

A decorative graphic consisting of a thick, grey diagonal line that starts from the top left and extends towards the bottom right. A large, grey, three-dimensional sphere is positioned where the line changes direction, appearing to be attached to it.

# The Practice Standards for Medical Imaging and Radiation Therapy

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## Glossary

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**Action plan** – A program or method that explains the actions or steps to be taken.

**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 the practice of advanced-practice radiologic technology.

**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.

**Artifact** – A structure or feature produced by the technique used and not occurring naturally.

**As low as reasonably achievable (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.

**Assessment** – The process by which a patient’s condition is appraised or evaluated.

**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.

**Change Management** – Systematic approach to preparing for, implementing, and sustaining a change in process.

**Clinical** – Pertaining to or founded on actual observations and treatments of patients.

**Clinically competent** – The ability to perform a clinical procedure in a manner that satisfies the demands of a situation, as assessed and documented by a qualified individual.

**Contrast media** – A substance administered during a medical imaging procedure for the purpose of enhancing the contrast between an internal structure or fluid and the surrounding tissue.

**Custom blocks** – Devices designed to shape the radiation field.

**Digital Imaging Communications in Medicine (DICOM)** – The Digital Imaging and Communications in Medicine (DICOM) standards are a complex set of instructions to exchange and present medical image information.

**Dose distribution** – Spatial representation of the magnitude of the dose produced by a source of radiation. It describes the variation of dose with position within an irradiated volume.

**Dosimetric calculations** – Computation of treatment unit settings, monitor units, treatment times and radiation doses to anatomical areas of interest.

**Educationally prepared** – The successful completion of didactic and clinical education necessary to properly perform a procedure in accordance with accepted practice standards.

**Examination preparation** – The act of helping to ready a patient for an imaging or therapeutic procedure.

**Fiducial markers** – Fixed reference points against which other objects can be measured. They may be placed internally, at skin surface or fixed externally to the patient.

**Hybrid imaging** – The combination of imaging technologies that allows information from different modalities to be presented as a single set of images.

**Image guided radiation therapy** – A process of using various imaging techniques to localize the target and critical tissues and, if needed, reposition the patient just before or during the delivery of radiotherapy.

**Immobilization device** – Device that assists in maintaining or reproducing the position while restricting patient movement.

**Initial observation** – Assessment of technical image quality with pathophysiology correlation communicated to a radiologist.

**Interpretation** – The process of examining and analyzing all images within a given procedure and integration of the imaging data with appropriate clinical data in order to render an impression or conclusion set forth in a formal written report composed and signed by a licensed practitioner.

**Interventional procedures** – Invasive medical imaging guidance methods used to diagnose and/or treat certain conditions.

**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, with education and specialist training in the medical or dental use of radiation who is deemed competent to independently perform or supervise medical imaging or radiation therapy procedures by the respective state licensure 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 both diagnostic and therapeutic purposes. An individual will be 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 (MU)** – Unit of output measure used for linear accelerators. Accelerators are calibrated so that 1MU delivers 1cGy for a standard, reference field size at a standard reference depth at a standard source to calibration point.

**Non interpretive fluoroscopic procedures**– Use of fluoroscopic imaging under the direction of a licensed practitioner for purposes other than interpretation.

**Normal tissue tolerance** – Radiation tolerance levels of healthy organs near or within the radiation treatment fields.

**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 same. The written survey report, validated by a medical physicist, contains sufficient information to document that each test was conducted according to local, state or federal requirements and includes an assessment of corrective actions and recommendations for improvements.

**Postprocessing** – Computerized processing of data sets after acquisition to create a diagnostic image.

**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.

**Quality control (QC)** – 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.

**Radiation oncologist** – A physician who specializes in using radiation to treat cancer.

**Radiation protection** – Prophylaxis against injury from ionizing radiation. The only effective preventive measures are shielding the operator, handlers and patients from the radiation source; maintaining appropriate distance from the source; and limiting the time and amount of exposure.

**Radioactive material** – A substance composed of unstable atoms that decay with the spontaneous emission of radioactivity. Includes radiopharmaceuticals, unsealed sources (open, frequently in liquid or gaseous form) and sealed sources (permanently encapsulated, frequently in solid form).

**Radiobiology** – The study of the effects of radiation on living organisms.

**Radiography** – The process of obtaining an image for diagnostic examination using x-rays.

**Sentinel event** – An unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase “or the risk thereof” includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome.

**Setup** – Arrangement of treatment parameters used in preparation for delivering radiation therapy; includes patient positioning data, field alignment information and equipment configurations.

**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.

**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 RA.

**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** – Number of standard deviations the individual’s bone mineral density is from the average bone mineral density for gender-matched young normal peak bone mass.

**Vascular access device** – Apparatus inserted into the peripheral or central vasculature for diagnostic or therapeutic purposes.

**Vascular closure device** – Active or passive medical devices used to achieve hemostasis after a cardiovascular or endovascular procedure that requires catheterization.

**Venipuncture** – The transcutaneous puncture of a vein by a sharp rigid stylet or cannula carrying a flexible plastic catheter or by a steel needle attached to a syringe or catheter.

**Verification images** – Images produced to confirm accurate treatment positioning and accurate treatment portals.

**Z-score** – Number of standard deviations the individual's bone mineral density is from the average bone mineral density for and gender-matched reference group.