



Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria™ for non traumatic knee pain.

BIBLIOGRAPHIC SOURCE(S)

Pavlov H, Dalinka MK, Alazraki N, Berquist TH, Daffner RH, DeSmet AA, el-Khoury GY, Goergen TG, Keats TE, Manaster BJ, Newberg A, Haralson RH, McCabe JB, Sartoris D. Nontraumatic knee pain. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun; 215(Suppl): 311-20. [39 references]

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

SCOPE

DISEASE/CONDITION(S)

Nontraumatic knee pain

GUIDELINE CATEGORY

Diagnosis

CLINICAL SPECIALTY

- Emergency Medicine
- Family Practice
- Internal Medicine
- Nuclear Medicine
- Orthopedic Surgery
- Pediatrics
- Radiology

INTENDED USERS

Health Care Providers
Health Plans
Hospitals
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of initial radiologic examinations for patients with nontraumatic knee pain.

TARGET POPULATION

Patients with nontraumatic knee pain

INTERVENTIONS AND PRACTICES CONSIDERED

1. Plain x-ray
 - Anteroposterior (standing or supine)
 - Lateral (routine or cross-table)
 - Notch or tunnel view (standing or supine)
 - Axial (merchant) view
 - Ipsolateral hip films (anteroposterior/frog leg lateral)
2. Nuclear medicine - 3 phase bone scan
3. Ultrasound
4. Computed tomography
5. Magnetic resonance imaging
6. Invasive
 - Aspiration/arthrogram
 - Computed tomography postarthrogram

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 recent peer-reviewed medical journals, primarily using the National Library of Medicine's MEDLINE database. The developer identified and collected the major applicable articles.

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

Expert Consensus (Delphi Method)
Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

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. 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 (80) percent agreement is considered a consensus. If consensus cannot be reached by this method, 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.

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 and the Chair of the ACR Board of Chancellors.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria™

Clinical Condition: Nontraumatic Knee Pain

Variant 1: Child or adolescent - nonpatellofemoral symptoms. Mandatory minimal initial exam.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Plain x-ray		
<ul style="list-style-type: none">Anteroposterior (standing or supine)	9	
<ul style="list-style-type: none">Lateral (routine or cross-table)	9	
<ul style="list-style-type: none">Notch or tunnel view (standing or supine)	1	
<ul style="list-style-type: none">Axial (Merchant) view	1	
<ul style="list-style-type: none">Ipsilateral hip films (anteroposterior/frog leg lateral)	1	

Nuclear medicine - 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 2: Child or adult: patellofemoral (anterior) symptoms. Mandatory minimal initial exam.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Plain x-ray		
• Anteroposterior (standing or supine)	9	
• Lateral (routine or cross-table)	9	
• Axial (Merchant) view	9	

• Notch or tunnel view (standing or supine)	1	
• Ipsolateral hip films – anteroposterior/frog leg lateral	1	
Nuclear medicine - 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 3: Adult: nontrauma, nontumor, nonlocalized pain. Mandatory minimal initial exam.

Radiologic Exam Procedure	Appropriateness Rating	Comments
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Plain x-ray		
• Anteroposterior (standing or supine)	9	
• Lateral (routine or cross-table)	9	
• Notch or tunnel view (standing or supine)	1	
• Axial (Merchant) view	No Consensus	
Nuclear medicine - 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u>		
1 2 3 4 5 6 7 8 9		
1=Least appropriate 9=Most appropriate		

Variant 4: Child or adolescent: nonpatellofemoral symptoms. Initial anteroposterior and lateral radiographs nondiagnostic (demonstrate normal findings or a joint effusion) next study if clinically indicated.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Magnetic resonance imaging	9	If additional study is needed.
Additional plain x-rays	1	If hip exam is normal.
Nuclear medicine - 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 5: Child or adult. Patellofemoral (anterior) symptoms. Initial anteroposterior, lateral, and axial radiographs nondiagnostic (demonstrate normal findings or a joint effusion).

Radiologic Exam Procedure	Appropriateness Rating	Comments
Magnetic resonance imaging	9	If additional imaging is necessary, and if internal derangement is suspected.
Additional plain x-rays	1	
Nuclear medicine – 3-phase bone scan	1	

Ultrasound	1	
Computed tomography	1	
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 6: Adult. Nontrauma, nontumor, nonlocalized pain. Initial anteroposterior and lateral radiographs nondiagnostic (demonstrate normal findings or a joint effusion).

Radiologic Exam Procedure	Appropriateness Rating	Comments
Magnetic resonance imaging	9	If additional studies are indicated, and if internal derangement is suspected.
Additional plain x-rays	1	
Nuclear medicine – 3-phase bone scan	1	Unless metastatic disease is a possibility.
Ultrasound	1	
Computed tomography	1	
Invasive		

• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 7: Child or adolescent. Nonpatellofemoral symptoms. Initial anteroposterior and lateral radiographs demonstrate osteochondral injuries (fracture/osteochondritis dessicans or a loose body).

Radiologic Exam Procedure	Appropriateness Rating	Comments
Additional plain x-rays	1	
Nuclear medicine – 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	Indicated only if further studies are necessary and magnetic resonance is contraindicated or cannot be performed.
Magnetic resonance imaging	No Consensus	Panel agreed that magnetic resonance is important to look for additional injury, status of articular surface, or suspected internal derangement and that treatment is dependent on additional information.
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 8: Child or adult. Patellofemoral (anterior) symptoms. Initial anteroposterior, lateral, and axial radiographs demonstrate degenerative joint disease and/or chondrocalcinosis.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Additional plain x-rays	1	
Nuclear medicine – 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	Unless treatment and/or surgery is dependent on findings.
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 9: Adult. Nontrauma, nontumor, nonlocalized pain. Initial anteroposterior and lateral radiographs demonstrate degenerative joint disease (uni- to tri- compartmental sclerosis, hypertrophic spurs, joint space narrowing, and/or subchondral cysts).

Radiologic Exam Procedure	Appropriateness Rating	Comments
Additional plain x-rays	1	Standing if evaluation of TKA. Standing views in extension and flexion.

Nuclear medicine – 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	Consider for preoperative assessment.
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u>		
1 2 3 4 5 6 7 8 9		
1=Least appropriate 9=Most appropriate		

Variant 10: Adult. Nontrauma, nontumor, nonlocalized pain. Initial anteroposterior and lateral demonstrates inflammatory arthritis (diffuse tricompartmental joint space narrowing and large joint effusion).

Radiologic Exam Procedure	Appropriateness Rating	Comments
Additional plain x-rays	1	
Nuclear medicine – 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	Unless preoperative assessment necessary.
Invasive		
• Computed tomography postarthrogram	1	
• Aspiration/arthrogram	No Consensus	Aspiration for crystals may be indicated but can be done without

		arthrogram.
<u>Appropriateness Criteria Scale</u>		
1 2 3 4 5 6 7 8 9		
1=Least appropriate 9=Most appropriate		

Variant 11: Adult - nontrauma, nontumor, nonlocalized pain. Initial anteroposterior and lateral radiographs demonstrate avascular necrosis.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Additional plain x-rays	1	
Nuclear medicine – 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Magnetic resonance imaging	1	
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u>		
1 2 3 4 5 6 7 8 9		
1=Least appropriate 9=Most appropriate		

Variant 12: Adult - nontrauma, nontumor, nonlocalized pain. Initial anteroposterior and lateral radiographs demonstrate evidence of internal derangement (e.g., Peligrini Stieda disease, joint compartment widening).

Radiologic Exam Procedure	Appropriateness Rating	Comments
Magnetic resonance imaging	9	
Additional plain x-rays	1	
Nuclear medicine - 3-phase bone scan	1	
Ultrasound	1	
Computed tomography	1	
Invasive		
• Aspiration/arthrogram	1	
• Computed tomography postarthrogram	1	
<u>Appropriateness Criteria Scale</u> 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

In summary, the mandatory initial examination for nontraumatic knee pain is an anteroposterior and lateral radiograph. In patients with localized anterior patellofemoral knee pain, an axial view should be included in the initial radiographic study. A magnetic resonance examination for nontraumatic knee pain is indicated when the pain is persistent and routine radiographs are nondiagnostic or for which additional information is necessary before instituting treatment or surgical intervention. A magnetic resonance is not indicated before a physical examination or before routine plain films or when there is diagnostic plain film evidence of severe degenerative joint diseases, inflammatory arthritis, stress fracture, osteonecrosis, or reflex sympathetic dystrophy, for which additional imaging is not going to alter the treatment plan. A nuclear medicine bone scan may be indicated if there is a clinical need to confirm or exclude other sites of involvement (e.g., suspicion of metastatic disease).

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

Appropriate selection of radiologic exam procedures to evaluate patients with nontraumatic knee pain.

POTENTIAL HARMS

None identified

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.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Pavlov H, Dalinka MK, Alazraki N, Berquist TH, Daffner RH, DeSmet AA, el-Khoury GY, Goergen TG, Keats TE, Manaster BJ, Newberg A, Haralson RH, McCabe JB, Sartoris D. Nontraumatic knee pain. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):311-20. [39 references]

ADAPTATION

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

DATE RELEASED

1995 (revised 1999)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

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

GUIDELINE COMMITTEE

ACR Appropriateness Criteria™ Committee, Expert Panel on Musculoskeletal Imaging.

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Names of Panel Members: Helene Pavlov, MD; Murray K. Dalinka, MD; Naomi Alazraki, MD; Thomas H. Berquist, MD; Richard H. Daffner, MD; Arthur A. DeSmet, MD; George Y. El-Khoury, MD; Thomas G. Goergen, MD; Theodore E. Keats, MD; B.J. Manaster, MD, PhD; Arthur Newberg, MD; Robert H. Haralson, III, MD; John B. McCabe, MD; David Sartoris, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline. It is a revision of a previously issued version (Appropriateness criteria for nontraumatic knee pain. Reston [VA]: American College of Radiology (ACR); 1995. 10 p. [ACR Appropriateness Criteria™]).

The ACR Appropriateness Criteria™ are reviewed after five years, if not sooner, depending upon introduction of new and highly significant scientific evidence. The next review date for this topic is 2004.

GUIDELINE AVAILABILITY

Electronic copies: Available from the [American College of Radiology \(ACR\) Web site](#).

Print copies: Available from ACR, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on May 6, 2001. The information was verified by the guideline developer as of June 29, 2001.

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