Complete Summary

GUIDELINE TITLE

Crohn's disease.

BIBLIOGRAPHIC SOURCE(S)

Huprich JE, Bree RL, Foley WD, Gay SB, Glick SN, Heiken JP, Levine MS, Ros PR, Rosen MP, Shuman WP, Greene FL, Rockey DC, Expert Panel on Gastrointestinal Imaging. Crohn's disease. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 11 p. [46 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. Imaging recommendations for patients with Crohn's disease. Reston (VA): American College of Radiology (ACR); 2001. 11 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
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Crohn's disease (CD)

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Emergency Medicine
Family Practice
Gastroenterology
Internal Medicine
Nuclear Medicine
Pediatrics
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 Crohn's disease (CD)

TARGET POPULATION

- Patients with suspected Crohn's disease (CD)
- Patients with known Crohn's disease and acute exacerbation or suspected complications

INTERVENTIONS AND PRACTICES CONSIDERED

1. X-ray
    - Small bowel follow-through (SBFT) with compression
    - Small bowel, enteroclysis
    - Abdomen, supine and upright
    - Colon, barium enema, with air contrast
    - Small bowel, peroral pneumocolon
    - Colon, barium enema, single contrast
    - Colon, water soluble contrast enema
2. Computed tomography (CT)
    - Abdomen and pelvis with neutral oral contrast, intravenous (IV) contrast (CT enterography)
    - Abdomen and pelvis, oral contrast
    - Abdomen and pelvis, with positive contrast, IV contrast
3. Ultrasound (US)
    - Abdomen/pelvis
    - Abdomen, Color Doppler

    - Endorectal
4. Nuclear medicine (NUC), leucoscintigraphy
5. Magnetic resonance imaging (MRI) of abdomen and pelvis, with or without contrast

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 1-9, 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: Evaluation of Crohn's Disease

Variant 1: Adult; initial presentation (abdominal pain, fever, or diarrhea); Crohn's disease suspected.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen and pelvis with neutral oral contrast, IV contrast (CT enterography)	8	
X-ray, small bowel follow-through with compression (SBFT)	7	
X-ray, small bowel, enteroclysis	7	
CT, abdomen and pelvis, oral contrast	7	
CT, abdomen and pelvis, with positive contrast, IV contrast	7	
X-ray, abdomen, supine and upright	6	
X-ray, colon, barium enema, with air contrast	6	
X-ray, small bowel, peroral pneumocolon	6	
MRI, abdomen and pelvis, with or without contrast	6	
X-ray, abdomen, supine	5	
X-ray, colon, barium enema, single contrast	5	
US, abdomen/pelvis	5	
X-ray, colon, water soluble contrast enema	4	
US, abdomen, Color	4	

Radiologic Exam Procedure	Appropriateness Rating	Comments
Doppler		
US, endorectal	3	
NUC, Leucoscintigraphy	3	
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: Initial presentation of a child (less than 14 years old); Crohn's disease suspected.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen and pelvis with neutral oral contrast, IV contrast (CT enterography)	8	
X-ray, SBFT with compression	7	
CT, abdomen and pelvis, oral contrast	7	
CT, abdomen and pelvis, with positive contrast, IV contrast	7	
X-ray, small bowel, enteroclysis	6	
MRI, abdomen and pelvis, with or without contrast	6	
US, abdomen/pelvis	6	
US, abdomen, Color Doppler	6	
X-ray, abdomen, supine and upright	5	

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, colon, barium enema, with air contrast	5	
X-ray, colon, barium enema, single contrast	5	
X-ray, small bowel, peroral pneumocolon	5	
X-ray, abdomen, supine	4	
X-ray, colon, water soluble contrast enema	4	
US, endorectal	2	
NUC, Leucoscintigraphy	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: Adult with known Crohn's disease and fever, increasing pain, leukocytosis, etc.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen and pelvis with neutral oral contrast, IV contrast (CT enterography)	8	
X-ray, abdomen, supine and upright	7	
CT, abdomen and pelvis, with positive contrast, IV contrast	7	
CT, abdomen and pelvis, oral contrast	6	

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, abdomen, supine	5	
X-ray, colon, water soluble contrast enema	5	
X-ray, small bowel follow-through with compression (SBFT)	5	
X-ray, small bowel, peroral pneumocolon	5	
MRI, abdomen and pelvis, with or without contrast	5	
US, abdomen/pelvis	5	
X-ray, colon, barium enema, with air contrast	4	
X-ray, colon, barium enema, single contrast	4	
X-ray, small bowel, enteroclysis	4	
US, abdomen, Color Doppler	4	
US, endorectal	4	
NUC, Leucoscintigraphy	3	
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: Child (less than 14 years of age) with known Crohn's disease and fever, increasing pain, leukocytosis, etc.

Radiologic Exam Procedure	Appropriateness Rating	Comments

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen and pelvis with neutral oral contrast, IV contrast (CT enterography)	8	
CT, abdomen and pelvis, with positive contrast, IV contrast	7	
X-ray, abdomen, supine and upright	6	
CT, abdomen and pelvis, oral contrast	6	
US, abdomen/pelvis	6	
X-ray, small bowel follow-through with compression (SBFT)	5	
MRI, abdomen and pelvis, with or without contrast	5	
US, abdomen, Color Doppler	5	
X-ray, abdomen, supine	4	
X-ray, colon, barium enema, with air contrast	4	
X-ray, colon, barium enema, single contrast	4	
X-ray, colon, water soluble contrast enema	4	
X-ray, small bowel, enteroclysis	4	
X-ray, small bowel, peroral pneumocolon	4	
NUC, Leucoscintigraphy	4	
US, endorectal	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
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: Adult with known Crohn's disease; stable, mild symptoms.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen and pelvis with neutral oral contrast, IV contrast (CT enterography)	7	
X-ray, small bowel follow-through with compression (SBFT)	6	
CT, abdomen and pelvis, with positive contrast, IV contrast	6	
X-ray, abdomen, supine	5	
X-ray, abdomen, supine and upright	5	
X-ray, colon, barium enema, with air contrast	5	
X-ray, colon, barium enema, single contrast	5	
X-ray, small bowel, enteroclysis	5	
X-ray, small bowel, peroral pneumocolon	5	
CT, abdomen and pelvis, oral contrast	5	
MRI, abdomen and pelvis, with or without contrast	4	

Radiologic Exam Procedure	Appropriateness Rating	Comments
US, abdomen/pelvis	4	
US, abdomen, Color Doppler	4	
X-ray, colon, water soluble contrast enema	2	
US, endorectal	2	
NUC, Leucoscintigraphy	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 6: Child (less than 14 years of age) with known Crohn's disease; stable, mild symptoms.

Radiologic Exam Procedure	Appropriateness Rating	Comments
US, abdomen/pelvis	6	
US, abdomen, Color Doppler	6	
X-ray, abdomen, supine	5	
X-ray, abdomen, supine and upright	5	
X-ray, small bowel follow-through with compression (SBFT)	5	
X-ray, small bowel, peroral pneumocolon	5	
CT, abdomen and pelvis with neutral oral contrast, IV contrast (CT enterography)	5	

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen and pelvis, with positive contrast, IV contrast	5	
MRI, abdomen and pelvis, with or without contrast	5	
X-ray, colon, barium enema, single contrast	4	
CT, abdomen and pelvis, oral contrast	4	
X-ray, colon, barium enema, with air contrast	3	
X-ray, colon, water soluble contrast enema	2	
X-ray, small bowel, enteroclysis	2	
US, endorectal	2	
NUC, Leucoscintigraphy	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.

Crohn's disease (CD) is a chronic inflammatory disease involving the gastrointestinal tract. The etiology is unknown, but evidence suggests that a genetic predisposition combined with an abnormal interaction between the gut and enteric microorganisms may play a role in the pathogenesis. Patients usually present with the abrupt or insidious onset of abdominal pain and diarrhea frequently accompanied by fever and weight loss. The small intestine and colon are most commonly affected, but any portion of the bowel from mouth to anus may be involved. The small bowel is affected alone in about a third of patients, the colon alone in 20 to 30% of patients, and combined involvement of the colon and the small bowel is seen in 40 to 50% of patients. The severity of symptoms, frequency of complications, and likelihood of intestinal resection due to CD are typically greater in patients with ileocolic involvement than in those with disease limited to the small bowel or colon alone.

Characteristic pathologic findings of CD in the gut include transmural granulomatous inflammation; deep ulcers which may progress to sinus tracts and fistulae; strictures that may lead to intestinal obstruction; and discontinuous involvement, with skip areas between diseased segments. Extraintestinal manifestations are common and include arthritis, cholelithiasis, ocular manifestations, dermatologic abnormalities, and, in children, growth retardation.

Role of Radiology

The initial diagnosis of CD is based on a combination of clinical, laboratory, histological, and imaging findings. No single diagnostic test allows unequivocal diagnosis. The imaging characteristics and distribution of disease provide supportive evidence for the diagnosis of CD. Imaging is commonly called upon to distinguish CD from other conditions causing colitis. In particular, the presence of small bowel involvement helps distinguish CD from ulcerative colitis.

In the last decade many new therapeutic strategies have been developed that have allowed the gastroenterologist and surgeon to treat virtually all forms of CD effectively. The success of these treatments (which target specific subtypes of CD) depends on accurate diagnosis of the nature and extent of disease. Therefore, it is no longer sufficient for the radiologist to only detect the presence of CD--he must also accurately assess its subtype, location, and severity. This is particularly important in distinguishing segmental small bowel narrowing due to active disease (which is effectively treated with medical therapy) from fibrotic strictures (more amenable to stricturoplasty). Likewise, complex fistulas may be more effectively treated surgically, while simple fistulas usually respond to anti-tumor necrosis factor (TNF) agents like infliximab. Therefore, accurate delineation of the frequently complex anatomy of these lesions is essential.

Radiology has traditionally played a smaller role in the long-term surveillance of patients with known CD because there is a poor correlation between clinical disease activity and the radiographic changes on barium studies. New imaging techniques discussed in the following sections of this article hold promise in predicting disease activity. It is well recognized that imaging is important in the evaluation of patients with complications of the disease, such as bowel obstruction, fistula formation, and abscess. This narrative will discuss the role of various imaging modalities in the initial diagnosis of CD and in the management of suspected complications of the disease.

Initial Presentation

Plain Films of the Abdomen

Plain films often depict abnormalities in patients with inflammatory bowel disease (IBD), and some authors advocate their routine use. Findings include mural thickening and dilatation; mucosal abnormalities of the small bowel and colon; and abnormal distribution of feces, with areas of colonic involvement devoid of fecal material. However, a false positive rate of 16 to 20%, and a low positive predictive value of a normal film (62%), make plain radiography a poor screening test in patients at initial presentation: negative films cannot preclude further studies, and positive findings would also lead to other radiological procedures to more accurately characterize the type of IBD and to map its anatomic distribution

in the gut. For these reasons, plain films are not essential when the initial presentation is typical for IBD and is not severe.

Barium Studies of the GI Tract

Along with endoscopy and other imaging techniques, barium studies remain an important diagnostic tool in the evaluation of patients with CD. The recent introduction of wireless capsule endoscopy is likely to play an increasing role in early diagnosis of CD. However, because of a 5% incidence of capsule retention proximal to unsuspected strictures, barium studies are likely to remain an important screening tool prior to capsule endoscopy exams.

The small bowel can be evaluated by either conventional SBFT or enteroclysis, and each has its proponents. Each technique is quite accurate in detecting small bowel involvement when performed correctly (89 to 97% for conventional SBFT and 83 to 100% for enteroclysis), and the superior diagnostic accuracy of enteroclysis in other conditions (e.g., detecting small bowel neoplasms and Meckel's diverticula) is not as well established in the evaluation of IBD. While enteroclysis has a shorter overall examination time, the peroral SBFT requires less total room time and radiologist time, and substantially less radiation exposure. It also has fewer side effects and greater patient acceptance. For these reasons, detailed SBFT, with frequent fluoroscopy using graded compression, is the best means of evaluating the small bowel, particularly in younger patients. Enteroclysis is usually reserved for problematic cases.

The peroral pneumocolon is a useful adjunct to SBFT or enteroclysis. Once the terminal ileum has been opacified, air is instilled through the rectum to obtain a double contrast examination of the distal small bowel (or the ascending colon, or both). Often this technique will result in better distention of the terminal ileum, and in better mucosal detail. It is particularly useful when the appearance of the ileum is indeterminate by SBFT or enteroclysis alone. One milligram of glucagon, given intravenously, facilitates reflux of air retrograde through the ileocecal valve, with a failure rate of about 10%.

Endoscopy is the preferred initial examination of the colon in patients suspected of having IBD. It is superior to the barium enema in detecting early changes and has largely replaced it as the initial diagnostic exam. The barium enema is reserved for those patients with unsuccessful colonoscopy or with contraindications such as patients on anticoagulation therapy.

Ultrasound

Numerous US studies have documented the ability of transabdominal US to demonstrate the presence of CD. US findings of CD include bowel wall thickening (4-5 mm or greater), producing the target sign when seen in cross-section, and reduced or absent peristalsis in affected loops.

More recently, proponents have argued that ultrasound could replace SBFT in the initial evaluation of patients suspected to have CD or in the surveillance of patients (particularly children) with CD, because of its acceptable sensitivity and the advantage of no radiation exposure. In the one prospective comparison of US and barium studies, which used the barium study as the gold standard, in the

initial evaluation of suspected CD, the sensitivity of US was 75% and the specificity was 97%. The authors describe a steep learning curve, with sensitivity increasing to 87% as experience is gained. This finding emphasizes the frequently made point that US is quite operator-dependent, perhaps more so than other modalities. Recent introduction of US contrast agents and power Doppler techniques suggest an increasing role for these techniques in the future. These data point to a potential role for US as the initial modality in patients (especially children) suspected of having CD.

Nuclear Medicine

Nuclear medicine plays little role in the initial evaluation of patients suspected of having CD. Radionuclide studies are not as effective as endoscopy or other imaging studies in assessing disease extent, and they lack the anatomic detail provided by those studies.

Computed Tomography

Although CT has traditionally been used to evaluate extraenteric complications of CD such as bowel obstruction, abscess, and fistula, multidetector CT has shown considerable promise in initial diagnosis and estimation of disease severity. Two modifications of standard abdominal CT technique are especially promising. These techniques differ from standard abdominal CT by using intraluminal bowel distension with neutral enteric contrast; multidetector CT with narrow slice thickness and reconstruction interval; and IV contrast administration followed by scan delays that optimize bowel wall enhancement. Large volumes of enteric contrast are necessary to achieve adequate luminal distension and may be administered orally (CT enterography) or injected through a nasojejunal tube (CT enteroclysis). The peroral administration of contrast enjoys greater patient acceptance and results in acceptable degrees of luminal distention. The use of neutral rather than positive enteric contrast is important so as not to obscure mucosal enhancement--an important indicator of active disease. Active disease is identified by mucosal hyperenhancement, bowel wall thickening, mural stratification, and hyperemic vasa recta. There is growing evidence suggesting that CT is more sensitive than barium small bowel examinations in detecting CD. Unlike conventional barium studies, CT allows good visualization of pelvic small bowel loops that are often obscured due to overlapping bowel in barium studies. CT also competes favorably with conventional and capsule endoscopy.

Magnetic Resonance Imaging

Contrast enhanced MRI scanning using fast imaging techniques can accurately display bowel wall changes in early CD. MRI appears to be superior to barium small bowel studies in diagnosing and depicting disease extent. Characteristic bowel wall changes such as mural hyperenhancement, bowel wall thickening, mural stratification, and hyperemic vasa recta are similar to these seen with CT. MR's ability to visualize these changes without the risks associated with ionizing radiation makes it a desirable technique for examining CD in children and in patients who must be subjected to multiple serial exams. Increased use of MR is very likely in the future.

Patients with Known Crohn's Disease Presenting with Acute Exacerbation or Symptoms, or with Suspected Complications

CD is a chronic disease, with frequent relapses and superimposed complications. These include bowel obstruction due to strictures; intra-abdominal or pelvic abscess; development of fistulae to skin, bladder, vagina, etc.; and toxic megacolon in patients with colonic CD.

Plain Films of the Abdomen

In patients with fulminant symptoms, plain films are useful, because they can often detect the presence of bowel obstruction, perforation, or toxic colon distention, directing further treatment quickly.

Barium Studies of the Gastrointestinal (GI) Tract

Barium small bowel exams remain useful in evaluating suspected complications of CD. The presence and anatomy of strictures and fistulas assist in preoperative planning. In patients who are acutely ill, with peritoneal signs or acute diarrhea, barium studies are not indicated because of the risk of perforation.

For evaluating the colon in patients with acute exacerbations, colonoscopy has supplanted barium enema. In patients with a low risk of perforation, a carefully performed barium enema can still provide valuable information, especially if fistula or stenoses are suspected.

In patients with CD who present with pain, a palpable mass, or fever, and in whom an abscess is suspected, barium studies have little role. While they may demonstrate a fistulous communication with an abscess, a negative study doesn't preclude other studies, and a positive one will likewise lead to additional imaging to guide therapy, such as percutaneous drainage.

Ultrasound

US has a limited role in management of suspected complications of CD except in children and in patients with perianal fistulas. The risks associated with ionizing radiation favor the role of US and MR in evaluating pediatric CD patients who are likely to require multiple exams over the course of their disease.

Endoscopic US has been shown to be superior to CT and conventional fistulography and plays a complementary role with MRI in evaluation of Crohn's perianal fistulas. Its ability to depict perianal anatomy makes it a valuable tool for preoperative planning.

Nuclear Medicine

Numerous articles support the use of technetium hexamethyl propylene amine oxime (HMPAO)-labeled white blood cells, with single photon emission computed tomography (SPECT) imaging, in assessing disease activity. These advocates propose that, once the histological diagnosis of CD has been established, the disease activity can be reliably assessed by this technique. Its advantages over

barium studies include the examination of both large and small bowel in one encounter, lower radiation exposure (important in younger patients, especially children, who will have multiple studies over their lifetime), and higher patient acceptance. In addition, HMPAO-labeled leucoscintigraphy can accurately distinguish CD from ulcerative colitis in a large proportion of patients, and may actually exceed conventional radiology in this regard. Recent application of SPECT leucoscintigraphy and positron emission tomography (PET) has reduced the false positive rate from physiological uptake in adjacent organs; however, the specificity remains limited.

While some advocates of leucoscintigraphy have argued that this technique compares favorably with CT or US in diagnosing extraintestinal complications of CD, this view is not widely accepted, and nuclear medicine plays a subordinate role in patients with known CD who present with signs and symptoms of abscess, fistula formation, or bowel obstruction.

Computed Tomography

Currently, CT is the initial imaging technique of choice in suspected CD complications, for both adults and children. In one large study of 80 patients, CT detected unsuspected findings that led to a change of medical or surgical management in 28% of patients. CT can most often differentiate the various causes of palpable abdominal mass (fibrofatty proliferation, abscess, thickened bowel wall, phlegmon, or neoplasm), and often can depict fistulas and sinus tracts.

Magnetic Resonance Imaging

Improvements in MR technology, such as fast scanning techniques, have permitted accurate diagnosis of complications of CD, including abscess, fistula, and stenosis. MRI is useful when ionizing radiation is contraindicated, and it has been used successfully in children and pregnant women. Along with endoscopic US, MRI is the preferred tool for evaluating perianal complications of CD.

Angiography and Interventional Radiology

The primary role of interventional radiology is in the percutaneous drainage of abscesses complicating CD. Numerous studies have documented the effective use of this technique, which is now the procedure of choice, often obviating the need for surgical resection.

Abbreviations

- CT, computed tomography
- IV, intravenous
- MRI, magnetic resonance imaging
- NUC, nuclear medicine
- SBFT, small bowel follow-through
- 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 Crohn's disease (CD)

POTENTIAL HARMS

In patients who are acutely ill, with peritoneal signs or acute diarrhea, barium studies are not indicated because of the risk 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

Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Huprich JE, Bree RL, Foley WD, Gay SB, Glick SN, Heiken JP, Levine MS, Ros PR, Rosen MP, Shuman WP, Greene FL, Rockey DC, Expert Panel on Gastrointestinal Imaging. Crohn's disease. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 11 p. [46 references]

ADAPTATION

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

DATE RELEASED

1998 (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

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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. Imaging recommendations for patients with Crohn's disease. Reston (VA): American College of Radiology (ACR); 2001. 11 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.

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 summary was updated by ECRI on July 31, 2002. The updated information was verified by the guideline developer on October 1, 2002. This summary was updated by ECRI on March 21, 2006.

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