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ACR PRACTICE GUIDELINE FOR THE USE OF INTRAVASCULAR CONTRAST MEDIA

PREAMBLE

These guidelines are an educational tool designed to assist practitioners in providing appropriate radiologic care for patients. They are not inflexible rules or requirements of practice and are not intended, nor should they be used, to establish a legal standard of care. For these reasons and those set forth below, the American College of Radiology cautions against the use of these guidelines in litigation in which the clinical decisions of a practitioner are called into question.

The ultimate judgment regarding the propriety of any specific procedure or course of action must be made by the physician or medical physicist in light of all the circumstances presented. Thus, an approach that differs from the guidelines, standing alone, does not necessarily imply that the approach was below the standard of care. To the contrary, a conscientious practitioner may responsibly adopt a course of action different from that set forth in the guidelines when, in the reasonable judgment of the practitioner, such course of action is indicated by the condition of the patient, limitations on available resources, or advances in knowledge or technology subsequent to publication of the guidelines. However, a practitioner who employs an approach substantially different from these guidelines is advised to document in the patient record information sufficient to explain the approach taken.

The practice of medicine involves not only the science, but also the art of dealing with the prevention, diagnosis, alleviation, and treatment of disease. The variety and complexity of human conditions make it impossible to always reach the most appropriate diagnosis or to predict with certainty a particular response to treatment.

Therefore, it should be recognized that adherence to these guidelines will not assure an accurate diagnosis or a successful outcome. All that should be expected is that the practitioner will follow a reasonable course of action based on current knowledge, available resources, and the needs of the patient to deliver effective and safe medical care. The sole purpose of these guidelines is to assist practitioners in achieving this objective.

I. INTRODUCTION

This guideline has been developed to establish guidelines for the safe administration of intravascular contrast media used for imaging studies.

Intravascular contrast media are used for a wide variety of imaging studies. The majority of intravascular contrast-enhanced imaging examinations involve iodinated contrast media, but other contrast media may be used for magnetic resonance imaging, ultrasonic imaging, and angiography.

II. GOAL

The goal of radiologists and other personnel administering intravascular contrast media should be to utilize these agents appropriately and properly so that imaging studies are optimized and risk to the patient is minimized.

III. QUALIFICATIONS AND RESPONSIBILITIES OF PERSONNEL

A. Supervising Physician

The supervising physician should be a licensed physician with the following qualifications:

1. Certification in Radiology, Diagnostic Radiology, or Radiation Oncology by the American Board of Radiology, the American Osteopathic Board of Radiology, the Royal College of Physicians and Surgeons of Canada, or Le College des Medecins du Quebec.

or

2. Completion of an Accreditation Council for Graduate Medical Education (ACGME) approved residency program or an American Osteopathic Association (AOA) approved residency program including radiographic training on all body areas, and have documentation of a minimum of 6 months of formal dedicated training in the interpretation and formal reporting of general radiographs for patients of all ages.

or

3. The physician whose residency or fellowship training did not include the above may still be considered qualified to administer contrast media provided he or she can demonstrate sufficient knowledge of the pharmacology, indications, and contraindications for the use of contrast media to enable safe administration and has the ability to recognize and initiate treatment for adverse reactions.

and

4. The supervising physician should be familiar with the various contrast media available and the indications and contraindications for each. The physician should also be familiar with patient preparation for the examination, including any necessary hydration or bowel preparation. He/she should have an understanding about the volume and concentration of the appropriate contrast media required for a given examination (see the ACR Manual on Contrast Media).

5. Personnel familiar with the various risk factors, preparation, and any necessary premedication strategies should perform appropriate history and preprocedural screening. It is necessary for the supervising physician or designee to acquire familiarity with the patient history (to include indications and risk factors that might increase the likelihood of adverse effects from contrast media). The supervising physician must be specifically aware of relative contraindications and pertinent risk factors. The physician has the responsibility for reviewing all indications for the examination, and for specifying the type, use, dosage, and rate of administration of contrast media (see the ACR Manual on Contrast Media).

6. The supervising physician must have appropriate knowledge of alternative imaging methods.

7. The person responsible for the injection, who may be a technologist or registered nurse, must be aware of the signs and symptoms of an adverse effect and must monitor the patient for the development of these signs and symptoms during the examination. The supervising physician, or his or her physician designee, must be immediately available to respond promptly to an adverse effect.

8. The supervising physician, or his or her physician designee, must be knowledgeable in the recognition and treatment of adverse effects (e.g., idiosyncratic reactions, extravasations) of contrast media used for these supervised studies. Training and proficiency in cardiopulmonary resuscitation are recommended for those who attend to patients undergoing contrast-enhanced examinations.

Continuing Medical Education

The physician's continuing medical education should be in accordance with the ACR Practice Guideline for Continuing Medical Education (CME).

B. Radiologist Assistant

A radiologist assistant is an advanced level radiographer who is certified and registered as a radiologist assistant by the American Registry of Radiologic Technologists (ARRT) after having successfully completed an advanced academic program encompassing an ACR/ASRT (American Society of Radiologic Technologists) radiologist assistant curriculum and a radiologist-directed clinical preceptorship. Under radiologist supervision, the radiologist assistant may perform patient assessment, patient management and selected examinations as delineated in the Joint Policy Statement of the ACR and the ASRT titled "Radiologist Assistant: Roles and Responsibilities" and as allowed by state law. The radiologist assistant transmits to the supervising radiologists those observations that have a bearing on diagnosis. Performance of diagnostic interpretations remains outside the scope of practice of the radiologist assistant. 2006 (Res. 34)

C. Radiologic Technologist

The technologist should be responsible for patient comfort as well as for preparing and positioning the

patient for the examination. Qualifications for technologists performing intravenous injections of contrast media should be in compliance with current ACR policy statements[1] and existing operating procedures or manuals at the imaging facility.

Certification by the American Registry of Radiologic Technologists (ARRT) or an unrestricted state license is required.

IV. WRITTEN REQUEST FOR THE EXAMINATION

The written or electronic request for an examination using IV contrast media should provide sufficient information to demonstrate the medical necessity of the examination and allow for the proper performance and interpretation of the examination.

Documentation that satisfies medical necessity includes 1) signs and symptoms and/or 2) relevant history (including known diagnoses). The provision of additional information regarding the specific reason for the examination or a provisional diagnosis would be helpful and may at times be needed to allow for the proper performance and interpretation of the examination.

The request for the examination must be originated by a physician or other appropriately licensed health care provider. The accompanying clinical information should be provided by a physician or other appropriately licensed health care provider familiar with the patient's clinical problem or question and consistent with the state scope of practice requirements. 2006 (Res. 35)

V. INTRAVASCULAR CONTRAST MEDIA

A. Iodinated

1. For specific details (e.g., nephrotoxicity and drug interactions) refer to the ACR Manual on Contrast Media.

2. Types of iodinated contrast media: Conventional ionic high-osmolality contrast media (HOCM) and low-osmolality contrast media (LOCM) of both ionic and nonionic types are considered safe for intravascular use by the FDA. Iodinated LOCM, most of which are nonionic agents, have been shown to be associated with less discomfort and have a lower incidence of adverse effects. A single iso-osmolality iodinated contrast media (IOCM) is currently available. There are only preliminary data on this agent at this time, so decisions concerning how or when to use it (instead of LOCM) have not been clearly defined.

3. Patients considered likely to benefit from use of LOCM are those who are at increased overall risk for adverse effects. They include:

   a. Patients with a history of any previous adverse effect from intravascular iodinated contrast media, with the exception of a sensation of heat, flushing, or a single episode of nausea or vomiting.

   b. Patients with asthma.

   c. Patients with previous serious allergic reactions to materials other than contrast media.

   d. Patients with known cardiac dysfunction, including patients with risks for or recent acute congestive heart failure, dysrhythmia, unstable angina pectoris, recent myocardial infarction, or pulmonary hypertension.

   e. Patients with renal insufficiency (particularly those with diabetes).

   f. Patients with generalized severe debilitation, as determined by a physician.

   g. Patients at high risk for contrast extravasation.

   h. Patients receiving contrast by power injector.

   i. Any other circumstances in which, after due consideration, the radiologist believes there is a specific indication for the use of LOCM. Examples include, but are not restricted to:
      i. Patients with sickle cell disease.
      ii. Patients at increased risk for aspiration.
      iii. Patients with suspected or known pheochromocytoma.
      iv. Patients with suspected or known myasthenia gravis disease.

[1]The American College of Radiology approves of the injection of contrast material and diagnostic levels of radiopharmaceuticals by certified and/or licensed radiologic technologists and radiologic nurses under the direction of a radiologist or his or her physician designee who is personally and immediately available, if the practice is in compliance with institutional and state regulations. There must be prior written approval by the medical director of the radiology department/ service of such individuals; such approval process having followed established policies and procedures, and the radiologic technologists and radiologic nurses who have been so approved maintain documentation of continuing medical education related to the materials being injected and to the procedure being performed. (Res. 1-H, 1987, 1997)

v. Patients who are very anxious about the contrast procedure or who request or demand the use of LOCM.
vi. Patients in whom the risk factors cannot be satisfactorily established.

B. MR Contrast Media

1. For specific details refer to the ACR Manual on Contrast Media.

2. Extracellular gadolinium chelate agents are extremely well tolerated by the vast majority of patients. Adverse reactions are encountered with a much lower frequency than is observed after administration of iodinated contrast media, but severe reactions can occur.

3. Adverse events, including some that are severe, have also been noted with other types of intravascular MR contrast media.

4. The supervising physician and radiologic technologists should adhere to the qualifications for administering intravascular contrast medium as stated in Section III.

C. The ACR recognizes the appropriateness of the use of any FDA-approved contrast media, in accordance with the supervising physician's best judgment.

VI. DOCUMENTATION

Reporting should be in accordance with the ACR Practice Guideline for Communication of Diagnostic Imaging Findings. The use of contrast media for radiation therapy planning should be documented in an appropriate record.

VII. EQUIPMENT SPECIFICATIONS

Appropriate medications and resuscitation equipment must be readily available to treat serious, potentially life-threatening adverse effects.

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

Policies and procedures related to quality, patient education, infection control, and safety should be developed and implemented in accordance with the ACR Policy on Quality Control and Improvement, Safety, Infection Control, and Patient Education Concerns appearing elsewhere in the ACR Practice Guidelines and Technical Standards book.

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