Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria™ for chronic chest pain, without evidence of myocardial ischemia/infarction.

BIBLIOGRAPHIC SOURCE(S)

Henkin RE, Levin DC, Bettmann MA, Gomes AS, Grollman J, Hessel SJ, Higgins CB, Kelley MJ, Needleman L, Polak JF, Stanford W, Wexler L, Abbott W, Port S. Chronic chest pain without evidence of myocardial ischemia/infarction. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):85-8. [13 references]

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SCOPE

DISEASE/CONDITION(S)

Chronic chest pain without evidence of myocardial ischemia/infarction

GUIDELINE CATEGORY

Diagnosis

CLINICAL SPECIALTY

Cardiology
Emergency Medicine
Family Practice
Geriatrics
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 chronic chest pain without evidence of myocardial ischemia/infarction

TARGET POPULATION

Patients with chronic chest pain without evidence of myocardial ischemia/infarction

INTERVENTIONS AND PRACTICES CONSIDERED

1. Chest x-ray
2. Stress echocardiography
3. Stress myocardial perfusion scan
4. Barium swallow and upper gastrointestinal series
5. Transthoracic echocardiography
6. Gall bladder ultrasound
7. Computed tomography
8. Coronary angiography with LV gram
9. Transesophageal echocardiography
10. Electron beam computed tomography
11. Magnetic resonance imaging
12. Aortic magnetic resonance angiography
13. Ventilation/perfusion scan
14. Radionuclide bone scan
15. Pulmonary angiography
16. Thoracic aortagram
17. Cardiac positron emission tomography

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: Chronic Chest Pain Without Evidence of Myocardial Ischemia/Infarction

Radiologic Exam Procedure	Appropriateness Rating	Comments
Chest X-ray	9	
Stress Echocardiography	8	
Stress Myocardial Perfusion Scan	8	
Barium Swallow and Upper Gastrointestinal Series	6	
Transthoracic Echocardiography	6	

Gall Bladder Ultrasound	6	
Computed Tomography	6	
Coronary Angiography with LV gram	6	
Transesophageal Echocardiography	4	
Electron Beam Computed Tomography	4	
Magnetic Resonance Imaging	4	
Aortic Magnetic Resonance Angiography	4	
Ventilation/Perfusion Scan	4	
Radionuclide Bone Scan	4	
Pulmonary Angiography	4	
Thoracic Aortagram	4	
Cardiac Positron Emission Tomography	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Approach to the Patient with Chronic Chest Pain

In general, this category of patients is defined as having pain that does not change in character over a period of time; it may wax and wane, but the intensity and duration generally show little change. For this reason, acute myocardial infarction studies with radionuclides are not commonly performed when the patient presents with this history.

However, findings of chronic chest pain may represent underlying coronary artery disease. A great many patients present with what has been characterized as "atypical chest pain." For this reason evaluation of patients for coronary artery

disease is commonly undertaken. The major test used is myocardial perfusion imaging, employing either thallium201 or one of the technetium99m agents (classified collectively as Myocardial Perfusion Studies – MPI).

Although there has been some controversy, it is becoming clear that thallium and the technetium agents have the same relative overall accuracy, although their applications are somewhat different. At this point, evaluation with Myocardial Perfusion Studies is suitable for the patient with chronic chest pain. The intervention performed with a Myocardial Perfusion Studies scan is either mechanical stress or pharmacological intervention. If the patient is in an emergency department setting, then a simple resting myocardial perfusion image with a technetium agent should suffice.

The study by Kerns et al on patients with atypical chest pain (this is slightly different than chronic chest pain) in an emergency department setting indicated that technetium myocardial perfusion imaging was highly accurate and in no patient with a normal test was there evidence of coronary artery disease, myocardial infarction, or sudden death during the follow-up.

The situation of the office visit of a patient with chronic chest pain is somewhat more complex. Whether or not a patient progresses to a diagnostic imaging study in part is governed by the appearance of the electrocardiogram and biochemical markers. Those patients with an intermediate probability of disease, based on clinical and laboratory findings, will often be referred for myocardial perfusion imaging.

If the patients are ambulatory and not felt to be at high risk, treadmill myocardial perfusion imaging is performed. However, a significant number of these patients are unable to successfully complete treadmill testing and they are studied with either adenosine or Persantine. The adenosine and Persantine studies have an accuracy similar to that of treadmill testing and offer the advantage of not requiring patient cooperation. Patients with extensive chronic lung disease or asthma are at high risk if Persantine or adenosine is used.

Cardiac catheterization may be employed if the myocardial perfusion image was consistent with coronary artery disease. The role of echocardiography in this particular setting is not well discussed. However, overall, echocardiography is competitive with myocardial perfusion imaging. While it is as accurate as Myocardial Perfusion Studies for detection of disease, it does not offer the prognostic value that myocardial perfusion imaging yields. When echocardiography is performed, either stress or dobutamine is commonly used. In some institutions adenosine is used as well. There is no consensus on the approach to this particular population in regard to the type of imaging study that should be performed.

In attempting to stratify the diagnostic tests, a chest x-ray would almost certainly be indicated to exclude bony pathology or chest masses. Depending on the history or physical examination and electrocardiographic findings, a myocardial perfusion study could well be justified. In any situation where a Myocardial Perfusion Studies study could be undertaken, a stress or dobutamine echocardiogram may be substituted. Evaluation of other diagnostic modalities would probably not be

routinely indicated unless there was additional information developed by the testing described above.

Anticipated Exceptions

The description term "chest pain" is so amorphous and subjective that exceptions to the above plan may be justified in individual cases; so much is dependent upon the judgment of the physician at the time the patient is seen and the particular presentation of the patient.

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 examination procedures for evaluation of chronic chest pain without evidence of myocardial ischemia/infarction.

Subgroups Most Likely to Benefit:

Patients with coronary artery disease.

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

Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

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

DATE RELEASED

1998

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 Cardiovascular Imaging.

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Names of Panel Members: Robert E. Henkin, MD; David C. Levin, MD; Michael A. Bettmann, MD; Antoinette S. Gomes, MD; Julius Grollman, MD; Samuel J. Hessel, MD; Charles B. Higgins, MD; Michael J. Kelley, MD; Laurence Needleman, MD; Joseph F. Polak, MD, MPH; William Stanford, MD; Lewis Wexler, MD; William Abbott, MD; Steven Port, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

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 2003.

GUIDELINE AVAILABILITY

Electronic copies: Available (in PDF format) 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 February 20, 2001. The information was verified by the guideline developer on March 14, 2001.

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