Complete Summary

GUIDELINE TITLE

Preventive health care, 1999 update: 2. Echocardiography for the detection of a cardiac source of embolus in patients with stroke.

BIBLIOGRAPHIC SOURCE(S)

Kapral MK, Silver FL. Preventive health care, 1999 update: 2. Echocardiography for the detection of a cardiac source of embolus in patients with stroke. Canadian Task Force on Preventive Health Care. CMAJ 1999 Oct 19;161(8):989-96. [96 references]

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INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
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SCOPE

DISEASE/CONDITION(S)

- Stroke
- Clinical cardiac disease
- Intracardiac thrombus
- Patent foramen ovale

GUIDELINE CATEGORY

Assessment of Therapeutic Effectiveness
Screening
Treatment

CLINICAL SPECIALTY

Cardiology
Family Practice
Geriatrics

Internal Medicine
Nursing

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Nurses
Physician Assistants
Physicians
Students

GUIDELINE OBJECTIVE(S)

To develop guidelines for the use of echocardiography in the investigation of patients with stroke.

TARGET POPULATION

Patients with stroke

INTERVENTIONS AND PRACTICES CONSIDERED

1. Routine transthoracic echocardiography
2. Routine transesophageal echocardiography
3. Routine transthoracic echocardiography followed by transesophageal echocardiography if the transthoracic echocardiography findings are noncontributory
4. Selective transthoracic echocardiography or transesophageal echocardiography in patients with cardiac disease who would not otherwise receive anticoagulant therapy

MAJOR OUTCOMES CONSIDERED

- Yield of transthoracic echocardiography and transesophageal echocardiography in detecting cardiac sources of cerebral emboli in patients with stroke
- Effectiveness of treatment for cardiac sources of emboli
- Effectiveness of screening echocardiography for secondary stroke prevention

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developers identified relevant articles by a computerized search of MEDLINE (U.S. National Library of Medicine) (January 1966 to April 1998) using the MeSH (medical subject headings) terms "cerebrovascular disorders," "heart diseases," "echocardiography," "thromboembolic disorders," "intracardiac thrombus," "diagnosis," "prevention" and "therapy." A professional librarian assisted with the search. The guideline developers also performed a manual review of references and obtained citations from experts. Studies were included if they were published in manuscript form in peer-reviewed journals. For the evaluation of the yield of echocardiography, studies involving patients referred for echocardiography (rather than consecutive patients with stroke) were excluded from this review because of the potential for selection bias, as were studies that included patients with systemic (peripheral) emboli (references available from the authors on request).

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

Quality of evidence was rated according to 5 levels:

I - Evidence from at least 1 properly randomized controlled trial.

II-1 - Evidence from well-designed controlled trials without randomization.

II-2 - Evidence from well-designed cohort or case-control analytic studies, preferably from more than 1 centre or research group.

II-3 - Evidence from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments could also be included here.

III - Opinions of respected authorities, based on clinical experience, descriptive studies or reports of expert committees.

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The task force, comprising expert clinician/methodologists from a variety of medical specialties, used a standardized evidence-based method for evaluating the effectiveness of this intervention. A manuscript providing critical appraisal of the evidence was prepared by the lead authors. This manuscript was circulated to the task force members in December 1997, and evidence for this topic was presented by the lead author(s) and deliberated on at a meeting in January 1998.

At the meeting the expert panellists addressed critical issues, clarified ambiguous concepts and analysed the synthesis of the evidence. At the end of this process, the specific clinical recommendations proposed by the lead authors were discussed, as were issues related to clarification of the recommendations for clinical application and any gaps in evidence. The results of this process are reflected in the description of the decision criteria presented with the specific recommendations. The final decisions on recommendations were arrived at unanimously by the group and lead authors.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Grades of Recommendation:

A. Good evidence to support the recommendation that the condition or maneuver be specifically considered in a periodic health examination.
B. Fair evidence to support the recommendation that the condition or maneuver be specifically considered in a periodic health examination.
C. Insufficient evidence regarding inclusion or exclusion of the condition or maneuver in a periodic health examination, but recommendations may be made on other grounds.
D. Fair evidence to support the recommendation that the condition or maneuver be specifically excluded from a periodic health examination.
E. Good evidence to support the recommendation that the condition or maneuver be specifically excluded from a periodic health examination

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Comparison with Guidelines from Other Groups
External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

A draft of the manuscript was circulated to the Task Force members in December 1997, and evidence for this topic was presented by the lead author(s) and deliberated on at a meeting in January 1998. At the meeting the expert panelists addressed critical issues, clarified ambiguous concepts and analysed the synthesis of the evidence. At the end of this process, the specific clinical recommendations proposed by the lead authors were discussed, as were issues related to clarification of the recommendations for clinical application and any gaps in evidence.

After the meeting, the lead authors revised the manuscript accordingly. After final revision, the manuscript was sent to 2 experts in the field (identified by members of the Canadian Task Force on Preventive Health Care). Feedback from these experts was incorporated into a subsequent draft of the manuscript, which was then submitted to the Canadian Medical Association Journal. The manuscript was then peer reviewed as part of the journal publication process. The American College of Cardiology and the American Heart Association recommend echocardiography in patients with stroke who have clinical evidence of heart disease or who are less than 45 years of age. Routine echocardiography is not recommended in patients over the age of 45 without clinical cardiac disease. The Cerebral Embolism Task Force recommends "liberal" echocardiography in patients with stroke in whom cerebrovascular mechanisms are deemed unlikely. The Ad Hoc Committee on Guidelines for the Management of Transient Ischemic Attacks for the Stroke Council of the American Heart Association recommends transthoracic echocardiography only in patients with clinical evidence of cardiac disease or young subgroups without major risk factors for primary cerebrovascular disease, and possibly for those in whom no source of transient ischemic attack has been identified after other tests are completed. Transesophageal echocardiography is not recommended in unselected patients.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Recommendation grade [A, B, C, D, E] and level of evidence [I, II-1, II-2, II-3, III] are indicated after each recommendation. These definitions are repeated following the recommendations. Citations in support of individual recommendations are identified in the original guideline text.

- There is fair evidence to recommend echocardiography in patients with stroke and clinical evidence of cardiac disease by history, physical examination, electrocardiography or chest radiography (B, II-2, III). Transesophageal echocardiography is recommended as the preferred initial screening test, based on sensitivity and cost-effectiveness data. There is insufficient evidence to recommend for or against transesophageal echocardiography in patients with normal results of transthoracic echocardiography (C, no level cited).
- There is insufficient evidence to recommend for or against routine echocardiography in patients (including young patients) without clinical cardiac disease (C, II-2, III).
- Routine echocardiography is not recommended for patients with clinical cardiac disease who have independent indications for or contraindications to anticoagulant therapy (D, II-2, III). It should be noted, however, that such patients often have non-stroke-related indications for echocardiography.

- There is fair evidence to recommend anticoagulant therapy in patients with stroke and documented intracardiac thrombus (B, I, II-1, II-2, III). There is insufficient (no) evidence to recommend for or against any specific therapy for patent foramen ovale (C, no level cited).

Definitions:

Recommendation Grade:

A. Good evidence to support the recommendation that the condition be specifically considered in a periodic health examination.
B. Fair evidence to support the recommendation that the condition be specifically considered in a periodic health examination.
C. Poor evidence regarding inclusion or exclusion of the condition in a periodic health examination, but recommendations may be made on other grounds.
D. Fair evidence to support the recommendation that the condition be specifically excluded from consideration in a periodic health examination.
E. Good evidence to support the recommendation that the condition be specifically excluded from consideration in a periodic health examination.

Level of Evidence:

I - Evidence from at least 1 properly randomized controlled trial.

II-1 - Evidence from well-designed controlled trials without randomization.

II-2 - Evidence from well-designed cohort or case-control analytic studies, preferably from more than 1 centre or research group.

II-3 - Evidence from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled experiments could also be included here.

III - Opinions of respected authorities, based on clinical experience, descriptive studies or reports of expert committees.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Maneuver: Echocardiography for patients with clinical cardiac disease and no pre-existing indications for anticoagulation.
Level of Evidence:
Three case-control studies (II-2)
Ten cross-sectional studies (III)

Maneuver: Echocardiography for patients with pre-existing indications for anticoagulation or contraindications to anticoagulation.
Level of Evidence:
Three case-control and cross-sectional studies (II-2, III)

Maneuver: Echocardiography for patients without clinical cardiac disease.
Level of Evidence:
Fifteen case-control and cross-sectional studies (II-2, III)

Maneuver: Anticoagulation (warfarin) for intracardiac thrombus to prevent systemic emboli.
Level of Evidence:
Two small, flawed randomized controlled trials (II-1)
Twenty-four case-control studies and case series (II-2, III)
Four randomized controlled trials of anticoagulation after myocardial infarction (I)

Maneuver: Treatment for patent foramen ovale.
Level of Evidence:
Treatment options have not been systematically evaluated

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Echocardiography can detect intracardiac masses (thrombus, vegetation or tumour) in about 4% (with transthoracic echocardiography) to 11% (with transesophageal echocardiography) of stroke patients. The yield is lower among patients without clinical evidence of cardiac disease by history, physical examination, electrocardiography or chest radiography (less than 2%) than among patients with clinical evidence of cardiac disease (less than 19%).
- For the diagnosis of left ventricular thrombus, transesophageal echocardiography has a sensitivity and specificity similar to those of transthoracic echocardiography. For the detection of left ventricular thrombi, thoracic echocardiography has a sensitivity of 86% to 95% and a specificity of 86% to 95%. For the diagnosis of left atrial thrombi, transesophageal echocardiography has a sensitivity of 100% and a specificity of 99%. For the diagnosis of patent foramen ovale, contrast transesophageal echocardiography (involving intravenous administration of agitated saline or other solutions) has a sensitivity of 89% and a specificity of 100%.

POTENTIAL HARMS

- The risks of echocardiography to patients are small. Transthoracic echocardiography has virtually no risks, and transesophageal echocardiography is associated with cardiac, pulmonary and bleeding complications in 0.18% of patients. Patients with an identified intracardiac thrombus are at increased risk for embolic events (absolute risk uncertain, range 0% to 38%), and this appears to be reduced with anticoagulant therapy (absolute risk reduction uncertain).

- Anticoagulant therapy carries a risk of major hemorrhage of 1% to 3% per year. The overall effectiveness of echocardiography in the prevention of recurrent stroke is unknown.
- Transthoracic echocardiography does not reliably visualize the left atrium or left atrial appendage, and it has a sensitivity of only 39%-63% for the detection of left atrial thrombi and a sensitivity of less than 50% for the diagnosis of patent foramen ovale.
- Transesophageal echocardiography involves the insertion of an ultrasound transducer into the esophagus. The patient is required to fast for at least 4 hours prior to the procedure. In a study of 10,419 attempted examinations, 0.6% of cases were interrupted due to patient intolerance to the transesophageal echocardiography probe, and 0.18% of cases because of reversible pulmonary, cardiac or bleeding complications. One death occurred in a patient with malignant esophageal infiltration.
- Transesophageal echocardiography performed on all stroke patients costs US $13,000 per quality-adjusted life year, while this figure is US $9,000 when performed only in patients with cardiac disease.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Implementation of preventive activities in clinical practice continues to be a challenge. To address this issue, Health Canada established a National Coalition of Health Professional Organizations in 1989. The purpose was to develop a strategy to enhance the preventive practices of health professionals. Two national workshops were held. The first focused on strengthening the provision of preventive services by Canadian physicians. The second addressed the need for collaboration among all health professionals. This process led to the development of a framework or "blueprint for action" for strengthening the delivery of preventive services in Canada (Supply and Services Canada: an Inventory of Quality Initiatives in Canada: Towards Quality and Effectiveness. Health and Welfare Canada, Ottawa, 1993). It is a milestone for professional associations and one that will have a major impact on the development of preventive policies in this country.

In 1991 the Canadian Medical Association spearheaded the creation of a National Partnership for Quality in Health to coordinate the development and implementation of practice guidelines in Canada. This partnership includes the following: the Association of Canadian Medical Colleges, the College of Family Physicians of Canada, the Federation of Medical Licensing Authorities of Canada, the Royal College of Physicians and Surgeons of Canada, the Canadian Council on Health Facilities Accreditation, and the Canadian Medical Association.

The existence of guidelines is no guarantee they will be used. The dissemination and diffusion of guidelines is a critical task and requires innovative approaches and concerted effort on the part of professional associations and health care professionals. Continuing education is one avenue for the dissemination of guidelines. Local physician leaders, educational outreach programs, and computerized reminder systems may complement more traditional methods such as lectures and written materials.

Public education programs should also support the process of guideline dissemination. In this context, rapidly expanding information technology, such as interactive video or computerized information systems with telephone voice output, presents opportunities for innovative patient education. The media may also be allies in the communication of some relevant aspects of guidelines to the public. All of these technologies should be evaluated.

The implementation of multiple strategies for promoting the use of practice guidelines requires marshaling the efforts of governments, administrators, and health professionals at national, provincial and local levels. It is up to physicians and other health professionals to adopt approaches for the implementation of guidelines in clinical practice and to support research efforts in this direction.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Kapral MK, Silver FL. Preventive health care, 1999 update: 2. Echocardiography for the detection of a cardiac source of embolus in patients with stroke. Canadian Task Force on Preventive Health Care. CMAJ 1999 Oct 19;161(8):989-96. [96 references]

ADAPTATION

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

DATE RELEASED

1999

GUIDELINE DEVELOPER(S)

Canadian Task Force on Preventive Health Care - National Government Agency [Non-U.S.]

SOURCE(S) OF FUNDING

The Canadian Task Force on Preventive Health Care is funded through a partnership between the Provincial and Territorial Ministries of Health and Health Canada.

GUIDELINE COMMITTEE

Canadian Task Force on Preventive Health Care (CTFPHC)

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

A complete list of planned reviews, updates and revisions is available under the What's New section at the CTFPHC Web site.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Canadian Task Force on Preventive Health Care (CTFPHC) Web site.

Print copies: Available from Canadian Task Force on Preventive Health Care, 100 Collip Circle, Suite 117, London, Ontario N6G 4X8, Canada.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Stachenko S. Preventive guidelines: their role in clinical prevention and health promotion. Ottawa: Health Canada, 1994. Available from the Canadian Task Force on Preventive Health Care (CTFPHC) Web site.
- CTFPHC history/methodology. Ottawa: Health Canada, 1997. Available from the CTFPHC Web site.
- Quick tables of current recommendations. Ottawa: Health Canada, 2000. Available from the CTFPHC Web site.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on March 24, 2001. The information was verified by the guideline developer as of June 1, 2001.

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