Master of Science in Radiologic Sciences

Radiologist Assistant

Radiologist Preceptor Handbook

with special interest areas for preceptors highlighted in blue

Revised 9/27/2016
TABLE OF CONTENTS

GRADUATE FACULTY AND STAFF ...................................................................................... 3
INTRODUCTION .................................................................................................................. .. 4
ANTI-DISCRIMINATION STATEMENT .................................................................................. 4
SPECIAL NEEDS ................................................................................................................. .. 4
PROGRAM MISSION STATEMENT ....................................................................................... 5
PROGRAM DESCRIPTION .................................................................................................... 5
ROLES & RESPONSIBILITIES .............................................................................................. 6
  RADIOLOGIST PRECEPTOR RESPONSIBILITIES ........................................................ 6
  LEVEL OF SUPERVISION .............................................................................................. 7
  TEACHING ...................................................................................................................... 8
  COMPETENCY & PROFICIENCY ................................................................................... 8
  REQUIRED & ELECTIVE CLINICAL COMPETENCIES ................................................. 8
  CLINICAL DOCUMENTATION COMPLETED BY THE RADIOLOGIST PRECEPTORS 9
RADIATION PROTECTION ........................................................................................... 10
RA MAJOR – SPECIFIC PROGRAM POLICIES ................................................................. 11

APPENDICES

APPENDIX A  PROGRAM SCHEDULES (fall and spring start)
APPENDIX B  CLINICAL COMPETENCY FORMS
APPENDIX C  ARRT ENTRY LEVEL CLINICAL ACTIVITIES, ARRT RRA EXAM
  CONTENTS SPECIFICATIONS, & APPLICATION INFORMATION
APPENDIX D  CLINICAL AFFILIATION AGREEMENT (Sample)
APPENDIX E  RADIOLOGIST PRECEPTOR AGREEMENT (Sample)
APPENDIX F  RADIOLOGIST ASSISTANT PRECEPTOR HANDBOOK
  ACKNOWLEDGEMENT FORM
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INTRODUCTION

This handbook is designed to provide information concerning policies and procedures to students in the Master of Science in Radiologic Sciences (MSRS) degree program at Midwestern State University (MSU). The faculty will announce changes or revisions to the material contained in this handbook. Enrolled students should check the MSRS website

http://mwsu.edu/academics/hs2/radsci/msrs/index
http://mwsu.edu/academics/hs2/radsci/ra/index

for revisions and updates. This handbook will be helpful to students in the program and to others who may wish to enroll. For general MSU policies, see the MSU Student Handbook and Catalog.

The information in this handbook is current at the time it is printed. However, policies, guidelines, and procedures are subject to change without notice. Final interpretation of program policies and procedures will be made by the Chair of Radiologic Sciences.

ANTI-DISCRIMINATION STATEMENT

The MSRS program, as a part of MSU, is an equal opportunity / affirmative action entity that complies with all federal and Texas laws, regulations, and executive orders regarding affirmative action requirements in all programs and policies. The MSRS program does not discriminate against any individual because of age, race, creed, color, sex, national origin, or handicap.

SPECIAL NEEDS

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, MSU endeavors to make reasonable adjustments in its policies, practices, services, and facilities to ensure equal opportunity for qualified persons with disabilities to participate in all educational programs and activities.

The Office of Disability Services (ODS) provides information and assistance, arranges accommodations, and serves as a liaison for students, instructors, and staff. The ODS has assistive devices such as books on tape, recorders, and adaptive software which can be loaned to qualified individuals. A student/employee who seeks accommodations on the basis of disability must register with the Office of Disability Services in the Counseling Center, Clark Student Center Room 108. Documentation of disability from a competent professional is required.

Individuals with grievances related to discrimination or lack of accommodation on the basis of a disability are encouraged to resolve the problem directly with the area involved. If the matter remains unresolved, the Office of Disability Services will provide advice and/or assistance. The grievance procedure may be found in the Student Handbook and Activities Calendar.

The director of the Counseling Center services as the ADA Coordinator may be contacted at (940) 397.4618, TDD (940) 397.4515, or 3410 Taft Blvd., Clark Student Center Room 108.
PROGRAM MISSION STATEMENT
The mission of the MSRS program is to prepare students to be leaders in the areas of administration, education, and advanced clinical practice in the radiologic sciences. The learning outcomes of the MSRS Program are:

1. MSRS students will be adequately prepared to function as leaders in the profession. MSRS RA students will be adequately prepared to enter and function in an advanced clinical role as radiologist assistants.
2. MSRS students will pursue education in addition to the MSRS Program.
3. MSRS students will develop professionalism through advanced scholarly productivity.

PROGRAM DESCRIPTION
MSU offers the first discipline-specific MSRS degree of its kind in the United States with three majors: radiologic administration, radiologic education, and radiologist assistant (RA). The MSRS program features a holistic approach to graduate education with options for specialization, providing a natural transition for working technologists interested in advancing to higher levels of administration, education, or advanced clinical roles.

This program provides opportunities for radiologic administrators, radiologic educators, and radiologist assistants regardless of their location. The unique curriculum design permits working professionals to complete the degree with minimal on-campus requirements while preserving the benefits of face-to-face contact with fellow graduate students. Courses offered during fall and spring semesters generally require only two visits to MSU. Most of the course requirements are completed independently and coordinated electronically. A limited number of master’s level courses are available online. Students pursuing an RA major have additional extensive clinical requirements.

Competitive scholarships are available to qualified applicants and for students in Academic Common Market states there is an established mechanism to waive out-of-state tuition fees. Refer to the section on Financial Aid and Scholarships.

Students benefit from the diverse experiences of their colleagues. Approximately 95 students are enrolled in the program from all over the U.S. and several foreign countries. All radiologic science disciplines and modalities are represented in the student population including radiography, radiation therapy, nuclear medicine, and sonography.

The highly qualified and enthusiastic program faculty have advanced degrees, many combined years of practical experience in the field, and are very active leaders in radiologic sciences.

The MSRS degree program includes graduate level radiologic science core courses, track courses, and elective courses. RA majors also have clinical preceptorships. All students must successfully complete the core courses. Track courses offer advanced educational experiences in administrative, educational, or advanced clinical procedure areas. MSU offers elective courses reflective of current issues and trends in radiologic sciences. With approval from the Graduate Coordinator, students may transfer up to six credit hours of graduate course work completed at other institutions.
Radiologist Assistant (RA)
An RA enhances patient care by extending the capacity of the radiologist in the diagnostic imaging environment. The RA performs patient assessment, patient management, fluoroscopy, and other radiology procedures. This new healthcare professional also makes initial observations of diagnostic images with official interpretations and final written reports being provided by supervising radiologists (as defined by the American College of Radiology (ACR) Standard for Communication: Diagnostic Radiology).

ROLES & RESPONSIBILITIES

RA clinical sites are located in a wide geographic area and are arranged by the students. Students are responsible for their own transportation, housing, and living expenses during their clinical courses. Additionally, students must also arrange to have Internet access.

RA students MUST always have Radiologist Preceptors willing to conduct their clinical education. If an RA student loses his/her radiologist preceptor, the student must notify the MSU Clinical Coordinator immediately. Clinical education is suspended until a suitable Radiologist Preceptor is established for the student.

If the loss of a Radiologist Preceptor is based on unacceptable, intolerable, or illegal actions by a student which violate the clinical policies set forth in this handbook, or which violate any local, state, or federal laws, the student will be removed from the clinical site and released from the MSU RA program. Under these circumstances, a student will not be allowed to reenter the MSU RA program at any time in the future.

RADIOLOGIST PRECEPTOR RESPONSIBILITIES

In compliance with ARRT and MSU RA Program requirements, radiologists accept responsibility for the following when they agree to serve as Radiologist Preceptors for MSU RA students:

- Provide input to the RA Program Advisory Committee to ensure program quality (Criterion 3.3)
- Sign a formal written agreement with the MSU RA Program. The agreement must include an authorizing signature from the group practice (Criterion 3.4.1)
- Commit the time and effort to assure the students receive the appropriate depth and scope of clinical education consistent with the ARRT’s Role Delineation (Criterion 3.5.2)
- Be willing and able to perform clinical competence assessments (Criterion 3.5.3)
- Complete the documentation of clinical experience and competence required by the ARRT and the MSU RA Program (Criterion 3.5.4)
MIDWESTERN STATE UNIVERSITY

- Work with the MSU RA Program officials, including the Medical Advisor, to ensure that the medical components of the clinical preceptorship meet acceptable standards (Criterion 3.5.5.)

- Verify that clinical activities emphasize the education of the student rather than focus on the productivity of the department (Criterion 3.7.1)

- Commit the minimum number of clinical contact hours with the students required by the program to meet the ARRT and MSU RA Program clinical education requirements (Criterion 3.7.2)

Radiologist Preceptors verify at least twenty-four (24) contact hours with RA students per week including at least four (4) hours of direct image review. Students document a minimum of 1440 clinical contact hours with a radiologist preceptor before graduation.

First Summer Semester = 216 clinical contact hours
First Fall Semester = 336
First Spring Semester = 336
Second Summer Semester = 216
Second Fall Semester = 336

- Commit to the duration of the clinical preceptorship to meet the ARRT and MSU RA Program clinical education requirements (Criterion 3.7.3)

The overall goal of the clinical preceptorship is to meet the ARRT and MSU RA Program clinical education requirements within a period of five (5) semesters. If, however, RA students can not complete all the required clinical competencies within the five (5) semester nominal program length, the program has additional courses available so students can extend their enrollment to complete the program requirements.

The clinical activities required by Midwestern State University will be updated as needed to comply with or exceed the American Registry of Radiologic Technologists (ARRT) certification standards.

LEVEL OF SUPERVISION

During clinical experiences, RA students are always under the direct supervision of Radiologist Preceptors who determine the capacity of the students to perform any specific functions. Direct supervision is defined as the radiologist present in the radiology facility and immediately available to furnish assistance and direction throughout the performance of the procedure, but not required to be present in the room when the procedure is performed. Under direct radiologist supervision, the RA students will perform patient assessment, patient management, and clinical imaging procedures. Best practice for all exams requiring consent includes the radiologist meeting the patient. Inclusion of clinical activities and educational requirements in the RA program does not indicate that all activities may be legally performed in all states nor that the activities, if performed, are eligible for reimbursement under current Centers for Medicare and Medicaid Services (CMS) regulations.

Individual state and/or institutional regulations and policies may place additional limitations on the activities and responsibilities authorized for an RA student in a given clinical setting.

1. This definition of direct supervision is based upon that of the CMS.
TEACHING

Radiologist Preceptors are responsible for the RA students’ clinical experiences. They teach students patient management skills, procedures, and image observations to meet the requirements of the MSU RA program. The required clinical competencies are based in general diagnostic radiography. They may also teach students additional skills as needed. They will work directly with students a minimum of twenty-four (24) clinical hours each week as part of the clinical education course. This clinical time may be divided between patient management, procedures, and at least four (4) hours of direct image review. Preceptors will verify that students are actively participating in all their required clinical hours and will evaluate their clinical performance.

Students document a minimum of 1440 clinical contact hours with a radiologist preceptor during the five (5) clinical semesters.
- First Summer Semester = 216 clinical contact hours
- First Fall Semester = 336
- First Spring Semester = 336
- Second Summer Semester = 216
- Second Fall Semester = 336

COMPETENCY & PROFICIENCY

Students operate under the supervision of the Radiologist Preceptors until the radiologists determine competency is achieved. Clinical competence means that the Radiologist Preceptors are satisfied that the students can perform the procedures or functions independently. Students must document their clinical competency with the Clinical Competency Evaluation Form.

Students must document their clinical proficiency through continued and repeated competence with patient management skills, procedures, and image observations. This will be documented in the clinical portfolio.

REQUIRED & ELECTIVE CLINICAL COMPETENCIES

Students are encouraged to participate fully in all procedures during clinical experiences. Radiologist Preceptors must verify clinical competence for each required clinical competency identified by the program. Additionally, the Radiologist Preceptors must verify clinical competence for elective procedures. Elective clinical competencies will vary from student to student depending on setting and clinical focus.

By the completion of the program, students must demonstrate competence in all required and elective procedure competencies.

Radiologist Preceptors verify daily patient log sheets that are prepared by the student, document clinical competence using the Clinical Competency Evaluations, and evaluate the student’s professional development twice each semester. Radiologist preceptors will also verify final summative clinical documentation at the end of the program.
**CLINICAL DOCUMENTATION COMPLETED BY THE RADIOLOGIST PRECEPTORS**

<table>
<thead>
<tr>
<th>Form</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR-1</td>
<td>ARRT Summary of Clinical Experience and Competence Assessments</td>
</tr>
<tr>
<td>CR-2 (A-E)</td>
<td>ARRT Clinical Competence Assessments</td>
</tr>
<tr>
<td>A</td>
<td>MSU Daily Patient Log Sheet</td>
</tr>
<tr>
<td>C</td>
<td>MSU Clinical Procedures Semester Summary</td>
</tr>
<tr>
<td>D</td>
<td>MSU Clinical Procedures Cumulative Summary</td>
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<tr>
<td></td>
<td>ARRT Summative Evaluation Rating Scales</td>
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**Patient Log Sheet** – FORM A
RA students must maintain a daily log of all examinations (observed, assisted, and performed). *The Radiologist Preceptor must initial the log sheet.*

**Clinical Procedure Competency Evaluations** – FORM CR-2 (A-E), FORM C
When an RA student feels competent to perform a procedure, he/she will request that the Radiologist Preceptor complete an ARRT Clinical Competency Evaluation (FORM CR-2 A-E).

> After teaching the student and determining that the student can safely attempt the clinical procedure, the Radiologist Preceptor will observe and evaluate the student as he/she attempts the clinical competency. *The radiologist preceptor will interrupt the procedure being evaluated if a patient’s welfare is compromised and/or equipment welfare is questionable.*

The MSU Clinical Coordinator has the final word in the acceptance or denial of clinical competencies. Competency evaluations must be included in the clinical portfolio and will contribute to the portfolio grade.

RA students must maintain semester summaries of clinical competencies. FORM C and FORM D

**ARRT CR-1 Form**
This form is completes by the student as he or she (a)completes the requisite number of cases for the mandatory and elective procedures and (b) is evaluated by a radiologist on the mandatory and elective procedures.

The student records the number of cases completed for each mandatory and elective procedure he or she performs. The student records only the date that the competency assessment was completed. *The preceptor and program director must verify and sign the bottom of Form CR-1*

**ARRT Summative Evaluation Rating Scales**
The purpose of this form is to obtain from the chief preceptor a final overall evaluation of the student’s clinical skills as demonstrated during his or her preceptorship. *The form should be completed by the chief preceptor during the final stages of the preceptorship and included in the student’s final clinical portfolio. To be eligible for certification, the student must receive a rating of three or higher in each skill area.*
RADIATION PROTECTION

It is the goal of this program to keep radiation exposure to students as low as reasonably achievable. NCRP Report #102 will be used to establish maximum dose values.

The radiologist preceptor will ensure that the clinical site(s) make a radiation monitor available for each student to wear during clinical hours. If a student performs radiographic procedures when not engaged in RA clinical education activities, the radiation monitor which is used for RA clinical education will not be used.

Students will wear their radiation monitor at collar level in front, outside of the protective apron and will follow the storage policy and other related policies of the clinical site (radiation monitor should remain at site).

The student will supply the RA program with the monthly or quarterly radiation report in their Clinical Portfolio.

If a student receives an exposure over a 30 day period that exceeds 100 millirems, the MSU Radiation Safety Officer will conduct an investigation.

Additional general rules concerning radiation monitor use are:

- Radiation monitors are to be worn any time a student is working at the clinical site
- Radiation monitors should not be placed on or near TVs or heat-producing appliances
- Radiation monitors should not be exposed to sunlight for an extended period of time or high temperatures such as in automobiles
- Radiation monitors should not get wet
- Radiation monitors should not be worn when the student is having medical or dental x-rays performed

RA STUDENT RESPONSIBILITIES

The clinical environment for an RA student will present special challenges. Even though they are certified radiologic technologists, RA students are not expected to function as radiologic technologists during their clinical hours. RA clinical hours are dedicated to learning from the radiologist preceptors and mastering the skills necessary to function as a Radiologist Assistant.

There is no standard MSU RA uniform. RA students should dress professionally and practically in accord with their clinical environments. Any questions regarding appropriate clinical dress should be directed to the radiologist preceptor and the MSU Clinical Coordinator.

There is a commonly accepted progression in medically-related education. The first step is academic preparation. The assignments in the RA Procedures courses and the on-campus seminar classes are designed to provide this component. RA students will have a minimum of twenty-four (24) contact clinical hours each week to achieve the remaining steps. The next step is observation. The RA student should carefully observe the activities of the radiologist preceptor, especially those directly related to the RA Clinical Competencies Checklist, but also the more subtle aspects of direct patient care. The third step is assisting the radiologist preceptor, working side by side for the patient’s safety. The fourth step is competency evaluation and documentation. At this point, the radiologist preceptor documents that the RA student can perform the specific clinical task competently. The final step is performance maintenance. RA students are expected to
show continued clinical competence by their willingness and ability to repeat previously documented clinical procedures.

RA students are responsible for maintaining all clinical course records including the clinical portfolio. They must communicate regularly with the radiologist preceptor and the MSU Clinical Coordinator about their clinical experiences.

**MSU RA CLINICAL COORDINATOR RESPONSIBILITIES**

Clinical experiences are a component of clinical courses. The MSU Clinical Coordinator will coordinate any activities related to clinical rotations. This includes managing all clinical forms and the clinical portfolio. The MSU Clinical Coordinator will work with other RA Program faculty to integrate clinical and didactic information each semester. The MSU Clinical Coordinator assigns clinical grades. Contact information will be included on the clinical course syllabus.

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**RA MAJOR – SPECIFIC PROGRAM POLICIES**

(In Alphabetical order)

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**Advanced Cardiac Life Support (ACLS)**

ACLS issued by the American Heart Association, Red Cross, or the American Health & Safety Institute must have been completed before the student enters the program and must be current during all clinical experiences. A current copy of the student’s ACLS card must be kept in the student file. It is the student’s responsibility to keep this certification current. The card issued must cover the entire program enrollment (minimum five semesters). If a student’s ACLS certification expires during the time he/she is in clinical, the student must be re-certified in ACLS.

**Academic Standards**

Demonstrates mastery in various disciplines, before matriculation and after; as judged by faculty members, examinations, and other measurements of performance. Once a student matriculates at the MSU RA Program, levels of mastery are required in six broad areas of competency.

These six areas of competency are:
- Medical Knowledge
- Interpersonal and Communication Skills
- Patient Care
- Professionalism
- Practice-based Learning and Improvement
- Systems-based Practice

Academic Standards are addressed in detail in the MSU MSRS Handbook distributed at orientation. Students with specific questions about academic performance requirements in a course should reference the course
syllabus or contact the course instructors. Any student who has specific questions about performance requirements in a course should speak with the individual course instructor.

Attendance

Clinical
Students must document clinical contact hours working with their radiologist preceptors during clinical courses. More specific requirements about clinical attendance will be provided in the clinical course syllabi. MSU MSRS RA Major clinical competencies meet or exceed the required clinical competencies set by the ARRT.

At least five semesters in the RA Major include clinical preceptorships with at least twenty-four (24) contact hours per week including at least four (4) hours a week of direct image review with the Radiologist Preceptor. The program currently requires about 1500 total clinical contact hours.

Because all RA students are experienced health care professionals, in cases of severe weather conditions, they should use their own judgment about attending clinical. RA students and radiologist preceptors should have an established system of communication for such situations. The students should inform the MSU Clinical Coordinator as soon as possible of any missed clinical time.

Didactic
Because of the unique distance learning format for this program, students must be present for both on-campus class sessions each semester to receive a passing grade in any didactic course which includes on-campus hours. There are no exceptions to this policy. If MSU is closed on an on-campus seminar day because of severe weather, RA program officials will contact students with specific instructions. The RA program must have current contact information for all students.

Background Check & Drug Screening Test

The MSRS RA program is committed to ensuring public and professional trust and providing safe patient care. In order to meet this goal, background investigation, finger printing, and drug screening of students is required. Many of our clinical education settings require additional criminal background investigations of all employees and students. To comply with these requirements, accepted students will be asked to submit to these tests to ascertain the student’s suitability for clinical rotations.

Criminal Background Check
All students will be required to submit to a criminal background check facilitated by www.castlebranch.com before clinical rotation. The background check will include, but is not limited to, a review of prior criminal records, review of nationwide sexual offender records, review of nationwide healthcare fraud and abuse records, review of the nationwide Patriot Act records, review of residency history, and Social Security verification. Students with any felonies on the criminal record will be ineligible for admission into the MSRS RA Program. The submission of any false information to MSU MSRS RA program shall be cause for immediate dismissal. Students are responsible for the payment of the criminal background check. *The criminal background check included criminal records for the state of Texas; additional counties outside of Texas will be searched for an additional fee.

Drug Screening Test Policy
Students may be required to submit for 10 panel urine drug screening (cocaine, amphetamines, barbiturates, benzodiazepines, marijuana, opiates, phencyclidine, propoxyphene, methadone, and synthetic opiates) before clinical rotation and at any time in the program. The student will be responsible for payment of the screening
test. If the student tests positive for any illegal substance, he/she will be withdrawn from the program immediately. Non-negative results will be processed further and may require additional testing. Additional drug screening will be at the student’s expense. Failure to pass drug screening will result in immediate dismissal from the program. The submission of any false information to MSU MSRS RA program shall be cause for immediate dismissal.

This information will remain confidential and will only be viewed by the Radiologic Science Program Chair or designee. Any criminal conviction which is found during the background investigation that may deem a student unsuitable for clinical rotations will be considered on a case by case basis. Additional information regarding the conviction may be required in order to make an informed decision. The background investigation will be made available to clinical education settings that require such. Individuals at the Clinical Education Setting, who are authorized to make decisions regarding an individual’s eligibility to attend a setting, will inform the Program Chair if a student will be allowed to attend clinical at that setting. If an offense appears on the criminal background check that disqualifies the student from attending clinical experiences, the clinical site(s) will notify the program regarding any students’ disqualification for attending clinical at that site. The student will receive written notification. Students who receive notification of ineligibility and who wish to dispute the results of the background investigation may follow the College of Health Sciences and Human Services Grievance Procedure.

If a student has been convicted of a crime, including a felony, a gross misdemeanor, or a misdemeanor with the sole exception of speeding and parking violations, these must be reported to the American Registry of Radiologic Technologists (ARRT). All alcohol and/or drug related violations must be reported. All potential violations must be investigated by the ARRT in order to determine eligibility. Individuals must file a pre-application with the ARRT in order to obtain a ruling of the impact of their eligibility for the examination. This pre-application may be submitted at any time either before or after entry into an accredited program. For pre-application contact the ARRT at:

ARRT
1225 Northland Dr.
St. Paul, MN 55120-1155
Tel: (651) 687.0048

Communicable Disease

Any student who suspects he/she may have been exposed to or contracted a communicable disease must notify the radiologist preceptor and the MSU Clinical Coordinator immediately. If a student has been exposed, appropriate action will be taken to ensure the health and well-being of the student, hospital patients and staff and fellow students.

Students are encouraged to make use of any protective devices available. Students must use surgical gloves and other protective or precautionary measures (consistent with institutional policies) for all procedures in which there may be contact with body fluids (urine, blood, excretion, saliva, etc.). Those students found not in compliance will come back to MSU for retraining on universal precautions for the first offense. Subsequent offenses will lead to a one day suspension for the second offense; a three day suspension for the third offense, and termination from the program for the fourth offense. Most contact will be with patients who have not yet been diagnosed, and therefore, the precautionary procedure of wearing gloves is of paramount importance. Students will use strict isolation techniques if the patient has been diagnosed as having a contagious disease. Students may not refuse to perform radiologic services for these patients.
If a student should be the carrier of a contagious disease, he/she must contact the radiologist preceptor and the MSU Clinical Coordinator immediately. A temporary suspension of training may be necessary for legal reasons and for the protection of the patients. In the event a student is barred from the clinical education center because of a communicable disease, the RA Program will work with the student to make up the missed clinical education with a minimum of lost time to the student.

Health / Medical Insurance

RA students are responsible for any personal injury that occurs at the university or hospital. Purchase of Health / Accident Insurance is required. A copy of the student’s medical insurance information must be presented during orientation and will be kept in the student file. It is the student’s responsibility to keep this information current.

Any MSU student may purchase health insurance through the university. Contact Vinson Health Center for additional information.

Immunization Requirements

By Texas state law, each RA student entering the clinical environment must have the currently required immunizations:

- MMR (measles, mumps, rubella)
- DT (diphtheria, tetanus)
- Varicella (Chicken Pox)
- Hepatitis B
- TB (tuberculosis) screening

All required immunizations must be completed prior to the first clinical day. Students who have not completed their immunizations will not be allowed to participate in clinical until cleared by the MSU Vinson Health Center. The Vinson Health Center requires all shot records be forwarded to them, and the Vinson Health Center may provide immunizations on an appointment basis only.

Liability Insurance

RA students must carry professional liability insurance during the clinical education phase of their training. These fees are to be paid annually to the Radiologic Sciences office. The liability insurance is effective on the day clinical education begins and ends on the day the RA program is completed. The coverage is only valid during the students scheduled clinical hours, and does not cover students when they are employed.

Professional Conduct & Honesty

Professional conduct and honesty are essential for Radiologist Assistants. The impression a student makes on the patients and others reflects not only upon the student, but on the RA Program and the University. The Program and the University will not tolerate unacceptable behavior in the classroom clinical setting, or public events where students represent the RA Program or the University. Students are to abide by the ARRT
Radiologic Science Professional Code of Ethics, especially regarding patient protection, patient confidentiality, and patient care.

Professional conduct includes, but is not limited to:

**Commitment to Excellence**
- refrains from performing any professional service which requires competence that one does not possess or which is prohibited by law unless the situation morally dictates otherwise;
- strives to exceed expectations at all times;
- commits to life-long learning by taking responsibility for one’s own learning and accurately;
- reflecting on the adequacy of one’s knowledge, skill development and personal barriers to accomplishing learning and growth;
- takes responsibility for learning in group settings by being present, prepared and engaged;
- strives for mastery learning appropriate for one’s level of training;
- reflects with colleagues on the success of group work.

**Honesty and Integrity**
- identifies truthfully and accurately one’s credentials and professional status;
- communicates appropriately in an honest and timely manner;
- accurately represents actions and events;
- avoids cheating, plagiarism, misrepresentation of the truth;
- reflects on one’s personal reaction to encounters with others and accepts responsibility for personal actions;
- recognizes, appropriately discloses and manages conflicts of interest;
- is forthcoming with information; does not withhold and/or use information for power;
- admits mistakes.

**Compassion**
- recognizes and responds to the fears, suffering and hopes of patients and their families;
- assists colleagues in dealing with the challenges of professional work.

**Respect for Others**
- respects confidentiality of patients;
- recognizes and respects personal and sexual boundaries;
- avoids bias (e.g., gender, race, age, sexual orientation) in interactions with others;
- articulates and embraces the many positive aspects of difference among people and demonstrates awareness of how such differences affect personal interactions;
- demonstrates a commitment to resolving conflicts in a collegial manner;
- shows sensitivity and respect for the needs, feelings, ideas and wishes of others in clinical and education settings;
- demonstrates humility in interactions with others;
- recognizes that appropriate dress and appearance demonstrate respect for others and for the profession.

**Professional Responsibility**
- is present and punctual for scheduled activities;
- takes responsibility to notify others for unavoidable absence or tardiness;
- copes with the challenges, conflicts, and ambiguities inherent in professional work;
- identifies and appropriately deals with problematic behaviors of oneself and colleagues;
• being cognizant of and adhering to the chain of command;
• appropriately displaces clinical responsibilities when personal needs demand it;
• adheres to established professional codes of conduct;
• practices according to accepted standards of care;
• identifies ethical issues in professional situations and acts in an ethical manner;
• regards as strictly confidential, all information concerning each patient and refraining from discussing this information with any unauthorized individual, including the patient.

**Social Responsibility**

• understands and actively addresses the multiple social factors that threaten the health of patients;
• actively works for appropriate social change to improve the health of populations;
• models healthy behaviors.

**Altruism**

• places the interests of others above self-interest;
• is able to give up some personal needs to meet needs of patients.

Unprofessional conduct will not be tolerated and may result in a recommendation for dismissal from the RA Program.

Serious infractions can result in immediate dismissal from the RA Program. Any student under the influence of drugs or alcohol that impairs clear clinical decision-making and functioning in the classroom or clinical area will be recommended for immediate dismissal from the RA Program.

**Radiation Protection & Pregnancy**

The RA student **may** inform the MSU Clinical Coordinator and the radiologist preceptor if she is pregnant. It is the RA student’s responsibility to inform the clinical site Radiation Safety Officer of her pregnancy so appropriate radiation protection measures can be taken.

**Technical Standards**

The essential aptitudes and abilities that allow RA students (and practicing RAs) to perform in the vast array of requisite ways summarized by the six areas of competency above.

Without the ability to demonstrate the essential capacities, students cannot fulfill the requirements of all the courses within the MSU RA Program. Meeting these Academic and Technical Standards is required for: a) matriculation (in so much as the abilities can reasonably be determined before matriculation), b) advancement toward candidacy, and c) graduation.

The listed standards are essential in meeting the core competencies as defined above by the Midwestern State University Radiologist Assistant Program.

Students enrolled in the MSU RA Program must have capacities in five broad areas:

1. **Perception/Observation**
2. **Communication**
3. Motor/Tactile Function
4. Cognition
5. Professionalism

**Perception/Observation**
Students must perceive, by the use of senses and mental abilities, the presentation of information through:
- Small group discussions and presentations
- Large group lectures
- Online lectures
- One-on-one interactions
- Demonstrations
- Laboratory experiences
- Patient encounters
- Diagnostic findings
- Procedures
- Written material
- Audiovisual material

Students’ diagnostic skills will be lessened without the functional use of the senses of equilibrium, smell, hearing, and taste. Additionally, they must have sufficient exteroceptive sense (touch, pain, and temperature), sufficient proprioceptive sense (position, pressure, movement, stereognosis, and vibratory) and sufficient motor function to permit them to carry out these functions.

**Communication**
Students must skillfully communicate, both orally and in writing (in English) with faculty members, the healthcare team, patients, families, and other students to:
- Elicit information
- Convey information
- Clarify information
- Create rapport
- Develop therapeutic relationships
- Work collaboratively

Students must speak, hear, and observe patients in order to elicit information, describe changes in mood, and perceive nonverbal communications. Students must communicate effectively with patients, including speech, reading and writing.

**Motor/Tactile Function**
Students must have sufficient motor function and tactile ability to:
- Attend and participate in classes, groups, and activities which are part of the curriculum
- Examine patients (including observation, auscultation, palpation, percussion, and other diagnostic maneuvers)
- Conduct basic radiologic procedures and tests
- Perform diagnostic/therapeutic procedures
- Provide patient care appropriate to the circumstances
- Function in a wide variety of patient care venues
Perform in a reasonably independent and competent way in potentially high speed/high demand environments

Stand, sit, push, pull, bend, lift, stoop, and perform other necessary functions to provide care to the patient.

Students must demonstrate coordination of both gross and fine muscular movements, equilibrium, and functional use of the senses of touch and vision.

Cognition

Students must demonstrate higher-level cognitive abilities, which include:

- Rational thought
- Measurement
- Calculation
- Visual-spatial comprehension
- Conceptualization
- Analysis
- Synthesis
- Organization
- Representation (oral, written, diagrammatic, three dimensional)
- Memory
- Application
- Clinical reasoning
- Ethical reasoning
- Sound judgment

Students must possess the above abilities to reach diagnostic and therapeutic judgments. They must also comprehend three-dimensional relationships and the spatial relationships of structures.

Professionalism

Students must consistently demonstrate the core attributes of professionalism. MSU has defined the following behaviors as indicators of professionalism. See MSU Professional Conduct and Honesty:

- Commitment to Excellence
- Honesty and Integrity
- Respect for Others
- Empathy and Compassion
- Professional Responsibility
- Social Responsibility
- Altruism

Students must possess the emotional health necessary for full utilization of their intellectual abilities, the exercise of sound judgment, the prompt completion of responsibilities attendant to the diagnosis and care of patients, and the development of mature, sensitive, and effective relationships with patients and co-workers. Students must tolerate physically taxing workloads and to function effectively under stress. They must adapt to changing environments, to display flexibility and to learn to function in the face of uncertainties inherent in the clinical problems of many patients. They must have a high level of compassion for others, motivation to serve, integrity, and a consciousness of social values and possess sufficient interpersonal skills to interact positively with people from all levels of society, all ethnic backgrounds, and all belief systems.
Students with Disabilities

It is the experience of the MSU Radiologist Assistant Program that students with disabilities (as defined by Section 504 of the Rehabilitation Act and the Americans with Disabilities Act) are qualified to study and practice as a RA with the use of reasonable accommodations. To be qualified for admission to the MSU RA Program, individuals must meet the Programs Academic Standards and Standards of Capacity, with or without reasonable accommodation. Accommodation is viewed as a means of assisting students with disabilities to meet essential standards by providing them with an equal opportunity to participate in all aspects of each course. (Reasonable accommodation is not intended to guarantee that students will be successful in meeting course requirements.)

Students needing clarification are encouraged to contact the MSU RA Program Director or Disability Support Services. Disability Support Services assessments are confidential and it is the students responsibility to submit written documentation to the RA Program Director in a timely manner.

The Use of Auxiliary Aids and Intermediaries

Students with documented disabilities are provided with accommodations at the Program, which may include involvement of an intermediary or auxiliary aid. No disability can be reasonably accommodated with an aid or intermediary that provides cognitive support, substitutes for essential clinical skills, or supplements clinical and ethical judgment. Thus, accommodations cannot eliminate essential program elements or fundamentally alter the RA program curriculum.
APPENDIX A
Program Schedules
## MSRS Program
Radiologist Assistant Program
Sample Completion Plan
Fall Start vs. Spring Start

<table>
<thead>
<tr>
<th>Semester</th>
<th>MSRS RA Fall Start</th>
<th>MSRS RA Spring Start</th>
<th>On Campus Trips</th>
<th>On Campus Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>5013 Trends 5023 Legal</td>
<td>RA Leveling Courses*</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Spring</td>
<td>RA Leveling Courses* 5043 Patient Interactions</td>
<td>0</td>
<td>5013 Trends 5023 Legal 5043 Patient Interactions</td>
<td>2</td>
</tr>
<tr>
<td>Summer</td>
<td>5153 Procedures I (Chest) 5174 Clinical I</td>
<td>1</td>
<td>5153 Procedures I (Chest) 5174 Clinical I</td>
<td>1</td>
</tr>
<tr>
<td>Fall</td>
<td>5003 Research I 5253 Procedures II (GI/GU) 5274 Clinical II</td>
<td>2</td>
<td>5003 Research I 5253 Procedures II (GI/GU) 5274 Clinical II</td>
<td>2</td>
</tr>
<tr>
<td>Spring</td>
<td>6773 Research Methods II 5353 Procedures III (MSK) 5374 Clinical III</td>
<td>2</td>
<td>6773 Research Methods II 5353 Procedures III (MSK) 5374 Clinical III</td>
<td>2</td>
</tr>
<tr>
<td>Summer</td>
<td>5453 Procedures IV (Invasive) 5474 Clinical IV</td>
<td>1</td>
<td>5453 Procedures IV (Invasive) 5474 Clinical IV</td>
<td>1</td>
</tr>
<tr>
<td>Fall</td>
<td>5033 Leadership 5553 Procedures V (Pathways) 5574 Clinical V</td>
<td>2</td>
<td>5033 Leadership 5553 Procedures V (Pathways) 5574 Clinical V</td>
<td>2</td>
</tr>
</tbody>
</table>

*contact Vicki Sanders for more information about the RA Leveling Courses and Challenge Exams*  
victoria.sanders@mwsu.edu
APPENDIX B
Clinical Competency Forms
# Form CR-1
## Summary of Clinical Experience and Competence Assessments

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Experience Documentation</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gastrointestinal and Chest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Esophageal study – must fluoro and image the esophagus, may be with UGI</td>
<td>Mandatory</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Swallowing function study (participate in procedure and provide initial observations to radiologist)</td>
<td>Mandatory</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Upper GI study</td>
<td>Mandatory</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Small bowel study – direct the study and spot TI</td>
<td>Mandatory</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Small bowel study via enteroclysis tube</td>
<td>Elective</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Enema with barium, air, or water soluble contrast</td>
<td>Mandatory</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Nasogastric/enteric and orogastric/enteric tube placement – may not require image guidance</td>
<td>Mandatory</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>T-tube cholangiogram</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Defecography</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Perform chest fluoroscopy for diaphragmatic motion</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td><strong>Genitourinary</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antegrade urography through existing tube (e.g., pyelostography, nephrostography)</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Cystography or voiding cystourethrogram, with a minimum of 10 bladder catheterizations</td>
<td>Mandatory</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Retrograde urethrogram or urethrocystography</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Loopography through existing tube</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Hysterosalpingography – imaging only</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Hysterosalpingography – procedure and imaging (physician participation required)</td>
<td>Elective</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Procedure</td>
<td>Mandatory or Elective</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td><strong>Invasive Nonvascular</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arthrogram (radiography, CT, and MR) joint injection and aspiration</td>
<td>Mandatory</td>
<td>15</td>
<td>45</td>
</tr>
<tr>
<td>Lumbar puncture</td>
<td>Mandatory</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Cervical, thoracic, or lumbar myelography – imaging only</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Lumbar puncture with contrast</td>
<td>Elective</td>
<td>15</td>
<td>45</td>
</tr>
<tr>
<td>Thoracentesis with or without catheter</td>
<td>Mandatory</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Placement of catheter for pneumothorax</td>
<td>Elective</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Paracentesis</td>
<td>Mandatory</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Abscess, fistula, or sinus tract study</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Injection for sentinel node localization</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Breast needle localization</td>
<td>Elective</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Change of percutaneous tube or drainage catheter</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Thyroid biopsy</td>
<td>Elective</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Liver biopsy (random)</td>
<td>Elective</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td><strong>Invasive Vascular</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peripheral insertion of central venous catheter (PICC) placement</td>
<td>Mandatory</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Insertion of non-tunneled central venous catheter</td>
<td>Elective</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Insertion of tunneled central venous catheter</td>
<td>Elective</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Port injection</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Extremity venography</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td><strong>Post-Processing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform CT post-processing</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Perform MR post-processing</td>
<td>Elective</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total Number of Cases</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Chief Preceptor Signature and Date**

**Program Director Signature and Date**

**Student Signature and ARRT ID #**

ARRT® Didactic and Clinical Portfolio Requirements for Certification as a Registered Radiologist Assistant 6
Form CR-2A
Clinical Competence Assessment for GI and Chest Procedures

(esophageal study; swallowing function study; upper GI study; small bowel study; small bowel study via enteroclysis tube; enema with barium, air, or water soluble contrast; nasogastric/enteric and orogastric/enteric tube placement; t-tube cholangiogram; defecography; chest fluoroscopy)

Directions: This form should be completed by the radiologist supervising the procedure after the student has completed a sufficient number of cases to merit evaluation. To meet the required performance standard, the student must perform each clinical activity safely and effectively on a consistent basis.

Procedure: ___________________________ Date Performed: ______________

<table>
<thead>
<tr>
<th>Clinical Activity</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review patient record and other information to verify appropriateness of procedure. Assessed patient for possible contraindications (e.g., history, medications, pregnancy, psychological status).</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Interview patient to obtain, verify, or update medical history. Explain procedure (risks, benefits, alternatives, and follow-up) and any required pharmaceuticals. Obtain or verify informed consent and confirm adequate exam preparation (e.g., diet, medications).</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Perform physical exam and evaluate lab studies as needed; report findings to the radiologist.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Prepare and administer contrast agents prescribed by radiologist. Position patient; operate fluoro unit, modifying procedure as necessary; observe and evaluate structure and function; and document fluoroscopy time.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Monitor patient status and respond as needed (e.g., discomfort, drug reactions, cardiac distress).</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Evaluate procedure for completeness and diagnostic quality; recommend additional images as required; communicate initial observations to the radiologist.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Educate patient regarding follow-up care and verify comprehension.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Document procedure and record exceptions from established protocol.</td>
<td>☐ ☐ ☐</td>
</tr>
</tbody>
</table>

Overall Evaluation

Radiologist Comments
(Note any particular strengths or areas for improvement for the student, or unusual features of the case that warrant consideration.)

Radiologist Signature ___________________________ Date ___________________________

Student Signature ___________________________ Date ___________________________
Form CR-2B
Clinical Competence Assessment for GU Procedures

(antegrade urography; cystography or voiding cystourethrography, retrograde urethrography or urethrocystography; loopography; hysterosalpingography)

Directions: This form should be completed by the radiologist supervising the procedure after the student has completed a sufficient number of cases to merit evaluation. To meet the required performance standard, the student must perform each clinical activity safely and effectively on a consistent basis.

Procedure: _______________________________ Date Performed: __________________

<table>
<thead>
<tr>
<th>Clinical Activity</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review patient record and other information to verify appropriateness of procedure. Assess patient for possible contraindications (e.g., history, medications, pregnancy, psychological status).</td>
<td></td>
</tr>
<tr>
<td>Interview patient to obtain, verify, or update medical history. Explain procedure (risks, benefits, alternatives, and follow-up) and any required pharmaceuticals. Obtain or verify informed consent and confirm adequate exam preparation (e.g., diet, medications).</td>
<td></td>
</tr>
<tr>
<td>Perform physical exam and evaluate lab studies as needed; report findings to the radiologist.</td>
<td></td>
</tr>
<tr>
<td>Perform urinary catheterization; prepare and administer contrast agents prescribed by radiologist.</td>
<td></td>
</tr>
<tr>
<td>Position patient; operate fluoro unit, modifying procedure as necessary; observe and evaluate structure and function; and document fluoroscopy time.</td>
<td></td>
</tr>
<tr>
<td>Monitor patient status and respond as needed (e.g., discomfort, drug reactions, cardiac distress).</td>
<td></td>
</tr>
<tr>
<td>Evaluate procedure for completeness and diagnostic quality; recommend additional images as required; communicate initial observations to the radiologist.</td>
<td></td>
</tr>
<tr>
<td>Educate patient regarding follow-up care and verify comprehension.</td>
<td></td>
</tr>
<tr>
<td>Document procedure and record exceptions from established protocol.</td>
<td></td>
</tr>
</tbody>
</table>

Overall Evaluation

<table>
<thead>
<tr>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>does not meet</td>
</tr>
<tr>
<td>□</td>
</tr>
</tbody>
</table>

Radiologist Comments
(Note any particular strengths or areas for improvement for the student, or unusual features of the case that warrant consideration.)

Radiologist Signature ____________________ Date ____________________

Student Signature ______________________ Date ____________________
Form CR-2C

Clinical Competence Assessment for Invasive Nonvascular Procedures

(arthrogram, joint injection and aspiration; lumbar puncture; myelography lumbar puncture with contrast; thoracentesis; placement of catheter for pneumothorax paracentesis; abscess, fistula, or sinus tract study; injection for sentinel node localization; breast needle localization; change of percutaneous tube or drainage catheter; thyroid biopsy; liver biopsy)

**Directions:** This form should be completed by the radiologist supervising the procedure after the student has completed a sufficient number of cases to merit evaluation. To meet the required performance standard, the student must perform each clinical activity safely and effectively on a consistent basis.

Procedure: __________________________________ Date Performed: _______________

<table>
<thead>
<tr>
<th>Clinical Activity</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review patient record and other information to verify appropriateness of procedure. Assess patient for possible contraindications (e.g., history, medications, pregnancy, psychological status).</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Interview patient to obtain, verify, or update medical history. Explain procedure (risks, benefits, alternatives, and follow-up) and any required pharmaceuticals. Obtain or verify informed consent and confirm adequate exam preparation (e.g., diet, medications).</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Perform physical exam and evaluate lab studies as needed; report findings to the radiologist.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Administer local anesthetic; select and insert needle, catheter, or tube to required location; collect fluids and measure pressures as needed; administer prescribed contrast; maintain aseptic environment throughout procedure.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Position patient; operate fluoro unit, modifying procedure as necessary; observe and evaluate structure and function; and document fluoroscopy time.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Monitor patient status and respond as needed (e.g., discomfort, drug reactions, cardiac distress).</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Evaluate procedure for completeness and diagnostic quality; recommend additional images as required; communicate initial observations to the radiologist.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Educate patient regarding follow-up care and verify comprehension.</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>Document procedure and record exceptions from established protocol.</td>
<td>☐ ☐ ☐</td>
</tr>
</tbody>
</table>

**Overall Evaluation**

<table>
<thead>
<tr>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>does not meet</td>
</tr>
<tr>
<td>☐</td>
</tr>
</tbody>
</table>

**Radiologist Comments**

(Notaany particular strengths or areas for improvement for the student, or unusual features of the case that warrant consideration.)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Radiologist Signature __________________________ Date ________________

Student Signature __________________________ Date ________________
**Form CR-2D**

**Clinical Competence Assessment for Invasive Vascular Procedures**

(PICC placement; insertion of non-tunneled central venous catheter; insertion of tunneled central venous catheter; port injection; extremity venography)

**Directions:** This form should be completed by the radiologist supervising the procedure after the student has completed a sufficient number of cases to merit evaluation. To meet the required performance standard, the student must perform each clinical activity safely and effectively on a consistent basis.

Procedure: __________________________ Date Performed: ______________

<table>
<thead>
<tr>
<th>Clinical Activity</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review patient record and other information to verify appropriateness of procedure. Assess patient for possible contraindications (e.g., history, medications, pregnancy, psychological status).</td>
<td>□ □ □</td>
</tr>
<tr>
<td>Interview patient to obtain, verify, or update medical history. Explain procedure (risks, benefits, alternatives, and follow-up) and any required pharmaceuticals. Obtain or verify informed consent and confirm adequate exam preparation (e.g., diet, medications).</td>
<td>□ □ □</td>
</tr>
<tr>
<td>Perform physical exam and evaluate lab studies as needed; report findings to the radiologist.</td>
<td>□ □ □</td>
</tr>
<tr>
<td>Administer local anesthetic; select and insert needle or catheter to required location; administer contrast and guide catheter; maintain aseptic environment throughout procedure.</td>
<td>□ □ □</td>
</tr>
<tr>
<td>Position patient; operate fluoro unit, modifying procedure as necessary; observe and evaluate structure and function; and document fluoroscopy time.</td>
<td>□ □ □</td>
</tr>
<tr>
<td>Monitor patient status and respond as needed (e.g., discomfort, drug reactions, cardiac distress).</td>
<td>□ □ □</td>
</tr>
<tr>
<td>Evaluate procedure for completeness and diagnostic quality; recommend additional images as required; communicate initial observations to the radiologist.</td>
<td>□ □ □</td>
</tr>
<tr>
<td>Educate patient regarding follow-up care and verify comprehension.</td>
<td>□ □ □</td>
</tr>
<tr>
<td>Document procedure and record exceptions from established protocol.</td>
<td>□ □ □</td>
</tr>
</tbody>
</table>

**Overall Evaluation**

<table>
<thead>
<tr>
<th>□ does not meet</th>
<th>□ meets</th>
<th>□ exceeds</th>
</tr>
</thead>
</table>

**Radiologist Comments**

(Note any particular strengths or areas for improvement for the student, or unusual features of the case that warrant consideration.)

__________________________________________________________

__________________________________________________________

__________________________________________________________

**Radiologist Signature** __________________________ Date __________________________

**Student Signature** __________________________ Date __________________________
Form CR-2E
Clinical Competence Assessment for
Post-Processing Activities
(CT post-processing; MR post-processing)

**Directions:** This form should be completed by the radiologist supervising the procedure after the student has completed a sufficient number of cases to merit evaluation. To meet the required performance standard, the student must perform each clinical activity safely and effectively on a consistent basis.

**Procedure:** ___________________________________________ Date Performed: _______________

<table>
<thead>
<tr>
<th>Clinical Activity</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrieve image data from archive system.</td>
<td>□</td>
</tr>
<tr>
<td>Preview image data set.</td>
<td>□</td>
</tr>
<tr>
<td>Load image data set.</td>
<td>□</td>
</tr>
<tr>
<td>Display volume using MPR, MIP, SSD, VRT, or CPR.</td>
<td>□</td>
</tr>
<tr>
<td>Use segmentation or editing tools to remove obstructive anatomy.</td>
<td>□</td>
</tr>
<tr>
<td>Evaluate final images.</td>
<td>□</td>
</tr>
<tr>
<td>Use measuring tools (distance, ROI, percent of stenosis calculation).</td>
<td>□</td>
</tr>
<tr>
<td>Export images to server, secure web site, or report.</td>
<td>□</td>
</tr>
</tbody>
</table>

**Overall Evaluation**

<table>
<thead>
<tr>
<th></th>
<th>does not meet</th>
<th>meets</th>
<th>exceeds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

**Radiologist Comments**
(Note any particular strengths or areas for improvement for the student, or unusual features of the case that warrant consideration.)

__________________________________________________________

__________________________________________________________

__________________________________________________________

**Radiologist Signature** ________________________________ Date ______________________

**Student Signature** ________________________________ Date ______________________
### Summative Evaluation Rating Scales

**Name of Student**

**Name of Educational Program**

**Chief Preceptor***

**Program Director***

**Preceptorship Start Date**

**Preceptorship End Date**

**Date**

**Date**

---

### 1. Evaluation of Medical Information

<table>
<thead>
<tr>
<th>Incomplete evaluation of records and other information; inefficient use of time; does not independently determine what data to obtain or where; superficial knowledge of radiologic sciences; fails to apply information to decision making; does not recognize fallibility of certain types of data.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Standard</strong></td>
</tr>
<tr>
<td>does not meet</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Thorough evaluation of records and other information; autonomous in locating information; in-depth knowledge of radiologic sciences literature; understands how data may or may not apply to case at hand, while clearly recognizing potential limitations of that data.</td>
</tr>
</tbody>
</table>

### 2. Patient Communication

<table>
<thead>
<tr>
<th>Fails to explain procedure in a manner that patient will understand; does not consider patient preferences or address patient concerns; neglects patient education needs; does not inspire patient confidence; unsystematic in patient follow-up.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Standard</strong></td>
</tr>
<tr>
<td>does not meet</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Explains procedure to patient in clear and understandable fashion; considers patient interests and preferences; identifies and addresses patient education needs; exhibits empathy and helps patient feel at ease; systematic in patient follow-up.</td>
</tr>
</tbody>
</table>

### 3. Professionalism

<table>
<thead>
<tr>
<th>Does not participate in professional development or quality improvement; minimal benefit from peer review or supervision; lacks appreciation for the total healthcare system; shows little regard for legal, ethical and scope of practice issues; makes little or no contribution to integrity of department.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Standard</strong></td>
</tr>
<tr>
<td>does not meet</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Participates in and benefits from activities such as continuing education, peer review, and other professional interactions; appreciates intricacies of the healthcare system; understands and respects legal, ethical and scope of practice issues; contributes to overall integrity of department.</td>
</tr>
</tbody>
</table>

### 4. Radiation Safety

<table>
<thead>
<tr>
<th>Limited knowledge of radiation biology and physics; unaware of or does not follow regulations; fails to take precautions to minimize dose to patient, self, or others (e.g., shielding, reproductive status, fluoroscopy time).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Standard</strong></td>
</tr>
<tr>
<td>does not meet</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Demonstrates knowledge of radiation biology and physics; appreciates importance of and adheres to regulations; conscientious about minimizing dose to patient, self, and others (e.g., shielding, reproductive status, fluoroscopy time).</td>
</tr>
</tbody>
</table>

* Complete next page before signing.
### Summative Evaluation Rating Scales

#### 5a. Procedural Skills: GI and Chest Studies

<table>
<thead>
<tr>
<th>Lacks knowledge of contrast (indications, contraindications, administration); awkward or imprecise when positioning patients; minimal thought given to imaging technique; inattentive to patient physiologic status during procedure; accepts images of marginal quality; does not recognize need for additional imaging.</th>
<th><strong>Performance Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>does not meet</strong></td>
<td><strong>meets</strong></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Thorough knowledge of contrast (indications, contraindications, administration); positions patients carefully and precisely; thoughtful and decisive when determining imaging technique; monitors patient physiologic status during procedure; accepts only high quality images; evaluates images to determine need for additional study.</td>
<td></td>
</tr>
</tbody>
</table>

#### 5b. Procedural Skills: GU Studies

<table>
<thead>
<tr>
<th>Superficial knowledge of contrast (indications, contraindications, administration); awkward or imprecise when positioning patients; minimal thought given to imaging technique; inattentive to patient physiologic status during procedure; accepts images of marginal quality; does not recognize need for additional imaging.</th>
<th><strong>Performance Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>does not meet</strong></td>
<td><strong>meets</strong></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Thorough knowledge of contrast (indications, contraindications, administration); positions patients carefully and precisely; thoughtful and decisive when determining imaging technique; monitors patient physiologic status during procedure; accepts only high quality images; evaluates images to determine need for additional study.</td>
<td></td>
</tr>
</tbody>
</table>

#### 5c. Procedural Skills: Invasive Nonvascular Studies

<table>
<thead>
<tr>
<th>Inattentive to demands of aseptic environment; superficial knowledge of contrast, anesthetics, or other medications; awkward when inserting or placing needle or catheter; little thought given to imaging technique; does not appreciate limitations of procedure; inattentive to patient physiologic status during procedure; accepts images of marginal quality; does not recognize need for additional imaging.</th>
<th><strong>Performance Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>does not meet</strong></td>
<td><strong>meets</strong></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Exercises caution in aseptic environment; thorough knowledge of contrast, anesthetics, and other medications; precisely inserts or places needle or catheter; thoughtful and decisive when determining imaging technique; appreciates limitations of procedure; monitors patient physiologic status during procedure; accepts only high-quality images; evaluates images to determine need for additional study.</td>
<td></td>
</tr>
</tbody>
</table>

#### 5d. Procedural Skills: Invasive Vascular Studies

<table>
<thead>
<tr>
<th>Inattentive to demands of aseptic environment; superficial knowledge of anesthetics or other medications; awkward when inserting or placing needle or catheter; little thought given to imaging technique; does not appreciate limitations of procedure; inattentive to patient physiologic status during procedure; accepts images of marginal quality; does not recognize need for additional imaging.</th>
<th><strong>Performance Standard</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>does not meet</strong></td>
<td><strong>meets</strong></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Exercises caution in aseptic environment; thorough knowledge of anesthetics and other medications; precisely inserts or places needle or catheter; thoughtful and decisive when determining imaging technique; appreciates limitations of procedure; monitors patient physiologic status during procedure; accepts only high-quality images; evaluates images to determine need for additional study.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C
ARRT Entry Level Clinical Activities, ARRT RRA Exam Contents Specifications, & Application Information
REGISTERED RADIOLOGIST ASSISTANT
ENTRY-LEVEL CLINICAL ACTIVITIES

Approved January 2013
Effective July 2014

Introduction

Discussions among the American College of Radiology (ACR), the American Society of Radiologic Technologists (ASRT), and The American Registry of Radiologic Technologists® (ARRT®) culminated in 2003 with a consensus statement that defines the Registered Radiologist Assistant (R.R.A.) as an advanced-level radiographer who works under the supervision of a radiologist to promote high standards of patient care by assisting radiologists in the diagnostic imaging environment. Under radiologist supervision, the R.R.A. performs patient assessment, patient management, and selected clinical imaging procedures. Certification as an R.R.A. does not qualify the R.R.A. to perform interpretations (preliminary, final, or otherwise) of any radiological examination.¹ The R.R.A. may make and communicate initial observations only to the radiologist.

The ARRT expanded this consensus definition to delineate more fully the entry-level role of a radiologist assistant and introduced a certification program based upon a job analysis in 2005. The R.R.A. certification requirements include certification, registration, and experience in radiography (i.e., R.T.(R)(ARRT)) and R.R.A.-specific educational, ethics, and examination standards. Details are available on ARRT’s website (www.arrt.org).

ARRT’s certification requirements are periodically updated to incorporate changing practice patterns and expectations. This document reflects the entry-level clinical activities for the radiologist assistant resulting from the most recent job analysis. One of the revisions was to change the name of the document from the Registered Radiologist Assistant Role Delineation to the Registered Radiologist Assistant Entry-Level Clinical Activities (ELCA). The name change was proposed to avoid confusion over the purpose of this document as explained below.

Purpose of this Document

In order to develop certification standards, ARRT first identifies a core set of activities that individuals should be qualified to perform at entry into that role. The list of entry-level clinical activities is then used to create ARRT test development and education requirements for certification. The ELCA is not intended as a scope of practice. Inclusion of activities in the ELCA does not indicate that the activities may be legally performed in all states by those certified nor that the activities, if performed, are eligible for reimbursement under current CMS regulations. State, institutional, and employer requirements should be consulted to determine the specific role allowed in an individual situation. Similarly, exclusion of activities from the ELCA is not to be interpreted as prohibiting the performance of the activities provided that state, institutional, and employer requirements support the performance of the activities and that appropriate education, training, and competence assessment have been completed for the procedures. For all ARRT certification programs it is assumed that the procedures covered by the certification requirements will serve as the foundation for developing qualifications to perform additional procedures.


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Initial Role Delineation Development

ARRT published the initial role delineation in 2005. It was developed based upon a survey of radiologists and radiology practitioner assistants (RPAs) conducted in early 2004. Radiologists were asked to rate clinical activities as to whether the activity could be performed by an appropriately prepared radiologist assistant and, if so, the suggested level of radiologist supervision. RPAs were asked to indicate if they performed the activities and, if so, the level of supervision they received.

An ARRT Advisory Committee composed of four radiologists, two R.R.A. educational program directors, two RPAs, one physicist, and organizational liaisons reviewed the survey responses. A draft description of the role of a radiologist assistant was produced. After additional refinements by the Advisory Committee based upon organizational and community feedback, the ARRT Board of Trustees adopted the R.R.A. Role Delineation in January 2005. Eligibility requirements and examination content specifications were approved in June 2005.

2014 Job Analysis Update

ARRT typically performs an interim update of the job analysis, upon which certification requirements are based, within three years of introduction of a new version of the requirements. A comprehensive update is performed after six years. Accordingly, the revised certification requirements for the R.R.A. are scheduled to be implemented in July 2014.

A survey, that included three new activities identified by the Registered Radiologist Assistant Examination Committee and Essay Evaluation Committee, was administered during the summer of 2012. The survey was sent to all R.R.A.s currently in the ARRT database. Radiologist surveys were also handed out by R.R.A.s to the radiologists for whom they worked. The response rate was 35.5% from the R.R.A.s and 69 surveys were returned by radiologists. The survey results were reviewed by the R.R.A. committees.

The draft survey and the draft ELCA were reviewed by the Inter-Societal Commission on Radiologist Assistants (ICRA). ICRA is composed of representatives of ACR, ASRT, and ARRT along with the participation of representatives from the Society of Radiology Physician Extenders. The suggestions from ICRA were incorporated into this document. The ARRT Board of Trustees approved the ELCA for implementation July of 2014.
Conclusion

The clinical procedures included in the ELCA reflect procedures performed by a significant percentage of radiologist extenders and which radiologists were generally comfortable delegating to an R.R.A. under their supervision. The survey identified many procedures that were being performed by some radiologist extenders, but not by a sufficient percentage to warrant inclusion in the ELCA. Exclusion from this document is not intended to limit the procedures performed by an R.R.A. provided that appropriate education, training, and competence assessment have been documented for those procedures and provided that state, institutional, and employer requirements support the performance.

Radiologist supervision of R.R.A. performed procedures is assumed. The ARRT test development and education requirements for certification assume that the level of supervision for entry-level R.R.A.s will be at the direct level for clinical procedures. Direct supervision\(^2\) is defined as the radiologist present in the radiology facility and immediately available to furnish assistance and direction throughout the performance of the procedure, but not required to be present in the room when the procedure is performed. The assumption of a specific level of supervision is intended to assist in the development of entry-level certification requirements. The actual level of radiologist supervision for an R.R.A. in practice will depend upon the R.R.A.s experience as well as state, institutional, and employer requirements. Best practice for all exams requiring consent includes the radiologist meeting the patient.

It is expected that R.R.A.s who perform procedures other than those listed in the ELCA will have received appropriate training and competence assessment on these procedures to assure patient safety and quality imaging. The additional clinical education and competence assessment should be documented within the individual R.R.A.s portfolio. All activities should be performed in compliance with state, institutional, and employer requirements.

\(^2\)This definition of direct supervision is based upon that of the Centers for Medicare and Medicaid Services (CMS).
**Entry-Level Clinical Activities for the Registered Radiologist Assistant**

**Clinical activities**

1. Review the patient’s medical record to verify the appropriateness of a specific exam or procedure and report significant findings to radiologist.
2. Assist the radiologist in determining whether indications meet the ACR Appropriateness Criteria* when advising those who order examinations.
3. Interview patient to obtain, verify, or update medical history.
4. Explain procedure to patient or significant others, including a description of risks, benefits, alternatives, and follow-up.*
5. Participate in obtaining informed consent.*
6. Determine if patient has followed instructions in preparation for the exam (e.g., diet, premedications).
7. Assess risk factors that may contraindicate the procedure (e.g., health history, medications, pregnancy, psychological indicators, alternative medicines). (Note: Must be reviewed with radiologist.)
8. Perform and document a radiology-focused physical examination and analysis of data (e.g., signs and symptoms, laboratory values, significant abnormalities, vital signs) and report findings to the supervising radiologist for the following:
   a. abdominal
   b. thoracic
   c. cardiovascular
   d. musculoskeletal
   e. peripheral vascular
   f. neurological and endocrine
   g. breast and axillae
9. Monitor ECG and recognize abnormal rhythms.
11. Perform venipuncture.
12. Monitor IV therapy for flow rate and complications.
13. Participate in the administration of moderate (conscious) sedation.
14. Observe and assess patient who has received moderate (conscious) sedation.
15. Assess patient’s vital signs and level of anxiety/pain and inform radiologist when appropriate.
16. Recognize and respond to medical emergencies (e.g., drug reactions, cardiac arrest, hypoglycemia) and activate emergency response systems, including notification of the radiologist.
17. Administer and monitor oxygen as prescribed.
18. Operate a fixed/mobile fluoroscopic unit.

* Patient must be able to communicate with the radiologist if he/she requests or if any questions arise that cannot be appropriately answered by the radiologist assistant.
Clinical activities

19. Assure documentation of fluoroscopy time.

20. Explain effects and potential side effects to the patient of the pharmaceutical required for the examination.

21. Administer contrast agents and radiopharmaceuticals as prescribed by the radiologist.

22. Administer general medications as prescribed by the radiologist.

23. Monitor patient for side effects or complications of the pharmaceutical.

24. Advocate for patient radiation safety and protection:
   a. assess the patient’s radiation dose history
   b. provide radiation procedure exposure and cumulative dose education
   c. recommend alternative procedures based on patient radiation dose

25. Perform procedures in compliance with Standards of Care, facility and regulatory requirements, and ARRT Standards of Ethics.

26. Perform the following GI and chest examinations and procedures including contrast media administration and operation of appropriate imaging equipment:
   a. esophageal study
   b. swallowing function study
   c. upper GI study
   d. small bowel study
   e. small bowel study via enteroclysis tube
   f. enema with barium, air, or water soluble contrast
   g. nasogastric/enteric and orogastric/enteric tube placement
   h. t-tube cholangiogram
   i. defecography
   j. chest fluoroscopy

27. Perform the following GU examinations and procedures including contrast media administration and operation of appropriate imaging equipment:
   a. antegrade urography through an existing catheter (e.g. pyelostography, nephrostography)
   b. cystography
   c. retrograde urethrography or urethrocystography
   d. voiding cystourethrography
   e. loopography through an existing catheter
   f. hysterosalpingography - imaging only
   g. hysterosalpingography - procedure and imaging (physician participation required)

28. Perform the following invasive nonvascular procedures with image guidance including contrast media administration and needle or catheter placement:
   a. joint injection and aspiration
   b. arthrogram (radiography, CT, and MR)
   c. lumbar puncture
Clinical activities

d. cervical, thoracic, or lumbar myelography – imaging only

e. lumbar puncture for myelography

f. thoracentesis with or without catheter

g. placement of catheter for pneumothorax

h. paracentesis

i. abscess, fistula, or sinus tract study

j. injection for sentinel node localization

k. breast needle localization

l. change of percutaneous tube or drainage catheter

m. thyroid biopsy

n. liver biopsy

29. Perform the following invasive vascular procedures with image guidance including contrast media administration and needle or catheter placement:

a. peripheral insertion of central venous catheter (PICC) placement

b. insertion of non-tunneled central venous catheter

c. insertion of tunneled central venous catheter

d. port injection

e. extremity venography

30. Perform CT post-processing.


32. Evaluate images for completeness and diagnostic quality, and recommend additional images as required (general radiography, CT, and MR). (Note: Additional images only in the same modality such as additional CT cuts.)

33. Review imaging procedures, make initial observations, and communicate observations only to the radiologist.

34. Record previously communicated initial observations of imaging procedures according to approved protocols.

35. Communicate radiologist’s report to appropriate health care provider consistent with ACR Practice Guideline for Communicating Diagnostic Imaging Findings. (Revised 2005-Res. 11 or its successor document)

36. Provide physician-prescribed pre- and post- care instructions to patients.

37. Perform follow-up patient evaluation, and post-procedure care, and communicate findings to the radiologist (includes inpatients and outpatients).

38. Document procedure and post-procedure evaluation in appropriate record.

39. Write patient admission and/or discharge summary for review and co-signature by radiologist.

40. Participate in quality improvement activities within radiology practice.

41. Assist with data collection and review for clinical trials or other research.

42. Assist the radiologist in presenting at multi-disciplinary conferences (e.g., tumor boards and case conferences).
Content Specifications for the Registered Radiologist Assistant Examination

Effective with the January 2011 Examination

The American Registry of Radiologic Technologists (ARRT) administers the national certifying examination for Registered Radiologist Assistants (R.R.A.s). To establish certification requirements for this area of advanced practice, the ARRT periodically sponsors a practice analysis project. The most recent study was completed in 2009 under the direction of the R.R.A. Advisory Committee, which included representatives from the American College of Radiologists (ACR) and the American Society of Radiologic Technologists (ASRT). Participants in the study included national samples of radiologists and radiologist extenders. The project culminated in the Entry-Level Clinical Activities (ELCA) document which identifies activities and clinical procedures performed by R.R.A.s.

The ELCA serves as the basis for the content specifications presented on the following pages. The content specifications identifies the knowledge and cognitive skills required to effectively perform the activities and clinical procedures included in the ELCA.

The table below presents the six major content categories, along with the number of questions appearing in each category. The examination consists primarily of selected response test questions (e.g., multiple choice). In addition, case studies are presented that require an essay response to several questions. Candidates are allowed 3½ hours to complete the selected response multiple-choice section, and 2½ hours to complete the case study section.

The pages that follow provide a detailed listing of topics within each major content category. Although this document covers many of the same topics included in curricula guides and related documentation, it is not intended to serve as a guide for educational programs. Educational programs are likely to be broader in scope.

<table>
<thead>
<tr>
<th>Content Categories</th>
<th>Selected Response Points</th>
<th>Case Study Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Patient Communication, Assessment, and Management</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>B. Drugs and Contrast Materials</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>C. Anatomy, Physiology, and Pathophysiology</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>D. Radiologic Procedures</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>E. Radiation Safety, Radiation Biology, and Fluoroscopic Operation</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>F. Medical-Legal, Professional, and Governmental Standards</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Total Number</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Testing Time Allowed</td>
<td>3.5 hours</td>
<td>2.5 hours</td>
</tr>
</tbody>
</table>

Notes: (1) The exam also contains two case studies. Each case is followed by four to six essay questions worth 3 or 6 points each. A case also includes a few selected response questions (e.g., multiple choice). Refer to Overview of CBT at www.arrt.org for additional details. (2) Test content in sections C or D may refer to appropriate imaging. (3) The exam also consists of an additional 20 unscored pilot questions.

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A. PATIENT COMMUNICATION, ASSESSMENT, AND MANAGEMENT (45)

1. PATIENT COMMUNICATION (5)
   A. Patient Education
      1. explanation of procedure
      2. alternatives to current procedure
      3. risk versus benefit
      4. radiation procedure exposure and cumulative dose education
   B. Psychosocial Support
      1. communication skills and issues
      2. cultural awareness
      3. social support structures
   C. Pre- and Post-Procedure Care

2. PATIENT ASSESSMENT: (20)
   Includes adaptations for pediatric, geriatric, and special needs populations
   A. Medical Data Review
      1. indications for procedure (ACR Appropriateness Criteria ®)
      2. contraindications for procedure
      3. laboratory values
      4. prior diagnostic studies
      5. current medications
      6. previous history (e.g., vital signs, nurses/physicians notes)
      7. assessment of vital signs, height, and weight
   B. Patient Interview
      1. verification
         a. patient identification and correct procedure
         b. patient preparation
         c. pregnancy status
      2. medical history
         a. chief complaint
         b. present illness
         c. past history
         d. family history
         e. personal and social history
         f. review of systems
      3. risk factors
         a. medications
         b. allergy history
         c. medical or psychological indicators
         d. alternative medicines
   C. Common Laboratory Tests, Analysis, and Significance
      1. complete blood count (CBC), RBC, WBC, hemoglobin, platelets
      2. electrolytes (sodium, potassium, bicarbonate, chloride)
      3. pancreatic and cardiac enzymes
      4. calcium
      5. albumin and total protein
      6. coagulation factors (e.g., prothrombin time (PT), partial thromboplastin time (PTT), International Normalized Ratio (INR), platelets)
      7. liver function
      8. renal function
      9. glucose
      10. culture and sensitivity
      11. cytology and histopathology
   D. Psychological Status
      1. cognitive abilities
      2. emotional stability
      3. speech and language skills
      4. disorders that affect communication
         a. dementia
         b. cognitive impairment
         c. drug and/or alcohol impairment

(Section A continues on the following page)
E. Abdomen Assessment
1. assessment procedures
   a. visual inspection
   b. auscultation
   c. percussion
   d. palpation
   e. pre-procedure rectal exam
2. signs and symptoms
   a. tenderness on palpation
   b. diarrhea
   c. flatulence
   d. dysuria
   e. pain
   f. constipation
   g. reflux
   h. nausea and vomiting

F. Thorax and Lung Assessment
1. assessment procedures
   a. visual inspection
   b. auscultation
   c. percussion
   d. palpation
   e. chest wall excursion
   f. oxygen saturation measurement
2. signs and symptoms
   a. cough/sputum production
   b. pain
   c. breathing pattern
   d. skin changes (e.g., cyanosis)
   e. clubbing
   f. exercise/activity tolerance

G. Cardiovascular Assessment
1. assessment procedures
   a. visual inspection
   b. auscultation
   c. palpation
   d. vital signs
   e. electrocardiogram (ECG)
   f. perfusion status
2. signs and symptoms
   a. venous distention
   b. heart rate and rhythm
   c. peripheral pulse
   d. edema
   e. exercise/activity tolerance
   f. pain
   g. skin changes (e.g., ulceration)

H. Musculoskeletal Assessment
1. assessment procedures
   a. visual inspection
   b. palpation
   c. range of motion analysis
   d. mobility and strength testing
2. signs and symptoms
   a. skin changes (e.g., redness, temperature)
   b. swelling
   c. crepitus
   d. pain
   e. change in function

I. Peripheral Vascular Assessment
1. assessment procedures
   a. visual inspection
   b. auscultation
   c. palpation
   d. pulse and edema scoring
   e. ABI-Ankle Brachial Index
2. signs and symptoms of arterial occlusion and insufficiency
   a. pain
   b. skin changes
   c. altered pulses
   d. arterial bruits
   e. claudication
   f. thrills
3. signs and symptoms of venous obstruction and insufficiency
   a. skin changes
   b. generalized edema
   c. varicose veins
   d. venous hum

J. Neurological Assessment
1. assessment procedures
   a. visual inspection (e.g., pupil size, symmetry, and reactivity)
   b. sensory evaluation
   c. motor evaluation
2. signs and symptoms
   a. pain
   b. weakness
   c. sensory changes
   d. motor changes

(Section A continues on the following page)
K. Breast and Axillae Assessment
   1. assessment procedures
      a. visual inspection
      b. palpation
      c. clinical breast examination
   2. signs and symptoms
      a. mass
      b. discharge
      c. depression
      d. skin changes
      e. asymmetry
      f. pain/tenderness
      g. nipple changes

3. PATIENT MANAGEMENT (20)
   A. Standard Precautions (mechanism of disease transmission)
   B. Sterile Technique
   C. Patients with Disabilities
   D. Patient Monitoring and Assessment (pre-, during, and post-procedure)
      1. physical status
      2. emotional status
      3. cardiac monitoring
   E. Intravenous Therapy
      1. venipuncture
      2. flow rate monitoring
      3. complications
   F. Oxygen Therapy
      1. level (flow rate)
      2. indications and contraindications
   G. Urinary Catheterization
      1. technique
      2. complications
      3. contraindications
   H. Medical Emergencies
      1. cardiac arrest
      2. hypoglycemia
      3. seizure
      4. respiratory arrest
      5. shock
   I. Radiological Procedure Complications
      1. contrast related complications
         a. nephrotoxicity
            1. contrast induced nephropathy
            2. NSF (nephrogenic systemic fibrosis)
         b. neurotoxicity
         c. extravasation
      2. infection
      3. hemorrhage
      4. pneumothorax
      5. perforation (GI or GU)
      6. respiratory distress
      7. aspiration
      8. vasovagal reaction
      9. pulmonary edema
      10. vascular injury or occlusion
      11. complications of catheterization
      12. seizures
      13. pain
      14. anaphylactoid shock
      15. neurologic deficit
      16. stroke
      17. cardiac arrest
      18. radiation injury
      19. physical injury
      20. death
   J. Medical Devices
      1. image appearance, indications, and purpose
         a. drainage catheters
         b. peritoneal dialysis catheters
         c. CSF shunts
         d. stents
         e. IABP
         f. pacers/AICD
         g. urinary catheters
         h. umbilical vascular catheters
         i. cardiovascular valves
         j. intrathecal catheters
         k. bariatric devices
         l. neuro stimulators
      2. image appearance, indications, purpose, appropriate location, and complications
         a. Swan Ganz catheters
         b. central venous catheters
         c. IVC filter
         d. chest tubes
         e. tracheal tubes
         f. gastroenteric tubes
B. DRUGS AND CONTRAST MATERIALS (30)

1. TERMINOLOGY (5)
   A. Regulations
      1. Federal Drug Administration (FDA)
      2. Drug Enforcement Agency (DEA)
      3. controlled substances
   B. Identifying Names
      1. generic
      2. trade
      3. United States Pharmacopoeia (USP)
   C. Drug Characteristics
      1. actions
      2. synergisms
      3. indications
      4. contraindications
      5. side effects
      6. adverse actions
   D. Dosage
      1. loading
      2. maintenance
      3. therapeutic dose
      4. lethal dose
   E. Safe Dosage Calculation
      1. ratio
      2. proportion
      3. pediatric
      4. geriatric
   F. Administration
      1. oral
      2. rectal
      3. sublingual
      4. parenteral
      5. intravenous
      6. intramuscular
      7. intrathecal
      8. cutaneous
      9. nasal

2. ANESTHETICS (7)
   A. Local Anesthetics
      1. short acting
      2. long acting
      3. injectables
      4. cutaneous
   B. Moderate/Conscious Sedation - American Society of Anesthesiologists (ASA) Guidelines
      1. definitions
      2. guidelines
         a. pre-procedure
            1. history and physical
            2. ASA guidelines
         b. intra-procedure
         c. post-procedure
         d. discharge scoring system
            1. motor activity
            2. respirations
            3. standing blood pressure
            4. consciousness
            5. oxygen saturation
      3. equipment
      4. medications (indications, contraindications, dosing guidelines)
         a. fentanyl
         b. morphine
         c. meperidine
         d. diazepam
         e. midazolam
         f. lorazepam
         g. pentobarbital
         h. chloral hydrate
         i. naloxone
         j. flumazenil
         k. epinephrine
         l. atropine

(Section B continues on the following page)
3. GENERAL MEDICATIONS: (9)
classifications, indications, contraindications

A. Anti-Infective Drugs
   1. antibiotics
   2. antivirals
   3. antifungals

B. Cardiac Drugs
   1. anti-hypertensive
      a. calcium channel blockers
      b. beta blockers
      c. ACE inhibitors
   2. vasoconstrictors
   3. vasodilators
   4. anti-arrhythmics

C. Gastrointestinal Drugs
   1. anti-reflux agents
   2. hypomotility (glucagon)
   3. cholecystokinetic (cholecystokinin)
   4. antiemetics

D. Vascular Drugs
   1. coagulation modifiers
   2. tissue plasminogen activator (TPA)

E. Anti-Inflammatory Drugs
   1. analgesics (aspirin)
   2. non steroidal anti-inflammatory drugs (NSAIDs)
   3. corticosteroids

F. Endocrine Drugs
   1. diabetic medication
   2. anti-hypoglycemic (glucagon)
   3. insulin
   4. thyroid medications

G. Diuretics

4. CONTRAST MEDIA (9)

A. Agents (e.g., indications, contraindications, adverse reactions, dosage, routes of administration, excretion process)
   1. negative contrast agents
   2. positive contrast agents
   3. barium sulfate
   4. iodinated contrast media
      a. osmolality (high versus low)
      b. molecular structure
      c. advantages

B. Allergies
   1. allergy history
   2. types of reactions (mild to severe)
   3. premedications
      a. diphenhydramine
      b. corticosteroids

C. Resuscitation
   1. life support
      a. basic life support (BLS)
      b. advanced cardiac life support (ACLS)
   2. basic drugs
      a. epinephrine
      b. atropine
      c. bronchodilator
      d. nitroglycerine
      e. lidocaine
      f. intravenous fluid
1. ANATOMY: (15) Includes gross and sectional anatomy, age-related changes, common surgical changes, congenital and developmental abnormalities/anomalies
   A. Abdominal Section
   B. Thoracic Section
   C. Musculoskeletal Section
   D. Neurological and Endocrine Section
   E. Vascular and Lymphatic Section
   F. Breast and Axilla Section

2. PHYSIOLOGY: (12) Includes age-related and surgery-related physiologic changes
   A. Abdominal Section
      1. gastrointestinal
      2. hepatobiliary
      3. urinary
      4. reproductive
   B. Thoracic Section
      1. cardiovascular
      2. pulmonary
   C. Musculoskeletal Section
      1. muscular
      2. skeletal
   D. Neurological and Endocrine Section
      1. neurological
      2. endocrine
   E. Vascular and Lymphatic Section
      1. vascular
      2. lymphatic
   F. Breast and Axilla Section

3. PATHOPHYSIOLOGY (28)
   A. Abdominal Section
      1. alteration in function related to disease/injury
      2. compensation mechanisms
      3. diseases/disorders/injuries (e.g., etiology, manifestations, physical examination, diagnostic studies, history and physical findings/clinical data)
         a. general abdomen
            1. abdominal calcifications
            2. abdominal aortic aneurysm
            3. normal and abnormal gas patterns – (e.g., ileus, obstruction, volvulus)
            4. pneumatosis intestinalis
            5. portal venous gas
            6. peritonitis
            7. pneumoperitoneum
            8. abscess
            9. free fluid
         b. gastrointestinal
            1. esophagus
               a. dysphagia
               b. achalasia
               c. scleroderma
               d. fistulae
               e. esophagitis
               f. varices
               g. Crohn’s disease
               h. presbyesophagus
               i. webs
               j. diverticuli (Zenker’s, Killian-Jameson, epiphrenic)
               k. primary muscular and neural disorders
               l. malignant and benign masses
               m. Barrett's esophagus

(Section C continues on the following page)
2. stomach
   a. hiatal hernias
   b. gastric outlet obstruction
   c. malignant and benign masses
   d. gastroparesis
   e. volvulus
   f. pyloric stenosis
   g. bezoar
   h. ulcers
   i. gastritis
   j. gastroesophageal reflux disease (GERD)
   k. surgical variation (Roux-en-Y, gastric band, Nissen fundoplication)

3. small intestine
   a. diverticuli
   b. non-rotation and malrotation
   c. duodenitis
   d. Crohn’s disease
   e. peptic ulcer disease
   f. malignant and benign tumors
   g. ischemia
   h. adhesions
   i. malabsorption
   j. hernias
   k. infections
   l. fistulae
   m. superior mesenteric artery (SMA) syndrome
   n. intussusception
   o. necrotizing enterocolitis
   p. Meckel’s diverticulum

4. large intestine
   a. intussusception
   b. Crohn’s disease
   c. polyps
   d. malignant and benign masses
   e. Hirschsprung’s disease
   f. fistulae
   g. inflammatory diseases
   h. adhesions
   i. appendicitis
   j. non-rotation and malrotation
   k. colitis
   l. diverticulosis/diverticulitis
   m. volvulus
   n. constipation
   o. toxic megacolon
   c. hepatobiliary, pancreas, and spleen
      1. hepatitis
      2. cirrhosis
      3. pancreatitis
      4. cholecystitis
      5. biliary calculi
      6. liver failure
      7. portal hypertension
      8. malignant and benign masses
      9. inflammatory processes
      10. biliary dyskinesia
      11. fatty liver
      12. Gaucher’s disease
      13. splenomegaly
      14. pancreatic insufficiency
      15. pancreatic pseudocyst

   d. urinary
      1. malignant and benign masses
      2. calculi
      3. inflammatory processes and abscesses
      4. acute and chronic renal failure
      5. glomerulonephritis and nephrotic syndrome
      6. infarcts, ischemia, thrombosis
      7. nephrocalcinosis
      8. renal papillary necrosis
      9. vesicoureteral reflux
      10. UPJ obstruction (congenital, adult)
      11. polycystic kidney disease

   e. reproductive
      1. female
         a. endometriosis
         b. malignant and benign masses
         c. pelvic inflammatory disease
         d. polycystic ovary disease
         e. pregnancy
         f. ectopic pregnancy
      2. male
         a. benign prostatic hypertrophy
         b. malignant and benign masses
         c. inflammatory processes
         d. testicular torsion
         e. hydrocele

(Section C continues on the following page)
B. Thoracic Section
1. alternation in function related to disease/injury
2. compensation mechanisms
3. diseases/disorders/injuries (e.g., etiology, manifestations, physical examination, diagnostic studies, history and physical findings/clinical data)
   a. inflammatory and infectious diseases
   b. malignant and benign masses
   c. adult respiratory distress syndrome (ARDS)
   d. infant respiratory distress syndrome (IRDS)
   e. hyaline membrane disease (HMD)
   f. bronchopulmonary dysplasia (BPD)
   g. chronic obstructive pulmonary disease (COPD)
   h. pleural effusions
   i. asthma
   j. diaphragmatic paresis
   k. pulmonary edema
   l. pulmonary fibrosis
   m. pulmonary emboli
   n. atelectasis
   o. pulmonary venous and arterial hypertension
   p. calcification
   q. pneumothorax
   r. pneumomediastinum
   s. congestive heart failure (CHF)
   t. coronary artery disease
   u. valvular heart disease
   v. pericardial disease
   w. cardiac dysrhythmias
   x. pleural diseases

C. Musculoskeletal Section
1. alteration in function related to disease/injury
2. compensation mechanisms
3. diseases/disorders/injuries (e.g., etiology, manifestations, physical examination, diagnostic studies, history and physical findings/clinical data)
   a. arthritis
      1. gout
      2. osteoarthritis
      3. rheumatoid arthritis
      4. ankylosing spondylitis
      5. psoriatic arthritis
   b. trauma (fractures, dislocations, and associated soft tissue injuries)
   c. tumors
      1. osteochondroma
      2. Ewing’s sarcoma
      3. osteosarcoma
      4. enchondroma
      5. chondrosarcoma
      6. osteoid osteoma
      7. metastatic disease
      8. multiple myeloma/plasmacytoma
   d. infections
      1. acute and chronic osteomyelitis
      2. soft tissue infection
   e. diseases
      1. osteomalacia
      2. osteoporosis
      3. Paget’s disease
      4. fibrous dysplasia
      5. osteogenesis imperfecta
      6. renal osteodystrophy

D. Neurological and Endocrine Section
1. alteration in function related to disease/injury
2. compensation mechanisms
3. diseases/disorders/injuries (e.g., etiology, manifestations, physical examination, diagnostic studies, history and physical findings/clinical data)
   a. neurological
      1. cerebrovascular accident (CVA)
      2. malignant and benign masses
      3. Parkinson’s disease
      4. amyotrophic lateral sclerosis (ALS)
      5. multiple sclerosis (MS)
      6. hydrocephalus
      7. normal pressure hydrocephalus (NPH)
      8. increased cranial pressure
      9. pseudotumor cerebri
      10. infection/inflammation
      11. open and closed head injuries
      12. spinal cord injury
      13. syringes
      14. seizures
      15. myasthenia gravis
      16. Alzheimer’s disease
      17. dementia
      18. herniated disc

(Section C continues on the following page)
b. endocrine
   1. osteoporosis
   2. hyperparathyroidism
   3. diabetes
   4. pituitary disorder
   5. thyroid disorders
      a. malignant and benign masses
      b. hypo and hyperthyroidism
   6. adrenal disorders
   7. renovascular hypertension

E. Vascular and Lymphatic Section
   1. alteration in function related to disease/injury
   2. compensation mechanisms
   3. diseases/disorders/injuries
      (e.g., etiology, manifestations, physical examination, diagnostic studies, history and physical findings/clinical data)
      a. blood clotting disorders
      b. anemias
      c. leukemias
      d. lymphomas
      e. shock
      f. hypertension
      g. arterio and atherosclerosis
      h. aneurysm
      i. varicosities
      j. arterial venous malformations (AVM)
      k. lymphedema
      l. coarctation of aorta

F. Breast and Axilla
   1. benign and malignant masses
      a. cysts
      b. fibroadenoma
      c. invasive ductal carcinoma
      d. invasive lobular carcinomas
      e. phyllodes
      f. inflammatory breast cancers
      g. Paget's disease
      h. ductal carcinoma in situ
   2. inflammatory diseases
D. RADIOLOGIC PROCEDURES (40)

This section addresses radiographic procedures for the categories that follow (1-5). Questions will cover the following topics:

- Anatomy & Pathophysiology
- Indications for Procedure
- Contraindications for Procedure
- Patient Assessment and Preparation for the Procedure
- Alternative and/or Complementary Procedures
- Access Methods and Closure Devices
- Patient Management During Procedure
- Operation of Diagnostic Equipment to Reduce Patient Exposure
- Contrast and Drug Administration
- Image Enhancement and Post-Processing
- Evaluation of Images for Diagnostic Utility
- Complications and Response to Emergencies
- Post-Procedure Patient Care
- Outcomes Measurement

1. GI AND CHEST STUDIES (10)
   A. Esophageal Study*
   B. Swallowing Function Study*
   C. Upper GI Study*
   D. Small Bowel Study*
   E. Small Bowel Study via Enteroclysis Tube
   F. Enema with Barium, Air, or Water Soluble Contrast*
   G. Nasogastric/Enteric and Orogastric/Enteric Tube Placement*
   H. T-Tube Cholangiogram
   I. Defecography
   J. Chest Fluoroscopy

2. GU STUDIES (8)
   A. Antegrade Urography (e.g., Pyelostography, Nephrostography)
   B. Cystography*
   C. Retrograde Urethrogram or Urethrocystography
   D. Voiding Cystourethrography
   E. Loopography
   F. Hysterosalpingography

3. INVASIVE NONVASCULAR PROCEDURES (10)
   A. Joint Injection and Aspiration
   B. Arthrogram (Radiography, CT, and MRI)*
   C. Lumbar Puncture*
   D. Cervical, Thoracic, or Lumbar Myelography
   E. Thoracentesis*
   F. Placement of Tube for Pneumothorax
   G. Paracentesis*
   H. Abscess, Fistula, or Sinus Tract Study

* Two of the 12 marked procedures (identified as mandatory on the clinical experience and competence assessments) will be included in the case study section of the exam.

(Section D continues on the following page)
I. Injection for Sentinel Node Localization
J. Breast Needle Localization
K. Change of Percutaneous Tube or Drainage Catheter
L. Thyroid Biopsy
M. Liver Biopsy

4. INVASIVE VASCULAR PROCEDURES (8)
   A. Peripheral Insertion of Central Venous Catheter (PICC) placement*
   B. Insertion of Non-Tunneled Central Venous Catheter
   C. Insertion of Tunneled Central Venous Catheter
   D. Port Injection
   E. Extremity Venography

5. IMAGE POST-PROCESSING (4)
   A. CT
      1. 3D reconstruction
      2. modifications to field of view (FOV)
      3. slice spacing
      4. algorithm
      5. maximum intensity projection (MIP)
      6. multiplanar reconstruction (MRP)
      7. quantitative measurements (volume, distance, diameter)
      8. cardiac analysis (calcium scoring and coronary artery mapping)
      9. shunt graft measurements
     10. volume rendering
   B. MRI
      1. 3D reconstructions
      2. maximum intensity projection (MIP)
      3. volume rendering
      4. multiplanar reconstruction
      5. quantitative measurements (volume, distance, diameter)
      6. subtraction
E. RADIATION SAFETY, RADIATION BIOLOGY, AND FLUOROSCOPIC OPERATION (15)

1. RADIATION SAFETY (6)

A. Exposure and Dose
1. exposure
2. absorbed dose, equivalent dose, effective dose
3. measurement and calculation of quantities (e.g., CTDI, DAP)
4. high dose exams and modalities

B. Radiation Safety Standards
1. organizations and their roles
   a. Nuclear Regulatory Commission (NRC)
   b. Occupational Safety and Health Administration (OSHA)
   c. Environmental Protection Agency (EPA)
   d. Food and Drug Administration (FDA)
   e. state health departments
2. principles of dose limitation (time, distance, shielding, ALARA)
3. monitoring and measuring devices
4. effective dose limits
   a. National Council on Radiation Protection and Measurement (NCRP)
      1. role
      2. reports
   b. ACR Appropriateness Criteria®
      1. role
      2. reports

C. Methods to Reduce Patient Exposure
1. intermittent fluoroscopy
2. limitation of field size
3. exposure factors (x-ray and CT)
4. filtration of the x-ray beam
5. protective shielding
6. immobilization
7. grid selection
8. limitation of fluoroscopic time
9. proper fluoroscope use
10. pediatric considerations

D. Methods to Reduce Occupational Exposure
1. location in radiation area
2. shielding devices in x-ray rooms
3. personal shielding devices
4. proper fluoroscope use

2. RADIATION BIOLOGY (4)

A. Cell Growth and Division

B. Radiosensitivity of Cells
1. direct and indirect effects
2. linear energy transfer (LET)
3. relative biological effectiveness (RBE)
4. oxygen enhancement ratio (OER)
5. dose rate, fractionation, and protraction

C. Radiation Effects
1. deterministic effects verses stochastic effects
2. background radiation
3. dose-response relationships
4. skin effects
5. acute radiation syndromes
6. local tissue damage
7. hematological effects
8. carcinogenesis
9. fetal effects
10. genetic effects

3. FLUOROSCOPIC OPERATION (5)

A. Fluoroscopy
1. components
   a. x-ray tube
   b. image intensifier
   c. collimators
   d. recording devices
      1. digital cameras
      2. cine
      3. spot films
      4. photo spot
   e. generator
   f. controls
   g. display
   h. recording
2. static image storage
3. dynamic image storage
4. pulsed fluoroscopy
5. high-level or boost mode
6. exposure factors
7. cumulative timer

B. Dose Monitoring Equipment
F. MEDICAL-LEGAL, PROFESSIONAL, AND GOVERNMENTAL STANDARDS (15)

1. MEDICAL RECORDS (3)
   A. Components of Documentation
      1. types of documentation for patient chart
      2. electronic and paper records
      3. fluoroscopic and image documentation
   B. Techniques and Procedures for Documentation
   C. Document Development and Administration
      1. examination findings
      2. exceptions from established protocol or procedure
      3. patient’s questions and concerns
      4. information regarding patient care, the procedure and final outcome
      5. diagnostic/therapeutic procedure and patient data
      6. radiologists report to referring physician
      7. direct communication with referring physician
      8. discharge summary
   D. Informed Consent
      1. patients competence
         a. cognitive impairment
            1. competence-assessment
            2. mental status
            3. medication
         b. surrogate consent
            1. health care power of attorney
            2. family
         c. patient education
            1. explain procedure
            2. risk versus benefit
            3. alternatives and options
            4. refusal of procedure and implications

2. REGULATORY REQUIREMENTS (3)
   A. Quality Assurance Management
      1. facility rules
      2. The Joint Commission requirements
   B. Credentialing
      1. local or hospital requirements
      2. state licensing/registration regulations
      3. continuing education requirements
      4. supervisory notification
      5. professional standards
   C. Government Regulations
      1. Medical Practice Act – supervisory requirements
      2. Health Insurance Portability and Accountability Act (HIPAA)

3. LEGAL CONSIDERATIONS (3)
   A. Definitions
      1. negligence and malpractice
         a. gross
         b. contributing
      2. standard of care
      3. assault and battery
      4. false imprisonment
      5. slander and libel
      6. elements of tort
   B. Legal Doctrines
      1. respondeat superior
      2. res ispa loquitur
      3. foreseeability
      4. personal liability
      5. good samaritan law

(Section F continues on the following page)
4. ETHICS (3)
   A. Patient Bill of Rights
   B. ASRT Practice Standards
   C. ARRT Standards of Ethics
   D. Definitions
      1. morals
      2. values
      3. ethics

5. QUALITY IMPROVEMENT, DATA ANALYSIS, AND CLINICAL RESEARCH (3)
   A. Definitions
      1. measures of frequency
      2. measures of central tendency
      3. measures of variance
   B. Assessment of Outcomes
Overview: This application packet includes the materials that you will need to apply for ARRT® certification and registration as a Registered Radiologist Assistant. Candidates should review these materials as well as the information on the R.R.A. certification and registration program included in the “Registered Radiologist Assistant” section on ARRT’s website (www.arrt.org). The Entry-Level Clinical Activities (ELCA) document serves as the basis for the eligibility requirements and should be reviewed.

Certification and Registration Eligibility Checklist: Candidates must meet the following eligibility requirements prior to participating in an examination:

_____ 1. ARRT Certified and Registered in Radiography.
Candidates must be certified and registered in radiography by the ARRT in order to be eligible for certification and registration as an R.R.A. R.R.A.s must maintain registration in radiography at all times to be eligible for continued certification and registration as an R.R.A. ARRT verifies satisfaction of this requirement against its records upon receipt of a candidate’s application materials.

_____ 2. One Year of Acceptable Clinical Experience.
Candidates must complete the equivalent of at least one year of full-time clinical experience following radiography certification and registration. The clinical experience may be earned concurrent to the radiologist assistant educational program, but may not be satisfied with radiologist assistant educational program activities. The clinical experience must be patient care related at the professional level. It is generally anticipated that this experience will be earned as a staff radiographer; however, experience could include related healthcare experience such as that earned as an EMT. The candidate attests that this requirement has been met on the Application for Certification and Registration form and agrees to supply additional documentation of the experience if audited by ARRT. ARRT reserves the right to audit all documentation related to a candidate’s eligibility for a period of five years after the candidate submits the application materials.

_____ 3. Educational Program Completion.
Candidates must successfully complete a radiologist assistant educational program that is recognized by ARRT, and completion must occur prior to sitting for the examination. In order to be recognized by ARRT, educational programs must meet the Recognition Criteria for Radiologist Assistant Educational Programs (recognition requirements). Successful program completion by the candidate, or scheduled completion, is attested to by the program director on the Application for Certification and Registration. If completion is scheduled, but has not occurred when the application is sent to ARRT, ARRT will subsequently contact the program director to verify completion.
4. **Didactic Competence Requirement.**

As part of the educational program, candidates must successfully complete coursework addressing the topics listed in the ARRT *Content Specifications for the Registered Radiologist Assistant Examination*. These topics should be covered as part of a nationally recognized radiologist assistant curriculum such as the one published by the ASRT. The program director attests to a candidate’s satisfaction of this requirement on the Application for Certification and Registration.

5. **Clinical Education Requirements.**

An essential part of the radiologist assistant’s education is the radiologist-supervised clinical preceptorship. During the preceptorship, students learn to perform radiologic procedures and clinical activities appearing in the R.R.A. ELCA. There will be numerous opportunities for the student to be observed and evaluated by the preceptor and other healthcare professionals, and for the student to critically evaluate and reflect on his or her own clinical experiences. The ARRT requires that candidates for certification and registration maintain a record of their clinical experiences and evaluations in the form of a clinical portfolio. The clinical portfolio consists of four components. The specific documentation for each component is described in 5A-5D below.

5A. **Component 1: Clinical Experience Documentation and Competence Assessments.**

Candidates for certification and registration must document performance of a set number of cases for a specified list of radiologic procedures and must successfully pass a competence assessment for each procedure (i.e., be evaluated by a preceptor and be deemed competent). The candidate’s clinical experience and competence assessments are documented on the Summary of Clinical Experience and Competence Assessment Form (CR-1) which is submitted to ARRT as part of the application materials. The competence assessments for individual procedures are documented on Forms CR-2A through CR-2E and are also submitted to ARRT as part of the application materials.

5B. **Component 2: Professional Activities and Accomplishments Record.**

Radiologist assistant students are expected to engage in critical self-evaluation and continued professional development during their educational program. Candidates for certification and registration must maintain the Professional Activities and Accomplishment Record and provide it to ARRT if the candidate’s records are audited. Students should include material in this record that they feel best captures and summarizes the multitude of experiences during their education as a radiologist assistant.
5C. **Component 3: Case Studies.**

Candidates must have submitted five case studies to their program directors for review and discussion during the educational program. It is expected that a case study will be one to three pages in length, address certain pieces of essential information (i.e., history, indications for procedure) and, if appropriate, be accompanied by information related to the procedure (e.g., images, lab results). The format may be modified to suit the needs of the program director, preceptor, and candidate. Candidates must maintain the five case studies and provide them to ARRT if the candidate’s records are audited.

5D. **Component 4: Summative Evaluation Rating Scales.**

The radiologist serving as the chief preceptor completes an overall evaluation of the candidate’s cognitive, psychomotor, and affective skills at the end of the preceptorship. The term “summative evaluation” denotes that this is an end-of-the-preceptorship summary assessment. The scales address five performance domains: evaluation of medical information; patient communication; radiation safety; professionalism; and specific procedural skills (GI/Chest, GU, invasive vascular, invasive nonvascular). To be eligible for certification and registration, the candidate must receive a rating of three or higher in each domain. The form is submitted to ARRT as part of the application materials.

6. **Baccalaureate Degree.**

Candidates must have earned a baccalaureate degree from an accredited educational institution. The degree does not need to have been awarded by the radiologist assistant educational program. Candidates attest to the satisfaction of this requirement on the Application for Certification and Registration and agree to supply additional documentation if audited.

7. **ARRT Ethics Requirements.**

Candidates for certification and registration must be persons of good moral character and must not have engaged in conduct that is inconsistent with the **ARRT Standards of Ethics** or the **ARRT Rules and Regulations** and must have complied and agree to continue to comply with the **ARRT Standards of Ethics** and the **ARRT Rules and Regulations**. Candidates attest to the satisfaction of this requirement on the Application for Certification and Registration. The Application for Certification and Registration also requires the candidate to report any misdemeanor or felony convictions.

8. **Application for Certification and Registration.**

The Application for Certification and Registration along with the required fee and the forms noted above must be received by ARRT within five years of completion of an ARRT-recognized educational program.

**NOTE:** Candidates graduating from an educational program beginning January 1, 2013, will have three years to establish eligibility for ARRT certification and registration, as opposed to the five years that is available to those who complete their program by December 31, 2012.
Didactic Requirements

Candidates for certification and registration as a Registered Radiologist Assistant are required to meet the Professional Education Requirements specified in Section 2.03 of the ARRT Rules and Regulations. One of the Professional Education Requirements is the following didactic competence requirement: Candidates must successfully complete coursework addressing the topics listed in the ARRT Content Specifications for the Registered Radiologist Assistant Examination. These topics should be covered as part of a nationally recognized curriculum such as the one published by the American Society of Radiologic Technologists (ASRT).

Overview of Clinical Portfolio Requirements

An essential part of the radiologist assistant’s training is the preceptorship, during which he or she participates in the provision of radiologic services under the supervision of one or more board-certified radiologists. During the preceptorship, students will learn to perform a majority of the radiologic procedures and clinical activities appearing in the Entry-Level Clinical Activities (ELCA). There will be numerous opportunities to be observed and evaluated by the preceptor and other health care professionals, and for the student to critically evaluate and reflect on his or her own clinical experiences.

The ARRT requires that candidates for certification and registration maintain a record of their clinical experiences and evaluations in the form of a Clinical Portfolio. An important goal of the Clinical Portfolio is to ensure that the student is exposed to and becomes proficient at a minimum number of these procedures and clinical activities. The Clinical Portfolio serves as a mechanism for maintaining and documenting these evaluative opportunities. The following pages are essential reading for the radiologist assistant student, the preceptor, and the program director.

Contents of Clinical Portfolio

The Clinical Portfolio consists of the following components: (1) Clinical Experience Documentation and Clinical Competence Assessments; (2) Professional Activities and Accomplishments Record; (3) Case Studies; and (4) Summative Evaluation Rating Scales. The table summarizes each component.

<table>
<thead>
<tr>
<th>Component</th>
<th>Purpose</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Clinical Experience Documentation and Competence Assessments.</td>
<td>To document performance of a specified number of certain radiologic procedures, and to ensure thorough evaluations of competence.</td>
<td>ARRT checklist and competence assessment forms. Signed by chief preceptor or other radiologist serving as preceptor. Submitted to ARRT as part of the application materials.</td>
</tr>
<tr>
<td>2. Professional Activities and Accomplishments Record.</td>
<td>To encourage ongoing self-assessment and professional development.</td>
<td>The student maintains various documents (e.g., CE, ACLS, presentations) in personal files. Not submitted, but subject to audit.</td>
</tr>
<tr>
<td>3. Case Studies.</td>
<td>To promote critical and reflective thinking about patient management.</td>
<td>Five cases reviewed and signed by program director. Not submitted, but subject to audit.</td>
</tr>
<tr>
<td>4. Summative Evaluation Rating Scales.</td>
<td>To obtain an end-of-preceptorship evaluation of competence in several skill domains.</td>
<td>ARRT assessment forms completed by chief preceptor and signed by program director. Submitted to ARRT as part of the application materials.</td>
</tr>
</tbody>
</table>

* Note: Candidates who complete their educational program during 2011 or 2012 may use either the previous requirements (effective 2005) or the current requirements (effective 2011). Candidates who graduate after December 31, 2012 may no longer use the previous competency requirements.
Clinical Portfolio Requirements and Documentation

The four components of the Clinical Portfolio are intended to complement one another and to supplement ARRT’s ethics and examination requirements. Although no single component provides an adequate description of a student’s clinical experiences, the four components, in conjunction with the examination, result in a comprehensive summary of the candidate’s qualifications.

Program directors, candidates, and preceptors may find that many of the requirements listed here are educational activities that would be completed even if not required for certification and registration. The ARRT has formalized some of these activities and developed a standard mechanism for documenting their completion. The paragraphs below offer a synopsis of the requirements, while the pages that follow present the requirements in detail.

1. Clinical Experience Documentation and Competence Assessments. Candidates for certification and registration must (a) perform certain mandatory and elective radiologic procedures for a specified number of cases; and (b) successfully pass a competence assessment for each procedure (i.e., be evaluated by a preceptor for one case for each mandatory and elective procedure). The ARRT has developed forms for recording number of cases and for the preceptor to use when completing the competence assessments.

2. Professional Activities and Accomplishments Record. The primary intent of this requirement is to ensure that the student engages in critical self-evaluation and continued professional development. Candidates are at liberty to include materials they feel best capture and summarize the multitude of experiences they have during their education.

3. Case Studies. Candidates must submit 5 case studies to their program director for review and discussion. It is expected that case studies will be one to three pages in length, address certain pieces of essential information (e.g., history, indications for procedure) and, if appropriate, be accompanied by information related to the procedure (e.g., images, lab results). The format may be modified to suit the needs of the program director, preceptor, and candidate.

4. Summative Evaluation Rating Scales. This performance evaluation instrument is completed by the chief preceptor at the end of the radiologist assistant’s preceptorship. The term “summative evaluation” is used to denote that it is an end-of-term summary assessment. It allows the radiologist serving as the chief preceptor to complete an overall evaluation of the candidate’s cognitive, psychomotor, and affective skills. The scales address five performance domains: evaluation of medical information; patient communication; radiation safety; professionalism; and specific procedural skills (GI/Chest, GU, invasive vascular, invasive nonvascular). To be eligible for certification and registration, the candidate must receive a rating of three or higher in each skill domain.

Components 1 and 4 of the Clinical Portfolio are submitted to ARRT as part of the application materials. Candidates are expected to retain components 2 and 3 for a period of five years after completing their preceptorship, during which time they may be subjected to audit by the ARRT. The remainder of this document describes the requirements in detail, provides examples, and presents forms that should be used and submitted to ARRT.
Registered Radiologist Assistant (R.R.A.)
Component 1: Clinical Experience Documentation and Competence Assessments

The R.R.A. Entry-Level Clinical Activities (ELCA) document identifies the radiologic procedures and clinical activities that serve as the basis for R.R.A. certification and registration standards. As part of the preceptorship, the student will be exposed to the vast majority of those procedures. This document identifies those clinical procedures the candidate is expected to master to become eligible for certification and registration by ARRT.

As part of their preceptorship, candidates for certification will satisfy two types of clinical requirements. First, they must submit documentation indicating the number of cases completed for a broad range of radiologic procedures. Second, candidates are required to demonstrate competence performing the various radiologic procedures. The specific requirements for the Clinical Experience Documentation and Competence Assessments follow. Forms for documenting the clinical and assessment requirements can be found at these links: CR-1, CR-2A thru 2E. Candidates must complete all clinical procedures prior to the examination administration date. Examination results will not be released until all clinical experience and competence assessment forms have been received and evaluated by ARRT.

Clinical Experience Documentation

A minimum of 500 total cases are required. A total of 36 procedures comprise the clinical experience and competence requirements for R.R.A. certification and registration. All candidates are required to perform 12 mandatory procedures for the specified minimum number of cases. In addition, candidates select a subset from the 24 elective procedures. The maximum number of mandatory and elective cases indicates the maximum reportable cases, not the maximum number a student may perform during their training program. Candidates are encouraged to complete as many additional mandatory and elective procedures as achievable.

Mandatory Procedures: The table on the following pages identifies the 12 mandatory radiologic procedures and the minimum and the maximum number of cases required for each procedure. Candidates are required to complete:

- A minimum of 375 of the cases must be from the mandatory procedures category.
- For each mandatory procedure, the specified minimum number of cases must be completed.

For example, assume a hypothetical candidate performed 70 upper GIs, 60 small bowel studies, 35 barium enemas, 30 cystograms, 65 arthrograms, 30 lumbar punctures, 30 NG tube placements, 20 paracenteses, and 75 PICC procedures. Of those, 50 UGI, 25 small bowel studies, 25 barium enemas, 30 cystograms, 45 arthrograms, 25 lumbar punctures, 25 NG tube placements, 20 paracenteses and 30 PICC line placements equaling 285 cases, which count toward the minimum 375 mandatory cases.

Elective Procedures: The table on the following pages also identifies 24 elective procedures from which candidates must select a minimum of 3 elective procedures. Candidates are required to complete:

- A minimum of 125 cases must be from the elective procedures category.
- For each selected elective, the specified minimum number of cases must be completed for that procedure.

For example, assume a hypothetical candidate performed 30 fistulograms, 5 extremity venograms, 35 port injections, 20 myelograms, 5 breast needle localizations, 5 retrograde urethromgrams, and 15 insertions of tunneled central venous catheters. Of those, 15 fistulograms, 5 extremity venograms, 15 port injections, 15 myelograms, 0 breast needle localizations (did not meet the minimum required number), 5 retrograde urethromgrams, and 15 insertions of tunneled central venous catheters total 70 which count toward the minimum 125 elective cases.

Candidates must use Form CR-1 for summarizing the number of cases for each procedure. In addition, candidates are expected to keep a detailed record of each case completed (e.g., date, time, facility) for audit purposes.
Clinical Competence Assessment

For all mandatory and elective procedures, candidates must be evaluated according to the following guidelines. The competence assessment is to be completed:

- Once for each procedure. A minimum of 15 assessment forms (12 mandatory and 3 elective) are to be submitted to ARRT.
- By a radiologist using the ARRT evaluation forms that follow. Note that there are separate forms for each class of procedures (GI and Chest, GU, invasive vascular, invasive nonvascular, and post-processing activities).
- At any time during the preceptorship, presumably after the student has completed a sufficient number of cases under appropriate instruction to acquire proficiency.

It is not necessary for the student to complete all cases (e.g., 15 cystograms) prior to presenting for competence assessment. The assessment may be completed at any time after the student has acquired sufficient skill performing a procedure.

During training it is expected that students will receive appropriate levels of supervision. For additional information on supervision, refer to the ELCA document. All procedures must be performed on actual patients; simulated procedures cannot be used to satisfy the competence assessments.

Required Documentation

Form CR-1: Summary of Clinical Experience and Competence Assessments

1. This form is completed by the student as he or she: (a) completes the requisite number of cases for the mandatory and elective procedures; and (b) is evaluated by a radiologist on the mandatory and elective procedures.
2. The student records the number of cases completed for each mandatory and elective procedure he or she performs.
3. The student records only the date that the competency assessment was completed. Note that the actual competence assessments are completed by a radiologist using Form CR-2, as described immediately below.
4. The preceptor and program director must verify and sign the bottom of Form CR-1. This form is submitted to ARRT at the time of application.

Form CR-2: Clinical Competence Assessments (Forms CR-2A through CR-2E)

1. These forms are completed by the radiologist at the time he or she evaluates the student. There are separate evaluation forms for each class of radiologic procedures:
   - Form CR-2A: GI/Chest
   - Form CR-2B: GU
   - Form CR-2C: invasive nonvascular
   - Form CR-2D: invasive vascular
   - Form CR-2E: post-processing activities
2. The radiologist and student are required to sign the bottom of Form CR-2 for each assessment, which is subsequently reviewed and signed by the program director.
3. The student must submit a minimum total of 15 assessment forms to ARRT (12 mandatory and 3 elective procedures).
Registered Radiologist Assistant (R.R.A.)
Component 2: Professional Activities and Accomplishments Record

Purpose
Most components of the Clinical Portfolio are highly structured and intended to accomplish very specific goals. In contrast, the Professional Activities and Accomplishments Record (Accomplishments Record) allows candidates to include materials they feel best summarize the variety of their preceptorship experiences. The intent of the Accomplishments Record requirement is twofold: (1) to help ensure active participation in the education and evaluation processes through critical self-reflection; (2) to lay the foundation for and to encourage career-long professional development.

Students may include materials they feel best summarize the wealth of experiences they have during their clinical education. Although this is a certification and registration requirement, candidates do not need to submit the Accomplishments Record with their application. ARRT reserves the right to audit the Accomplishments Record for a period of five years following initial certification and registration.

Types of Documentation
The Accomplishments Record should contain evidence of self-assessment activities and continuing professional development pursuits. Specific ideas are suggested below; however, the student is not required to participate in each activity, nor is participation restricted to those listed. Documentation may be maintained electronically or on paper.

1. Examples of Self-Assessment Activities
   a. Case Journals. These would not be comprehensive case studies, but rather case summaries noting questions or difficulties encountered during the case (e.g., unusual pathologies, ethical situations) and the strategies employed to resolve them. The journals may be of interest to colleagues or for future publications or research.
   b. Self-Assessments. These could be done periodically using forms contained in other sections of the Clinical Portfolio Requirements. Alternatively, checklists or other types of evaluation instruments might be utilized, with the goal of identifying activities already mastered and activities that require further training. It may be helpful to include strategies and resources found to be most or least effective.

2. Examples of Continuing Professional Development Activities
   a. Presentations. A file including the presentation abstract, the length of time, and the audience.
   b. Papers and Publications. A file of papers the student has authored or coauthored, or participation in research projects.
   c. Community Service. The student may elect to document participation in activities such as public health initiatives, university service, and community support.
   d. Certificates of CE Attendance. Include documentation of attendance at conferences such as RSNA, AVIR, ASRT, or state and local conferences; include a brief summary for each educational activity, noting any benefits.
   e. Training/Skill Certificates. Document successful completion of activities such as ACLS, PICC, CPT/ICD-9 Coding, ECG, or phlebotomy.
Registered Radiologist Assistant (R.R.A.)
Component 3: Case Studies

To ensure that the student becomes proficient in the procedures identified in the R.R.A. Entry-Level Clinical Activities (ELCA), documentation of case studies is a component of the Clinical Portfolio. This is an opportunity to document cases encountered in daily work experience and to critically evaluate and reflect upon those clinical experiences. Cases demonstrating typical abnormalities or injuries should be selected for the case study requirement.

One case study from each of the 5 following categories is required:

1. GI and Chest (esophageal study; swallowing function study; upper GI study; small bowel study – small bowel study via enteroclysis tube; enema with barium, air, or water soluble contrast; nasogastric/enteric and orogastric/enteric tube placement; t-tube cholangiogram; defecography; chest fluoroscopy).

2. GU (antegrade urography; cystography or voiding cystourethrography; retrograde urethrogram or urethrocytography; loopography; hysterosalpingography).

3. Invasive nonvascular; arthrogram, joint injection and aspiration; lumbar puncture myelography; lumbar puncture with contrast; thoracentesis; placement of catheter for pneumothorax; paracentesis; abscess, fistula, or sinus tract study; injection for sentinel node localization; breast needle localization; change of percutaneous tube or drainage catheter; thyroid biopsy; liver biopsy).

4. Invasive vascular (PICC placement; insertion on non-tunneled central venous catheter; insertion of tunneled central venous catheter; port injection; extremity venography).

5. CT post-processing; MR post-processing, or a case with unique ethical aspects.

Case studies should address the following areas:

- Etiology and epidemiology of disease or injury (cause, prevalence, incidence, and morbidity).
- Indications and reason for procedure; patient history; results of any prior diagnostic studies (e.g., lab values, physical assessments, imaging studies) as appropriate.
- A brief description of the procedure (e.g., how it was done, notable complicating factors).
- Patient care issues that arose and how they were addressed.
- Preliminary observations to radiologist and final diagnosis made by radiologist.
- Patient outcome, if known.

Case studies may be documented in a 1-3 page written narrative or with electronic media. Accompanying images are encouraged (remove patient identification). The case studies do not need to be submitted with the application, but must be kept by the student for five years after application date for possible audit.
Registered Radiologist Assistant (R.R.A.)
Component 4: Summative Evaluation Rating Scales

The purpose of this form is to obtain from the chief preceptor a final overall evaluation of the student’s clinical skills as demonstrated during his or her preceptorship. The form should be completed by the chief preceptor during the final stages of the preceptorship and forwarded to the director of the educational program. The form must be signed by both the chief preceptor and program director.

The Summative Evaluation Rating Scales address five skill areas: (1) evaluation of medical information, (2) patient communication, (3) radiation safety, (4) professionalism, and (5) specific procedural skills. Each of these skill areas is defined below; the rating scales appear on the following pages. To be eligible for certification and registration, the student must receive a rating of three or higher in each skill area.

1. **Evaluation of Medical Information** includes skill in acquiring relevant medical information from patient records, prior diagnostic studies, the scientific literature, and other healthcare providers, and in evaluating this information and its applicability to the patient’s needs. The R.R.A. candidate recognizes the benefits and potential limitations of various types of information (e.g., interview reports, lab values) and of the medical procedures included in the R.R.A. Entry-Level Clinical Activities (ELCA) document.

2. **Patient Communication** refers to the ability to establish rapport and maintain professional relationships with patients and families of various cultural backgrounds in a manner that preserves dignity and conveys respect. The R.R.A. demonstrates effective questioning strategies, listening and speaking skills, and applies nonverbal communication techniques as appropriate. Patient communication includes activities such as: explaining the procedure to the patient; assessing his or her ability to comply with the procedure; explaining benefits and risks; verifying consent; educating the patient about follow-up care and health maintenance; and evaluating patient outcomes.

3. **Professionalism** is reflected by the R.R.A.s commitment to ethical practice and continued quality improvement. Professionalism includes the development of professional relationships with peers and colleagues, involvement in professional development activities (e.g., CE, peer review), and demonstrating an appreciation for the context and systems in which healthcare is provided. The R.R.A. conducts his or her practice activities under appropriate levels of supervision, and respects the ethical and legal boundaries of his or her practice. The R.R.A. upholds the laws governing medical practice and radiologic technology in his or her state, practices in accordance with institutional policies, and contributes to the overall integrity of his or her institution.

4. **Radiation Safety** involves the application of knowledge of radiation biology and physics to everyday practice activities. The R.R.A. is conscientious about ensuring the safety of patients, family, staff, and self. Such activities include, but are not limited to, the proper use of shielding, thoughtful selection of exposure factors, and prudent use of imaging technique (e.g., pulsed fluoroscopy). The R.R.A. routinely monitors exposure and adheres to professional and regulatory standards.

5. **Procedural Skills** refers to the cognitive and psychomotor skills required to successfully complete radiologic procedures under appropriate supervision. Such skills include patient positioning, set-up of medical equipment, administration of contrast or medications, catheter insertion or placement, and use of fluoroscopy. Ratings are provided for four categories of radiologic procedures: GI/Chest, GU, invasive nonvascular, and invasive vascular.
Glossary of Terms Related to
Registered Radiologist Assistant Certification and Registration

**Application Packet**: The packet includes the application form (with information on postmarking deadlines and fees) and clinical portfolio forms that must be submitted with the application along with instructions for completing the forms. Students should obtain and review the certification and registration application packet early in their educational program to assure that they meet all eligibility requirements during the course of the program.

**Cases**: Number of repetitions of a procedure used to document clinical experience for each procedure required in the clinical portfolio.

**Case Studies**: The third component of the clinical portfolio. It consists of documentation of original studies completed by the student. This documentation is not submitted with the certification and registration application, but must be maintained by the student and provided to ARRT if the student’s records are selected for audit. Instructions for preparing case studies are included in the certification and registration application packet.

**Chief Preceptor**: The radiologist designated as having primary responsibility for the individual student’s clinical education and who has agreed to educate, assess clinical competence, and complete the documentation forms for clinical experience and competence for the student.

**Clinical Experience Documentation and Competence Assessments Forms**: The first component of the clinical portfolio. These are actually a collection of forms that document the student’s clinical experience and competence assessments. Form CR-1 summarizes the information. Forms CR-2A through CR-2E are assessment forms specific to GI/Chest, GU, invasive nonvascular, invasive vascular, and post-processing activities. These forms are submitted with the certification and registration application packet.

**Didactic and Clinical Portfolio Requirements**: In addition to the didactic requirements, the portfolio includes four components that document the student’s clinical education. The four components are: the Clinical Experience Documentation and Competence Assessment Forms; Professional Activities and Accomplishments Record; Case Studies; and Summative Evaluation Rating Scales.

**Direct Supervision**: For direct supervision, the radiologist must be present in the office suite and immediately available to furnish assistance and direction throughout the performance of the procedure, but not required to be present in the room when the procedure is performed. This definition is based upon that of CMS.

**Elective Procedures**: A list of procedures from which students must choose a certain number in which to demonstrate competence. Twenty-four elective procedures are identified in Component 1: Clinical Experience Documentation and Competence Assessments and candidates must select a minimum of three. A total of 125 repetitions of the elective procedures are required. Elective refers to choosing from among the procedures on the list.

**Entry-Level Clinical Activities (ELCA) document**: Document developed by the ARRT with community input (including from the ASRT and ACR) that identifies a core set of activities that R.R.A.s should be qualified to perform at entry into the profession.

**Mandatory Procedures**: Procedures for which students are required to demonstrate competence and to document completion of a set number of cases. Twelve mandatory procedures are identified in Component 1: Clinical Experience Documentation and Competence Assessments and candidates are given a minimum and a maximum number of cases to be documented. A minimum of 375 repetitions of the mandatory procedures are required.

**Medical Advisor**: A radiologist who serves as a professional resource to the educational program to help assure that the medical components of the preceptorships meet acceptable standards. Must be ABR Diplomate or equivalent.
Post-Radiography Certification and Registration Experience: One year of experience is required post-radiography certification and registration and prior to certification and registration as a Registered Radiologist Assistant. The experience cannot be earned while performing the role of a radiologist assistant.

Preceptorship: Educational process in which a student learns in the clinical environment under the supervision of a radiologist.

Professional Activities and Accomplishments Record: The second component of the clinical portfolio. It consists of documentation of self-assessment activities and continuing education. This documentation is not submitted with the certification and registration application, but must be maintained by the student and provided to ARRT if the student’s records are selected for audit.

Program Director: Person designated to manage and direct the educational program (including both the didactic and clinical educational components), develop contracts with preceptors, students, and institutions, monitor preceptorship activities, and complete final certification and registration application materials.

Repetitions: The number of times that a clinical procedure must be performed to satisfy the clinical experience requirement.

Summary of Clinical Experience and Competence Assessments (Form CR-1): One of the forms included in the Clinical Experience Documentation and Competence Assessments Forms. The form summarizes the number of cases completed and competence assessment dates. It is submitted with the certification and registration application.

Summative Evaluation Rating Scales: The fourth component of the clinical portfolio. It consists of the final evaluation conducted by the chief preceptor. Both the chief preceptor and the program director sign the form. It is submitted with the certification and registration application.

Supervising Radiologist or Preceptor: Radiologist supervising the student during procedures. May also perform clinical assessments of the student. Typically within the same practice as the Chief Preceptor. Differs from the Chief Preceptor in that he or she does not have primary responsibility for the clinical education of the student. For some students, there may be only the Chief Preceptor working with the student. In other cases there may be one Chief Preceptor and multiple Preceptors.
APPENDIX D
Clinical Affiliation Agreement (Sample)
MEMORANDUM OF AGREEMENT
RADIOLOGIST ASSISTANT PROGRAM
MIDWESTERN STATE UNIVERSITY
RADIOLOGICAL SCIENCE

1. SUBJECT: Affiliation agreement between _________________________ (herein referred to as the Facility) and Midwestern State University (herein referred to as the University) in an educational program for Radiologist Assistants.

2. PURPOSE: The purpose of this affiliation is to provide educational experience to students which will prepare them to enter the field as a Radiologist Assistant.

3. OBJECTIVES: To provide a coordinated educational program leading to a Radiologist Assistant Masters Degree.

4. UNDERSTANDING:
   a. The University will take continuous action to assure that the program is based on the current guidelines and curriculum set by the American Society of Radiologic Technologists.
   b. Radiologist Assistant Masters Degree will be awarded by the University to each student who successfully completes the requirements of the program as outlined in the University catalog and Radiologist Assistant program.
   c. The selection of students for the program will be accomplished by the University. All students must meet the entrance requirements of the University prior to registration.
   d. Each student will be assigned to the Facility for clinical education and experience. The weekly hours, work center, and rotation will be specified by the program and Radiologist preceptor.
   e. The program director of the University will be responsible for supervising and coordinating all phases of the educational program.
   f. Students and University personnel will abide by existing rules and regulations of the Facility insofar as they may pertain to their activities while in the Facility.
   g. This agreement shall be effective upon signature by the parties concerned; automatically renewing each year, unless terminated by either institution by written notification to the other. Except under unusual conditions such notification will be submitted at least 120 days prior to the beginning of a semester PROVIDED, HOWEVER, that such termination shall not affect students already enrolled in the program. Students currently in the program shall have an opportunity to complete the program at the Facility until they meet the requirements for graduation and certification.
5. RESPONSIBILITIES OF THE UNIVERSITY

The University Shall:

a. Establish measurable performance objectives for each clinical education course.

b. Maintain student records.

c. Prepare students academically.

d. Insure that students carry liability insurance for the duration of the clinical training. The insurance will be blanket coverage of at least $1,000,000 each person/$3,000,000 each occurrence. The insurance carrier is Bill Beatty Insurance Agency, Inc., 13140 Coit Road, Suite 510, Dallas, Texas, 75240.

6. RESPONSIBILITIES OF THE FACILITY

The Facility Shall:

a. Cooperate with the University and Radiology group in concurrent and terminal evaluation of student as appropriate. Evaluations will be performed by University faculty and Radiology group members.

b. Not assume any liability responsibility for students’ personal injuries and/or student errors. Clinical errors made by students shall be documented using Facility incident report forms. Reports shall indicate that the error was made by a Radiologist Assistant student. The Radiologist preceptor will countersign the incident report and take responsibility for reporting error to appropriate authorities. The student is responsible for his or her own health insurance.

c. Make available to the students the appropriate clinical areas of the institution, including necessary equipment and supplies.

d. Refer students with personal or health problems to the clinical course instructor.

e. Provide film badge service and radiation reports for students.

Signed: _____________________________________ Date: _________________________
Administrator
(Facility)

Signed: _____________________________________ Date: _________________________
Radiology Department Representative
(Facility)

Signed _____________________________________ Date: _________________________
Dr. Betty Stewart
Provost
Midwestern State University

Memorandum of Agreement 2
APPENDIX E
Radiologist Preceptor Agreement (Sample)
RADIOLOGIST PRECEPTOR WRITTEN AGREEMENT
RADIOLOGIST ASSISTANT PROGRAM

I agree to serve as the Radiologist Preceptor without remuneration for ____________________________________ as he/she completes the MSU Radiologist Assistant Master's Degree.

I have reviewed the online MSU RA Program information and understand that the clinical component of the program runs five (5) semesters (Summer-Fall-Spring-Summer-Fall). Students must take the RA courses in the order indicated on the RA curriculum. Students are required to attend seminar classes on the MSU campus twice each semester and must have reliable access to computers to complete online course requirements throughout each semester. Students must meet all program requirements including demonstrated competence in the specified number of General Diagnostic Clinical Competencies and the specified number of Elective Clinical Competencies to successfully complete the program. Upon completion of the program students will receive a Master of Science in Radiological Science degree for the MSU RA Program.

I understand and accept that my responsibilities as Radiologist Preceptor include, but are not limited to:

• Teaching and guiding the RA student as he/she develops overall RA clinical skills.
• Supervising and overseeing all RA student interactions with patients.
• Teaching, evaluating, and documenting successful completion of the RA Clinical Competencies (Required and Elective) as identified by the MSU RA curriculum.
• Verifying that the RA student has at least twenty four (24) clinical contact hours per week to develop RA clinical skills each semester.
• Maintaining communication with the MSU faculty about the progress of the RA student in the RA program.

I understand that the student MUST have a Radiologist Preceptor to participate in the MSU Radiologist Assistant Program. I understand the student will function under the affiliation and privileges extended to the radiologist or radiology group by the facilities served.

If, for any reason, I cannot continue to serve as this student's preceptor, I will immediately notify the MSU RA program. I understand that the student must identify another radiologist willing to serve as Radiologist Preceptor to remain in the MSU RA Program.

Signed,

_________________________  __________________________
Radiologist Preceptor Name / Date

_________________________
Printed Radiologist Name

_________________________  __________________________
Authorizing Signature for Group Practice / Date

Revised 09/13
Appendix F
RADIOLOGIST ASSISTANT PRECEPTOR HANDBOOK ACKNOWLEDGEMENT FORM
ACKNOWLEDGEMENT OF THE 2016
MASTER OF SCIENCE IN RADIOLOGIC SCIENCES PROGRAM
RADIOLOGIST ASSISTANT PRECEPTOR HANDBOOK
Midwestern State University

My signature below indicates that I have received the Radiologist Preceptor Handbook. I agree to abide by the policies and procedures outlined and understand that I am responsible for adhering to them.

_______________________________________
Radiologist Preceptor Signature

______________________________
Date