Complete Summary

GUIDELINE TITLE

Chronic elbow pain.

BIBLIOGRAPHIC SOURCE(S)

Steinbach LS, Dalinka MK, Daffner RH, DeSmet AA, El-Khoury GY, Kneeland JB, Manaster BJ, Morrison WB, Pavlov H, Rubin DA, Schneider R, Weissman BN, Haralson RH III, Expert Panel on Musculoskeletal Imaging. Chronic elbow pain. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 5 p. [37 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 Musculoskeletal Imaging. Chronic elbow pain. Reston (VA): American College of Radiology (ACR); 2001. 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

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SCOPE

DISEASE/CONDITION(S)

Chronic elbow pain

GUIDELINE CATEGORY

Diagnosis

CLINICAL SPECIALTY

Family Practice
Internal Medicine
Nuclear Medicine
Orthopedic Surgery
Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of initial radiologic examinations for chronic elbow pain

TARGET POPULATION

Patients with chronic elbow pain

INTERVENTIONS AND PRACTICES CONSIDERED

1. Magnetic resonance (MR) arthrogram
2. Magnetic resonance imaging (MRI), routine
3. Computed tomography (CT)
4. Tomography
5. Ultrasound (US)
6. Nuclear medicine (NUC), bone scan
7. X-ray, stress

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, primarily 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 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: Chronic Elbow Pain

Variant 1: Suspect intra-articular osteocartilaginous body; radiographs nondiagnostic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
MR arthrogram, elbow	9	Either method is appropriate. Depends on availability, expertise, and local conditions. If effusion is present, without contrast is preferred.
MRI, elbow, routine	9	Either method is appropriate. Depends on availability, expertise, and local conditions. If effusion is present, without contrast is preferred.
CT, elbow	8	If double contrast is used, dose of less than 0.5 cc of contrast should be used.

Radiologic Exam Procedure	Appropriateness Rating	Comments
Tomography, elbow	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: Suspect occult injury; e.g., osteochondral injury; radiographs nondiagnostic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
MRI, elbow, routine	9	
MR arthrogram, elbow	2	
CT, elbow	2	
Tomography, elbow	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 3: Suspect unstable osteochondral injury; radiographs nondiagnostic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
MR arthrogram	9	Either MR arthrogram or MR routine is appropriate. Depends on availability, expertise, and local conditions.
MRI, elbow, routine	9	Either MR arthrogram or MR routine is appropriate. Depends on availability, expertise, and local conditions.
CT, elbow	2	
Tomography, elbow	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 tables are listed at the end of the "Major Recommendations" field.

Variant 4: Suspect nerve entrapment or mass; radiographs nondiagnostic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
MRI, elbow, routine	9	
US, elbow	5	An alternative to MRI if expertise is available.
No imaging indicated	2	
CT, elbow	2	
NUC, bone scan	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: Suspect chronic epicondylitis; radiographs nondiagnostic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
MRI, elbow, routine	9	
US, elbow	5	An alternative to MRI if expertise is available
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 6: Suspect collateral ligament tear; radiographs nondiagnostic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
MR arthrogram, elbow	9	Either MR arthrogram or MR routine is appropriate. Depends on availability, expertise, and local conditions.
MRI, elbow, routine	9	Either MR arthrogram or MR routine is appropriate. Depends on availability, expertise, and local conditions.
US, elbow	5	An alternative to MRI if expertise is available.
CT, elbow	2	
X-ray, elbow, stress	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 7: Suspect biceps tendon tear and/or bursitis; radiographs nondiagnostic.

Radiologic Exam Procedure	Appropriateness Rating	Comments
MRI, elbow, routine	9	
US, elbow	5	An alternative to MRI if expertise is available.
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.

Osteochondral Lesion or Intra-articular Osteocartilaginous Body

Radiographs are required before other imaging studies and may be diagnostic for osteochondral fracture, osteochondritis dissecans, and osteocartilaginous intra-articular body (IAB). Tomography, single-contrast (iodinated contrast or air) and double-contrast (iodinated contrast and air) arthrography with or without computed tomography (CT), and CT alone have been used for detecting an osteochondral lesion or IAB. All of these studies have limitations; a small IAB may be obscured by contrast or confused with air bubbles (double-contrast

arthrography). A CT air arthrogram can avoid confusion of air bubbles with IABs. More recently, magnetic resonance imaging (MRI) has been advocated as the initial study for suspected osteochondral fracture or IAB. Regardless of method, detection of an IAB is limited by its size and location within the elbow joint. Detection of IAB is enhanced by the presence of joint effusion. Direct intra-articular magnetic resonance arthrography (MRA) is preferred to routine MRI for diagnosis of IAB and may also play a role in improving diagnosis of stability of the osteochondral lesion.

Tendon, Ligament, Muscle, Nerve, or Other Soft-Tissue Abnormality

Radiographs can be useful to identify heterotopic calcification (ossification) of the ulnar collateral ligament. This finding may be associated with partial or complete tears of that structure. Avulsion of the ulnar collateral ligament at the insertion site on the ulna is a source of chronic medial elbow pain in the throwing athlete. This finding is best evaluated with a combination of radiographs and coronal MRI. MRI may provide important diagnostic information for evaluating the adult elbow in many different conditions, including collateral ligament injury, epicondylitis, injury to the biceps and triceps tendons, and abnormality of the ulnar, radial, or median nerve, and for evaluating masses about the elbow joint. There is a lack of studies showing the sensitivity and specificity of MRI in many of these cases; most of the studies demonstrate MRI findings in patients either known or highly likely to have a specific condition. Ultrasound (US) has been shown to be helpful for diagnosing complete and partial tears of the distal biceps tendon, flexor and extensor tendons, and ligaments, providing an alternative to MR imaging.

With use of appropriate pulse sequences, MRI is an effective tool in the preoperative diagnosis of posterolateral rotatory instability. This includes assessment of the ulnar band of the lateral collateral ligament. Magnetic resonance arthrography has been advocated to distinguish complete tears from partial tears of the medial collateral ligament. Epicondylitis--lateral ("tennis elbow") or medial (in pitchers, golfers, and tennis players)--is a common clinical diagnosis, and MRI is usually not necessary. MRI may be useful for confirming the diagnosis in refractory cases and to exclude associated tendon and ligament tear.

Bicipitoradial and interosseous bursitis around the distal biceps tendon is a source of elbow pain that can be assessed with MRI or ultrasound. MRI also demonstrates the effects of the bursa on adjacent structures including the posterior interosseous and median nerves.

The ulnar nerve is particularly vulnerable to trauma from a direct blow in the region of its superficial location in the restricted space of the cubital tunnel. Anatomic variations of the cubital tunnel retinaculum may contribute to ulnar neuropathy. Axial T1-weighted images have been shown to depict the size and shape of the nerve, and axial T2-weighted or STIR images may show increased signal in the presence of neuritis. A snapping of the medial head of the triceps can cause recurrent dislocation of the ulnar nerve. This diagnosis can be confirmed with MRI or CT using axial images with the elbow in flexion and extension. Ultrasound can also be used for confirmation of snapping triceps and for evaluating the ulnar nerve. Radial nerve and median nerve entrapment syndromes may also be evaluated with MR imaging.

Abbreviations

- CT, computed tomography
- MR, magnetic resonance
- 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 chronic elbow pain

POTENTIAL HARMS

Not stated

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)

Steinbach LS, Dalinka MK, Daffner RH, DeSmet AA, El-Khoury GY, Kneeland JB, Manaster BJ, Morrison WB, Pavlov H, Rubin DA, Schneider R, Weissman BN, Haralson RH III, Expert Panel on Musculoskeletal Imaging. Chronic elbow pain. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 5 p. [37 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 resource for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Musculoskeletal Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Lynne S. Steinbach, MD (*Principal Author*); Murray K. Dalinka, MD (*Panel Chair*); Richard H. Daffner, MD; Arthur A. De Smet, MD; George Y. El-Khoury, MD; John B. Kneeland, MD; B.J. Manaster, MD, PhD; William B. Morrison, MD; Helene Pavlov, MD; David A. Rubin, MD; Robert Schneider, MD; Barbara N. Weissman, MD; Robert H. Haralson III, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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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 May 6, 2001. The information was verified by the guideline developer as of June 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 NGC summary was updated by ECRI on January 4, 2006. The updated information was verified by the guideline developer on January 19, 2006.

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