EVIDENCE-FINDING SEARCH STRATEGIES
Process overview

Formulating a question

Technique 1: Quick search
- Systematic reviews (SR) from The Cochrane Collaboration

Technique 2: Moderately quick search
- SR and meta-analyses (MA) with critical summaries (CS) and other high levels of evidence

Technique 3: Extensive search and evaluation
- SR and MA (or even primary literature) located on PubMed without CS
- Evaluation of the quality of evidence
Process overview

- Ask an answerable question

- Find your evidence
  - Primary evidence: RCT, case control studies
  - **Secondary evidence:** SR, MA, SR or MA with CS

- Evaluate the quality of your evidence
  - May choose to skip this step if you find a SR or MA with a CS or a Cochrane SR
Ask your question

- PICO
  - **Patient/Problem:** children
  - **Intervention:** topical fluoride
  - **Comparison:** no topical fluoride
  - **Outcome:** caries reduction

**Question**

What is the evidence that **topical fluoride** is effective at **reducing caries** in **children**?
Technique 1: Quick search

The Cochrane Collaboration: the “Gold Standard” of SR’s
Technique 1: Quick search

- Combinations of topical fluoride (toothpastes, mouthrinses, gels, varnishes) versus single topical fluoride for preventing dental caries in children and adolescents
- Complete and non-conservative removal of decayed tissue in unfilled teeth
- Dental fillings for the treatment of caries in the primary dentition
- Direct versus indirect veneer restorations for intrinsic dental stains
- Domestic violence screening and intervention programmes for adults with dental or facial injury
- Enamel matrix derivative (Emdogain®) for periodontal tissue regeneration in intrabony defects
- Extraction of primary (baby) teeth for unerupted palatally displaced permanent canine teeth in children
- Feeding interventions for growth and development in infants with cleft lip, cleft palate or cleft lip and palate
- Fluoridated milk for preventing dental caries
- Fluoride gels for preventing dental caries in children and adolescents
- Fluoride mouthrinses for preventing dental caries in children and adolescents
- Fluoride toothpastes for preventing dental caries in children and adolescents
- Fluoride toothpastes of different concentrations for preventing dental caries in children and adolescents
- Fluoride varnishes for preventing dental caries in children and adolescents
- Fluorides for the prevention of white spots on teeth during fixed brace treatment
- Full-mouth disinfection for the treatment of adult chronic periodontitis
- Guided tissue regeneration for periodontal infra-bony defects
Technique 1: Quick search

“Fluoride varnish applied professionally two to four times a year would substantially reduce tooth decay in children.”
Technique 2: Moderately quick search

- Utilization of EBD resources that specialize in the critical review process and other high levels of evidence
- Combines search and quality appraisal process

- EBD.ADA.org
- *The Journal of Evidence Based Dental Practice*
- *The Evidence-based Dentistry*
- TRIP database
- DARE database
WELCOME TO A WEBSITE FOR EVIDENCE-BASED DENTISTRY

A practical resource for scientific evidence
Looking for answers? We provide systematically assessed evidence as tools and resources to support your clinical decisions. A practical approach to integrating evidence into your patient care!

ABOUT EBD
Topic Index for Database of Systematic Reviews

- Anesthesia, Oral Sedation and Pain Control
- Cariology and Caries Management
- Community Oral Health and Health Policy
- Dental Materials and Biomaterials
- Endodontics
- Esthetic Dentistry
- Geriatric Dentistry
- Implantology
- Occlusion
- Oral and Maxillofacial Surgery
- Oral and Systemic Health Relationship
- Oral Health Communication and Literacy
- Oral Pathology
- Oral Radiology, Imaging and Photography
- Oral, Head, and Neck Cancer
- Orthodontics
- Osteoporosis and Bone Health
- Other
- Pediatric Dentistry
- Periodontics
- Pharmacology and Therapeutics
- Preventive Dentistry
- Prosthodontics
- Restorative Dentistry
- Special Care Dentistry
- TMJ and TMD
- Tobacco Use and Smoking Cessation
- Tooth Restorations
## Systematic Reviews: Preventive Dentistry

### Fluoride

<table>
<thead>
<tr>
<th>Systematic Reviews</th>
<th>Critical Summary</th>
<th>Plain Language Summary</th>
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<tbody>
<tr>
<td>[Anticaries effectiveness of fluoride toothpaste: a meta-analysis]</td>
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<td>Caries prevention with fluoride toothpaste in children: an update</td>
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<td>Caries preventive effect of fluoride in milk, salt and tablets: a literature review</td>
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## Systematic Reviews: Preventive Dentistry

### Fluoride

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Critical Summary
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<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Source</th>
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<tbody>
<tr>
<td>Fluoridated milk for preventing dental caries</td>
<td>Yeung CA, Hitnongs JI, Macfarlane TV, Tidball AG, Glenny AM</td>
<td>Cochrane Database Syst Rev. 2005; (3)CD003878</td>
</tr>
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<td>Walsh T, Worthington HV, Glenny AM, Appelbee P, Marinho VC, Shi X, Glenny AM</td>
<td>Cochrane Database of Systematic Reviews. 2010; (1)CD007889</td>
</tr>
</tbody>
</table>

Azarpazhooh A, Main PA.
Department of Endodontics, Faculty of Dentistry, University of Toronto, Ontario, Canada.
Republished from:

Abstract

OBJECTIVE: To develop a scientifically current and evidence-based protocol for the use of fluoride varnish for the prevention of dental caries among high-risk children and adolescents.

METHODS: Previous systematic reviews on this topic were used as the basis for the current review. Ovid MEDLINE, CINAHL and several other relevant bibliographic databases were searched for English-language articles, with human subjects, published from 2000 to 2007.

RESULTS: A total of 105 articles were identified by the literature search; relevance was determined by examining the title, abstract and body of the article. Seven original research studies met the inclusion criteria. These articles were read and scored independently by 2 reviewers, and evidence was extracted for systematic review.

RECOMMENDATIONS: The following recommendations were developed on the basis of the evidence: 1. For high-risk populations (e.g., people with low socioeconomic status, new immigrants and refugees, First Nations and Inuit children and adolescents), fluoride varnish should be applied twice a year, unless the individual has no risk of caries, as indicated by past and current caries history. This schedule of application would permit sealants to be checked biannually to ensure retention. 2. Single-dose packages of fluoride varnish should be used for children; the varnish in such packages should be stirred vigorously before application, to ensure that any precipitated fluoride is redissolved. 3. There is good evidence of the complementary efficacy of preventive strategies such as sealants and varnish, as well as toothbrushing and nutritional counselling; oral health care programs should therefore include as many complementary strategies as possible.

PMID: 19496902 [PubMed]
<table>
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<tr>
<th>Title</th>
<th>Journal</th>
<th>Year</th>
<th>Volume</th>
<th>Issue</th>
<th>Pages</th>
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Limited evidence suggests fluoride varnish applied twice yearly is effective for caries prevention in children

Critical Summary Prepared by: James Zahirowski DMD, MS; Arthur Jeske DMD, PhD

A Critical Summary of:
Fluoride varnish in the prevention of dental caries in children and adolescents: a systematic review

“This systematic review identified seven controlled trials which met clearly stated inclusion criteria. The authors concluded that fluoride varnish, applied twice yearly, effectively reduces the incidence of caries among high-risk children and adolescence.”

Conclusion:
Children and adolescents at high risk for caries would benefit from twice yearly application of fluoride varnish. Oral health programs should include other complementary caries prevention strategies, such as sealants, tooth brushing, and nutrition counseling.

Source of funding:
Source of funding:
Primary Health Care and Public Health Directorate, First Nations and Inuit Health Branch, Health Canada.

Commentary:

Importance and Context:
Fluoride treatments have shown to substantially reduce tooth decay in both primary and permanent teeth.(1) Fluoride varnishes provide longer fluoride contact with enamel and offer the advantages of less fluoride ingestion and ease of application. Single-dose fluoride varnish packets have been reported to deliver the most uniform fluoride concentration when stirred vigorously prior to application. Fluoride varnish, although efficacious for caries prevention, has not been found superior to gel applications. Evaluation of current research is needed to assess efficacy of fluoride varnish treatments.

**Strengths and Weaknesses of the Systematic Review:**
This systematic review included a comprehensive search with defined inclusion and exclusion criteria. The authors searched for English-only publications. They did not search for grey literature nor contact manufacturers. A list of excluded studies was not provided. The authors assessed the quality of the included trials. The study results could not be combined and were presented descriptively. Some of the author’s recommendations were not evaluated in the included controlled clinical trials.

**Strengths and Weaknesses of the Evidence:**
Two lower quality studies were of faulty design, with no blinding, randomizing, or controlling outside of fluoride. One study concluded that varnish had no protective effect. Another study included the use of chlorhexidine varnish, which would make the results difficult to assess.

Implications for Dental Practice:
An expert panel of the American Dental Association concluded that “Fluoride varnish applied every six months is effective in preventing caries.”(2) Topical fluoride administration should be based on a caries risk assessment and caries risk factors such as three-year history of caries, poor oral hygiene, cariogenic diet, presence of cariogenic bacteria, exposed root surfaces, and orthodontic treatment. Fluoride varnish, when applied twice yearly, is efficacious for preventing caries in caries-prone children and adolescents with high caries patients possibly benefiting from an application every three months.

(2) Application of fluoride varnish in addition to a comprehensive oral health care program including sealants, oral hygiene instruction, and nutritional counseling may be beneficial.
Trip database

Trip Database - Clinical Search Engine

The TRIP Database is a clinical search tool designed to allow health professionals to rapidly identify the highest quality clinical evidence for clinical practice.

Registered users (registration is free) benefit from extra features such as CPD, search history, and collaborative tools. Register here, or Login if you have registered before.

Find out more about Trip Database.
Trip database
ADA Clinical Recommendations

Developed under the sponsorship of the ADA Council on Scientific Affairs and the ADA Center for Evidence-Based Dentistry, clinical recommendations are useful tools that can be used by practitioners in conjunction with their clinical judgement and their patients' needs and preferences to make evidence-based treatment decisions.

ADA Clinical Recommendations do not constitute standards of care but instead are a useful tool that can be applied in making evidence-based treatment decisions.

Fluoride

- Professionally applied topical fluoride: Evidence-based clinical recommendations
  - Executive Summary: Professionally applied topical fluoride: Evidence-based clinical recommendations
  - Chairside Guide: Topical Fluoride

Infective Endocarditis

- Prevention of infective endocarditis: Guidelines from the American Heart Association
Professionally applied topical fluoride
Evidence-based clinical recommendations

American Dental Association Council on Scientific Affairs

Editor’s note: See the summary of these topical fluoride recommendations bound into this issue of JADA after page 1120.

Definition of evidence-based dentistry. The American Dental Association defines the term "evidence-based dentistry" as follows:

Evidence-based dentistry (EBD) is an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence relating to the patient’s oral and medical condition and history, with the dentist’s clinical expertise and the patient’s treatment needs and preferences.

In adopting this definition for EBD, the American Dental Association recognizes that treatment recommendations should be determined for each patient by his or her dentist, and that patient preferences should be considered in all decisions. Dentists’ experience and other circumstances, such as patients’ characteristics, also should be considered in treatment planning. EBD does not provide a “cookbook” that dentists must follow, nor does it establish a standard of care. Box 1 lists definitions of terms commonly used in

ABSTRACT

Background. With the dramatic increase in the amount of scientific information available about oral health, an evidence-based approach to oral health care and the practice of dentistry is necessary. There is a need to summarize, critique and disseminate scientific evidence and to translate the evidence into a practical format that is used easily by dentists. The evidence-based clinical recommendations in this report were developed by an expert panel established by the American Dental Association Council on Scientific Affairs that evaluated the collective body of scientific evidence on the effectiveness of professionally applied topical fluoride for caries prevention. The recommendations are intended to assist dentists in clinical decision making.

Types of Studies Reviewed. MEDLINE and the Cochrane Library were searched for systematic reviews and clinical studies of professionally applied topical fluoride—including gel, foam and varnish—through October 2005.

Results. Panels were selected on the basis of their expertise in the relevant subject matter. The recommendations are stratified by age groups and caries risk and indicate that periodic fluoride treatments should be considered for both children and adults who are at moderate or high risk of developing caries. Included in the clinical recommendations is a summary table that can be used as a chairside resource.

Clinical Implications. The dentist, knowing the patient’s health history and vulnerability to oral disease, is in the best position to make treatment decisions in the interest of each patient. These clinical recommendations must be balanced with the practitioner’s professional expertise and the individual patient’s preferences.

Key Words. Fluoride; caries; caries prevention; evidence-based dentistry; clinical recommendations.

Chairside guides

ADA Center for Evidence-Based Dentistry™

Home | Systematic Reviews | Clinical Recommendations | Resources | Suggest Clinical Ideas | For the Patient

Home > Clinical Recommendations

ADA Clinical Recommendations

Developed under the sponsorship of the ADA Council on Scientific Affairs and the ADA Center for Evidence-Based Dentistry, clinical recommendations are useful tools that can be used by practitioners in conjunction with their clinical judgement and their patients’ needs and preferences to make evidence-based treatment decisions.

RECENT CLINICAL RECOMMENDATIONS

- Professionally applied topical fluoride: Evidence-based clinical recommendations
- Prevention of infective endocarditis: Guidelines from the American Heart Association
- Evidence-Based Clinical Recommendations for the Use of Pit-and-Fissure Sealants

ADA Clinical Recommendations do not constitute standards of care but instead are a useful tool that can be applied in making evidence-based treatment decisions.

Fluoride

- Professionally applied topical fluoride: Evidence-based clinical recommendations
- Executive Summary: Professionally applied topical fluoride: Evidence-based clinical recommendations
- Chairside Guide: Topical Fluoride

Infective Endocarditis

- Prevention of infective endocarditis: Guidelines from the American Heart Association
Chairside guide

### Professionally Applied Topical Fluoride: Evidence-based Clinical Recommendations

<table>
<thead>
<tr>
<th>Assess</th>
<th>Caries Risk (see back for risk factors)</th>
<th>Risk Group/Age</th>
<th>&lt; 6 years</th>
<th>6–18 years</th>
<th>18+ years</th>
<th>Decide</th>
</tr>
</thead>
<tbody>
<tr>
<td>&amp; Patient Age</td>
<td>Low</td>
<td>Patient may not receive any additional benefit*</td>
<td>Patient may not receive any additional benefit*</td>
<td>Patient may not receive any additional benefit*</td>
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<tr>
<td></td>
<td>Moderate</td>
<td>Varnish every 6 months</td>
<td>Varnish or Fluoride gel every 6 months</td>
<td>Varnish or Fluoride gel every 6 months</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>High</td>
<td>Varnish every 6 or 3 months</td>
<td>Varnish every 6 or 3 months or Fluoride gel every 6 or 3 months</td>
<td>Varnish or Fluoride gel every 6 or 3 months</td>
<td></td>
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</tr>
</tbody>
</table>

*Fluoridated water and fluoride toothpastes may provide adequate caries prevention in this risk category.

- Application time for fluoride gel and foam should be 4 minutes.
- Due to limited evidence these recommendations have not been extrapolated to foams.
- There is limited evidence differentiating NaF and APF gels.

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**Levels of evidence and strength of recommendations:**

Each recommendation is based on the best available evidence. The level of evidence available to support each recommendation may differ. Lower levels of evidence do not mean the recommendation should not be applied for patient treatment.
Technique 3: Extensive search - PubMed
Limiting search results

Results: 1 to 20 of 41539

   - Gray-Weale A, Beattie JK.
   - PMID: 20865182 [PubMed - as supplied by publisher]

   - Vácha R, Horinek D, Buchner R, Winter B, Jungwirth P.
   - PMID: 20865181 [PubMed - as supplied by publisher]

   - PMID: 20862410 [PubMed - in process]

4. Low-Fluoride Acidic Dentifrice: A Randomized Clinical Trial in a Fluoridated Area.
   - Vilhena FV, Olympio KP, Lauris JR, Delbrum AC, Buzalaf MA.
   - PMID: 20861532 [PubMed - as supplied by publisher]
MeSH terms
MeSH is the U.S. National Library of Medicine’s controlled vocabulary used for indexing articles for MEDLINE/PubMed. MeSH terminology provides a consistent way to retrieve information that may use different terminology for the same concepts.

- Use the MeSH database to find Medical Subject Heading Terms and build a search strategy.

MeSH database tutorials:

- Searching with the MeSH Database
- Combining MeSH Terms
- Applying Subheadings and other features of the MeSH Database
MeSH terms

1. **Fluorides**
   - Inorganic salts of hydrofluoric acid, HF, in which the fluorine atom is in the -1 oxidation state. (McGraw-Hill Dictionary of Scientific and Technical Terms, 4th ed) Sodium and stannous salts are commonly used in dentifrices.

2. **Fluorides, Topical**
   - Fluorides, usually in pastes or gels, used for topical application to reduce the incidence of DENTAL CARIES. First introduced: 1965

3. **sodium fluoride topical preparation [Substance Name]**
   - Fluoride varnish containing 50mg/ml NaF; N1 same as NM; topical fluoride caries inhibitor
   - Date introduced: May 1, 1980
1: Fluorides, Topical
Fluorides, usually in pastes or gels, used for topical application to reduce the incidence of DENTAL CARIES.
Year introduced: 1965

Subheadings: This list includes those paired at least once with this heading in MEDLINE and may not reflect current rules for allowable combinations.
- administration and dosage
- adverse effects
- analysis
- chemical synthesis
- chemistry
- classification
- contraindications
- economics
- history
- isolation and purification
- metabolism
- pharmacokinetics
- pharmacology
- poisoning
- radiation effects
- standards
- supply and distribution
- therapeutic use
- therapy
- toxicity

- Restrict Search to Major Topic headings only.
- Do Not Explode this term (i.e., do not include MeSH terms found below this term in the MeSH tree).

Entry Terms:
- Topical Fluorides
- Fluoride Varnishes
- Varnishes, Fluoride

Pharmacologic Action:
- Cariostatic Agents

All MeSH Categories
Chemicals and Drugs Category
- Inorganic Chemicals
  - Fluorine Compounds
    - Hydrofluoric Acid
      - Fluorides
  - Fluorides, Topical
1: **Dental Caries**

Localized destruction of the tooth surface initiated by decalcification of the enamel followed by enzymatic lysis of organic structures and leading to cavity formation. If left unchecked, the cavity may penetrate the enamel and dentin and reach the pulp. The three most prominent theories used to explain the etiology of the disease are that acids produced by bacteria lead to decalcification; that micro-organisms destroy the enamel protein; or that keratolytic micro-organisms produce chelates that lead to decalcification.

Year introduced: DENTAL CARIES CONTROL was heading 1965-1966

2: **Dental Caries Susceptibility**

The predisposition to tooth decay (DENTAL CARIES).

Year introduced: 1965

3: **Dental Caries Activity Tests**

Year introduced: 1972(1970)
MeSH terms

Entry Terms:
- Decay, Dental
- Dental Decay
- Caries, Dental
- Dental White Spot
- White Spots, Dental
- White Spots
- Spot, White
- Spots, White
- White Spot
- Dental White Spots
- White Spot, Dental

See Also:
- Cariogenic Agents
- Cariostatic Agents
- Diet, Cariogenic
- Tooth Demineralization
- Root Caries

Alternative terms for dental caries
Limiting search results
Limiting search results

PubMed Clinical Queries

<table>
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<tr>
<th>Clinical Study Categories</th>
<th>Systematic Reviews</th>
<th>Medical Genetics</th>
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<tr>
<td>Category: Therapy</td>
<td>Sample Results of Systematic Reviews Query</td>
<td>Topic: All</td>
</tr>
<tr>
<td>Scope: Broad</td>
<td></td>
<td>Filter citations to topics in medical genetics.</td>
</tr>
</tbody>
</table>

Filter citations to a specific clinical study category and scope. These search filters were developed by Haynes RB et al.

Filter citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines. See related sources.
Limiting search results to SR
Accessing SR

Results: 1 to 20 of 59

   - Evans RW, Dennison PJK.
   - PMID: 20415939 [PubMed - indexed for MEDLINE]
   - Related citations

2. Pit and fissure sealants versus fluoride varnishes for preventing dental decay in children and adolescents.
   - Hilti A, Ahovuo-Saloranta A, Nordblad A, Mäkelä M.
   - PMID: 20238319 [PubMed - indexed for MEDLINE]
   - Related citations

   - Wong MC, Grinyer AM, Tsang BW, Lo EC, Worthington HV, Marinho VC.
   - PMID: 20091545 [PubMed - indexed for MEDLINE]
   - Related citations

   - Azarpazhooh A, Main PA.
   - PMID: 19816459 [PubMed - indexed for MEDLINE]
   - Related citations
Accessing SR

34. Systematic review of controlled trials on the effectiveness of fluoride gels for the prevention of dental caries in children.
   Marinho VC, Higgins JP, Logan S, Sheiham A.
   PMID: 12749574 [PubMed - indexed for MEDLINE] Free Article
   Related citations

35. Practitioner's guide to fluoride.
   Scheifele E, Studen-Pavlovich D, Markovic N.
   PMID: 12436834 [PubMed - indexed for MEDLINE]
   Related citations

36. Assessment of evidence-based dental prophylaxis education in postdoctoral pediatric dentistry programs.
   Redford-Badwal DA, Nainar SM.
   Related citations

37. Caries, bitewings, and treatment decisions.
   Tan PL, Evans RW, Morgan MV.
   PMID: 12139267 [PubMed - indexed for MEDLINE]
   Related citations

   Marinho VC, Higgins JP, Logan S, Sheiham A.
   PMID: 12137653 [PubMed - indexed for MEDLINE]
   Related citations

   Marinho VC, Higgins JP, Logan S, Sheiham A.
Systematic review of controlled trials on the effectiveness of fluoride gels for the prevention of dental caries in children.

Marinho VC, Higgins JP, Logan S, Sheiham A.
Systematic Review Training Unit, Institute of Child Health, London, vcmarinho@yahoo.com

Abstract
Fluoride gels have been widely used since the 1970s. The aim of this review was to assess the effectiveness and safety of fluoride gels in the prevention of dental caries in children and to examine factors potentially modifying their effectiveness. Relevant randomized or quasi-randomized trials were identified without language restrictions by searching multiple databases, reference lists of articles, and journals and by contacting selected authors and manufacturers. Trials with blind outcome assessment comparing fluoride gel with placebo or no treatment for at least one year and involving children under seventeen years of age were selected. Inclusion decisions, quality assessment, and data extraction were duplicated in a random sample of one third of studies, and consensus was achieved by discussion or a third party. Random effects meta-analysis were performed where data could be pooled. Potential sources of heterogeneity were examined in random effects meta-regression analyses. The main outcome was caries increment measured by the change in decayed, missing, and filled permanent tooth surfaces (DMFS). The primary measure of effect was the prevented fraction (PF) that is the difference in mean caries increment between the treatment and control groups expressed as a percentage of the mean increment in the control group. Potential adverse effects and acceptability of treatment were also recorded. Twenty-five studies were included, involving 7,747 children. For the twenty-three that contributed data for meta-analysis, the DMFS pooled prevented fraction estimate was 28 percent (95 percent CI, 19 percent to 37 percent; p = 0.0001). There was clear heterogeneity, confirmed statistically (p < 0.0001). The effect of fluoride gel varied according to type of control group used, with DMFS PF on average being 19 percent (95 percent CI, 5 percent to 33 percent; p = 0.0009) higher in non-placebo controlled trials. Only two trials reported on adverse events. There is clear evidence of a caries-inhibiting effect of fluoride gel. The best estimate of the magnitude of this effect, based on the fourteen placebo-controlled trials, is a 21 percent reduction (95 percent CI, 14 to 28 percent) in DMFS. This corresponds to an NNT of two (95 percent CI, 1 to 3) to avoid one DMFS in a population with a caries increment of 2.2 DMFS/year, or an NNT of twenty-four (95 percent CI, 18 to 36) based on an increment of 0.2 DMFS/year. However, further work is needed to identify and quantify potential harmful effects of fluoride gels.
Systematic Review of Controlled Trials on the Effectiveness of Fluoride Gels for the Prevention of Dental Caries in Children


Abstract: Fluoride gels have been widely used since the 1970s. The aim of this review was to assess the effectiveness and safety of fluoride gels in the prevention of dental caries in children and to examine factors potentially modifying their effectiveness. Relevant randomized or quasi-randomized trials were identified without language restrictions by searching multiple databases, reference lists of articles, and journals and by contacting selected authors and manufacturers. Trials with blind outcome assessment comparing fluoride gel with placebo control treatment for at least one year and involving children under seventeen years of age were selected. Inclusion criteria, quality assessment, and data extraction were duplicated in a random sample from third of studies, and consensus was achieved by discussion or a third party. Random-effects meta-analyses were performed where data could be pooled. Potential sources of heterogeneity were examined in random-effects meta-regression analyses. The main outcome was caries increment measured by the change in decayed, missing, and filled permanent tooth surfaces (DMFS). The primary measure of effect was the prevention fraction (PF) that is the difference in mean caries increment between the treatment and control groups expressed as a percentage of the mean increment in the control group. Potential adverse effects and unacceptability of treatment were also recorded. Twenty-five studies were included, involving 7,747 children. For the twenty-one trials that contributed data for meta-analysis, the DMFS-pooled prevention fraction estimate was 28 percent (95 percent CI, 19 percent to 37 percent; p < 0.001). There was clear heterogeneity, statistical heterogeneity (p < 0.001). The effect of fluoride gel varied according to type of control group used; with DMFS 95 percent CI, 5 percent to 33 percent, p < 0.001 higher in non-placebo-controlled trials. Only two trials reported on adverse events. There is clear evidence of a caries-inhibiting effect of fluoride gel. The best estimate of the magnitude of this effect, based on the fourteen placebo-controlled trials, is a 21 percent reduction (95 percent CI, 14 to 28 percent) in DMFS. This corresponds to an NNT of 10 (95 percent CI, 1 to 3) to avoid one DMFS in a population with a caries increment of 2.2 DMFS/year, or an NNT of twenty-four (95 percent CI, 14 to 36) based on an increment of 0.2 DMFS/year. However, further work is needed to identify and quantify potential harmful effects of fluoride gels.

Keywords: dental caries, caries prevention, fluoride gel, fluoride, topical application, meta-analysis, systematic review

Submitted for publication 7/1/03, accepted 2/26/03
Evaluation of evidence

- What are the results?
- Are the results valid?
- Will the results help me in caring for my patient(s)?
WELCOME TO A WEB SITE FOR EVIDENCE-BASED DENTISTRY
A practical resource for scientific evidence
Looking for answers? We provide systematically assessed evidence as tools and resources to support your clinical decisions: A practical approach to integrating evidence into your patient care.
## EBD resources

**ADA. Center for Evidence-Based Dentistry™**

[Home] [Systematic Reviews] [Clinical Recommendations] [Resources] [Suggest Clinical Ideas] [For the Patient]

**Home > Resources**

The following links open in a separate browser window. You may need to disable your pop-up blocker for these links to work properly.

### ORGANIZATIONS
- Association of State and Territorial Dental Directors: Guidelines, Recommendations and Evidence-based Practices Resource Links
- Centre for Evidence-Based Dentistry
- Cochrane Collaboration
- DSM-Forsyth Center for Evidence-Based Dentistry
- Evidence-Based Practice Centers—Agency for Healthcare Research and Quality
- International Centre for Evidence-Based Oral Health (UCL Eastman Dental Institute—London, UK)
- Oxford Centre for Evidence-Based Medicine
- University of York NHS Centre for Reviews and Dissemination: Database of Abstracts of Reviews of Effects (DARE)
- NIDCR Dental Practice-Based Research Networks (PERNs)

### CRITICAL APPRAISAL AND EVIDENCE ANALYSIS
- Study Designs and Levels of Evidence (Centre for Evidence-Based Medicine, UK)
- Study Designs and Clinical Decision-making (Medical Journal of Australia)
- Appraisal Tools—Critical Appraisal Skills Programme (Public Health Resource Unit, UK)
- AMSTAR (Assessment of Multiple Systematic Reviews)
- PRISMA Statement
- CONSORT Statement (Consolidated Standards of Reporting Trials)
- Critical Appraisal Tools (Centre for Evidence-Based Medicine, UK)
- **Meta-analysis of Observational Studies in Epidemiology (MOOSE): A Proposal for Reporting**

### SYSTEMATIC REVIEWS
- Cochrane Oral Health Group

### CLINICAL RECOMMENDATIONS/GUIDELINES
- ADA Evidence-Based Clinical Recommendations
- National Guideline Clearinghouse
- PubMed Clinical Queries (National Library of Medicine)
- National Institute for Health and Clinical Excellence (NICE)
- CDC Division of Oral Health
- Scottish Intercollegiate Guidelines Network
- Royal College of Surgeons of England
- TRIP Database, Oral Health page
- Agency for Healthcare Research and Quality (AHRQ)
- SUMSearch
- Centre for Evidence-Based Dentistry (UK)

### TUTORIALS
- Introduction to Evidence-Based Dentistry (Boston University)
- Student’s Guide to the Medical Literature
Evaluation of quality of SR

BMC Medical Research Methodology

Research article
Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews
Beverley J Shea¹,⁵, Jeremy M Grimshaw¹,², George A Wells³, Maarten Boers⁴, Neil Andersson⁵, Candyce Hamel¹⁵, Ashley C Porter⁵, Peter Tugwell², David Moher⁶ and Lex M Bouter¹
ADA member benefits

- Copies of manuscripts for low-cost from ADA library
- Access to full manuscripts of SR by Cochrane
Process overview

- Ask a PICO question

- Search the evidence
  - Technique 1: Quick search
    - SR’s from The Cochrane Collaboration
  - Technique 2: Moderately quick search
    - SR’s and MA’s with CS’s and other high levels of evidence
  - Technique 3: Extensive search and evaluation
    - SR’s and MA’s (or even primary literature) located on PubMed without CS’s
      - Evaluate the quality of evidence
Questions???
Thank you!!