Complete Summary

GUIDELINE TITLE

Left lower quadrant pain.

BIBLIOGRAPHIC SOURCE(S)

Levine MS, Bree RL, Foley WD, Gay SB, Glick SN, Heiken JP, Huprich JE, Ros PR, Rosen MP, Shuman WP, Greene FL, Rockey DC, Expert Panel on Gastrointestinal Imaging. Left lower quadrant pain. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 6 p. [25 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: American College of Radiology (ACR), Expert Panel on Gastrointestinal Imaging. Evaluation of left lower quadrant pain. Reston (VA): American College of Radiology (ACR); 2003. 5 p. (ACR appropriateness criteria).

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
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SCOPE

DISEASE/CONDITION(S)

Left lower quadrant pain

GUIDELINE CATEGORY

Diagnosis

CLINICAL SPECIALTY

Emergency Medicine
Family Practice
Internal Medicine
Nuclear Medicine
Radiology
Surgery

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of initial radiologic examinations for patients with left lower quadrant pain

TARGET POPULATION

Patients with left lower quadrant pain

INTERVENTIONS AND PRACTICES CONSIDERED

1. Computed tomography (CT)
    - Oral and intravenous (IV) contrast
    - Oral, IV, and colonic contrast
    - Without contrast
    - Colonic contrast
2. X-ray
    - Abdomen
    - Single-contrast barium enema
    - Double-contrast barium enema
    - Water-soluble contrast enema
3. Ultrasound (US)
    - Transabdominal graded compression
    - Transrectal or transvaginal
4. Magnetic resonance imaging (MRI)
5. Nuclear medicine (NUC), nuclear scintigraphy

MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in differential diagnosis

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of peer-reviewed medical journals, and the major applicable articles were identified and collected.

NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed to reach agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as

developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1 to 9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by the Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible. If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria®

Clinical Condition: Left Lower Quadrant Pain

Variant 1: Older patient with typical clinical presentation for diverticulitis.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen, with oral and IV contrast	8	

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen, with oral, IV, and colonic contrast	7	Indicated when visualization of colon lumen might be helpful.
CT, abdomen, without contrast	6	
CT, abdomen, with colonic contrast	6	
X-ray, double-contrast barium enema	6	
X-ray, single-contrast barium enema	5	
X-ray, abdomen	5	
X-ray, water-soluble contrast enema	5	
US, abdomen, transabdominal graded compression	5	
US, abdomen, transrectal or transvaginal	4	
MRI, abdomen	4	
NUC, nuclear scintigraphy	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 2: Acute, severe, with or without fever.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen, with oral and IV contrast	8	
CT, abdomen, with	7	Indicated when visualization of colon

Radiologic Exam Procedure	Appropriateness Rating	Comments
oral, IV, and colonic contrast		lumen might be helpful.
CT, abdomen, without contrast	6	
CT, abdomen, with colonic contrast	6	
X-ray, abdomen	6	
US, abdomen, transabdominal graded compression	5	
X-ray, water-soluble contrast enema	4	
X-ray, single-contrast barium enema	4	
X-ray, double-contrast barium enema	4	
US, abdomen, transrectal or transvaginal	4	
MRI, abdomen	3	
NUC, nuclear scintigraphy	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 3: Chronic, intermittent, or low grade.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen, with oral and IV contrast	8	
CT, abdomen, with oral, IV, and colonic	7	Indicated when visualization of colon lumen might be helpful.

Radiologic Exam Procedure	Appropriateness Rating	Comments
contrast		
X-ray, double-contrast barium enema	7	
CT, abdomen, with colonic contrast	6	
X-ray, single-contrast barium enema	6	
CT, abdomen, without contrast	5	
X-ray, abdomen	5	
X-ray, water-soluble contrast enema	5	
US, abdomen, transabdominal graded compression	5	
US, abdomen, transrectal or transvaginal	4	
MRI, abdomen	4	
NUC, nuclear scintigraphy	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 4: Woman of childbearing age.

Radiologic Exam Procedure	Appropriateness Rating	Comments
US, abdomen, transabdominal graded compression	8	Could be done first to exclude gynecologic abnormality.
US, abdomen, transrectal or	8	Could be done first to exclude gynecologic abnormality.

Radiologic Exam Procedure	Appropriateness Rating	Comments
transvaginal		
CT, abdomen, with oral and IV contrast	7	
CT, abdomen, with oral, IV, and colonic contrast	7	Indicated when visualization of colon lumen might be helpful.
CT, abdomen, with colonic contrast	6	
X-ray, double-contrast barium enema	6	
CT, abdomen, without contrast	5	
X-ray, abdomen	5	
X-ray, single-contrast barium enema	5	
MRI, abdomen	5	
X-ray, water-soluble contrast enema	4	
NUC, nuclear scintigraphy	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 5: Obese patient.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen, with oral and IV contrast	8	
CT, abdomen, with oral, IV, and colonic contrast	7	Indicated when visualization of colon lumen might be helpful.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen, with colonic contrast	6	
CT, abdomen, without contrast	5	
X-ray, abdomen	5	
X-ray, water-soluble contrast enema	5	
X-ray, single-contrast barium enema	5	
X-ray, double-contrast barium enema	5	
US, abdomen, transabdominal graded compression	4	
US, abdomen, transrectal or transvaginal	4	
MRI, abdomen	4	
NUC, nuclear scintigraphy	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

The most common cause of left lower quadrant pain in adults is acute sigmoid diverticulitis, which is estimated to occur in 20 to 25% of patients with diverticulosis. Appropriate imaging triage for patients with suspected diverticulitis (i.e., left lower quadrant pain) should address two major clinical questions: 1) what are the differential diagnostic possibilities in this clinical situation, and 2) what information is necessary to make a definitive management decision. Some patients with acute diverticulitis may not require any imaging, notably those with typical symptoms of diverticulitis (e.g., left lower quadrant pain and tenderness, fever) or those with a previous history of diverticulitis who present with clinical symptoms of recurrent disease. Many such patients are treated medically without undergoing radiologic examinations, but diverticulitis can be simulated by other acute abdominal disorders. Furthermore, 15 to 30% of patients with diverticulitis require surgery because of associated abscesses, fistulas, obstruction, or perforation. As a result, there has been a trend toward greater use of radiologic

imaging tests to confirm the diagnosis of diverticulitis, evaluate the extent of disease, and detect complications before treatment.

Abdominal plain films are of limited value in evaluating diverticulitis unless complications such as free perforation (pneumoperitoneum) or obstruction are suspected. Nuclear medicine imaging appears to have little role in the evaluation of left lower quadrant pain. The role of MRI has not been adequately evaluated, but preliminary data suggest that it may have diagnostic potential in patients with suspected diverticulitis. The two imaging tests most often used for the diagnosis of diverticulitis are the contrast enema and CT, but graded compression sonography has also been used.

In the past, the contrast enema was the primary imaging test for diverticulitis. Some authors were reluctant to perform contrast enemas during an acute episode of diverticulitis because of concern about colonic perforation. Others recommend the use of water-soluble contrast media to avoid contaminating the peritoneal cavity with barium if perforation occurred. However, many studies have shown that single-contrast or even double-contrast barium enemas can be safely performed during the acute episode if there are no clinical signs of perforation. The barium enema has a reported sensitivity of 59 to 90% in diagnosing sigmoid diverticulitis. It can also be used to detect other colonic diseases (e.g., ischemic colitis, inflammatory bowel disease) that cause similar clinical findings. Finally, it is a relatively low-cost examination that is available in nearly all imaging departments. Although CT has replaced the contrast enema as the initial imaging test for diverticulitis in most patients, the contrast enema may be helpful as a follow-up study for patients in whom the CT findings cannot unequivocally differentiate diverticulitis from colonic carcinoma. Also, some patients with chronic or low-grade diverticulitis may initially be evaluated by contrast enema because of altered bowel habits without other typical clinical findings of diverticulitis. The contrast enema therefore should be considered complementary to CT for evaluating these patients.

CT is now widely advocated as the primary imaging test for evaluating patients with suspected sigmoid diverticulitis because of its high sensitivity and specificity and its ability to diagnose other causes of left lower quadrant pain that mimic diverticulitis. It is less invasive than the contrast enema and has a reported sensitivity of 79 to 99%. CT also has a major role in determining disease extent; this assessment is rarely possible with contrast enema. By assessing the presence and extent of abscess formation, CT facilitates selection of patients for medical versus surgical therapy. When abscesses are present, it has been shown that CT-guided percutaneous drainage of abscess collections can eliminate multistage operative procedures and, in some cases, can eliminate the need for surgery entirely. Finally, CT can demonstrate extracolonic diseases (e.g., genitourinary and gynecologic abnormalities) that have a similar clinical presentation.

A variety of contrast media have been used for CT to optimize the sensitivity and specificity of the examination, including oral and intravenous contrast agents and rectally administered contrast or air. Many authors currently advocate the routine use of rectal contrast material to improve colonic distention and increase the accuracy of the examination for detecting diverticulitis.

Although most of the reported experience has been with CT, transabdominal sonography has been advocated as an alternative technique for evaluating patients with suspected diverticulitis. Graded compression sonography is reported to have a sensitivity of 77 to 98% and a specificity of 80 to 99% in the diagnosis of diverticulitis. Some investigators advocate the select use of transrectal sonography to improve detection of diverticulitis if the findings on transabdominal sonography are negative or equivocal. Sonography is particularly of value when left lower quadrant pain and fever occur in women of childbearing age. In this setting, gynecologic processes such as ectopic pregnancy and pelvic inflammatory disease are also important diagnostic considerations. Sonography is therefore an excellent choice for the initial imaging of this patient population, because it is more sensitive than CT or contrast enemas in detecting gynecologic abnormalities that cause left lower quadrant pain. However, graded compression sonography is a technique that is highly operator dependent.

Finally, it should be recognized that a perforated colon cancer can mimic both the clinical and radiographic findings of diverticulitis. An argument could therefore be made that patients with equivocal CT findings of diverticulitis should undergo a follow-up examination of the colonic mucosa after the acute symptoms have resolved. Either a colonoscopy or barium enema could be performed to differentiate healing diverticulitis from a perforated colon cancer in these patients.

In summary, CT is now widely advocated as the primary imaging test for evaluating acute sigmoid diverticulitis because of its high sensitivity and specificity, its ability to determine the presence and extent of disease that might warrant percutaneous catheter drainage or surgery, and its ability to demonstrate extracolonic disease in these patients. Nevertheless, the contrast enema remains a useful follow-up test for patients with equivocal CT findings. Alternatively, the contrast enema or sonography can be performed as the primary imaging test for suspected diverticulitis, depending on the availability of these various modalities and the experience and preferences of the examining radiologist.

Abbreviations

- CT, computed tomography
- IV, intravenous
- MRI, magnetic resonance imaging
- NUC, nuclear medicine
- US, ultrasound

CLINICAL ALGORITHM(S)

Algorithms were not developed from criteria guidelines.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Selection of appropriate radiologic imaging procedures for evaluation of patients with left lower quadrant pain

POTENTIAL HARMS

In the past, the contrast enema was the primary imaging test for diverticulitis. Some authors were reluctant to perform contrast enemas during an acute episode of diverticulitis because of concern about colonic perforation. Others recommend the use of water-soluble contrast media to avoid contaminating the peritoneal cavity with barium if perforation occurred. However, many studies have shown that single-contrast or even double-contrast barium enemas can be safely performed during the acute episode if there are no clinical signs of perforation.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Levine MS, Bree RL, Foley WD, Gay SB, Glick SN, Heiken JP, Huprich JE, Ros PR, Rosen MP, Shuman WP, Greene FL, Rockey DC, Expert Panel on Gastrointestinal Imaging. Left lower quadrant pain. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 6 p. [25 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1996 (revised 2005)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Gastrointestinal Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Marc S. Levine, MD (*Principal Author*); Robert L. Bree, MD, MHSA (*Panel Chair*); W. Dennis Foley, MD; Spencer B. Gay, MD; Seth N. Glick, MD; Jay

P. Heiken, MD; James E. Huprich, MD; Pablo R. Ros, MD, MPH; Max Paul Rosen, MD, MPH; William P. Shuman, MD; Frederick L. Greene, MD; Don C. Rockey, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

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The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

ACR Appropriateness Criteria® *Anytime*, *Anywhere*™ (PDA application). Available from the ACR Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on March 19, 2001. The information was verified by the guideline developer on March 29, 2001. This NGC summary was updated by ECRI on November 11, 2004. The information was verified by the

guideline developer on December 21, 2004. This summary was updated by ECRI on March 21, 2006.

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Date Modified: 9/15/2008