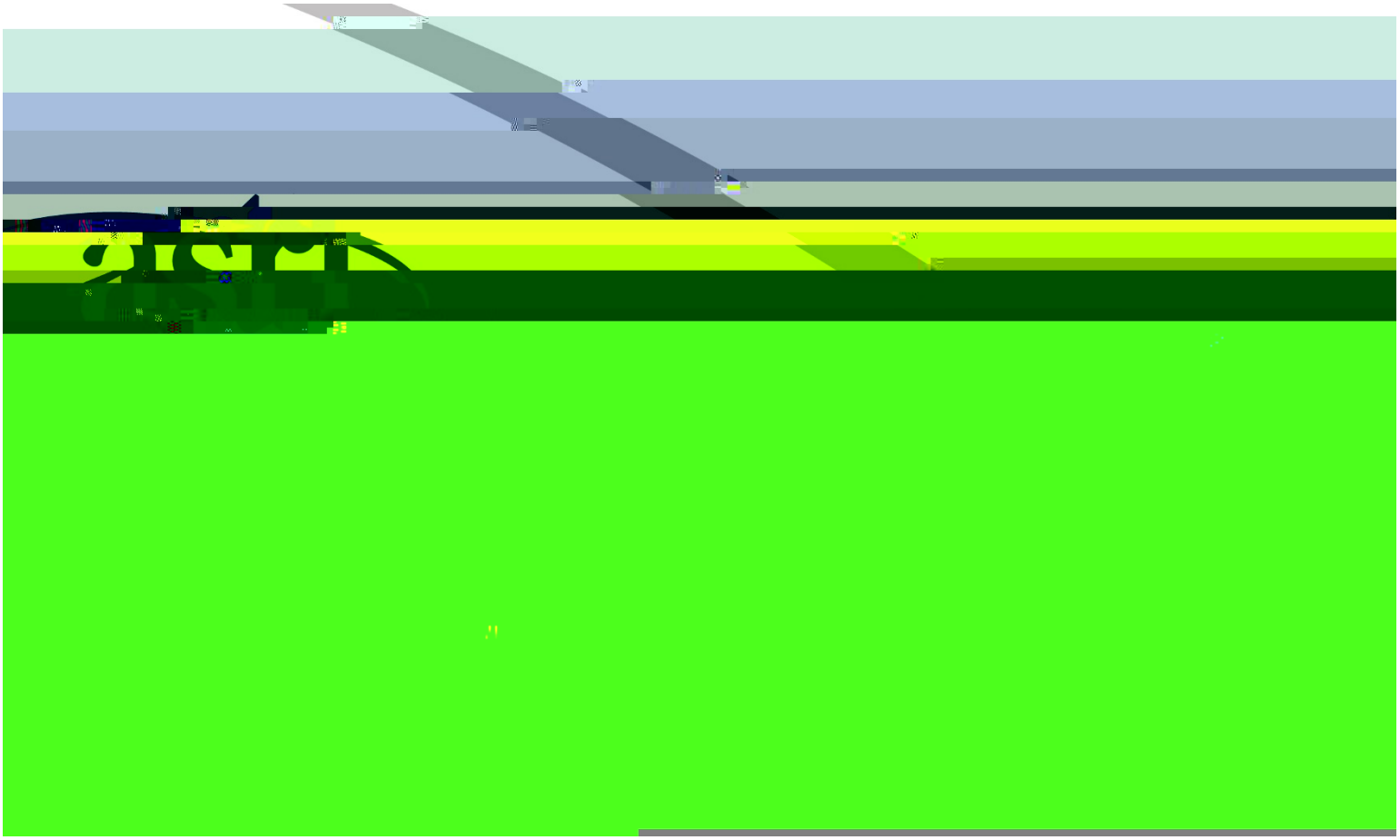

Table of Contents

Preface

A profession's practice standards serve as a guide for appropriate practice. The practice standards define the practice and establish general criteria to determine compliance. Practice standards are authoritative statements established by the profession for evaluating the quality of practice, service and education provided by individuals within the profession.

Practice standards can be used by individual facilities to develop job descriptions and practice parameters. Those outside the profession can use the standards as an overview of the role and responsibilities of individuals within the profession.

The medical imaging and radiation therapy professional and any individual who is legally authorized to perform medical imaging must be educationally prepared and clinically competent as a prerequisite to professional practice. The individual should, consistent with all applicable legal requirements and restrictions, exercise individual thought, judgment and discretion in the performance of the procedure. [illegible] ectcabcedicativtandards as

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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

Medical Imaging and Radiation Therapy Scope of Practice

Scopes of practice delineate the parameters of practice and identify the boundaries for practice. A comprehensive procedure list for the medical imaging and radiation therapy professional is impractical because clinical activities vary by the practice needs and expertise of the individual. As medical imaging and radiation therapy professionals gain more experience, knowledge and clinical competence, the clinical activities may evolve.

Excludes limited x-ray machine operator
Excludes medical dosimetry

- Verifying archival storage of data.
-

Standards

Standard One – Assessment

The medical imaging and radiation therapy professional collects pertinent data about the patient,

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
E

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 plan of action. Quality assurance activities provide valid and reliable information regarding the performance of equipment, materials and processes.

The medical imaging and radiation therapy professional:

General Criteria

- Adheres to radiation safety rules and standards.
- Administers first aid or provides life support.
- Applies principles of aseptic technique.
- Assesses and monitors the patient's physical, emotional and mental status.
-

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.
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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.
- Bases the revised plan on the patient's condition and the most appropriate means of achieving the expected outcome.

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Effective June 23, 2019

Standard Nine – Quality

The medical imaging and radiation therapy professional strives to provide optimal care.

Rationale
Patients expect and deserve optimal care during diagnosis and treatment.

The medical imaging and radiation therapy professional:

General Criteria

Standard Ten – Self-Assessment

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

Bone Densitometry

Refer to general criteria.

Standard Twelve – Ethics

The medical imaging and radiation therapy professional adheres to the profession's accepted 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.
- Respects the patient's right to privacy and confidentiality.

Specific Criteria

Bone Densitometry

Refer to general criteria.

Standard Thirteen –

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 – Acronym for "as low as (is) reasonably achievable," which means making every 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.

and/or treat certain conditions.

ISCD – International Society for Clinical Densitometry

JRC-DMS – Joint Review Committee on Education in Diagnostic Medical Sonography

least significant change – The least amount of bone mineral densitometry change that can be considered statistically significant.

licensed practitioner – A medical or osteopathic physician, chiropractor, podiatrist or dentist who has education and specialist training in the medical or dental use of radiation and is deemed competent to perform independently or supervise medical imaging or radiation therapy procedures by the respective state licensure board.

MDCB – Medical Dosimetrist Certification Board

medical physicist – An individual who is competent to practice independently in the safe use of x-rays, gamma rays, electron and other charged particle beams, neutrons, radionuclides, sealed radionuclide sources, ultrasonic radiation, radiofrequency radiation and magnetic fields for diagnostic and therapeutic purposes. An individual is considered competent to practice in the field of medical physics if he or she is certified by the appropriate recognized certification organization.

medication – Any chemical substance intended for use in the medical diagnosis, cure, treatment or prevention of disease.

minimal sedation (anxiolysis) – A drug-induced state during which patients respond normally to verbal commands. Although cognitive function and coordination may be impaired, ventilatory and cardiovascular functions are unaffected.

moderate sedation – A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

molecular imaging – A biomedical discipline enabling the visualization, characterization and quantification of biologic processes taking place at the cellular and subcellular levels within intact living subjects.

monitor units – Unit of output measure used for linear accelerators, s1 (o)-4 (r)-1 (s)]TJ0.8957mfrud2 (s)]TJlivtt

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

shuttering – A postprocessing technique that may be used to eliminate ambient light around an

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.

The medical imaging and radiation therapy professional's performance should be evidence-based and consistent with federal and state laws, regulations, established standards of practice, facility policies and procedures. Links to external websites may change without notice.

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.

The ASRT's position is to determine the practice standards and scopes of practice for medical 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.

Guidance for the Communication of Clinical and Imaging Observations and Procedure Details by Radiologist Assistants to Supervising Radiologists

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 Aai51 (t)-212 -0 0 1n (a)4 (t)-2- opiricula, position

II. Evaluation of Diagnostic Accuracy

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

  - Providing follow-up patient evaluation.

- The ASRT Practice Standards for Medical Imaging and Radiation Therapy
  - Performs follow-up patient evaluation and communicates findings to the supervising radiologist. (Standard Seven, radiologist assistant only)
  - Reports clinical and imaging observations and procedure details to the supervising radiologist. (Standard Eight, radiologist assistant only)
  - Maintains documentation of quality assurance activities, procedures and results. (Standard Eight)
  - Documents in a timely, accurate and comprehensive manner. (Standard Eight)
  - 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

Medication Administration by Medical Imaging and Radiation Therapy Professionals

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,

- 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 29, 2018.

QUALITY OF EVIDENCE: High

Curricula

The ASRT curricula for all practice areas were reviewed.

- Cardiac-Interventional and Vascular-Interventional Curriculum (ASRT, 2014)
- Computed Tomography Curriculum (ASRT, 2018)
- Magnetic Resonance Curriculum (ASRT, 2015)
- Mammography Curriculum (ASRT, 2018)
- National Education Curriculum for Sonography (JRC-DMS, 2016)
- NEC Common Curricula (JRC-DMS, 2016)
- Nuclear Medicine Technology Competency-Based Curriculum Guide (SNMMI, 2013)
- Radiation Therapy Professional Curriculum (ASRT, 2014)
- Radiography Curriculum (ASRT, 2017)
- Radiologist Assistant Curriculum (ASRT, 2015)

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- Scope of Practice
  - 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
ASRT House of Delegates

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

Certification Agency Examination Content Specifications

- Components of Preparedness (NMTCB, 2017)
- Computed Tomography (ARRT, 2017)
- Vascular Interventional Radiography (ARRT, 2017)

Other Certification Agency Content Specifications

- Components of Preparedness (NMTCB, 2017)
- Positron Emission Tomography (PET) Specialty Examination Content Outline (NMTCB, 2016)

QUALITY OF EVIDENCE: High

Scopes of Practice and Practice Standards Reference

- Scope of Practice
  - Administering medications parenterally through new or existing vascular access, enterally or through other appropriate routes as prescribed by a licensed practitioner.
  - Administering medications with an infusion pump or power injector as prescribed by a licensed practitioner.
  -

*Excludes limited x-ray machine operator
† Excludes medical dosimetry

Medication Administration Through Existing Vascular Access

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 3 (r)-7 (e41yhmb10 (a)4 (s)2 (ne)4up-2 1 (c)4 (ur)3 (r)-7 (e)4 (nt)-2 (l)-2 (i)-2 (t)-
neA24 gy); -4j (R)-3 (6)1N[(A2M3 4 (s)-3 (TC4 (R)B4 (R)-1 (a)4 4 ( )]TJTC4 (R)C4 (R)m[(I); (nt)-2 (ur)3 (a)-6 (co)4 (m)

QUALITY OF EVIDENCE: High

Curricula

- Cardiac-Interventional and Vascular-Interventional Curriculum (ASRT, 2014)
- Computed Tomography Curriculum (ASRT, 2018)
- Magnetic Resonance Curriculum (ASRT, 2015)
- Mammography Curriculum (ASRT, 2018)
- National Education Curriculum for Sonography (JRC-DMS, 2016)
- NEC Common Curricula (JRC-DMS, 2016)
- Nuclear Medicine Technology Competency-Based Curriculum Guide (SNMMI, 2013)
- Radiation Therapy Professional Curriculum (ASRT, 2014)
- Radiography Curriculum (ASRT, 2017)
- Radiologist Assistant Curriculum (ASRT, 2015)

QUALITY OF EVIDENCE: High

Certification Agency Examination Content Specifications

- Computed Tomography (ARRT, 2017)
- Magnetic Resonance Imaging (ARRT, 2017)
- Nuclear Medicine Technology (ARRT, 2017)
- Radiography (ARRT, 2017)
- Registered Radiologist Assistant (ARRT, 2018)
- Vascular Interventional Radiography (ARRT, 2017)

Other Certification Agency Content Specifications

- Components of Preparedness (NMTCB, 2017)
- Examination Overview: Registered Cardiovascular Invasive Specialist (CCI, 2018)

QUALITY OF EVIDENCE: High

Scopes of Practice and Practice Standards Reference

- 8-3b(ne)4 (E)-1/by(E)-1/a(and0 Tw §)-11 Td(5.17o)2Ęa(nlc)4 (e)8(St)-2 (andnsnc)4 (e14 (d p)-10 a-2 (f)1-

Excludes limited x-ray machine operator
Excludes medical dosimetry

Effective June 23, 2019

Placement of Personal Radiation Monitoring Devices

After research of evidentiary documentation such as current literature, curricula, position

- Positron Emission Tomography (PET)-Computed Tomography (CT) Curriculum (ASRT, 2004)
- Nuclear Medicine Technology Competency-Based Curriculum Guide (SNMMI, 2013)
- Radiation Therapy Professional Curriculum (ASRT, 2014)
- Radiography Curriculum (ASRT, 2017)
- Radiologist Assistant Curriculum (ASRT, 2015)

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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

- American College of Radiology. ACR-AAPM-SIIM-SPR practice parameter for digital radiography. Revised 2017.
- Bomer J, Wiersma-Deijl L, Holscher HC. Electronic collimation and radiation protection in paediatric digital radiography: revival of the silver lining. *Insights Imaging.* 2013;4(5):723-727. doi:10.1007/s13244-013-0281-5
- Carroll QB. *Radiography in the Digital Age*. 2nd ed. Springfield, IL: Charles C Thomas; 2014.
- Carter C, Vealé B. *Digital Radiography and PACS*. 2nd ed. Maryland Heights, MO: Elsevier; 2014.
- Chalazonitis AN, Koumarianos D, Tzovara J, Chronopoulos P. How to optimize radiological images captured from digital cameras, using the Adobe Photoshop 6.0 program. *J Digit Imaging.* 2003;16(2):216-229.
- 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
- Fauber TL, Dempsey MC. X-ray field size and patient dosimetry. *Radiol Technol.* 2013;85(2):155-161.
- Fauber TL. *Radiographic Imaging and Exposure*. 5th ed. St Louis, MO: Elsevier; 2016.
- Goske MJ, Charkot E, Herrmann T, et al. Image Gently: challenges for radiologic technologists when performing digital radiography in children. *Pediatr Radiol.* 2011;41(5):611-619. doi:10.1007/s00247-010-1957-3
- Herrmann TL, Fauber TL, Gill J, et al; American Society of Radiologic Technologists. Best practic (T)1 (e)-r:ative: Arhnologi.

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Curricula
Not applicable

Certification Agency Content Specifications
Not applicable

Scopes of Practice and Practice Standards Reference

- Scope of Practice
  - Applying principles of ALARA to minimize exposure to patient, self and others.
- The ASRT Practice Standards for Medical Imaging and Radiation Therapy
  - Analyzes digital images to determine the use of appropriate imaging parameters. (Standard Two)
  - Optimizing technical factors in accordance with the principles of ALARA. (Standard Two)
  - Verifies that exposure indicator data for digital radiographic systems has not been altered or modified and is included in the DICOM header and on images exported to media. (Standard Two)
  - Employs proper radiation safety practices. (Standard Four)
  - Optimizes technical factors according to equipment specifications to meet the ALARA principle. (Standard Four)
  - Positions patient for anatomic area of interest, respecting patient ability and comfort. (Standard Four)
  - Uses pre-exposure collimation and proper field-of-view selection. (Standard Four)
  - Adheres to the established practice standards of the profession. (Standard Five)
  - Evaluates images for overall image quality of a specific area of anatomical interest based on limited education, training and licensure/certification within the scope of practice. (Standard Five, limited x-ray machine operator only)
  - Evaluates images for optimal technical exposure factors. (Standard Five, radiography only)
  - Evaluates images for positioning to demonstrate the anatomy ind8oy4Ta002 TwTw [(c)46 (9 ƀBDj/TT4