Complete Summary

GUIDELINE TITLE

Task force on the management of chest pain.

BIBLIOGRAPHIC SOURCE(S)

Erhardt L, Herlitz J, Bossaert L, Halinen M, Keltai M, Koster R, Marcassa C, Quinn T, van Weert H. Task force on the management of chest pain. Eur Heart J 2002 Aug;23(15):1153-76. [181 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE
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SCOPE

DISEASE/CONDITION(S)

Chest pain

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Treatment

CLINICAL SPECIALTY

Cardiology
Emergency Medicine

Family Practice
Internal Medicine

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

- To make recommendations on the management of patients with chest pain
- To analyse and advise the patient with chest pain
- To reduce time delay in the management of patients with chest pain
- To identify life-threatening conditions in patients with chest pain
- To maximize diagnostic and therapeutic alternatives and thereby improve outcome in patients with chest pain

TARGET POPULATION

Patients with chest pain

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

1. Physical examination (e.g., consciousness, respiration, blood pressure, heart rate, body temperature and temperature of extremities, sweating, etc.)
2. Electrocardiogram (ECG)
3. Blood gas determination from arterial blood
4. Clinical chemistry/biochemical markers in serum (e.g., haemoglobin [Hb], red blood cells [RBC], white blood cells [WBC], platelets, C reactive protein [CRP], creatine kinase [CK], creatine kinase isoenzyme MB [CK-MB], troponin T [TnT] and troponin I [TnI], myoglobin)
5. Chest radiography
6. Radionuclide imaging (thallium-201, technetium-99m labeled tracers)
7. Single photon emission computed tomography (SPECT)
8. 2-dimensional (2-D) transthoracic echocardiogram
9. Transesophageal echocardiogram
10. Computed tomography (CT)
11. Magnetic resonance (MR) scan
12. Pulmonary scintigraphy
13. Spiral computed tomography (CT)
14. Exercise test

Treatment

1. Fast-acting aspirin (250-500 mg)
2. Short-acting or intravenous nitrates
3. Morphine
4. Beta-blocker
5. Fibrinolytics
6. Diuretics

7. Antithrombin treatment (e.g., heparin)
8. Platelet glycoprotein (GP) IIb/IIIa inhibitors
9. Coronary angiography
10. Percutaneous coronary intervention (PCI)

MAJOR OUTCOMES CONSIDERED

- Patient symptoms and signs
- Sensitivity and specificity, positive and negative predictive value of diagnostic tests
- Aetiology to chest pain in various clinical settings
- Final diagnoses of patients with chest pain
- Typical features in various types of chest pain
- Delay time between onset of symptoms and start of treatment in acute chest pain
- Appropriateness of the level and type of response to chest pain
- Risk of death or complications due to myocardial infarction

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The literature search included the following: a Pub Med search for chest pain units, and a formal process of review and evaluation of scientific literature related to diagnostic imaging techniques, undertaken based on Medline literature searches. All relevant English language literature on each technology was reviewed, summarized, and analyzed.

For chest pain and the general practitioner, the authors searched Medline and Embase using Mesh-headings (combined): chest pain and family practice. For chest pain and patient delay, the authors made a systematic search of Medline, Embase, Bids etc. For chest pain and epidemiology, clinical findings and ambulance transport, PubMed was used; for clinical queries research methodology filters were used. For chest pain and the dispatch centre, the authors made a complete search in Medline, based on triggers such as 'dispatching,' 'triage' emergency medical system, etc., in various combinations.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Strength of Evidence

A. Data derived from at least two randomized clinical trials or meta-analyses
B. Data derived from a single randomized trial and/or meta-analysis from non-randomized studies
C. Consensus opinion of the experts based on trials and clinical experience

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

A review of the literature and position papers was prepared by the members according to their area of expertise, and evidence-grading applied wherever possible.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Usefulness or Efficacy of a Recommended Treatment

Class I = Evidence and/or general agreement that a given treatment is beneficial, useful and effective

Class II = Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the treatment

IIa: weight of evidence/opinion is in favour of usefulness/efficacy

IIb: usefulness/efficacy is less well established by evidence/opinion

Class III* = Evidence or general agreement that the treatment is not useful/effective and in some cases may be harmful.

* Use of Class III is discouraged by the ESC

COST ANALYSIS

- Initial sestamibi single-photon emission computed tomography (SPECT) perfusion imaging may potentially reduce the cost of managing patients with chest pain in the emergency department. One group of analysts projected a 10%-17% cost saving with a strategy based on the results of early sestamibi imaging to decide whether to admit or discharge patients.
- In a small, randomized trial, an aggressive diagnostic strategy with resting emergency department perfusion tomography and early exercise test has been shown to decrease the length of stay and in-hospital costs.
- Chest pain units have been shown to be a safe, effective and cost-saving means of ensuring appropriate care to patients with unstable angina and at intermediate risk of cardiovascular events.
- 2D-echocardiography may prove or rule out existing wall motion abnormalities in patients with chest pain. In such patients, and a non-diagnostic electrocardiogram on admission restricted to those with regional wall motion abnormalities, 2D-echocardiography may result in a reduction in hospital costs. Of note, the echocardiogram is not required to be done close to the episode of chest pain, since regional wall motion abnormalities may persist late after symptom resolution as a consequence of myocardial stunning. The sensitivity of 2D for detecting an acute myocardial infarction was high (93%) but the specificity was limited, due to the inclusion of patients with previous myocardial infarction. Presence of regional wall motion abnormalities as a selection criterion for hospital admission in selected patients presenting to the emergency department with ST-segment elevation, could reduce hospitalizations and costs by about a third.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The document was circulated to the members of the European Society of Cardiology (ESC) Committee for Practice Guidelines (W. Klein [Chairman], V. Dean, D. Jumeau, M.A. Alonso, C. Blomström-Lundqvist, G. De Backer, M. Flather J. Hradec, K. H. McGregor, A. Oto, A Parkhomenko, S. Silber, A. Torbicki, G. Mazzotta, J. Deckers, H. Dargie, H-J. Trappe), to the members of the ESC Board, and to ten reviewers who are named in the original guideline document. After further revision it was submitted for approval to the ESC Committee for Practice Guidelines.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The class of recommendations (I-IIb) and level of evidence (A-C) are defined at the end of the "Major Recommendations" field.

<u>Recommendations for Diagnostic Tests in Acute Chest Pain</u>

A 12-lead electrocardiogram (ECG) is a readily available and inexpensive tool and should be considered a standard of care and always be recorded in patients suffering from acute chest pain if the cause of the pain is not sufficiently clear from the patients' history and physical examination (Class I, level C). Biochemical markers, particularly troponins in combination with creatine kinase MB isoenzyme (CK-MB), are recommended as standard tests in the evaluation of chest pain (Class IIa, level B).

In conditions where the clinical history, ECG, and biochemical measurements for myocardial damage are equivocal or unavailable, imaging techniques may be particularly helpful in identifying low-risk patients, who can be eligible for early discharge or undergo early stress testing and avoid hospital admission, potentially reducing the utilization of hospital resources (Class IIb, level B). Their use, however, depends on institutional accessibility, cost, and individual expertise.

The diagnostic level of evidence for various imaging techniques are as follows:

- Thallium scan: Grade C
- Tc-99m labeled tracers: Grade B
- Echocardiography: Grade B

Recommendations for Clinical Decision Making

It is evident that various decision making algorithms based on computerizing relevant information can improve the diagnostic accuracy in acute chest pain (Class IIb, level B). Their predictive value will differ in different circumstances. Before introducing such algorithms in clinical practice one should try to optimize the physicians' skilfulness with regard to the handling of patients with acute chest pain. Today there is no universally applicable and recommended algorithm that can be used for patients with chest symptoms. Clinical judgement is still the most important factor for proper management of patients.

The Five Doors and the Fast Track

Recommendations for the Patient

Patient delay still forms the major part of the delay time between onset of symptoms and start of treatment in acute chest pain. Various factors, including severity of symptoms, age, sex, social and educational factors influence the patient's decision to seek help. Educational campaigns have been only moderately successful in shortening this delay (Class IIb, level B). Maybe the message has not been clear enough since many patients with acute myocardial infarction have a gradual onset of pain rather than an abrupt onset, as was highlighted in previous campaigns.

Call for Action / Fast Track

Messages to the public

Early diagnosis and treatment is life-saving

- Chest symptoms may indicate a serious and life-threatening condition.
- Symptoms are highly individual and may appear as chest pain, oppression, dyspnoea, heavy chest or slight discomfort.
- Symptoms may radiate to the arm, the jaw, the neck or back.
- The onset of symptoms may be acute, gradual or intermittent.
- Other signs/symptoms accompanying chest discomfort are important to recognize as indicators of possible underlying severity of the symptoms.
- Indicators of a less severe condition are: pain (discomfort), which varies with respiration, body position, food intake, and/or is well localized on the chest wall and/or is accompanied by local tenderness.

A serious condition may be present if the symptoms:

- Interrupt normal activity
- Are accompanied by: cold sweat, nausea, vomiting, fainting, anxiety/fear

Action

- Make immediate contact with professional medical advice
- Do not wait for the symptoms to disappear since these are poor indicators of risk
- Take a fast acting aspirin tablet (250-500 mg)

Recommendations for the General Practitioner

Chest pain is a common symptom in general practice and the range of possible diagnoses is wide. Musculoskeletal pain is the most prevalent diagnosis and cardiac problems only account for 10-34% of all episodes. Most of the time a general practitioner can make a diagnosis based on the medical history and simple investigations only. When confronted with pain of acute onset and signs pointing to a serious problem the patient has to be referred, sometimes already on information provided by telephone (Class I, level C). The patient´s condition can be optimized by treatment with aspirin, relieving pain, reducing anxiety and by stabilizing any haemodynamic and/or electric disturbance before transportation (Class 1, level C).

In the situation where a patient cannot reach the hospital within 30 minutes, local agreements and protocols on pre-hospital thrombolysis are necessary (Class II, level B).

In order to implement primary angioplasty, a close collaboration between general practitioners and local hospitals based on protocols is warranted.

Call for Action / Fast Track

- The degree of symptoms is a poor indicator of the patient´s risk of having a serious condition.
- The type of chest discomfort (pain), pattern of radiation and concomitant symptoms, such as nausea, sweating and cold, pale skin are valuable signs of a possible serious condition.

- A patient who is haemodynamically unstable (shock, low blood pressure) or who displays an arrhythmia (severe bradycardia/tachycardia) needs immediate attention regardless of the underlying cause.

If a serious, life-threatening condition is suspected:

- Do not lose time in reaching a diagnosis unless there are therapeutic options such as fibrinolysis and a defibrillator available
- Optimize the patient's condition by relieving pain, reducing anxiety and stabilizing any haemodynamic and/or electrical disturbance
- If a heart attack is suspected treatment should be initiated with:
    - Aspirin
    - Short-acting nitrate
    - Morphine
    - Beta-blocker (bearing in mind heart rate, systolic blood pressure and high degree atrioventricular [AV] block)
    - And in selected cases based on ECG findings fibrinolytics
- Other treatment may be given on special indications
    - Intravenous nitrates
    - Diuretics

<u>Recommendations for the Dispatch Centre</u>

Organization of dispatch centres differ widely as does the background and training level of dispatchers. The higher the training level, the higher the level of interrogation of the caller to define the medical problem. The lower the training level, the more the dispatcher must adhere to standard protocols.

The process of handling a call is divided into phases:

Phase 1: Identification of the problem at the symptom level, not a diagnosis.

Phase 2: Determine the priority and level of the dispatch.

Phase 3: Activity. Dispatching, giving the caller instructions, including telephone cardiopulmonary resuscitation when indicated.

Dispatchers should be formally trained and certified. Continuing education and evaluation of their performance should be standard (Class I, level C).

Call for Action/ Fast Track

- Assess symptoms and signs to give priority to, not to make a diagnosis
- Send an ambulance when the following conditions are present:
    - Severe discomfort (either pain, heavy feeling, difficulty breathing, etc.) lasting more than 15 min and still present while the call is made.
- Location anywhere in the chest, possibly including neck, arms, back, high abdomen.
- Symptoms associated with sweating, nausea, vomiting.
- Factors favouring fast track decision:

- Age over 30 years, either gender
- Discomfort similar to previous known angina pectoris or previous heart attack
- Discomfort includes right arm
- Intermittent loss of consciousness

Recommendations for the Ambulance

The main goals in assessing and treating patients with acute chest pain by the ambulance crew are to: correct vital function, stabilize the condition, start the diagnostic work-up, begin treatment in order to relieve symptoms and to prevent development of complications and permanent organ damage (Class I, level B). The use of ECG prior to hospital admission has been shown to reduce the in-hospital delay time and can furthermore be used to start various treatments prior to hospital admission with the intention to limit or sometimes even abort myocardial infarction (Class I, level B).

Call for Action / Fast Track

- In most ambulance organizations the majority of patients seen by the ambulance staff need urgent attention
- The action taken may depend on whether the patient has been seen by a doctor, called a dispatch centre or is seen directly by the ambulance crew
- The first priority is to check vital signs and stabilize the condition
- If possible, record and interpret an ECG within 5 minutes
- Treatment is given according to symptoms and signs, e.g. aspirin, pain relief (morphine), nitrates (myocardial ischaemia, congestive heart failure) and beta blockers (myocardial ischaemia or tachyarrhythmia)
- A proper diagnosis based on ECG is mandatory if thrombolytic therapy treatment is planned
- An intravenous line should be established whenever possible
- Monitoring cardiac activity facilitates rapid defibrillation of ventricular tachycardia/ventricular fibrillation
- If facilities are available, the ambulance crew may decide whether to transport the patient directly to intensive care (based on clinical presentation and ECG pattern)

Recommendations for the Hospital

Immediate assessment of patients with chest pain is mandatory on arrival at the emergency department (Class I, level C). ECG should be recorded and assessed within 5 minutes (Class I, level C). Pain relief, correction and stabilization of haemodynamic changes should be done without delay (Class I, level C). If ST-segment change indicates evolving Q wave infarction, thrombolytic treatment should be started within 30 minutes (Class I, level B). If acute coronary syndrome is suspected aspirin should be given as soon as possible and low-molecular-weight heparin can be started in the emergency department (Class IIb, level C). Blood samples should be drawn for assays of CK-MB mass and troponin T or I on admission, and at 10-12 hours after the beginning of the index chest pain or symptom for diagnosis of possible myocardial infarction, and for assessment of risk of the patient (Class I, level B). If the symptoms are not related to myocardial ischaemia the patient should be examined for other cardiovascular causes and for

acute illnesses in need for urgent intervention. A great proportion of patients have a benign cause of chest pain and further diagnostic work-up can be done in a chest pain unit or as outpatients.

Definitions:

Strength of Evidence

A. Data derived from at least two randomized clinical trials or meta-analyses
B. Data derived from a single randomized trial and/or meta-analysis from non-randomized studies
C. Consensus opinion of the experts based on trials and clinical experience

Usefulness or Efficacy of a Recommended Treatment

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CLINICAL ALGORITHM(S)

Algorithms are provided for the diagnosis of acute chest pain and the evaluation and treatment of patients with chest pain in the emergency department.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Evidence grading has been applied (and indicated) wherever possible, but the majority of the developer's statements are not based on firm evidence, but clinical experience gathered from the available literature, combined with expert opinion.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Chest symptoms are common and are most often caused by a benign condition. In situations when the condition is life-threatening, treatment is more successful if started immediately after onset of symptoms. Early

diagnosis is pivotal and early treatment may be life-saving. Patients with a potentially dangerous condition should be offered a "fast track" in diagnosis and treatment.

- The delay from symptom onset to initiation of reperfusion therapy is an important determinant of the likely benefit of treatment: the longer the delay, the less benefit derived from reperfusion. Moreover, seeking professional help in the early stages of symptoms may result in an increase in the proportion of patients developing ventricular fibrillation in the presence of emergency medical service personnel, improving the chances of successful resuscitation.

Subgroups Most Likely to Benefit:

Individuals with life-threatening conditions, such as myocardial infarction, unstable angina, aortic aneurysm, pulmonary embolism, or pneumothorax.

POTENTIAL HARMS

Not stated

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Quality assessment indicators in the management of chest pain are included in the guideline.

Structure

- Presence of clinical practice guidelines
- Monitoring care and outcomes by a programme specific for patients with chest pain
- Equipment and availability of drugs

Process

Indicators measuring all steps from onset of pain to final diagnosis and treatment.

- Public awareness and knowledge as expressed by e.g. interviews and polls of when and how to act when chest symptoms occur
- The accessibility of general practitioners to handle a patient with chest symptoms
    - 24-hour service
    - Waiting times both at office visits and home calls
    - Home or office visits
- Performance of the dispatch centre
    - Proportion of correct diagnoses (case by case)
    - Time from call to a preliminary diagnosis
    - Time from call to order ambulance
- Performance of the ambulance service
    - Availability of ambulances when called
    - Waiting time to send ambulance

- The organization of emergency department to handle patients with chest discomfort
    - Electrocardiogram (ECG) availability (< 5 minutes)
    - Door to needle time for thrombolytic therapy
    - Immediate access to coronary care unit care

IMPLEMENTATION TOOLS

Clinical Algorithm

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
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Erhardt L, Herlitz J, Bossaert L, Halinen M, Keltai M, Koster R, Marcassa C, Quinn T, van Weert H. Task force on the management of chest pain. Eur Heart J 2002 Aug;23(15):1153-76. [181 references] PubMed

ADAPTATION

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

DATE RELEASED

2002 Aug

GUIDELINE DEVELOPER(S)

European Society of Cardiology - Medical Specialty Society

SOURCE(S) OF FUNDING

European Society of Cardiology (ESC). The Task Force on the Management of Chest Pain Report was supported financially in its entirety by The European Society of Cardiology and was developed without any involvement of the pharmaceutical industry.

GUIDELINE COMMITTEE

Task Force on the Management of Chest Pain

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Task Force members: L. Erhardt (Chairman); J. Herlitz (Secretary); L. Bossaert; M. Halinen; M. Keltai; R. Koster; C. Marcassa; T. Quinn; H. van Weert

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

ENDORSER(S)

Belgian Society of Cardiology - Medical Specialty Society
British Cardiac Society - Medical Specialty Society
Bulgarian Society of Cardiology - Medical Specialty Society
Czech Society of Cardiology - Medical Specialty Society
Estonian Cardiac Society - Medical Specialty Society
Finnish Cardiac Society - Medical Specialty Society
French Society of Cardiology - Medical Specialty Society
German Society of Cardiology - Medical Specialty Society
Hellenic Cardiological Society - Medical Specialty Society
Irish Cardiac Society - Medical Specialty Society
Italian Federation of Cardiology - Medical Specialty Society
Latvian Society of Cardiology - Medical Specialty Society
Lebanese Society of Cardiology - Medical Specialty Society
Lithuanian Society of Cardiology - Medical Specialty Society
Macedonian Society of Cardiology - Medical Specialty Society
Polish Cardiac Society - Medical Specialty Society
Portuguese Society of Cardiology - Medical Specialty Society
San Marino Society of Cardiology - Medical Specialty Society
Slovenian Society of Cardiology - Medical Specialty Society
Spanish Society of Cardiology - Medical Specialty Society
Ukrainian Society of Cardiology - Medical Specialty Society

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the European Society of Cardiology (ESC) Web site.

Print copies: Available from Elsevier Science Ltd. European Heart Journal, ESC Guidelines - Reprints, 32 Jamestown Road, London, NW1 7BY, United Kingdom. Tel: +44.207.424.4422; Fax: +44 207 424 4515; Web site: www.eurheartj.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Recommendations for Task Force creation and report production. Sophia Antipolis (France): European Society of Cardiology, 2002.

Electronic copies: Available in Portable Document Format (PDF) from the European Society of Cardiology (ESC) Web site.

PATIENT RESOURCES

None available

NGC STATUS

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