Clinical Practice Guideline: **Radiographic Quality and Safety Parameters**

Date of Implementation: **October 26, 2006**

Product: **Specialty**

The goal of radiography is to establish the presence or absence and nature of disease by demonstration of the disease process itself or the effects of the disease process on the normal anatomy. All studies should be done with the minimal radiation dose necessary to achieve an optimal image.

The following specifications for radiological examination and equipment are intended to ensure optimum diagnostic quality, while minimizing radiation exposure to patients, practitioner/technician, and support personnel.

Education and Training of Practitioner

A practitioner performing radiographic examinations must have documented training and understanding of the physics of diagnostic radiography, experience with the equipment, demonstrate an understanding of the principles of radiation protection, knowledge of the hazards of radiation exposure to both patients and radiology personnel, and utilize appropriate radiation monitoring devices in the facility. The practitioner should also possess knowledge and competency in the principles and procedures of general radiography, screen-film combinations, and image processing (conventional and/or digital as applicable to the facility).

The practitioner should perform, interpret, and report radiographic examinations in accordance with nationally recognized standards of practice. The practitioner's continuing clinical education should include continuing medical education in general radiography as is appropriate to his/her practice and in accordance with applicable state law.

If a radiology technologist or qualified assistant performs radiographic examinations, the technologist/assistant must maintain a state approved license/certification, as required.

Quality Assurance, Safety, and Infection Control

- Appropriate collimation and shielding should be utilized to limit exposure to the anatomical area(s) of interest and improve image quality by limiting scatter radiation. A properly centered and focused square-leaf collimator with light must be employed. Collimation must be used to exclude the eyes and other sensitive organs whenever possible, and should not be any wider than is necessary. Collimations should at least be evident on three sides of the film.

- All facilities producing radiographs should have policies and procedures for appropriate shielding of patients and healthcare workers.
- Facilities should have policies and procedures to reasonably attempt to identify pregnant patients prior to the performance of any diagnostic examination involving ionizing radiation. Pregnancy, especially in the early trimesters, significantly impacts the benefit:risk ratio and the decision whether to obtain radiographs needs to be carefully considered. If a decision is made to obtain radiographs of a pregnant or a potentially pregnant patient, a written informed consent should be obtained prior to performing the procedure.
- Notices regarding pregnancy should be posted in compliance with all applicable state regulatory requirements, and include language such as, "If it is possible that you might be pregnant, notify the physician or other staff before your x-ray examination."
- Suitable gonadal shielding must be utilized whenever possible on all patients.
- Facilities providing radiographic services should have documented policies and procedures related to quality control, patient education, infection control, and safety.
- The quality control program should include documented protocols and procedures for maintaining imaging equipment; maintenance and cleaning of film processors; and orientation and training of staff. All applicable state regulatory requirements must also be maintained.

Specifications of Radiographic Examination

- Objects which may produce unacceptable artifacts (e.g., jewelry, hair ornaments, patient's clothing in the area of the study) should be removed before exposure is made. A supply of clean gowns should be available to avoid clothing artifacts such as zippers and buttons.
- All radiographic studies should be permanently imprinted with patient's complete name; facility name and location; and date of the examination. The side (right or left) of the anatomic site radiographed should be permanently labeled (e.g., use of Mitchel marker).
- All facilities performing radiography should have written protocols for standard views of each anatomic area that will be imaged. These should be designed to optimize diagnostic information while minimizing radiation exposure.
- All facilities performing radiography should have a Supertech calculator and/or technique charts listing exposure factors that will reliably produce diagnostic radiographs of anatomic parts of patients of various dimensions to minimize the need for repeat exposures. Images of non-diagnostic quality should be repeated. Causes and frequency for repeating x-rays due to non-diagnostic quality should be identified as part of a routine quality control process.
- All radiographs should be reviewed for positioning and diagnostic quality at the

facility before the patient is released for the day. X-rays must be of diagnostic quality. A minimum of two views at 90 degrees to each other are the professional standard and may be a regulatory requirement.

- Radiographic examinations of the spine or extremities should completely demonstrate the designated regions, or the levels of clinical interest in a limited examination.

Radiographic Reporting Documentation Standards

All radiography examinations must include a documented interpretation of the findings (radiology report). This report must be maintained as a permanent part of the patient's medical record, and include at a minimum:

- Patient name or other identifier
- Facility name and location
- Date of the examination
- Relevant clinical information and diagnosis
- Description of the studies (anatomical location and views taken)
- Report should include appropriate anatomic, pathologic, and radiologic terminology to describe all findings.
- Limitations impacting the ability to read/interpret radiographic findings should be identified (e.g., artifacts, poor quality of film, technical factors).
- The report should address any specific clinical questions; if there are factors that prevent answering the clinical question, this should be stated explicitly.
- Comparison with relevant examinations and reports (e.g., previous x-rays, CT, MRI) should be included in the radiologic report when appropriate.
- Impression should include a precise differential diagnosis, any significant patient reaction, and recommendations for follow-up or additional diagnostic studies to clarify or confirm the impression when appropriate.
- Person providing the interpretation of the study must be identified on the report.

Specifications of Equipment

- The mandatory minimum power for radiographic equipment is 100 kVp / 200 MA or greater for standard, digital and high speed digital imaging.
- The diagnostic radiographic equipment and facility should meet all applicable federal and state radiation standards.
- For non-digital imaging, automated film processing is preferred. Carefully controlled temperature and regularly scheduled processor maintenance should be included in a quality control program. A constant time and temperature should be maintained for manual processing. The chemicals must also be replenished appropriately.

References

American College of Radiology. (2008). ACR Practice Guideline for General Radiography. Retrieved April 11, 2012 from http://www.acr.org/SecondaryMainMenuCategories/quality_safety/guidelines/dx/general_radiography.aspx

American College of Radiology. (2007). ACR Practice Guideline for the Performance of Spine Radiography in Children and Adults. Retrieved April 11, 2012 from http://www.acr.org/SecondaryMainMenuCategories/quality_safety/guidelines/dx/head-neck/spine_radiography.aspx

American College of Radiology. (2010). ACR Practice Guideline for Communication of Diagnostic Imaging Findings. Retrieved April 11, 2012 from http://www.acr.org/SecondaryMainMenuCategories/quality_safety/guidelines/dx/comm_diag_rad.aspx

American Specialty Health. (2012) *Office Facility Standards – Chiropractic Addendum* (QM 20) Retrieved March 17, 2012 from http://www.ashcompanies.com/WCMGenerated/OfficeFacilityStandardsChiroAddendum_tcm19

International Commission on Radiological Protection. (1990). *Radiation And Your Patient: A Guide For Medical Practitioners.* Retrieved August 27, 2006 from http://www.icrp.org/docs/Rad_for_GP_for_web.pdf