c" = BE, VCUG, Myelography, Arthrogram, C-arm, OR radiography, Portables, Head work, Met Series, CT

Signatures of student and CI documents compliance with repeat policy.

Student Signature: _____ Date:_____

Clinical Instructor Signature: _____ Date: _____

STUDENT SUMMARY LOG SHEET

Middlesex Community College **Clinical Site:** _____

Student: **Month/year:**

Transcribe data from your Daily Activity Log Sheets – (Summative Totals Line)																
			PT/Case Type			Obs/Asst as Tech Perf			Perf as Tech Obs/Asst			Student "Solo"			Repeats	
Date	Room/ area		I	II	III	a	b	c	a	b	c	a	b	c	Number of repeats	Reason for repeats
Summative Totals:																

Patient / Case Type:

I.	II.	III.
Ambulatory Adult Cooperative Uncomplicated Single Exam	Stretcher Mobility Impaired Pediatric 6 – 10 Simple multiple exam	Trauma Pediatric under 5 Multiple complex exams

Repeats:
A. artifacts
B. improper positioning
C. improper technique
D. misalignment of tube/IP
E. other

Category Descriptions:

"(a)" = Chests (all, Abdomen (all), Extremities (all), Shoulder Girdle, Bone age	"(b)" = Hips & Pelvis (all), Boney Thorax(all), All spines – C.T.L.S. and SI jts, Barium Swallow, UGI, S. B.	(c)" = = BE, VCUG, Myelography, Arthrograms, CT, C-arm, O.R. Radiography, Portables, Head work, Met series

CLINICAL GRADING FORMS

GRADE SHEET

CLINICAL PRACTICUM I, II, III, IV, V

Students Name: _____

Clinical Site: _____

CLINICAL COMPETENCY EVALUATIONS

DATE OF EXAM	EXAM	GRADE

MONTHLY EVALUATIONS

DATE	GRADE

	Percent of grade	Percent Received
Clinical Competencies	60 Percent	_____
Monthly Evaluations	40 Percent	_____

Clinical Grade: _____

P = Pass (85% - 100%)

F = Fail (Less than 85%)

Students Signature: _____

Clinical Instructors Signature: _____

Date: _____

NOTE: Please attach room assignments and clinical objectives for current semester.

CRITICAL CLINICAL OBJECTIVES CLINICAL PRACTICUM I

The following critical objectives will be used during Clinical Practicum I to evaluate cognitive and affective skills. Each objective must be accomplished for completion of practicum.

Clinical Responsibilities **Clinical Practicum**

The Student **YES** **NO**

1. Arrives for clinical experiences on time and prepared _____
2. Maintains confidentiality of patients and staff. _____
3. Implements legal standards during professional interactions._____
4. Takes responsibility for own actions._____
5. Maintains patient's safety._____
6. Follows all hospital/department policies._____

Communication

The Student

Uses correct terminology at appropriate level of competency._____
Explains upcoming procedures and examinations to the best of the student's ability at the appropriate level of competency._____

Note to Student: Failure to meet any objective will require a written notice from your Clinical Instructor. Also, a formal conference will follow.

Clinical Instructor: _____

Student: _____

Date: _____

CRITICAL CLINICAL OBJECTIVES CLINICAL PRACTICUM II

The following critical objectives will be used during Clinical Practicum II to evaluate cognitive and affective skills. Each objective must be accomplished for completion of practicum.

Clinical Responsibilities **Clinical Practicum**

The student: **YES** **NO**

1. Arrives for clinical experiences on time and prepared._____
2. Maintains confidentiality of patients and staff._____
3. Implements legal standards during professional interactions._____
4. Takes responsibility for own actions._____
5. Assumes initiative in preparing for use of new skills._____
6. Accepts suggestions and constructive criticism in an appropriate manner._____
7. Maintains patient's safety._____
8. Follows all hospital / department policies._____

Communication

Demonstrates the ability to successfully interact with fellow workers._____
Talks with patient in a concerned, professional manner._____
Uses correct terminology at appropriate level of competency._____
Explains upcoming procedures and examinations to the best of the student's ability at the appropriate level of competency._____

Note to Student: Failure to meet any objective will require a written notice from your Clinical Instructor. Also, a formal conference will follow.

Clinical Instructor: _____

Student: _____

Date: _____

CRITICAL CLINICAL OBJECTIVES CLINICAL PRACTICUM III

The following critical objectives will be used during Clinical Practicum III to evaluate cognitive and affective skills. Each objective must be accomplished for completion of practicum.

Clinical Responsibilities **Clinical Practicum**

The Student: **YES** **NO**

1.Arrives for clinical experiences on time and prepared._____
2.Maintains confidentiality of patients and staff._____
3.Implements legal standards during professional interactions._____
4.Takes responsibility for own actions._____
5.Assumes initiative in preparing for use of new skills._____
6.Accepts suggestions and constructive criticism in an appropriate manner._____
7.Maintains patient's safety._____
8.Correctly prepares radiographic room for upcoming procedures._____
9.Follows all hospital / department policies._____

Communication

Demonstrates the ability to successfully interact with fellow workers._____
Talks with patient in a concerned, professional manner._____
Uses correct terminology at appropriate level of competency._____
Explains upcoming procedures and examinations to the best of the student's ability at the appropriate level of competency._____

Note to Student: Failure to meet any objective will require a written notice from your Clinical Instructor. Also a formal conference will follow.

Clinical Instructor: _____

Student: _____

Date: _____

CRITICAL CLINICAL OBJECTIVES CLINICAL PRACTICUM IV

The following critical objectives will be used during Clinical Practicum IV to evaluate cognitive and affective skills. Each objective must be accomplished for completion of practicum.

Clinical Responsibilities **Clinical Practicum**

The Student: **YES** **NO**

1.Arrives for clinical experiences on time and prepared._____
2.Maintains confidentiality of patients and staff._____
3.Implements legal standards during professional interactions._____
4.Takes responsibility for actions._____
5.Assumes initiative in preparing for use of new skills._____
6.Accepts suggestions and constructive criticism in an appropriate manner._____
7.Maintains patient's safety._____
8.Correctly prepares radiographic room for upcoming procedures._____
9.Follows all hospital / department policies._____

Communication

Demonstrates the ability to successfully interact with fellow workers._____
Talks with patient in a concerned, professional manner._____
Uses correct terminology at appropriate level of competency._____
Explains upcoming procedures and examinations to the best of the student's ability at the appropriate level of competency._____

Note to Student: Failure to meet any objective will require a written notice from your Clinical Instructor. Also, a formal conference will follow.

Clinical Instructor: _____

Student: _____

Date: _____

CRITICAL CLINICAL OBJECTIVES CLINICAL PRACTICUM V

Clinical Responsibilities **Clinical Practicum**

The student: **YES NO**

1.Arrives for clinical experiences on time and prepared_____
2.Maintains confidentiality of patients and staff_____
3.Implements legal standards during professional interactions_____
4.Takes responsibility for own actions._____
5.Assumes initiative in preparing for use of new skills_____
6.Accepts suggestions and constructive criticism in an appropriate manner._____
7.Maintains patient's safety_____
8.Correctly prepares radiographic room for upcoming procedures_____
9.Routine examinations are performed competently and consistently_____
10.Follows all hospital/department policies_____

Communication

Demonstrates the ability to successfully interact with fellow workers_____
Talks with patient in a concerned, professional manner_____
Uses correct terminology at appropriate level of competency_____
Explains upcoming procedures and examinations to the best of the student's ability at the appropriate level of competency_____

Note to student: Failure to meet any objective will require a written notice from your Clinical Instructor. Also, a formal conference will follow.

Clinical Instructor: _____
Student: _____
Date: _____

ROOM ROTATION SCHEDULE

Students: _____

Clinical Site: **Clinical Practicum: I, II, III, IV, V** **Semester/Year:**

Date	Trauma	General/ Portable	C-arm	Fluoro	Other Assignments

CLINICAL INSTRUCTOR: _____

CLINICAL COORDINATOR: _____

INCIDENT REPORT FORMS

STUDENT CONFERENCE FORM

MIDDLESEX COMMUNITY COLLEGE

RADIOLOGIC TECHNOLOGY PROGRAM

Instructor – Student Conference Form

Student Name:

Instructor's Name:

Date:

Reason for Conference:

Statement of Student:

Action Taken:

Instructor Signature: _____

Student Signature: _____

Signature does not show agreement or disagreement only that it has been shown to the student.

RADIATION DOSIMETRY REPORT

MIDDLESEX COMMUNITY COLLEGE
RADIOLOGIC TECHNOLOGY PROGRAM
RADIATION DOSIMETRY REPORT

Students Name:_____ Date: _____

Dosimeter report:

Deep:

Shallow:

Whole Body:

The dosimeter report for the period of _____ has been reviewed by the student and program faculty.

_____
Student Signature

_____
Program Faculty Signature

Notice: Dose limit for <u>any single quarterly reading is 80 mrem or above</u>. The Program Director, Program faculty, Chief Radiologist, Radiation Safety Officer, Radiation Physicist, or all five, will investigate all instances in which dose limits are exceeded. The student will then be counseled as to the appropriate course of action and review radiation safety practices. "accidental "exposures due to badges left on aprons, etc., will be documented where proven.

RADIATION RECEIVED DURING GESTATION PERIOD

Student's Name: _____

Social Security Number: _____

Date Notification Received: _____

Estimated Delivery Date: _____

Cumulative radiation exposure prior to start of gestation: _____

Written permission to continue program received from physician dated: _____

Record of all radiation received during gestation period (in mr.):

Period	From	Through	MR		Students Initial
			Shallow	Deep	
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____
9.	_____	_____	_____	_____	_____
10.	_____	_____	_____	_____	_____

Student counseled regarding radiation protection by one or more of the following:

Signed: _____ Date: _____
Chief Radiologist or Radiation Safety Officer

Signed: _____ Date: _____
Program Director

Signed: _____ Date: _____
Clinical Instructor

My signature acknowledges that I have received counseling on radiation safety measures to protect my fetus and that I have read NCRP Report 53 and 54, or Regulatory Guide 8.13.

Signed: _____ Date: _____

ACCIDENT REPORT: Blood and Body Fluid Exposure

Name_____ Student ID #_____

Address_____Telephone_____

Occupation_____Date of Birth_____/_____/_____/ Age_____ Gender ( ) M ( ) F

Date of Accident_____ Time of Accident_____ Clinical facility where accident occurred_____

Hepatitis B Vaccine status: Dose #1_____ #2_____ #3_____ Last Tetanus/Diphtheria booster: _____

PLEASE DESCRIBE:

(a) Type of exposure (e.g., needlestick/sharps injury; mucous membrane contact with potentially infectious fluids: body part affected.

(b) Use back of form if necessary)

(c) The volume of blood or body fluid involved and duration of exposure_____

INITIAL ACTIONS:

(a) Immediate first aid consisted of_____ Time_____

(b) Notification of Clinical Supervisor/Program Coordinator_____ Time_____

(c) Referral site for serological testing/post exposure prophylaxis evaluation (name of hospital emergency center or physician)_____Time_____

(d) If testing is declined by exposed person, that person must read and sign below.

DECLINATION OF TESTING AND FOLLOW-UP

I have been informed and understand the importance of baseline testing for the Hepatitis B and C viruses and HIV and evaluation for post exposure prophylaxis immediately after an accidental exposure to blood and body fluids. The importance of receiving future follow-up testing at six weeks, twelve weeks, and six months from the date of exposure has also been discussed with me; however, I decline to have testing at this time.

Signature_____ Date_____

SOURCE PATIENT:

(a) Name (if known)_____ Address_____

(b) Consent and referral for serological testing to_____ Time_____

(c) If no testing, please explain on back of form_____

WITNESS:

Name_____Address_____ Telephone_____

Signature of person filing report_____ Date: _____

IMPORTANT

RETURN REPORT TO THE HEALTH SERVICE OFFICE AT YOUR CAMPUS WITHIN 24 HOURS OF ACCIDENTCampus Center, Bldg. 8,Bedford Campus OR City Bldg., Ground Floor, Lowell Campus

RADIATION SAFETY REVIEW

MIDDLESEX COMMUNITY COLLEGE
RADIOLOGIC TECHNOLOGY PROGRAM
RADIATION SAFETY REVIEW

_____ has exceeded the maximum dose equivalent of 80 mrem during the following quarter: _____. The dosimeter report has been reviewed and signed by the student. He/she has been given a radiation safety review and can describe means in which to adhere to the concept of ALARA and understands the importance of practicing good radiation safety measures.

Student Signature_____ Date_____

Program Director Signature_____ Date_____

MIDDLESEX COMMUNITY COLLEGE

RADIOLOGIC TECHNOLOGY PROGRAM

ORIENTATION FORMS

MIDDLESEX COMMUNITY COLLEGE

RADIOLOGY PROGRAM

CONFIDENTIALITY AGREEMENT

As a student of Middlesex Community College enrolled in the Radiologic Technology Program, I agree to maintain a patient's right to confidentiality. I understand that the use and disclosure of a patient's protected health information for other than clinical reasons is punishable by law and will result in dismissal from the program.

Print Name: _____

Signature: _____

Date: _____

Radiologic Technology Program
Grade Release Authorization

I._____, do authorize

Middlesex Community College to release my grades

to_____ Hospital as required for academic purpose.

_____
Signature

_____
Date

CLINIC TRANSFER POLICY

Radiologic Technology Program
Clinic Transfer Policy

I_____ understand that as a student in the Radiologic Technology Program, I am required to participate in clinical practicums. I also understand that I will perform at an indicated skill level and in an appropriate manner.

If I am dismissed from a clinical site because of inappropriate behavior, patient care infractions or failure to meet clinical objectives, the program is not obligated to transfer me to another clinical site. Consequently, I will be dismissed from the program.

Signature: _____ Date: _____

Policies and Procedures

I, _____, have read and understand the Student Handbooks, college, program, and clinical policies. The policies and procedures are clear and questions have been answered by the Program Director, Clinical Coordinator, or Clinical Instructor.

I have signed this form indicating that I have read and understand and will comply with the policies and procedures at Middlesex Community College.

Signature: _____ Date: _____

CLINICAL AFFILIATE ASSIGNMENT

Below is a list of the hospitals that you will be assigned to for the clinical education component of the Radiologic Technology Program. You will be required to rotate to at least two of the Clinical sites. Every effort will be made to assign you based on your proximity to these sites. However, due to the limited number of spaces at each Radiology Department, this may not be possible.

Hospital	**Location**
Lahey Hospital	Burlington, MA
Newton Wellesley Hospital	Newton, MA
Lowell General Hospital, Saints Campus	Lowell, MA
Winchester Hospital	Winchester, MA
Emerson Hospital	Concord, MA