

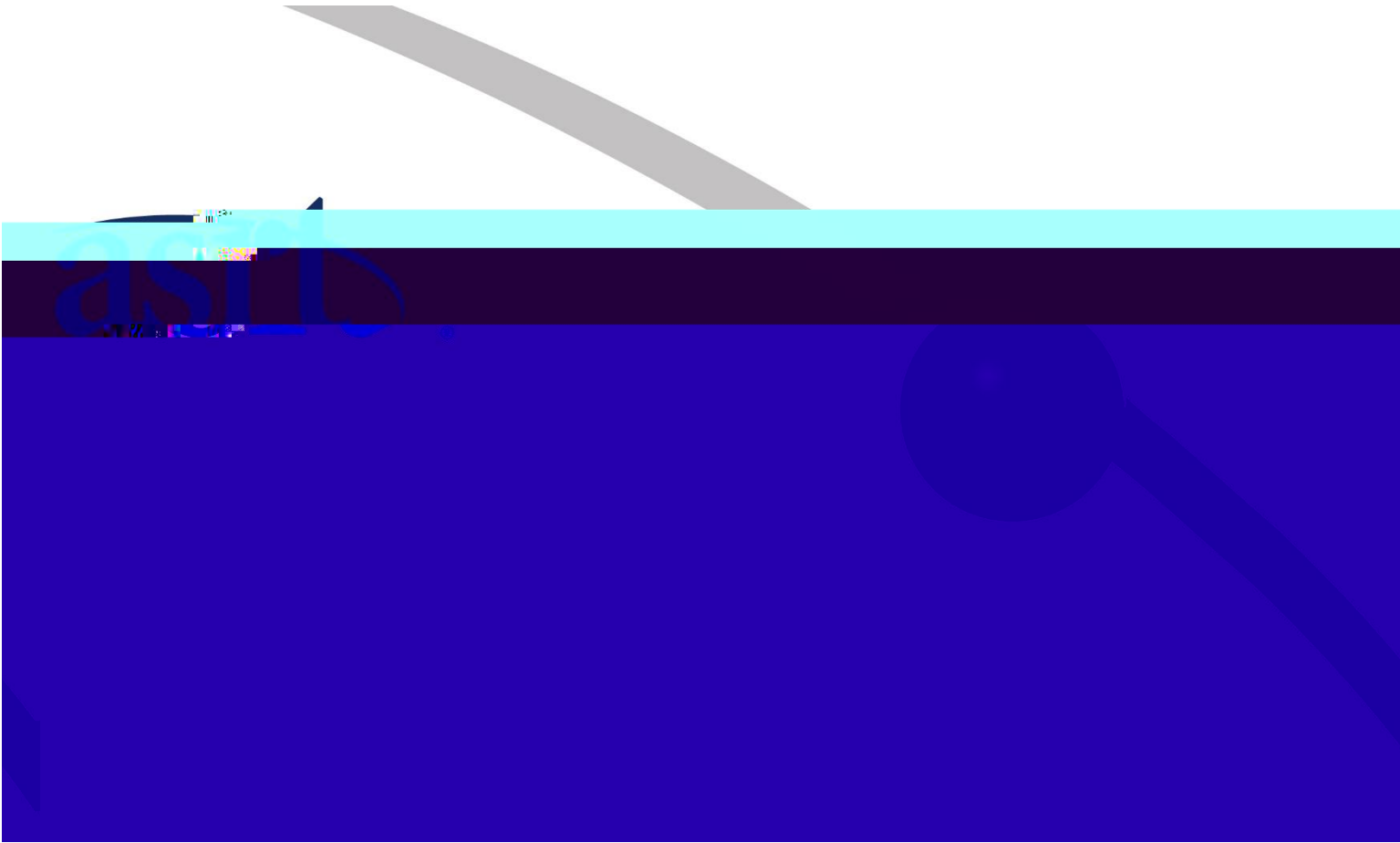


Table of Contents

therapy are similar, others are not. The specific criteria were developed with these differences in mind.

Within this document, all organizations are referenced by their abbreviation and spelled out within the glossary.

Introduction

Definition

The medical imaging and radiation therapy profession comprises health care professionals identified as a bone density technologist, cardiac-interventional and vascular-interventional technologist, computed tomography technologist, magnetic resonance technologist, mammographer, medical dosimetrist, nuclear medicine technologist, quality management technologist, radiation therapist, radiographer, radiologist assistant or sonographer who are educationally prepared and clinically competent as identified by these standards.

Furthermore, these standards apply to health care employees who are legally authorized to perform medical imaging and radiation therapy and who are educationally prepared and clinically competent as identified by these standards.

The complex nature of disease processes involves multiple imaging modalities. Medical imaging and radiation therapy professionals are vital members of a multidisciplinary team that forms a core of highly trained health care professionals, who each bring expertise to the area of patient care. They play a critical role in the delivery of health services as new modalities emerge and the need for medical imaging and radiation therapy procedures increases.

Medical imaging and radiation therapy integrates scientific knowledge, technical competence and patient interaction skills to provide safe and accurate procedures with the highest regard to all aspects of patient care. A medical imaging and radiation therapy professional recognizes elements unique to each patient, which is essential for the successful completion of the procedure.

Medical imaging and radiation therapy professionals are the primary liaison between patients, licensed practitioners and other members of the support team. These professionals must remain sensitive to the needs of the patient through good communication, patient assessment, patient monitoring and patient care skills. As members of the health care team, medical imaging and radiation therapy professionals participate in quality improvement processes and continually assess their professional performance.

Medical imaging and radiation therapy professionals think critically and use independent, professional and ethical judgment in all aspects of their work. They engage in continuing education to include their area of practice to enhance patient care, safety, public education, knowledge and technical competence.

Quality Management

The practice of quality management is performed by health care professionals responsible for the identification, measurement, control and improvement of the various core processes th

creating an interdisciplinary team. The quality management technologist is a member of the health care team, which includes clinicians, management, support staff and customers.

Quality management has four main components: quality planning, quality control, quality Tfy 34 g EMg00 1 72.

Education and Certification

The individual must be educationally prepared and clinically competent as a prerequisite to professional practice.

Medical imaging and radiation therapy professionals performing multiple modality hybrid imaging should be registered by certification agencies recognized by the ASRT and be educationally prepared and clinically competent in the specific modality(ies) they are responsible to perform. Medical imaging and radiation therapy professionals performing diagnostic procedures in more than one imaging modality will adhere to the general and specific criteria for each area of practice.

To maintain certification(s), medical imaging and radiation therapy professionals must complete appropriate continuing education requirements to sustain their expertise and awareness of changes and advances in practice.

Quality Management

Only medical imaging and radiation therapy professionals who have completed the appropriate education and obtained certification(s) as outlined in these standards should perform quality management procedures.

Quality management technologists prepare for their roles on the interdisciplinary team by successfully completing a program in radiography, nuclear medicine technology or radiation therapy that is programmatically accredited or part of an institution that is regionally accredited, and by attaining appropriate primary certification from the ARRT or the NMTCB.

Eligibility to take the ARRT postprimary examination in quality management requires appropriate primary certification, documentation of structured education and clinical experience at the time of application. Those passing the quality management postprimary examination use the credential R.T.(QM).

Verifying archival storage of data.

Verifying informed consent for applicable procedures.*

Quality Management

Coordinating, performing and monitoring quality control procedures for all types of equipment.

Creating policies and procedures to meet regulatory, accreditation and fiscal requirements.

Determining and monitoring exposure factors and/or procedural protocols in accordance with ALARA principles and age-specific considerations.

Ensuring adherence to accreditation, federal, state and local regulatory requirements.

Facilitating change through appropriate management processes.

Facilitating performance improvement processes.

Performing physics surveys independently on general radiographic and fluoroscopic equipment, with medical physicist oversight.

Providing assistance to staff for image optimization, including patient positioning, proper

* Excludes limited x-ray machine operator

Standards

* Excludes limited x-ray machine operator

† Excludes medical dosimetry

Standard Two – Analysis/Determination

The medical imaging and radiation therapy professional analyzes the information obtained during the assessment pha

* Excludes limited x-ray machine operator

† Excludes medical dosimetry

Standard Three – Education

The medical imaging and radiation therapy professional provides information about the procedure and related health issues according to protocol; informs the patient, public and other health care providers about procedures, equipment and facilities; and acquires and maintains current knowledge in practice.

Rationale

Education and communication are necessary to establish a positive relationship and promote safe practices. Advancements in the profession and optimal patient care require additional knowledge and skills through education.

The medical imaging and radiation therapy professional:

General Criteria

Advocates for and participates in continuing education related to area of practice, to maintain and enhance clinical competency.

Advocates for and participates in vendor specific applications training to maintain clinical competency.

Educates the patient, public and other health care providers about procedures and the associated biological effects.

Elicits confidence and cooperation from the patient, the public and other health care providers by providing timely communication and effective instruction.

Explains effects and potential side effects of medications.*†

* Excludes limited x-ray machine operator

† Excludes medical dosimetry

Standard Four – Performance

The medical imaging and radiation therapy professional performs the action plan and quality assurance activities.

Rationale

Quality patient services are provided through the safe and accurate performance of a deliberate

* Excludes limited x-ray machine operator

† Excludes medical dosimetry

Standard Five – Evaluation

The medical imaging and radiation therapy professional determines whether the goals of the action plan have been achieved, evaluates quality assurance results and establishes an appropriate action plan.

Rationale

Careful examination of the procedure is important to determine that expected outcomes have been met. Equipment, materials and processes depend on ongoing quality assurance activities that evaluate performance based on established guidelines.

The medical imaging and radiation therapy professional:

General Criteria

- Communicates the revised action plan to appropriate team members.
- Completes the evaluation process in a timely, accurate and comprehensive manner.
- Develops a revised action plan to achieve the intended outcome.
- Evaluates quality assurance results.
- Evaluates the patient, equipment and procedure to identify variances that might affect the expected outcome.
- Identifies exceptions to the expected outcome.
- Measures the procedure against established policies, protocols and benchmarks.
- Validates quality assurance testing conditions and results.

Specific Criteria

Quality Management

- Confirms data is accurate and complete.
- Evaluates customer satisfaction.
- Evaluates measured processes and results against established policies, protocols, guidelines and benchmarks.
- Evaluates sentinel events to minimize risk.

Standard Six – Implementation

The medical imaging and radiation therapy professional implements the revised action plan based on quality assurance results.

Rationale

It may be necessary to make changes to the action plan based on quality assurance results to promote safe and effective services.

The medical imaging and radiation therapy professional:

General Criteria

Adjusts imaging parameters, patient procedure or additional factors to improve the outcome. VH 612 792 reW* nQ EMC /P A MCID 11BDC q0.00000912 0 612 792 reW* n265/F00.10 G
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Standard Eight – Documentation

The medical imaging and radiation therapy professional documents information about patient care, procedures and outcomes.

Rationale

Clear and precise documentation is essential for continuity of care, accuracy of care and quality assurance.

The medical imaging and radiation therapy professional:

General Criteria

- Archives images or data.

- Documents diagnostic, treatment and patient data in the medical record in a timely, accurate and comprehensive manner.

- Documents procedural timeout.

- Documents unintended outcomes or exceptions from the established criteria.

- Maintains documentation of quality assurance activities, procedures and results.

- Provides pertinent information to authorized individual(s) involved in the

- Records information used for billing and coding procedures.

- Reports any out-of-tolerance deviations to the appropriate personnel.

- Verifies patient consent is documented.

Specific Criteria

Quality Management

- Documents goals and outcomes based on data analysis.

- Documents process flow variances and outcomes.

Standard Ten – Self-Assessment

The medical imaging and radiation therapy professional evaluates personal performance.

Rationale

Self-assessment is necessary for personal growth and professional development.

The medical imaging and radiation therapy professional:

General Criteria

Assesses personal work ethics, behaviors and attitudes.

Standard Eleven – Collaboration and Collegiality

The medical imaging and radiation therapy professional promotes a positive and collaborative practice atmosphere with other members of the health care team.

Rationale

To provide quality patient care, all members of the health care team must communicate effectively and work together efficiently.

The medical imaging and radiation therapy professional:

General Criteria

- Develops and maintains collaborative partnerships to enhance quality and efficiency.
Informs and instructs others about radiation safety.
Promotes understanding of the profession.
Shares knowledge and expertise with others.

Specific Criteria

Quality Management

Refer to general criteria.

Standard Twelve – Ethics

ethical standards.

Rationale

Decisions made and actions taken on behalf of the patient are based on a sound ethical foundation.

The medical imaging and radiation therapy professional:

General Criteria

- Accepts accountability for decisions made and actions taken.
- Acts as a patient advocate.
- Adheres to the established ethical standards of recognized certifying agencies.
- Adheres to the established practice standards of the profession.
- Delivers patient care and service free from bias or discrimination.
- Provides health care services with consideration for a diverse patient population.

Specific Criteria

Quality Management

- Promotes and monitors adherence to radiation safety standards.

Standard Thirteen – Research, Innovation and Professional Advocacy

The medical imaging and radiation therapy professional participates in the acquisition and dissemination of knowledge and the advancement of the profession.

Rationale

Participation in professional organizations and scholarly activities such as research, scientific investigation, presentation and publication advance the profession.

The medical imaging and radiation therapy professional:

General Criteria

- Adopts new best practices.
- Investigates innovative methods for application in practice.
- Monitors changes to federal and state law, regulations and accreditation standards affecting area(s) of practice.
- Participates in data collection.
- Participates in professional advocacy efforts.
- Participates in professional societies and organizations.
- Pursues lifelong learning.
- Reads and evaluates research relevant to the profession.
- Shares information through publication, presentation and collaboration.

Specific Criteria

Quality Management

Refer to general criteria.

Glossary

The glossary is an alphabetical list of defined terms or words specifically found in the ASRT Practice Standards for Medical Imaging and Radiation Therapy. The terms or words have meaning that might not be general knowledge. The definitions are formulated using evidentiary documentation and put into place following extensive review and subsequent approval. The glossary is not all-inclusive. New terms and new usage of existing terms will emerge with time and advances in technology.

AAPM American Association of Physicists in Medicine

ACR American College of Radiology

advanced-practice radiographer A registered technologist who has gained additional knowledge and skills through the successful completion of an organized program or radiologic technology education that prepares radiologic technologists for advanced-practice roles and has been recognized by the national certification organization to engage in advanced-practice radiologic technology.

adverse event Any undesirable experience associated with the use of a medical product in a patient.

ALARA

reasonable effort to maintain exposures to radiation as far below the dose limits as practical, consistent with the purpose for which the licensed activity is undertaken, while taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety and other societal and socioeconomic considerations, and in relation to the use of nuclear energy and licensed materials in the public interest. The ASRT recognizes the concept of ALARA to include energies used for magnetic resonance and sonographic imaging.

anatomic (anatomical) landmarks Bones or other identifiable points that are visible or palpable and indicate the position of internal anatomy.

archive (archival) The storage of data in either hard (film) or soft (digital) form.

ARDMS American Registry for Diagnostic Medical Sonography

ARRT American Registry of Radiologic Technologists

artifact Extraneous information on the image that interferes with or distracts from image quality.

ASRT American Society of Radiologic Technologists

authorized user A physician, dentist or podiatrist who meets the requirements as defined by the United States Nuclear Regulatory Commission.

beam-modification devices Devices that change the shape of the treatment field or distribution of the radiation at (tissue) depth.

brachytherapy A type of radiation therapy in which radioactive material sealed in needles, seeds, wires or catheters is placed directly into or near a tumor. Also called implant radiation therapy, internal radiation therapy and radiation brachytherapy.

CCI Cardiovascular Credentialing International

change management Systematic approach to preparing for, implementing and sustaining a change in process.

clinical

panning Movement of the imaging equipment during image acquisition to maintain visualization of an anatomic region of interest.

personal radiation monitoring devices Devices designed to be worn or carried by an individual for the purpose of measuring the dose of radiation received.

physics survey Performing equipment testing, evaluating the testing results and completing a formal written report of results. The written survey report, validated by a medical physicist, contains sufficient information to document that each test was conducted according to local, federal or state requirements and includes an assessment of corrective actions and recommendations for improvements.

postprocessing Computerized processing of data sets after acquisition to create a diagnostic or therapeutic image.

procedure Specific course of action intended to result in an imaging study, treatment or other outcome.

protocol The plan for carrying out a procedure, scientific study or a patient's treatment regimen.

quality assurance Activities and programs designed to achieve a desired degree or grade of care in a defined medical, nursing or health care setting or program. Sometimes indicated with the abbreviation QA.

quality control The routine performance of techniques used in monitoring or testing and maintenance of components of medical imaging and radiation therapy equipment. This includes the interpretation of data regarding equipment function and confirmation that corrective actions are/were taken. Sometimes indicated with the abbreviation QC.

radiation oncologist

shuttering A postprocessing technique that may be used to eliminate ambient light around an image for the sole purpose of improving the quality of the displayed image. It should not be used as a substitute for insufficient collimation of the irradiated field.

simulation A process using imaging technologies to plan radiation therapy so that the target area is precisely located and marked; the mockup procedure of a patient treatment with medical imaging documentation of the treatment portals.

SNMMI Society of Nuclear Medicine and Molecular Imaging

static Any medical image that is fixed or frozen in time.

supervising radiologist A board-certified radiologist who oversees duties of the radiologist assistant and has appropriate clinical privileges for the procedure performed by the radiologist assistant.

timeout Preprocedural pause to conduct a final assessment that the correct patient, site and procedure are identified.

tolerance levels (doses) The maximum radiation dose that may be delivered to a given biological tissue at a specified dose rate and throughout a specified volume without producing an unacceptable change in the tissue.

treatment calculations *See dosimetric calculations.*

treatment field (portal) Volume of tissue exposed to radiation from a single radiation beam.

treatment planning The process by which dose delivery is optimized for a given patient and clinical situation. It encompasses procedures involved in planning a course of radiation treatment, including simulation through completion of the treatment summary.

treatment record Documents the delivery of treatments, recording of fractional and cumulative doses, machine settings, verification imaging and the ordering and implementation of prescribed changes.

T-score

average bone mineral density for gender-matched young normal peak bone mass.

v

Advisory Opinion Statements

Advisory opinion statements are interpretations of the practice standards. They are intended for clarification and guidance for specific practice issues.

The ASRT issues advisory opinions as to what constitutes appropriate practice. As such, an opinion is not a regulation or statute and does not have the force and effect of law. It is issued as a guidepost to medical imaging and radiation therapy professionals who wish to engage in safe practice. Federal and state laws, accreditation standards necessary to participate in government programs and institutional policies and procedures supersede these standards. The individual must be educationally prepared and clinically competent as a prerequisite to professional practice.

The profession holds medical imaging and radiation therapy professionals responsible and accountable for rendering safe, effective clinical services to patients and for judgments exercised and actions taken in the course of providing those services.

Acts that are within the recognized scope of practice for a given license or certification may be performed only by those individuals who possess the education and clinical proficiency to perform those acts in a safe and effective manner.

and consistent with federal and state laws, regulations, established standards of practice, facility policies and procedures. Links to external websites may change without notice. evidence-based

Each medical imaging and radiation therapy professional must exercise professional and prudent judgment when determining whether the performance of a given act is within the scope of practice for which the individual is licensed, if applicable within the jurisdiction in which the person is employed, educationally prepared and clinically competent to perform.

imaging and radiation therapy professionals. The practice standards emphasize the importance of an individual being educationally prepared and clinically competent to practice in the profession of medical imaging and radiation therapy.

quality patient services in a safe environment.
GRADE: Strong

Definitions

The following definitions can be found in the glossary to the ASRT Practice Standards for Medical Imaging and Radiation Therapy:

clinically competent
educationally prepared

Evidentiary Documentation

Current Literature
Not applicable

II. Evaluation of Diagnostic Accuracy

- A. Benchmarks
- B. Sensitivity and specificity
- C. Predictive values
- D. Prior probability
- E. Bias

III. Clinical Audit

- A. Rationale
- B. Audit schemes
 - 1. External quality assessment
 - 2. Internal quality assessment
 - 3. Accreditation
 - 4. Clinical governance (i.e., credentialing)
- C. Audit categories
 - 1. Access
 - 2. Process
 - 3. Output
 - 4. Outcome
 - 5. Use of resources
- D. Measurement criteria and instruments (i.e., ACR Appropriateness Criteria)

QUALITY OF EVIDENCE: High

Certification Agency Entry-Level Clinical Activities

Registered Radiologist Assistant Entry-Level Clinical Activities (ARRT, 2018)

initial observations, and communicate observations **ONLY** [*emphasis added*] to the radiologist; record initial observations of imaging procedures following radiologist approval;
with the ACR Practice Parameter for Communication of Diagnostic Imaging Findings.

QUALITY OF EVIDENCE: High

Scopes of Practice and Practice Standards Reference

Scope of Practice

o

provider consistent with the American College of Radiology Practice Guidelines for Communication of Diagnostic Imaging Findings.

- o Providing follow-up patient evaluation.

The ASRT Practice Standards for Medical Imaging and Radiation Therapy

- o Performs follow-up patient evaluation and communicates findings to the supervising radiologist. (Standard Seven, radiologist assistant only)
- o Reports clinical and imaging observations and procedure details to the supervising radiologist. (Standard Eight, radiologist assistant only)
- o Maintains documentation of quality assurance activities, procedures and results. (Standard Eight)
- o Documents in a timely, accurate and comprehensive manner. (Standard Eight)
- o Documents and assists radiologist in quality reporting measures for the purpose of improved patient care. (Standard Eight, radiologist assistant only)

QUALITY OF EVIDENCE: High

Federal and State Statute References

Not applicable

Other

Not applicable

Approved: June 19, 2011

Amended, Main Motion, C-13.21 & C13.23, 2013

Amended, Main Motion, C-16.11, 2016

Amended, Main Motion, C-18.07, 2018

ASRT House of Delegates

American College of Radiology. ACR-SAR practice parameter for the performance of excretory urography. Revised 2014. Accessed November 29, 2018.

American College of Radiology. ACR-SPR practice parameter for the use of intravascular contrast media. Revised 2017. Accessed November 29, 2018.

American College of Radiology. ACR-SPR technical standard for therapeutic procedures using radiopharmaceuticals. Revised 2016. Accessed November 29, 2018.

Covered medical and other health services. In: *Medicare Benefit Policy Manual*. Baltimore, MD: Centers for Medicare & Medicaid Services; 2017. Accessed November

Scope of Practice*†

- o Identifying, preparing and/or administering medications as prescribed by a licensed practitioner.

QUALITY OF EVIDENCE: High

Federal and State Statute References

Not applicable

Other

Not applicable

Approved: July 1, 2012

Amended, Main Motion, C-13.21 and C13.23, 2013

Amended, Main Motion, C-16.13, 2016

Amended, Main Motion, C-17.09, 2017

Amended, Main Motion, C-18.11, 2018

* Excludes limited x-ray machine operator

† Excludes medical dosimetry

Medication Administration in Peripherally Inserted Central Catheter Lines or Ports With a Power Injector

After research of evidentiary documentation such as current literature, curricula, position statements, scopes of practice, laws, federal and state regulations and inquiries received by the ASRT, the ASRT issued the opinions contained herein.

Advisory Opinion

It is the opinion of the ASRT that based upon current literature; curricula set forth by the ASRT, ASRT Practice Standards for Medical Imaging and Radiation Therapy and SNMMI; certification examination specifications by the ARRT and NMTCB; and where federal or state law and/or institutional policy permits that:

1. It is within the scope of practice for medical imaging and radiation therapy professionals to access and use a Food and Drug Administration approved peripherally inserted central catheter (PICC) line or port designated for use with power injectors, when manufacturer guidelines regarding infusion rate and pressure are followed and where federal or state law and/or institutional policy permits.

With proper education and proven competence, the use of power injectors with PICC lines or ports provides quality patient services in a safe environment.

GRADE: Strong

Definitions

access The process of inserting the designated needle through the access point of an existing vascular access device to deliver intravenous (IV) fluids or medication.

The following definitions can be found in the glossary to the ASRT Practice Standards for Medical Imaging and Radiation Therapy:

educationally prepared
clinically competent

Evidentiary Documentation

Certification Agency Examination Content Specifications

Components of Preparedness (NMTCB, 2017)

Computed Tomography (ARRT, 2017)

Vascular Interventional Radiography (ARroP1l5ii* nBT00000912 0 612 792 2900000912 0 612 792 reW

* Excludes limited x-ray machine operator

† Excludes medical dosimetry

Placement of Personal Radiation Monitoring Devices

After research of evidentiary documentation such as current literature, curricula, position statements, scopes of practice, laws, federal and state regulations and inquiries received by the ASRT, the ASRT issued opinions contained herein.

Advisory Opinion

It is the opinion of the ASRT that based upon current literature; curricula set forth by the ASRT and SNMMI; certification examination specifications by the ARRT and NMTCB; regulatory requirements; AAPM recommendations; and where federal or state law and/or institutional policy permits that:

- 1.

pproved: July 1, 2012
Amended, Main Motion, C-13.21 & C13.23, 2013
Amended, Main Motion, C-16.15, 2016
Amended, Main Motion, C-18.09, 2018
ASRT House of Delegates

Evidentiary Documentation

Current Literature

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Don S, Macdougall R, Strauss K, et al. Image Gently campaign back to basics initiative: ten steps to help manage radiation dose in pediatric digital radiography. *AJR Am J Roentgenol*. 2013;200(5):W431-W436. doi:10.2214/AJR.12.9895

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Federal and State Statute References

Not applicable

Other

Not applicable

Approved: June 28, 2015

Adopted, Main Motion, C-15.23, 2015

Amended, Main Motion, C-18.10, 2018

ASRT House of Delegates