CAR Standards for General (Plain) Radiography

First adopted: June 2000

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The standards of the Canadian Association of Radiologists (CAR) are not rules, but are guidelines that attempt to define principles of practice that should generally produce radiological care. The physician and medical high-quality physicist may modify an existing standard as determined by the individual patient and available resources. Adherence to CAR standards will not assure a successful outcome in every situation. The standards should not be deemed inclusive of all proper methods of care or exclusive of other methods of care reasonably directed to obtaining the same results. The standards are not intended to establish a legal standard of care or conduct, and deviation from a standard does not, in and of itself, indicate or imply that such medical practice is below an acceptable level of care. The ultimate judgment regarding the propriety of any specific procedure or course of conduct must be made by the physician and medical physicist in light of all circumstances presented by the individual situation.

I. INTRODUCTION

Radiography is a proven and useful procedure for evaluation of most areas of human anatomy. It utilizes differences in x-ray attenuation to demonstrate that anatomy and pathology. 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 normal anatomy. The study should be done with the minimal radiation dose necessary to achieve an optimal study. For this purpose, the ALARA principle ("as low as reasonably achievable") has been accepted by the federal and provincial regulatory agencies.

If a CAR standard exists for the specific type of radiographic examination being performed, that standard would apply.

II. INDICATIONS AND CONTRAINDICATIONS

A. There are many indications for radiography, and these are dependent on the patient's clinical history and the disease processes that affect the anatomic area to be studied. There should be a sufficient clinical indication to warrant performance of a study, and a reasonable anticipation that the results of the radiograph, normal or abnormal, will influence the treatment course of the patient. Requests for general radiographs should be done according to the principles for "Request for Diagnostic Imaging Examinations" of the CAR.

B. All imaging facilities should have policies and procedures to reasonably attempt to identify pregnant patients prior to the performance of any diagnostic examination involving ionizing radiation. If the patient is known to be pregnant the potential radiation risk to the fetus and clinical benefits of the procedure should be considered before proceeding with the study. If the study is deemed essential, adequate shielding of the fetus should be applied.

III. QUALIFICATIONS AND RESPONSIBILITIES

A. Physician

Physicians involved in the performance, supervision and interpretation of standard radiographs should be Diagnostic Radiologists and must have a Fellowship or Certification in Diagnostic Radiology with the Royal College of Physicians and Surgeons of Canada and/or the Collège des médecins du Quebec. Also acceptable are foreign specialist qualifications if the Radiologist so qualified holds an appointment in Radiology with a Canadian University.

As new imaging modalities and interventional techniques are developed additional clinical training, under supervision and with proper documentation, should be obtained before radiologists interpret or perform such examinations or procedures independently. Such additional training must meet with pertinent provincial/regional regulations. Continuing professional development must meet with the

requirements of the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.

B. Technologist Qualifications

The medical radiation technologist must have Canadian Association of Medical Radiation Technologist Certification or be certified by an equivalent licensing body recognized by the C.A.M.R.T.

Under the overall supervision of the radiologists, the technologist will have the responsibility for patient comfort and safety for examination preparation and performance and for image technical evaluation and quality and applicable quality assurance.

The training of technologists engaged in specialty activities shall meet with applicable and valid national and provincial specialty qualifications.

Continued education of technologists is encouraged by the C.A.M.R.T. and should meet pertinent provincial regulations.

The technologist should have training in fluoroscopy either in his/her training curriculum or through special courses and must perform fluoroscopy on a regular basis.

IV. SPECIFICATIONS OF THE EXAMINATION

Technique

1. All radiographic studies should be permanently labeled with patient identification and date of the examination. The time of the examination should be included, if relevant. The side (right or left) of the anatomic site radiographed should be permanently labeled.

2. All facilities performing radiography should have protocols for standard views of each anatomic area that will be radiographed. These should be designed to optimize diagnostic information while minimizing radiation exposure.

3. Appropriate collimation should be used to limit exposure to the anatomic area of interest.

4. All facilities performing radiography should have technique charts listing exposure factors which will reliably produce diagnostic radiographs of anatomic parts of patients of different sizes to minimize the need for repeat exposures. Repeat rates should be part of the routine quality control process.

5. All radiographs should be reviewed for positioning and diagnostic quality at the facility before the patient is released. Repeat radiographs should be performed when necessary for diagnostic quality.

6. All facilities producing radiographs should have policies and procedures for appropriate shielding of patients.

7. For pediatric or uncooperative patients, immobilization procedures should be available to enable diagnostic quality images to be obtained.

V. EQUIPMENT SPECIFICATIONS

A. The diagnostic radiographic equipment and facility should meet all applicable federal and provincial radiation regulations.

B. Where an analog film system is used, appropriate film-screen and grid combinations should be available to obtain diagnostic radiographs of all anatomic areas to be imaged.

C. Where digital radiography is used, the equipment should meet the specifications described in currently valid standards.

D. Automated processing is preferred. Carefully controlled temperature and regular processor maintenance should be included in a quality control program. A constant time and temperature shall be maintained for manual processing.

VI. QUALITY CONTROL AND IMPROVEMENT, SAFETY, INFECTION CONTROL AND PATIENT EDUCATION CONCERNS

The quality control program should be designed to minimize patient, personnel, and public radiation risks and maximize the quality of the diagnostic information.

Radiographic techniques, filtration, scatter reduction and the choice of optimal screen combinations and film processing performance are amongst the factors that must be assessed in order to provide appropriate image quality. By far the greatest number of technical errors are related to mismatched or poor choice of film-screen combinations or the use of deteriorated screens and cassettes, inadequately calibrated low power x-ray generators, inadequate attention to control of secondary radiation, and improper film development. With automated film processing the final stages of image production is often ignored. The improper processing, particularly the use of partially exhausted or over-diluted developers is a common cause for poor image contrast. Sensitometry must be used to monitor processor performance. Simple quality assurance procedures similar to those now used in mammography also can be used to monitor chemical processing and to assure consistent results. Technologists must look for the same detail in radiographs that radiologists look for, and there must be self-education and constant feedback of information.

Each imaging facility should have documented policies and procedures for monitoring and evaluating the safety and operation of imaging equipment. Equipment performance should be monitored at least annually and a quantitative dose determination should be conducted by a qualified medical radiation physicist.

The following quality control procedures should be applied to all radiographic examinations:
1. When the examination is completed the radiographs should be checked either by a radiologist or a qualified technologist.
2. Films not of diagnostic quality should be repeated as necessary. A repeat rate program should be part of the quality control process.

Procedures and policies should be systematically monitored and evaluated as part of the overall quality improvement program of the facility. Monitoring should include the evaluation of accuracy of radiological interpretation as well as the appropriateness of the examination. The data should be collected in a manner which complies with statutory and regulatory peer review procedures in order to protect the confidentiality of the peer review data.

Policies and procedures related to quality, patient education, infection control, and safety should be developed and implemented.

The findings on the radiograph should be reported in a timely fashion in compliance with the CAR Standards on Communication. Unusual, unexpected, or urgent findings should be communicated directly to the referring physician or his or her representative.

VII. DOCUMENTATION

The result of the examination should be communicated to the referring physician in accordance with the CAR Standard on Communication: Diagnostic Radiology.

· Requisitions:
The requisition is a legal document and must contain pertinent clinical information using precise and accurate terminology - not jargon - legibly recorded on the request form.

· Reports:
Communication is the goal of radiological interpretation and reporting and the ability of the radiologist to communicate the results of the examination to the referring physician is often a neglected aspect of the radiologist's work. Ambiguous and confusing reports reduce the practical value of the imaging procedure leads to diminished confidence by the referring physician and the patient, and may result in inappropriate care and delay in diagnosis.

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