Complete Summary

GUIDELINE TITLE

Prevention and management of dental decay in the pre-school child. A national clinical guideline.

BIBLIOGRAPHIC SOURCE(S)

Scottish Intercollegiate Guidelines Network (SIGN). Prevention and management of dental decay in the pre-school child. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2005 Nov. 41 p. (SIGN publication; no. 83). [181 references]

GUIDELINE STATUS

This is the current release of the guideline.

Any amendments to the guideline in the interim period will be noted on Scottish Intercollegiate Guidelines Network (SIGN) Web site.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Dental caries

GUIDELINE CATEGORY

Diagnosis
Management
Prevention
Risk Assessment

CLINICAL SPECIALTY

Dentistry
Pediatrics
Preventive Medicine

INTENDED USERS

Dentists
Nurses
Public Health Departments

GUIDELINE OBJECTIVE(S)

To present effective strategies for preventing and managing dental decay in the pre-school child

TARGET POPULATION

All pre-school children in Scotland including children at increased risk

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Risk Assessment/Prevention

1. Early diagnosis of caries using clinical examination and bitewing radiographs
2. Caries risk assessment using the Dundee Caries Risk Assessment Model (DCRM)
3. Promotion of breast-feeding and avoidance of drinks containing free sugars
4. Toothbrushing using fluoride toothpaste, brushing at bedtime and on at least one other occasion, not eating directly after brushing, not rinsing with water post-brushing, and using a toothbrush with a small head
5. Health promotion programs
6. Targeted prevention including "at-risk" population
7. Oral health education including oral hygiene instruction, the appropriate use and provision of fluoride toothpaste
8. Regular dental care, and topical fluoride varnish application at least twice yearly for "at-risk" children

Note: The following measures were considered but not recommended due to lack of sufficient evidence: water fluoridation; fluoride based treatments including slow release fluoride beads, silver diamine fluoride, chlorhexidine, fissure sealants.

Management

1. Restorative treatment in conjunction with preventive treatment
2. Indirect pulp capping technique as appropriate
3. Avoiding iatrogenic damage to adjacent tooth surfaces
4. Using atraumatic restorative technique (ART)
5. Using amalgam, composite, resin-modified glass-ionomers, compomer or pre-formed crowns as restorative material for Class II cavities

Note: Dental lasers and chemomechanical techniques were considered but not recommended.

MAJOR OUTCOMES CONSIDERED

- Risk for and development of dental caries
- Effectiveness of dental caries preventive measures
- Performance of restorative materials and techniques

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

An initial search for guidelines covered Embase and Medline for the period 1996 - 2003. The following websites were also searched:

- American Dental Association
- Canadian Dental Association
- Canadian Practice Guidelines Infobase
- National Guidelines Clearinghouse
- New Zealand Guidelines Group
- National Health and Medical Research Council (NHMRC) - Australia
- Swedish Council on Technology Assessment in Health Care (SBU)
- UK Health Technology Assessment Programme
- US Agency for Healthcare Research and Quality

Searches for systematic reviews, meta-analyses, randomised controlled trials, and observational studies were carried out on the Cochrane Library, Embase, and Medline for the years 1990 - 2003. Searches were later updated to June 2004. Grey literature was not included.

The main searches were supplemented by material identified by individual members of the development group. All selected papers were evaluated using standard methodological checklists before conclusions were considered as evidence.

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

Levels of Evidence

1++: High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias

1+: Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias

1-: Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias

2++: High quality systematic reviews of case control or cohort studies
High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+: Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2-: Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3: Non-analytic studies (e.g., case reports, case series)

4: Expert opinion

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

Once papers have been selected as potential sources of evidence, the methodology used in each study is assessed to ensure its validity. The result of this assessment will affect the level of evidence allocated to the paper, which will in turn influence the grade of recommendation that it supports.

The methodological assessment is based on a number of key questions that focus on those aspects of the study design that research has shown to have a significant influence on the validity of the results reported and conclusions drawn. These key questions differ between study types, and a range of checklists is used to bring a degree of consistency to the assessment process. Scottish Intercollegiate Guidelines Network (SIGN) has based its assessments on the MERGE (Method for Evaluating Research and Guideline Evidence) checklists developed by the New South Wales Department of Health, which have been subjected to wide consultation and evaluation. These checklists were subjected to detailed evaluation and adaptation to meet SIGN's requirements for a balance between methodological rigour and practicality of use.

The assessment process inevitably involves a degree of subjective judgment. The extent to which a study meets a particular criterion - e.g., an acceptable level of loss to follow up - and, more importantly, the likely impact of this on the reported

results from the study will depend on the clinical context. To minimise any potential bias resulting from this, each study must be evaluated independently by at least two group members. Any differences in assessment should then be discussed by the full group. Where differences cannot be resolved, an independent reviewer or an experienced member of SIGN Executive staff will arbitrate to reach an agreed quality assessment.

Evidence Tables

Evidence tables are compiled by SIGN executive staff based on the quality assessments of individual studies provided by guideline development group members. The tables summarise all the validated studies identified from the systematic literature review relating to each key question. They are presented in a standard format to make it easier to compare results across studies, and will present separately the evidence for each outcome measure used in the published studies. These evidence tables form an essential part of the guideline development record and ensure that the basis of the guideline development group's recommendations is transparent.

Additional details can be found in the companion document titled "SIGN 50: A Guideline Developers' Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50]), available from the SIGN Web site.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Synthesising the Evidence

Guideline recommendations are graded to differentiate between those based on strong evidence and those based on weak evidence. This judgment is made on the basis of an (objective) assessment of the design and quality of each study and a (perhaps more subjective) judgment on the consistency, clinical relevance and external validity of the whole body of evidence. The aim is to produce a recommendation that is evidence-based, but which is relevant to the way in which health care is delivered in Scotland and is therefore implementable.

It is important to emphasise that the grading does not relate to the importance of the recommendation, but to the strength of the supporting evidence and, in particular, to the predictive power of the study designs from which that data was obtained. Thus, the grading assigned to a recommendation indicates to users the likelihood that, if that recommendation is implemented, the predicted outcome will be achieved.

Considered Judgment

It is rare for the evidence to show clearly and unambiguously what course of action should be recommended for any given question. Consequently, it is not always clear to those who were not involved in the decision making process how guideline developers were able to arrive at their recommendations, given the evidence they had to base them on. In order to address this problem, SIGN has introduced the concept of considered judgment.

Under the heading of considered judgment, guideline development groups summarise their view of the total body of evidence covered by each evidence table. This summary view is expected to cover the following aspects:

- Quantity, quality, and consistency of evidence
- Generalisability of study findings
- Directness of application to the target population for the guideline.
- Clinical impact (i.e., the extent of the impact on the target patient population, and the resources needed to treat them.)
- Implementability (i.e., how practical it would be for the NHS in Scotland to implement the recommendation.)

Guideline development groups are provided with a pro forma in which to record the main points from their considered judgment. Once they have considered these issues, the group is asked to summarise their view of the evidence and assign a level of evidence to it, before going on to derive a graded recommendation.

Additional detail about SIGN's process for formulating guideline recommendations is provided in Section 6 of the companion document titled "SIGN 50: A Guideline Developers' Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50], available from the SIGN Web site.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Grades of Recommendation

Note: The grade of recommendation relates to the strength of the evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation.

A: At least one meta-analysis, systematic review of randomized controlled trials (RCTs), or RCT rated as 1++ and directly applicable to the target population; *or*

A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

B: A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 1++ or 1+

C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 2++

D: Evidence level 3 or 4; *or*

Extrapolated evidence from studies rated as 2+

Good Practice Points: Recommended best practice based on the clinical experience of the guideline development group

COST ANALYSIS

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

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The national open meeting is the main consultative phase of Scottish Intercollegiate Guidelines Network (SIGN) guideline development.

Peer Review

All SIGN guidelines are reviewed in draft form by independent expert referees, who are asked to comment primarily on the comprehensiveness and accuracy of interpretation of the evidence base supporting the recommendations in the guideline. A number of general practitioners (GPs) and other primary care practitioners also provide comments on the guideline from the primary care perspective, concentrating particularly on the clarity of the recommendations and their assessment of the usefulness of the guideline as a working tool for the primary care team. The draft is also sent to a lay reviewer in order to obtain comments from the patient's perspective. The comments received from peer reviewers and others are carefully tabulated and discussed with the chairman and with the guideline development group. Each point must be addressed and any changes to the guideline as a result noted or, if no change is made, the reasons for this recorded.

As a final quality control check prior to publication, the guideline and the summary of peer reviewers' comments are reviewed by the SIGN Editorial Group for that guideline to ensure that each point has been addressed adequately and that any risk of bias in the guideline development process as a whole has been minimised. Each member of the guideline development group is then asked formally to approve the final guideline for publication.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Note from the Scottish Intercollegiate Guidelines Network (SIGN) and National Guideline Clearinghouse (NGC)*: In addition to these evidence-based recommendations, the guideline development group also identifies points of best clinical practice in the full-text guideline document.*

The grades of recommendations (A-D) and levels of evidence (1++, 1+, 1-, 2++, 2+, 2-, 3, 4) are defined at the end of the "Major Recommendations" field.

Diagnosis

Early Diagnosis of Dental Caries

B - Caries should be diagnosed as early as possible to allow management before cavitation and pulpal involvement, and to identify caries-active patients and those at increased risk of caries in the future.

Diagnostic Techniques

Bitewing Radiographs

D - The use of bitewing radiography for caries diagnosis should be considered for pre-school children attending for dental care, particularly if they are assessed as being at increased risk of dental caries.

D - The timing of subsequent radiographic examinations should be based on the patient's caries risk status.

Other Diagnostic Tools and Training

C - Practitioners should receive training in clinical and radiographic caries diagnosis.

Predicting Caries Risk

Carries Risk Assessment Tool

D - Specialist community public health nurses and child healthcare professionals could consider carrying out a caries risk assessment of children in their first year as part of the child's overall health assessment.

C - A dental practice based caries risk assessment should be carried out on individual pre-school children and should include the following risk indicators:

- evidence of previous caries experience
- resident in a deprived area
- healthcare worker's opinion
- oral mutans streptococci counts (if accessible)

B - Children whose families live in a deprived area should be considered as at increased risk of early childhood caries when developing preventive programmes.

Diet and Nutrition

Maternal Diet and Pregnancy

B - Pregnant women should be advised that there is no benefit to the child of taking fluoride supplements during pregnancy.

Milk Feeding and Caries

Duration and Timing of Feeding

C - Members of the dental team should support and promote breastfeeding according to current recommendations.

C - Parents and carers should be advised that drinks containing free sugars, including natural fruit juices, should never be put in a feeding bottle.

Free Sugars and Dental Caries

Free Sugars in Food

B - Parents and carers should be advised that foods and confectionery containing free sugars should be minimised, and if possible, restricted to meal times.

Free Sugars in Fluids

C - Parents and carers should be advised that drinks containing free sugars, including natural fruit juices, should be avoided between meals. Water or milk may be given instead.

Other Foodstuffs and Caries

C - Parents and carers should be advised that cheese is a good high energy food for toddlers as it is non-cariogenic and may be actively protective against caries.

Sugar Substitutes

B - Parents and carers should be advised that confectionery and beverages containing sugar substitutes are preferable to those containing sugars.

Toothbrushing with Fluoride Toothpaste

Use of Fluoride Toothpaste

A - Children should have their teeth brushed with fluoride toothpaste.

Fluoride Concentration and Amount of Toothpaste

A - Toothpaste containing 1,000 ppmF +/-10% should be used by pre-school children.

C - Pre-school children should use no more than a smear or small pea-sized amount of toothpaste.

Frequency of Brushing

Supervised Toothbrushing

C - Children should have their teeth brushed, or be assisted with toothbrushing by an adult, at least twice a day, with a smear or pea-sized amount of fluoride toothpaste.

Age at Commencement of Brushing

C -Toothbrushing should commence as soon as the primary teeth erupt

Toothbrushing Practice

Post-brushing Rinsing

A - Children should be encouraged to spit out excess toothpaste and not rinse with water post-brushing.

Use of Powered versus Manual Toothbrushes

A - Children's teeth can be brushed with either manual or powered toothbrushes as an effective means of administering fluoride.

Community Based Prevention

Dental Health Education

B - Dental or dietary health education in isolation should not be undertaken as a community based prevention approach.

Health Promotion

C - The oral health of young children should be promoted through multiple interventions and multisessional health promotion programmes for parents.

D - Oral health promotion programmes to reduce the risk of early childhood caries should be available for parents during pregnancy and continued postnatally.

D- Oral health promotion programmes for young children should be initiated before the age of three years.

D - Oral health promotion programmes should address environmental, public and social policy changes in order to support behaviour change.

Communicating Oral Health Messages

C - Professionals should ensure oral health messages are relevant and applicable to communities and lifestyles.

C - Teachers, community workers and lay or peer educators can be effective in delivering health promotion interventions and their role should be considered in the development of oral health promotion programmes.

D - Non-dental health professionals and lay oral health workers should be provided with adequate educational or training interventions prior to their participation in oral health promotion programmes.

Health Promotion Programmes Including Fluoride

A - Community or home based oral health promotion interventions should use fluoride containing agents such as fluoride toothpaste.

Toothbrushing Programmes Set in Community or School Venues

Community based toothbrushing programmes should:

A - include fluoride toothpaste with a concentration of 1,000 ppmF (parts per million fluoride)

B - be undertaken in community based settings such as nurseries

B - be undertaken with parents to create a supportive environment for oral health behaviour.

Fluoride Tablets, Salt and Milk

D - Fluoride supplements are not recommended as a public health measure.

D - Fluoride supplements should only be prescribed by dental practitioners on an individual patient basis.

Targeted Prevention

Targeting Specific Groups

B - The impact on inequalities in oral health should be considered when planning population based prevention strategies.

B - Caries prevention measures should target 'at-risk' populations and individuals to reduce oral health inequalities.

<u>Practice Based Prevention</u>

Health Education by the Dental Team

B - The dental health team should deliver caries prevention strategies in conjunction with physical prevention techniques such as the use of fluoride.

B - Parents and their pre-school children should receive oral health education from their dental team. This should include oral hygiene instruction, the appropriate use of fluoride toothpaste and the provision of fluoride agents such as toothpaste.

Topical Fluoride Varnish

B - Topical fluoride varnish should be applied to the dentition at least twice yearly for preschool children assessed as being at increased risk of dental caries.

Practice Based Management

Management of the Active Carious Lesion in Primary Teeth

D - Primary teeth with caries progressing into dentine should be actively managed with a preventive, or a preventive and restorative approach as appropriate to a child's ability to cooperate.

Cavity Preparation Techniques

Extent of Caries Removal

B - If complete caries removal from a vital primary molar is not possible, an indirect pulp capping technique should be considered.

Iatrogenic Damage During Cavity Preparation

B - When preparing a Class II cavity, care must be taken to avoid iatrogenic damage to adjacent proximal tooth surfaces.

The Atraumatic Restorative Technique (ART)

B - Use of the ART approach for cavity preparation in carious primary teeth should be considered as an alternative, where appropriate, to conventional cavity preparation techniques.

Materials for Cavity Restoration

A - Amalgam, composite, resin-modified glass-ionomers, compomer or pre-formed metal crowns should be used as restorative materials for Class II cavities in primary molars.

A - Conventional glass-ionomer should be avoided, where possible, for Class II cavity restoration.

Non-Conventional Caries Management Techniques

B - Copper phosphate cement (black copper cement) should not be used as a restorative material.

Definitions:

Levels of Evidence

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1+: Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias

1-: Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias

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High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

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3: Non-analytic studies (e.g. case reports, case series)

4: Expert opinion

Grades of Recommendation

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Extrapolated evidence from studies rated as 1++ or 1+

C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 2++

D: Evidence level 3 or 4; *or*

Extrapolated evidence from studies rated as 2+

Good Practice Points: Recommended best practice based on the clinical experience of the guideline development group

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate prevention and management of dental decay, resulting in improved dental health in pre-school children

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This guideline is not intended to be construed or to serve as a standard of care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan. This judgement should only be arrived at following discussion of the options with the patient, covering the diagnostic and treatment choices available. It is, however, advised that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient's case notes at the time the relevant decision is taken.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Implementation of national clinical guidelines is the responsibility of local National Health Service (NHS) organisations and is an essential part of clinical governance. It is acknowledged that not every guideline can be implemented immediately on publication, but mechanisms should be in place to ensure that the care provided is reviewed against the guideline recommendations and the reasons for any differences assessed and, where appropriate, addressed.

The guideline complements the Scottish Executive's Action Plan for Improving Oral Health and Modernising Dental Services. The guideline outlines the need for wider involvement than health and dental professionals and discussions around caries prevention and dental care for pre-school children should involve a range of clinical disciplines, lay representatives, parents and nursery staff, with an emphasis on reducing inequalities in health. Local arrangements may then be made to implement the national guideline in community settings, clinics, practices and nurseries, and to monitor compliance. This may be done by a variety of means including patient-specific reminders, continuing education and training, and clinical audit.

Key points for audit are identified in the original guideline document.

IMPLEMENTATION TOOLS

Audit Criteria/Indicators
Patient Resources
Quick Reference Guides/Physician Guides

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
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Scottish Intercollegiate Guidelines Network (SIGN). Prevention and management of dental decay in the pre-school child. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2005 Nov. 41 p. (SIGN publication; no. 83). [181 references]

ADAPTATION

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

DATE RELEASED

2005 Nov

GUIDELINE DEVELOPER(S)

Scottish Intercollegiate Guidelines Network - National Government Agency [Non-U.S.]

SOURCE(S) OF FUNDING

Scottish Executive Health Department

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Declarations of interests were made by all members of the guideline development group. Further details are available from the Scottish Intercollegiate Guidelines Network (SIGN) Executive.

GUIDELINE STATUS

This is the current release of the guideline.

Any amendments to the guideline in the interim period will be noted on Scottish Intercollegiate Guidelines Network (SIGN) Web site.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Quick reference guide: Prevention and management of dental decay in the pre-school child. Scottish Intercollegiate Guidelines Network, 2005 Nov. 2 p. Available in Portable Document Format (PDF) from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.
- SIGN 50: A guideline developer's handbook. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network. (SIGN publication; no. 50). Available from the SIGN Web site.
- Appraising the quality of clinical guidelines. The SIGN guide to the AGREE (Appraisal of Guidelines Research & Evaluation) guideline appraisal instrument. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network, 2001. Available from the SIGN Web site.

PATIENT RESOURCES

The following is available:

- Advice to patients – dental decay in the pre-school child. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2 p.

Electronic copies: Available in Portable Document Format (PDF) from the SIGN Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the

authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This summary was completed by ECRI on February 22, 2006.

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