Complete Summary

GUIDELINE TITLE

Imaging strategies in the initial evaluation of the jaundiced patient.

BIBLIOGRAPHIC SOURCE(S)

Foley WD, Bree RL, Gay SB, Glick SN, Heiken JP, Huprich JE, Levine MS, Ros PR, Rosen MP, Shuman WP, Greene FL, Expert Panel on Gastrointestinal Imaging. Imaging strategies in the initial evaluation of the jaundiced patient. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 6 p. [24 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Balfe DM, Ralls PW, Bree RL, DiSantis DJ, Glick SN, Levine MS, Megibow AJ, Saini S, Shuman WP, Greene FL, Laine LA, Lillemoe K, Kidd R. Imaging strategies in the initial evaluation of the jaundiced patient. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):125-33.

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)

Jaundice

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Family Practice
Gastroenterology
Internal Medicine
Radiology

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 jaundice

TARGET POPULATION

Patients with jaundice

INTERVENTIONS AND PRACTICES CONSIDERED

1. Ultrasound
    - Abdominal ultrasound
    - Endoscopic ultrasound
2. Endoscopic retrograde cholangiopancreatography
3. Percutaneous transhepatic cholangiography
4. Computed tomography (CT)
    - Abdominal CT
    - Dynamic multiplanar or helical CT
5. Nuclear medicine (NUC), cholescintigraphy (considered but not recommended)
6. Magnetic resonance imaging with magnetic resonance cholangiopancreatography

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 for reaching 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 (80) 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 this 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: Jaundice

Variant 1: Acute abdominal pain; at least one of the following: fever, history of biliary surgery, known cholelithiasis.

Radiologic Exam Procedure	Appropriateness Rating	Comments

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen	7	
MRI, abdomen, MRCP	5	
NUC, Cholescintigraphy	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

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

Variant 2: Painless; one or more of the following: weight loss, fatigue, anorexia, duration of symptoms greater than 3 months. Patient otherwise healthy.

Radiologic Exam Procedure	Appropriateness Rating	Comments
CT, abdomen, dynamic multiplanar or helical	8	
US, abdomen	8	
MRI, abdomen, with MRCP	7	
INV, ERCP and EUS	6	
INV, PTC	4	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

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

Variant 3: Painless; one or more of the following: weight loss, fatigue, anorexia, duration of symptoms greater than 3 months. Patient will not tolerate radical surgical procedure.

Radiologic Exam Procedure	Appropriateness Rating	Comments

Radiologic Exam Procedure	Appropriateness Rating	Comments
INV, ERCP and EUS	8	
US, abdomen	8	
CT, abdomen, dynamic multiplanar or helical	8	
MRI, abdomen, with MRCP	7	
INV, PTC	5	
NUC, Cholescintigraphy	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

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

Variant 4: Clinical condition and laboratory examination makes mechanical obstruction unlikely.

Radiologic Exam Procedure	Appropriateness Rating	Comments
US, abdomen	8	
CT, abdomen	5	
MRI, abdomen, with MRCP	5	
NUC, Nuclear medicine	4	
INV, ERCP and EUS	4	
INV, PTC	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

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

Variant 5: Confusing clinical picture; patient not described in previous scenarios.

Radiologic Exam Procedure	Appropriateness Rating	Comments
US, abdomen	8	
CT, abdomen	8	
INV, ERCP	6	
MRI, abdomen	6	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

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

Appropriateness Criteria

To determine the appropriateness of any imaging test, it is necessary to consider the general clinical category to which the patient belongs. The major categories are (1) high likelihood of mechanical obstruction; (2) low likelihood of mechanical obstruction; and (3) indeterminate. For situations in which the pre-imaging probability for obstruction is high, it is also appropriate to consider a secondary question: whether the obstruction is likely to be benign or malignant.

Situation 1A: High Likelihood of Benign Biliary Obstruction

Patients in this category present with jaundice and acute abdominal pain. There may be a prior history of gallstones documented by sonography or of prior biliary surgery. Sonography is an accurate and the least expensive method for detecting dilated intrahepatic bile ducts and the common hepatic duct at the hepatic hilum. Biliary ductal calculi are not detected with the same sensitivity as gallbladder calculi. The subhepatic common duct is not visible in a high proportion of patients due to overlaying bowel gas. In addition, intrahepatic bile ducts may not be dilated in the early phase of acute obstruction or in patients with partial obstruction.

ERCP though invasive and expensive, is the most sensitive technique for detecting biliary calculi and endoscopic sphincterotomy, and associated therapeutic interventions may be curative. Appropriate patient selection, based on established clinical criteria, significantly improves the diagnostic yield of ERCP. IF ERCP cannot be performed (for example, in patients with previous gastroenteric anastomoses) or if attempted ERCP is unsuccessful or inadequate, MRCP is the most sensitive noninvasive method to document the presence of biliary calculi.

In patients with a history of prior surgery or suspected sclerosing cholangitis, in whom biliary stricture is a diagnostic consideration, MRCP is the preferred imaging

test, avoiding the possibility of suppurative cholangitis that may be induced by endoscopic catheter manipulation into an obstructed biliary system. MRCP findings may guide directed approaches such as ERCP with brushing, percutaneous transhepatic biliary stenting or reconstructive surgery.

Situation 1B: High Likelihood of Malignant Biliary Obstruction

Patients in this category typically present with insidious development of jaundice and associated constitutional symptoms (weight loss, fatigue, etc.). Mechanical biliary obstruction can be confirmed by sonography. Malignant obstruction is most commonly due to pancreatic carcinoma but may be secondary to cholangiocarcinoma of either the proximal or distal duct or to periductal nodal compression. A contrast-enhanced multipass CT examination with multiplanar reformation has high sensitivity to lesion detection and 70% accuracy in discrimination of resectable and unresectable disease. Important information in tumor staging includes tumor contiguity or invasion of the superior mesenteric and portal vein, peripancreatic tumor extension, regional adenopathy, and hepatic metastases. Contrast-enhanced multipass CT has 70% accuracy in tumor staging.

MR and MRCP are also accurate in tumor detection and staging. There are no wide scale comparative studies of CT and MRI in the evaluation of malignant biliary obstruction. CT is generally more available and more frequently used, with MRI/MRCP reserved for patients with contraindications to CT.

ERCP is invasive and more expensive than CT or MRI, has equivalent sensitivity in tumor detection, but does not provide staging information for operability. Tissue diagnosis can be obtained by endoscopically directed brushing or guided ultrasound with fine needle aspiration (FNA). In patients with pancreaticobiliary cancer who are surgical candidates, there is no established role for preoperative biliary drainage by ERCP. However, endoscopic biliary drainage may be used for operative candidates in whom there is delay prior to surgery. Endoscopic or percutaneous transhepatic biliary drainage is appropriate for patients who are not candidates for surgery, the percutaneous transhepatic technique being preferred for patients with hilar biliary obstruction.

In patients with suspected malignant biliary obstruction and negative or equivocal CT or MRI studies, ERCP with EUS may provide an imaging and cytologic diagnosis (FNA).

Cytological tumor diagnosis in nonoperative candidates can be obtained either by EUS directed brushing or FNA, US directed or CT directed pancreatic or nodal biopsy of by fluoroscopically guided brushing or FNA (PTC).

Focal chronic pancreatitis may mimic pancreatic carcinoma on all imaging tests and only be conclusively diagnosed on operative exploration and biopsy.

Periductal nodal compression may result from metastatic disease or malignant lymphoma. Diagnosis is usually based on imaging appearances and clinical history. Tissue confirmation may be obtained by imaging directed percutaneous biopsy.

Situation 2: Low Likelihood of Mechanical Biliary Obstruction

In situations in which the pre-test probability of obstruction is low but concern about the possibility exists, either ultrasound or MRCP is the first-line test, because of patient convenience and low complication rates. MRCP findings are likely to be accepted without proceeding to ERCP or PTC. Of the two, UT is less expensive, though less definitive.

Situation 3: Indeterminate Likelihood of Obstruction

In this clinical situation, the patient's presentation is confusing, and the imaging work-up frequently is geared to the dominant clinical symptom. Ultrasound is an inexpensive, relatively accurate method, certainly appropriate if the sole question is whether or not obstruction exists. In cases in which most of the abdominal organs need to be assessed, either CT or MRI can be used, though CT more reliably displays all abdominal anatomy. When computed tomography evaluation is compromised (e.g., in patients unable to receive iodinated intravenous contrast material), the combination of MR and MRCP is a reliable alternative.

In summary, the diagnostic approach for adults presenting with jaundice depends to a large extent on (a) the pre-imaging probability that the jaundice is obstructive rather than nonobstructive; (b) the pre-test probability that the most likely cause is benign versus malignant; and (c) whether the patient is an operative candidate, once the diagnosis is made. Lastly, the availability of each possible modality and the expertise with which it is offered are important considerations in any clinical situation.

Abbreviations

- CT, computed tomography
- ERCP, endoscopic retrograde cholangiopancreatography
- EUS, endoscopic ultrasound
- INV, invasive
- MRCP, magnetic resonance cholangiopancreatography
- MRI, magnetic resonance imaging
- NUC, nuclear medicine
- PTC, percutaneous transhepatic cholangiography
- 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 jaundice

POTENTIAL HARMS

- Percutaneous transhepatic cholangiography is an invasive procedure with reported major complications in the 3%-5% range.
- The complication rate with endoscopic retrograde cholangiopancreatography is lower than or equal to percutaneous transhepatic cholangiography.
- False-positive and false-negative results of imaging studies.

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)

Foley WD, Bree RL, Gay SB, Glick SN, Heiken JP, Huprich JE, Levine MS, Ros PR, Rosen MP, Shuman WP, Greene FL, Expert Panel on Gastrointestinal Imaging. Imaging strategies in the initial evaluation of the jaundiced patient. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 6 p. [24 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: W. Dennis Foley, MD; Robert L. Bree, MD, MHSA (Panel Chair); Spencer B. Gay, MD; Seth N. Glick, MD; Jay P. Heiken, MD; James E. Huprich, MD; Marc S. Levine, MD; Pablo R. Ros, MD, MPH; Max Paul Rosen, MD, MPH; William P. Shuman, MD; Frederick L. Greene, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

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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 January 26, 2006.

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