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The American College of Radiology will periodically define new practice guidelines and technical standards for radiologic practice to help advance the science of radiology and to improve the quality of service to patients throughout the United States. Existing practice guidelines and technical standards will be reviewed for revision or renewal, as appropriate, on their fifth anniversary or sooner, if indicated.

Each practice guideline and technical standard, representing a policy statement by the College, has undergone a thorough consensus process in which it has been subjected to extensive review, requiring the approval of the Commission on Quality and Safety as well as the ACR Board of Chancellors, the ACR Council Steering Committee, and the ACR Council. The practice guidelines and technical standards recognize that the safe and effective use of diagnostic and therapeutic radiology requires specific training, skills, and techniques, as described in each document. Reproduction or modification of the published practice guideline and technical standard by those entities not providing these services is not authorized.

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ACR PRACTICE GUIDELINE FOR THE PERFORMANCE OF A BARIUM ENEMA EXAMINATION IN ADULTS

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

The radiographic examination of the colon by single-contrast or double-contrast technique is a proven and useful procedure. The purpose of this examination is to establish the presence or absence of disease and its nature by opacifying the lumen and/or the wall of the colon. The goal is to obtain a diagnostic quality study by visualizing the colon in multiple projections with the minimum radiation dose necessary.

II. INDICATIONS

A. The indications for a barium enema examination include, but are not limited to:

1. Diverticular disease
2. Inflammatory bowel disease
3. Colon cancer screening

The barium enema may also be helpful in diagnosing almost all disease states intrinsically or extrinsically affecting the colon.

B. Pertinent history and symptoms serving as indications for the barium enema examination include, but are not limited to:

1. Abdominal pain
2. Diarrhea
3. Constipation
4. Other changes in bowel habits
5. Gastrointestinal bleeding
6. Anemia
7. Abdominal masses
8. Intestinal obstruction
9. Weight loss
10. Fever or sepsis
11. History of previous colon polyp or neoplasm
12. Bowel fistulas
13. Familial inheritance pattern diseases involving the colon

For the pregnant or potentially pregnant patient, see the [ACR Practice Guideline for Imaging Pregnant or Potentially Pregnant Adolescents and Women with Ionizing Radiation](#).

III. QUALIFICATIONS OF PERSONNEL

For physician, radiologist assistant, and radiologic technologist qualifications, see the [Practice Guideline for General Radiography](#).

IV. SPECIFICATIONS OF EXAMINATION

The written or electronic request for a barium enema examination should provide sufficient information to demonstrate the medical necessity of the examination and allow for its proper performance and interpretation.

Documentation that satisfies medical necessity includes 1) signs and symptoms and/or 2) relevant history (including known diagnoses). 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. (ACR Resolution 35, adopted in 2006)

A. Colon Preparation

The preparation should consist of an effective combination of dietary restriction, hydration, osmotic laxatives, contact laxatives, and cleansing enemas. These preparations are intended to rid the colon of fecal material and excess fluid as much as possible. In appropriate clinical situations, preparation may be limited or omitted.

B. Examination Preliminaries

1. An appropriate medical history should be available, including results of laboratory tests and imaging, endoscopic, and surgical procedures as applicable.
2. The barium enema tip should be inserted by a physician or a trained assistant (e.g., technologist, radiologist assistant, nurse, or physician assistant). A retention cuff may be used. It should be inflated carefully in accordance with the manufacturer's guidelines and under fluoroscopic guidance whenever possible. A physician should be in the fluoroscopic area during cuff inflation.
3. Medications may be administered to facilitate the examination.

C. Examination Technique

The following barium enema examination procedures should be tailored by the physician to the individual patient, as warranted by clinical circumstances and the condition of the patient, to produce a diagnostic quality examination.

1. Single-contrast examination
 - a. A sufficient volume of an appropriate low-density (i.e., 15%–25% weight/volume) barium suspension should be administered rectally to provide colonic distention. In early postsurgical patients, if perforation is suspected or if preparation is contraindicated or not possible for other reasons, water soluble contrast should be used.
 - b. Kilovoltage of 100 kVp or greater should be used (depending on patient size) during image acquisition.
 - c. Manual or mechanical compression should be applied as appropriate to all accessible segments of the colon during fluoroscopy.
 - d. Spot images should demonstrate all fluoroscopically identified suspicious findings as well as those segments of the colon in profile that may not routinely be demonstrated on overhead projections.
 - e. Images should include frontal and oblique views of the entire filled colon, an angled-beam view of the sigmoid colon, and a lateral view of the rectum. Whenever possible, the lateral rectal view should be obtained with the enema tip removed or at least the cuff deflated.
 - f. Postevacuation images may be helpful.
 - g. The quality assurance indicators specific to the single-contrast barium enema examination are:
 - i. Compression views are recommended.

- ii. Each accessible segment of the colon is seen during fluoroscopy.
 - iii. Each segment of the entire colon is seen without overlap, if possible.
 - iv. Imaging technique should attempt to penetrate all segments of the colon.
2. Double-contrast examination
- a. Commercially prepared high-density (80% weight/volume or greater) barium suspension is used.
 - b. Kilovoltage of 90 kVp or greater, depending on the patient's size, is used.
 - c. Barium suspension and air are introduced under fluoroscopic control to achieve adequate coating and distention of the entire colon.
 - d. The entire colon should be examined fluoroscopically during the course of the examination.
 - e. Images should be taken to attempt to demonstrate all segments of the colon in double-contrast. Suggested views include the following:
 - i. Spot images of the rectum, sigmoid colon, flexures, and cecum in double-contrast.
 - ii. Large format images, including prone and supine views of the entire colon, an angled-beam view of the sigmoid colon, and a lateral view of the rectum, either cross-table lateral or vertical beam, preferably with the tube removed or the cuff deflated.
 - iii. Both lateral and decubitus views of the entire colon using a horizontal beam (a wedge filter is recommended).
 - f. The quality assurance indicators specific to the double-contrast barium enema examination are:
 - i. Adequate barium coating of the entire colon has been achieved.
 - ii. The colon is well distended with air.
 - iii. Each segment of the colon is seen in double-contrast on at least 2 images taken in different positions, whenever possible.
 - iv. Complete visualization of the entire colon is assured through demonstration of the terminal ileum or appendix.

D. Quality Assurance

- 1. The following quality assurance indicators should be applied as appropriate to all barium enema examinations:
 - a. Colon preparation should be adequate for the clinical indication.

- b. When examinations are completed, patients should be held in the fluoroscopic area until the physician has reviewed images.
 - c. An attempt should be made to resolve questionable radiologic findings before the patient leaves. Repeat fluoroscopy of the patient should be performed as necessary.
2. The following are suggested for a quality assurance and continuing quality improvement program:
- a. Correlation of radiologic, endoscopic, and pathologic findings.
 - b. Determination of detection rates for colorectal cancer and polyps of 1 cm or greater.

V. DOCUMENTATION

Reporting should be in accordance with the [ACR Practice Guideline for Communication of Diagnostic Imaging Findings](#).

VI. EQUIPMENT SPECIFICATIONS

Examinations should be performed with fluoroscopic image intensification and radiographic equipment meeting all applicable federal and state radiation standards.

Equipment should provide diagnostic fluoroscopic image quality and recording (film, video, or digital) capability. Equipment should be capable of producing kilovoltage greater than 100 kVp. Equipment necessary to compress and isolate regions of the colon should be readily available.

VII. RADIATION SAFETY IN IMAGING

Radiologists, medical physicists, radiologic technologists, and all supervising physicians have a responsibility to minimize radiation dose to individual patients, to staff, and to society as a whole, while maintaining the necessary diagnostic image quality. This concept is known as "as low as reasonably achievable (ALARA)."

Facilities, in consultation with the medical physicist, should have in place and should adhere to policies and procedures, in accordance with ALARA, to vary examination protocols to take into account patient body habitus, such as height and/or weight, body mass index or lateral width. The dose reduction devices that are available on imaging equipment should be active; if not, manual techniques should be used to moderate the exposure while maintaining the necessary diagnostic image quality. Patient radiation doses should be periodically measured by a medical physicist in accordance with the appropriate ACR Technical Standard. (ACR Resolution 17, adopted in 2006)

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.

For issues specific to quality control in the barium enema examination, see the ACR Barium Enema Quality Control Manual.

Equipment performance monitoring should be in accordance with the [ACR Technical Standard for Diagnostic Medical Physics Performance Monitoring of Radiographic and Fluoroscopic Equipment](#).

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