Developing Implementation Strategies and Tools

Jan Clarkson

Co-Editor Cochrane Oral Health Group
Co Director Dental Health Services Research Unit
Director Scottish Dental Clinical Effectiveness Programme
Director Scottish Dental Practice Based Research Network
Good teeth may help sporting success

By James Gallagher
Health and science reporter, BBC News

Mo Farah enjoying Olympic gold

Dentists say elite athletes could stand a better chance of winning gold medals if they look after their teeth.

The Oral Health and Performance in Sport conference in London heard that athletes' oral health was often bad and could impair training and performance.

At the pinnacle of elite sport, the difference between winning and losing is tiny, so even marginal improvements can make a crucial difference.

Doctors for Team GB's boxing squad are already trying to improve oral health.

Disruptive

A study, published in the British Journal of Sports Medicine, showed a fifth of athletes said their oral health damaged their training and performance for the Games.

At the conference, dentists said tooth pain could disrupt sleep and training and that inflammation of the gums could affect the rest of the body, impairing performance.

It is not unusual for poor oral health to have wider effects. The NHS says it is linked to type 2 diabetes and heart problems.

A regular floss, a bottle of mouthwash and good brushing technique are not going to transform a weekend nipper into an Olympian.
Adapted from Graham et al (2006). Lost in Knowledge Translation. Time for a Map? *Journal of Continuing Education for Health Professionals*
For optimum, cost effective maintenance of oral health in adult patients, what is the best recall interval?

What is the clinical and cost effectiveness of filling caries in primary teeth, compared to no treatment?

What is the clinical and cost effectiveness of oral hygiene advice and scale and polish in dental primary care?
IQuaD Participant Recruitment

NIHR HTA HUB Monitoring Meeting, 3 June 2013, London
Welcome

The Cochrane Oral Health Review Group comprises an international network of healthcare professionals, researchers and consumers preparing, maintaining, and disseminating systematic reviews of randomised controlled trials in oral health. Oral health is broadly conceived to include the prevention, treatment, and rehabilitation of oral, dental and craniofacial diseases and disorders.

Click here to read our Newcomer's Guide to COHG.

The Oral Health Group is one of 53 review groups around the world belonging to The Cochrane Collaboration, an international non-profit and independent organisation, providing up-to-date information about the effects of health care.

Oral Health Group reviews and protocols are published on the Cochrane Database of Systematic Reviews (CDSR) on The Cochrane Library, a regularly updated collection of evidence-based healthcare databases available on DVD-ROM and on the Internet.

The most recent issue of The Cochrane Library was Issue 2, released in February 2014. Within it, COHG published:
The Strategy to 2020 is based around achieving four key goals:

**GOAL 1: Producing evidence**
To produce high-quality, relevant, up-to-date systematic reviews and other synthesised research evidence to inform health decision making.

**GOAL 2: Making our evidence accessible**
To make Cochrane evidence accessible and useful to everybody, everywhere in the world.

**GOAL 3: Advocating for evidence**
To make Cochrane the ‘home of evidence’ to inform health decision making, build greater recognition of our work, and become the leading advocate for evidence-informed health care.

**GOAL 4: Building an effective & sustainable organisation**
To be a diverse, inclusive and transparent international organisation that effectively harnesses the enthusiasm and skills of our contributors, is guided by our principles, governed accountably, managed efficiently and makes optimal use of its resources.
Guidance Development

‘supporting the dental team to provide quality patient care’

- Provides user-friendly, evidence-based guidance
- Priority topics for oral health
- Relevant to other healthcare disciplines
- Used within Scotland and beyond
- Underpins education and informs policy
Cranberry juice 'offers little protection against cystitis'

It has been recommended for years, but new research suggests cranberry juice offers little protection against cystitis, writes Cherrill Hicks.
Is flossing your teeth a waste of time?: Dentists nag us about it. Scientists insist it prevents heart disease. But now an expert says they've all got it wrong...

By LUCY ELKINS

Published: 02:38, 23 November 2012 | Updated: 20:53, 23 November 2012

Visits to the dentist are never pleasant. Not only do we have our pearly whites scraped, prodded and drilled, we then have to endure a telling off for not having flossed.

Dentists insist it will keep our teeth sparkling and free from decay, as well as keeping our gums healthy. Regular flossing has even been said to protect us from heart disease.

Yet, for most of us who try wrestling with the tape, it only results in a cricked neck and bleeding gums.

And now, according to a provocative new book, Kiss Your Dentist Goodbye, it seems that dedicated followers of flossing could actually be wasting their time.

Scroll down for video
When To Start Flossing

When Should Children Begin Flossing?

You should start flossing your children's teeth even when they have only their baby (primary) teeth. Once a child's teeth start to fit closely together, usually between the ages of two and six, parents should start to get their children in the habit of flossing daily. As they develop dentistry, you can help them learn to floss. Children usually develop the ability to floss on their own around the age of 10.

To stress the importance of flossing, do it for them regularly until they're able to do it themselves. This will help them develop a good habit of flossing while they still have their baby teeth so that when their permanent teeth come in, they already have flossing worked into their daily oral routine. Use floss that is soft and flexible so that it doesn't hurt their teeth and is comfortable on their gums.

How Can I Help My Child Learn To Floss?

Try tying the floss into small circles or either end of the strand so that your child's fingers can easily fit in. This will help them get a grip on the floss in the early stages before they learn how to hold it on their own. Next, have your child follow these basic flossing steps:

1. Take about 18 inches of floss and loosely wrap most of it around each middle finger leaving an inch of floss between.
2. Gently slide it down between your teeth with your thumb and index fingers holding the floss taut. Be careful not to snap it down on your gums.
3. Place the floss between each tooth in a "C" shape and gently move it up and down the sides of each tooth, including behind the last tooth in the row.
4. Repeat for each side of all teeth.
5. Rinse and dry your mouth after flossing.
6. Floss daily to keep plaque and food from building up between your teeth.

Oral-B Products - Toothbrushes, Toothpaste, Dental Floss
www.oraltb.com/products/
... including toothbrushes, mouthwash, toothpaste, and dental floss to help you designed specifically for the special needs for babies and kids ages 2-7 Years.
Oral-B Rechargeable Electric ... - Manual Toothbrushes - Replacement Brush Heads

Locin Kid's Floss Individually Wrapped Children's Dental Flossers
www.amazon.com/Locin-Kid-Floss..Childrens/dp/B001ET77G6
Locin Kid's Floss dental flossers make flossing fun! Neon colored sparkle flossers and vibrant ecological themes make learning to floss, and learning about...
The Benefits of Chewing Sugarfree Gum

HELP PROTECT TEETH!

New Orbit for Kids is sugarfree and ADA approved, and it comes in two delicious flavors that kids love! Best of all, it can help protect teeth by:

01 Stimulating Saliva Flow
02 Neutralizing Plaque Acids
03 Helping to Keep Teeth Clean

THE BENEFITS OF CHEWING SUGARFREE GUM

Complement your child’s daily brushing routine by letting them enjoy Orbit for Kids sugarfree gum for 20 minutes after eating and drinking, and during those times they can’t brush. Chewing Orbit sugarfree gum can help protect teeth because it:

01 Stimulates Saliva Flow
Chewing sugarfree gum stimulates saliva production—an important defense mechanism to help protect teeth. And healthy teeth mean happy mouths!

02 Neutralizes Plaque Acids
The increased saliva stimulation that comes from chewing sugarfree gum has been demonstrated to neutralize plaque acids. Fabulous!
### Interventions for periodontal health

**Gingivitis:** Loe-Silness Gingival Index (0-3 scale)

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Time (months)</th>
<th>Mean Difference</th>
<th>Number of Trials</th>
<th>Quality of evidence</th>
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<td>-0.08 (-0.13 to 0.03) *</td>
<td>5</td>
<td>moderate</td>
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</table>

* p<0.001
The COMET (Core Outcome Measures in Effectiveness Trials) Initiative brings together people interested in the development and application of agreed standardised sets of outcomes, known as ‘core outcome sets’. These sets represent the minimum that should be measured and reported in all clinical trials of a specific condition, and are also suitable for use in clinical audit or research other than randomised trials. The existence or use of a core outcome set does not imply that outcomes in a particular trial should be restricted to those in the relevant core outcome set. Rather, there is an expectation that the core outcomes will be collected and reported, making it easier for the results of trials to be compared, contrasted and combined as appropriate, while researchers continue to explore other outcomes as well. COMET aims to collate and stimulate relevant resources, both applied and methodological, to facilitate exchange of ideas and information, and to foster methodological research in this area.

When searching the COMET database, please note that a systematic review is currently underway to identify eligible material, and we are continually updating the database as we identify eligible studies. Therefore, the records retrieved by any search might increase on a daily basis.

Search COMET database

The COMET database currently contains 498 references of planned, ongoing and completed work.

Enter Keyword

Search

The keyword used for the search will be compared with study title, abstract and author’s surname.

View full search options

Latest News

- Monday 03 February, 2014 - Raising awareness of the work of the COMET initiative amongst patients and patient involvement groups

COMET recognises the expertise and crucial contribution of patients and carers in developing relevant core outcome sets. It is therefore important to ensure that organisations promoting patient and public involvement in research and those that provide information to patients about clinical trials are aware of the work of COMET. In recent weeks COMET has been linked with two key organisations, INVOLVE and ECRAN.

INVOLVE is a national advisory group that supports greater public involvement in England through National Health Service, public health and social care research (www.invo.org.uk). It shares knowledge and learning on public involvement in research. INVOLVE have recently established an online resource called invoDIRECT on its main website. This resource provides
Full guidance – evidence-based recommendations
clear instructions on how to carry them out

5 Treatment of Periodontal Conditions

5.1 Non-surgical Periodontal Therapy

Non-surgical periodontal therapy begins by motivating and instructing the patient in adequate self-care, followed by re-establishment of a higher level of oral hygiene. Non-surgical instrumentation to disrupt the plaque plaque and remove calculus to give a clean, smooth tooth root surface can then be completed on both supra- and sub-gingivally. However, it is not the intention to deliberately remove tooth substance. Other plaque retentive factors, such as plaque and overhanging restorations, also need to be removed or adjusted (see Section 5.2). Removal of stain, such as caused by tobacco, often motivate patients to improve their oral hygiene. If the patient can achieve good personal oral hygiene, then non-surgical therapy can be highly effective in stabilising periodontal health (see Figure 5.1).

Key to the success of non-surgical periodontal therapy is regular re-enforcement of oral hygiene advice, regular, effective removal of the plaque build-up and, where applicable, smoking cessation advice to bring about a life-long change in patient behaviour. Further discussion of the evidence relevant to this topic is provided in Section 10.6.

The goal of non-surgical periodontal treatment is to achieve signs of periodontal stability which are easy to perform. Optimal outcomes are plaque scores of below 15%, bleeding scores of below 10% (13, 14) and probing depths of less than 4 mm (15, 16). However, this is recognised that this level of improvement may not be achievable for all patients. Patients with significantly improved oral hygiene, reduced bleeding on probing and a considerable reduction in probing depth from baseline can be considered to have responded successfully to treatment and may progress to supportive periodontal therapy (see Section 6).

- Explain to the patient the potential benefits of successful treatment: stabilisation of the disease and reduced risk of tooth loss.
- Explain to the patient the patient’s role in improving periodontal health.
- Make clear that periodontal disease is a chronic condition that needs to be managed.
- Emphasise that management of the disease is a partnership between patient and clinician and requires a lifelong commitment.
- Use the Oral Hygiene TIPPSL behaviour change strategy to highlight the importance of effective plaque removal and to show the patient how he/she can achieve this (see Section 5.2). Where applicable, give the patient smoking cessation advice (see Section 3.3). Emphasise that due to the patient’s history of periodontics, he/she is highly susceptible to even very small amounts of plaque.
- Remove supra-gingival plaque, calculus and stain using an appropriate method. Consider using this opportunity to highlight to the patient areas where supra-gingival deposits are detected.
- Carry out root surface instrumentation at sites of 24 mm probing depth where sub-gingival deposits are present or which bleed on probing. Local anaesthesia may be required for this.
- Advise the patient that he/she may experience some discomfort and sensitivity following treatment and to expect some gingival recession as a result of healing.
- Carry out a full periodontal examination (see Section 2.4) a minimum of eight weeks after treatment.

Figure 5.1 Generalised aggressive periodontitis

Images A and B show patient with generalised aggressive periodontitis before treatment. The panoramic radiograph (C) shows severe generalized horizontal bone loss up to 50% of root length with an alveolar ridge defect. After root canal treatment (D), a glass ionomer post-core restoration (E) is placed. Figure 5.2 shows the improvement in the appearance of the gingiva with a reduction in inflammation, redness and swelling.

Nomenclature

In this guidance, the cleaning of the sub-gingival root surface is termed root surface instrumentation (RSI). It can equally be called root surface debridement (RSD). This technique aims to mechanically remove sub-gingival plaque and calculus without any intentional removal of the root surface. However, it is accepted that since root surface instrumentation is conducted blind, some removal of the root surface (denudation) may inadvertently occur.

Instrumentation

Root surface instrumentation (RSI) can be performed using either hand instruments or powered applicators (sonic or ultrasonic) (see Figure 5.2). Successful utilisation of these instruments requires a thorough understanding of root anatomy and knowledge of which instrument works best in a particular area.
Focus on oral hygiene demonstration
Oral Hygiene TIPPS

- Talk
- Instruct
- Practise
- Plan
- Support

Video produced to aid implementation of OH TIPPS

Photographs: www.angusbremner.com
Guidance in Brief

Assessment and Diagnosis

Use of Radiographs

- Radiographs are indicated: for patients having radiographs or scans and consultant views using the long range radiographic technique in patients, they should be at risk of oral health problems. The guidance was to support the dental team to:
- Improve oral health at all the presented
- Improve management of oral health
- Improve the overall dental health at the presentation

Management and Diagnosis

- Early in treatment, patients who have been risk factors (e.g., smoking, diabetes) that may be a risk of developing oral health disease and are 10% within the full problem
- Explain to patients how oral health problems, such as periodontal disease and oral health issues, and their risk factors

Basic Periapical Examination (BPE)

- Carry out a periapical examination of all teeth with visible radiographic status and assess the need for further investigation and treatment
- For patients with a BPE category of 0 or with a BPE score of 1 in the strategy to the patient’s dental health
- Explain to patients how to maintain oral health
- For patients with a BPE score of 2, a periodontal examination and treatment is recommended to maintain oral health
- For patients with a BPE score of 3, a periodontal examination and treatment is recommended to maintain oral health

Patients and General Health

- Refer to medical teams and general health teams such as the GP
- Physical activity
- Nutrition and smoking cessation

The full guidance can be downloaded from www.scotlanddental.org.uk

Education for a Healthier Scotland

NHS Education for Scotland
Translating SDCEP guidance into practice

- Widespread translation of SDCEP guidance into practice is unlikely to be achieved through publication and dissemination

- Dissemination and implementation strategies
  - seldom explicit theoretical rationale for intervention choice
  - The ISLAGIATT\(^1\) Principle
    It **Seemed Like A Good Idea At The Time**
  - unable to predict what works where and when
  - majority of studies conducted in USA
  - few conducted in dental practice

1. Martin Eccles, Emeritus Professor of Clinical Effectiveness
TRiADS Aim

To improve the quality of the dental healthcare of patients in Scotland by:

- establishing a practical evaluative framework
- conducting and evaluating a programme of integrated, multi-disciplinary, knowledge translation research embedded within SDCEP

**STUDY PROTOCOL**

The translation research in a dental setting (TRiADS) programme protocol

Jan E Clarkson¹, Craig R Ramsay², Martin P Eccles³, Sandra Eldridge⁴, Jeremy M Grimshaw⁵, Marie Johnston⁶, Susan Michie⁷, Shaun Treweek⁸, Alan Walker⁹, Linda Young¹⁰, Irene Block¹, Debbie Bonetti¹, Heather Cassie¹, Jill Francis¹, Gillian Mackenzie¹⁰, Lorna MacPherson¹¹, Lorna McKee¹, Nigel Pitts¹, Jim Rennie¹², Doug Stirling¹⁰, Colin Tilley¹³, Carole Torgerson¹¹, Luke Vale²

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SDCEP Guidance - Define Scope

TRiADS - Define Professional Behaviour Outcomes

SDCEP Guidance Development Group identify and prioritise professional behaviour outcomes to assess best practice

SDCEP Guidance - Consultation Period

TRiADS - Diagnostic Analysis

Identify barriers and enablers to best practice using questionnaires and interviews with GDPs/DCPs

SDCEP Guidance - Develop Consultation Draft

Measure variation in professional behaviour using routine or bespoke data

SDCEP Guidance - Publication and Dissemination Period

TRiADS - Determine the Need for and Design of Knowledge Translation Intervention

Identify trend and step changes following publication of guidance

TRiADS - Collect Data from Steps Above and Collate With Each Guidance Experience to Synthesise What is Known About Changing Each Set of Behaviours

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Clarkson et al. Implementation Science 2010, 5:57
http://www.implementationscience.com/content/5/1/57
Underpinning the TRiaDS Process

- KT requires behaviour change
  - determinants of behaviour
  - barriers and facilitators to change
  - effective interventions to effect change
- An alternative to ISLAGIATT – integrative theoretical frameworks

**Implementation Science**

This Provisional PDF corresponds to the article as it appeared upon acceptance. Fully formatted PDF and full text (HTML) versions will be made available soon.

**The Behaviour Change Wheel: a new method for characterising and designing behaviour change interventions**

*Implementation Science* 2011, 6:42  
doi:10.1186/1748-5908-6-42

Susan Michie (s.michie@ucl.ac.uk)  
Maartje M van Stralen (MM.vanStralen@vumc.nl)  
Robert West (robertwest100@googlemail.com)
The TRiaDS Process

- Scoping

- Define professional behaviour outcomes

- Diagnostic analyses
  - What determines the target behaviour(s)?
  - barriers and facilitators to change

- Determine the need for and design of an additional KT intervention?
  - What are the potential interventions and BCTs that might effect the desired change?

- Evaluation
Choosing the Target Behaviour

- Identify all possible behaviours to change
- Consider each one in terms of
  - **who** needs to do **what** differently **where, when and how**
  - its likely impact
  - how easy it is to change – likelihood of implementation
  - possible spill-over effects
  - if it can be measured?
- Don’t try to change all behaviours at once
  - Incremental change likely to be more effective
- For the chosen target behaviour we need to understand
  - why is the behaviour as it is
Diagnostic Analyses – COM-B

- **Capability**
  - Psychological or physical ability to enact the behaviour

- **Motivation**
  - Reflective and automatic mechanisms that activate or inhibit behaviour

- **Opportunity**
  - Physical and social environment that enables the behaviour

- **Behaviour**

  Michie et al (2011) *Implementation Science*
Theoretical Domains Framework

Extends the COM-B used to diagnose implementation problems

1. Knowledge
2. Cognitive and interpersonal skills
3. Physical skills
4. Social/Professional role and identity
5. Beliefs about capabilities
6. Beliefs about consequences
7. Goals
8. Social influences
9. Emotion
10. Behavioural regulation
11. Optimism
12. Memory, attention and decision processes
13. Intentions
14. Reinforcement
Theoretical Domains Framework

1. Knowledge
2. Cognitive and interpersonal skills
3. Physical skills
4. Social/Professional role and identity
5. **Beliefs about capabilities**
6. Beliefs about consequences
7. Goals

**Constructs (examples)**
- Self-confidence
- Perceived professional competence
- Self-esteem
- Perceived behavioural control
Questions to Identify Relevant Constructs

1. Knowledge
2. Cognitive and interpersonal skills
3. Physical skills
4. Social/Professional role and identity
5. Beliefs about capabilities
6. Beliefs about consequences
7. Goals

Question (examples)
- How difficult is it to do x
- How confident are they that they can do x despite difficulties
- How capable do they think they are to do x
- What would help them do x
Starting point for TRiaDS Diagnostic analyses

Sources of behaviour

Michie et al (2011) *Implementation Science*
Sources of behaviour

TDF Domains

Soc - Social influences
Env - Environmental Context and Resources
Id - Social/Professional Role and Identity
Bel Cap - Beliefs about Capabilities
Opt - Optimism
Int - Intentions
Goals - Goals
Bel Cons - Beliefs about Consequences
Reinf - Reinforcement
Em - Emotion
Know - Knowledge
Cog - Cognitive and interpersonal skills
Mem - Memory, Attention and Decision Processes
Beh Reg - Behavioural Regulation
Phys - Physical skills

Michie et al.
## Implementing the TRiaDS framework

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<tr>
<th>Guidance Topic</th>
<th>Inform Scope</th>
<th>Define Professional Behaviour Outcomes</th>
<th>Diagnostic Analysis</th>
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Prevention and Management of Dental Caries in Children
April 2010

6 Caries Prevention

6.3 Dietary Advice

Frequent sugar consumption is the major cause of dental caries.

- *At least once a year, give dietary advice for oral health as follows:*
  - Restrict fixed and drinks containing sugar to no more than four occasions in any one day.
  - Cortisone-containing products and sweets, must not be used in children under 5 years of age.
  - After the age of 1 year, use toothpaste containing fluoride in moderation.
  - Use a soft toothbrush. Use a soft toothbrush. Use a soft toothbrush.

**Brushing Technique**

- Encourage the parent/patient to brush twice a day, at least twice a week, and every time between meals.
- Use a soft toothbrush and fluoride toothpaste. Use a soft toothbrush and fluoride toothpaste. Use a soft toothbrush and fluoride toothpaste.
- Using a soft toothbrush, gently brush the teeth in a circular motion, using a gentle, rotatory motion.
- Brush all teeth surfaces, including the ones behind the back teeth.

**Flossing Technique**

- For motivated parents/careers: encourage using dental floss, or fissure sealants, for the D.T.S. (x1-3 times per week).
- This is particularly important when the milk teeth are involved.

**Toothbrushing Instruction Technique**

- Demonstrate the correct technique, using the child’s own toothbrush.
- Your child should be able to brush their teeth without supervision.
- Practice brushing techniques with your child.
- Ensure that the child understands the importance of brushing.
- Use a timer to help the child brush for a set amount of time.
- Encourage the child to brush their teeth twice a day, using a soft toothbrush.

**Habits**

- Avoid giving children sweets or sugary drinks before bed.
- Avoid giving children sugary drinks before bed:
  - Milk
  - Juice
  - Water
  - Avoid giving children sugary drinks before bed:
    - Milk
    - Juice
    - Water
  - Avoid giving children sugary drinks before bed:
    - Milk
    - Juice
    - Water
**Guideline Request**

**Fluoride varnish versus placebo/no treatment**

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<td>0.45086685</td>
<td>1.9%</td>
<td>-0.18 [-1.06, 0.71]</td>
<td>2007</td>
<td></td>
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<tr>
<td>Milsom 2011</td>
<td>0.0299</td>
<td>0.14444597</td>
<td>7.9%</td>
<td>0.03 [-0.25, 0.31]</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>Tagliaferro 2011</td>
<td>0.4211</td>
<td>0.2445</td>
<td>4.8%</td>
<td>0.42 [-0.06, 0.90]</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>Gugwad 2011</td>
<td>1.8772</td>
<td>0.83164576</td>
<td>0.6%</td>
<td>1.88 [0.25, 3.51]</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>Arruda 2012</td>
<td>0.4028</td>
<td>0.091</td>
<td>10.1%</td>
<td>0.40 [0.22, 0.58]</td>
<td>2012</td>
<td></td>
</tr>
</tbody>
</table>

**Total (95% CI)**

100.0% 0.43 [0.30, 0.57]

Heterogeneity: Tau² = 0.04; Chi² = 48.38, df = 12 (P < 0.00001); I² = 75%

Test for overall effect: Z = 6.36 (P < 0.00001)

- **D(M)FS pooled prevented fraction = 43%**
Fissure Sealants
Resin-based sealant compared to control without sealant for preventing dental caries

**Patient or population:** Children and adolescents  
**Settings:** Sealant applications for school children in USA, Canada, China & Colombia  
**Intervention:** Resin-based sealant applications on occlusal tooth surfaces of permanent molars  
**Comparison:** No sealant application

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Illustrative comparative risks* (95% CI)</th>
<th>Relative effect (95% CI)</th>
<th>Number of participants (studies)</th>
<th>Quality of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control teeth</strong></td>
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<tr>
<td>Dentine caries in permanent molars</td>
<td>Incidence of carious first molars (40%)</td>
<td>OR 0.12 (0.07 to 0.19)</td>
<td>1259 children randomised &amp; 1066 evaluated after 2 years (6 studies)</td>
<td><img src="https://example.com/moderate" alt="moderate" /></td>
<td>Benefits of resin-sealant maintained up to at least 48 months of follow-up²</td>
</tr>
<tr>
<td></td>
<td>(63 per 1000)</td>
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<td></td>
<td>(38 to 98)</td>
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<td></td>
<td><img src="https://example.com/moderate" alt="moderate" /></td>
<td>Benefits of resin-based sealant maintained up to at least 48 months of follow-up²</td>
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<td><img src="https://example.com/moderate" alt="moderate" /></td>
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</tbody>
</table>

**CI:** confidence interval; **OR:** odds ratio

**GRADE Working Group grades of evidence**  
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.  
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.  
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.  
**Very low quality:** We are very uncertain about the estimate.

¹ The incidence of carious control teeth in the five split-mouth trials included in this comparison ranged from 37% to 69% (studies published between 1976 and 1979). We have shown the effect of sealants at each end of this range. These studies did not give information on the baseline caries prevalence of the children.

The sixth study included in this meta-analysis (parallel group study published in 2012) reported clearly lower incidence of carious first molars than the five split-mouth studies. In sealant group, carious first molars were detected in 9 out of 121 children (7.4%) (11 carious teeth out of 367 sealed teeth) and in placebo group in 21 out of 124 children (17%) (28 carious teeth out of 379 placebo teeth). Caries prevalence: mean baseline dmft level of 3.4.
Is fee & education more effective than either strategy alone?

908 GDP Population

337 Sampled

130 refused/no response

58 ineligible

149 Recruited

Randomised

Control
25%

Fee
35%

Education
31%

Both
27%
This research led to a change in policy on 1st April 2006.

2008/09/10/11/12
40 000 claims for preventive fissure sealants
120 000 sealants placed cost £930 000

No change in restorative fissure sealants
Figure 11: Proportion of D₃MFT, fissure-sealed and apparently sound, and apparently sound but NOT sealed first permanent molars in P7 children in 2013 by SIMD decile.
Prevention and management of dental caries in children
GDP surveys Apr 2010 & Jan 2011

Give Toothbrushing Advice

- Pre Guidance
- Post Guidance

Pre Guidance
- Rarely/Never
- Sometimes
- Usually
- Always

Post Guidance
- Rarely/Never
- Sometimes
- Usually
- Always

Demonstrate Toothbrushing

- Pre Guidance
- Post Guidance

Pre Guidance
- Rarely/Never
- Sometimes
- Usually
- Always

Post Guidance
- Rarely/Never
- Sometimes
- Usually
- Always

Apply Fluoride Varnish

- Pre Guidance
- Post Guidance

Pre Guidance
- Rarely/Never
- Sometimes
- Usually
- Always

Post Guidance
- Rarely/Never
- Sometimes
- Usually
- Always

Place Preventive Fissure Sealants

- Pre Guidance
- Post Guidance

Pre Guidance
- Rarely/Never
- Sometimes
- Usually
- Always

Post Guidance
- Rarely/Never
- Sometimes
- Usually
- Always

Quality Education for a Healthier Scotland
Fluoride varnish – free text

A useful adjunct but not a replacement for establishing good patient habits

“...some parents will think that this application is all their child needs – I have to stress to them that this is just a boost. The best way for fluoride application is still twice daily by personal brushing.”

“...We do use fluoride in our preventative regime but cannot equate a twice yearly coating of F1 varnish as effective as good diet habits and F1 toothpaste used twice daily for long term use...”

Many children find the taste unpleasant – this can affect the relationship between the child and the dentist and create problems at the next appointment
Fissure sealants – free text

Often difficult to achieve good moisture control

“Correct placement of fissure seals, especially in a difficult patient when attempting ideal moisture control, can be difficult to do and is often underestimated by clinicians I feel.”

Can lead to undetected caries

“I personally don't like to place fissure seals as I feel these often disguise decay.”

“...I see fissure sealants done by other dentists failing all the time with huge amounts of undetected caries. Either quality was poor or poor OH will always lead to caries regardless of sealant quality...”

Need to be maintained

“I personally feel fissure sealants can do more damage especially high risk where the patients would not be brought in to get them replaced when needed...”
Nursery toothbrushing saves £6m in dental costs

A scheme to encourage nursery children to brush their teeth has saved more than £6m in dental costs, according to a new study.

Childsmile involves staff at all Scottish nurseries offering free supervised toothbrushing every day.

Glasgow researchers found that the scheme had reduced the cost of treating dental disease in five-year-olds by more than half between 2001 and 2010.

The programme was launched in 2001 and costs about £1.8m a year.

It emphasises the importance of toothbrushing and helps parents establish a healthy diet from the earliest stage.

A number of nurseries and schools in targeted areas also provide fluoride varnish and toothbrushing in primary one and two.

An evaluation, funded by the Scottish government and carried out by Glasgow University, found that fewer children needed dental extractions, fillings or general anaesthetics as a result of the programme.

'Less toothache'

There was also said to be a drop in the number of children needing hospital treatment for dental problems, freeing up operating theatres.

Public Health Minister Michael Matheson said: "This is an amazing achievement and shows just how much can be saved from a very simple health intervention.

"This has seen less tooth decay in children which means less toothache,
Preventing Dental Caries: School-Based Dental Sealant Delivery Programs

Task Force Finding and Rationale Statement

Definition

Dental (pit and fissure) sealants are clear or opaque plastic resinous materials applied to the chewing surfaces of the back teeth to prevent dental caries. School-based dental sealant delivery programs provide dental sealants to students either onsite at schools (using portable dental equipment) or offsite in dental clinics. These programs often target schools in low socioeconomic status (SES) neighborhoods, often identified based on the percentage of children eligible for the federal free or reduced-price meal programs. Some programs may target individuals within a school, based on their risk for caries.

Application demands meticulous technique, and licensed dental health professionals should consult manufacturer’s instructions for specific sealant products.

Task Force Finding

The Community Preventive Services Task Force recommends school-based sealant delivery programs based on strong evidence of effectiveness in preventing tooth decay among children. This recommendation is based on evidence that shows these programs increase the number of children who receive sealants at school, and that dental sealants result in a large reduction in tooth decay among school-aged children (5 to 16 years of age).

Rationale

Basis of Finding

The Task Force finding is based on four studies of sealant delivery programs in which sealants were applied within the school setting, and one high quality systematic review (Ahoovo-Salaranta et al. 2013; search period 1946-2012; 34 included studies) evaluating the efficacy of sealants in school-aged children. Based on this updated review, the previous Task Force finding of strong evidence of effectiveness for this intervention remains the same.

The systematic review included 34 trials, 12 of which compared sealants with no sealants for the prevention of caries in children. The four studies of school-based, onsite, sealant delivery programs reported on caries incidence (2 studies), sealant placement (2 studies), and health disparities (2 studies).
## COM-B – BCW Intervention matrix

<table>
<thead>
<tr>
<th>COM-B</th>
<th>Education</th>
<th>Persuasion</th>
<th>Incentivisation</th>
<th>Coercion</th>
<th>Training</th>
<th>Restriction</th>
<th>Environmental Restructuring</th>
<th>Modelling</th>
<th>Enablement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical capability</td>
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<td>Psychological capability</td>
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<td>Physical opportunity</td>
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<td>Social opportunity</td>
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<td>Automatic motivation</td>
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<td>Reflective motivation</td>
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</table>

Michie et al (2011) *Implementation Science*
Look, progress! Key domains selected for future stakeholder meeting.
Antibiotic Prescribing in Dentistry

• Antimicrobial resistance is recognised as a major threat to public health and patient safety

• Antibiotic prescribing in dentistry now accounts for 9% of total antibiotic prescribing in primary care in Scotland

• The overall use of antibiotics in dentistry was 7.6% higher in 2011 than in 2010
  • The increase in use by dentists was greater than the overall increase in primary care
Total prescribing by dentists

- **Quarterly Breakdown:**
  - April-June 2007 (Apr-Jun 07)
  - July-September 2007 (Jul-Sep 07)
  - October-December 2007 (Oct-Dec 07)
  - January-March 2008 (Jan-Mar 08)
  - April-June 2008 (Apr-Jun 08)
  - July-September 2008 (Jul-Sep 08)
  - October-December 2008 (Oct-Dec 08)
  - January-March 2009 (Jan-Mar 09)
  - April-June 2009 (Apr-Jun 09)
  - July-September 2009 (Jul-Sep 09)
  - October-December 2009 (Oct-Dec 09)
  - January-March 2010 (Jan-Mar 10)
  - April-June 2010 (Apr-Jun 10)
  - July-September 2010 (Jul-Sep 10)
  - October-December 2010 (Oct-Dec 10)
  - January-March 2011 (Jan-Mar 11)
  - April-June 2011 (Apr-Jun 11)
  - July-September 2011 (Jul-Sep 11)
  - October-December 2011 (Oct-Dec 11)
  - January-March 2012 (Jan-Mar 12)

- **Categories:**
  - Antibiotics
  - Ear, nose, & oropharynx
  - Fluoride
  - Analgesics
  - Hypnotics
  - Other

- **Note:** SDCEP Ed 1 indicates a specific intervention or event in the data.
70% reduction in prescribing of amoxicillin 3g following publication of national guidance
RAPiD – Trial Design

General Dental Practices Randomised (795)

Control Group (163)
- Current Practice No A&F

Intervention Group (632)
- Audit & Feedback (316)
- Audit & Feedback + Text Based Intervention (316)

0.6 months with comparator (79)
0.6, 9 months with comparator (79)
0.6, 9 months without comparator (79)
0.6 months with comparator (79)
0.6 months without comparator (79)
0.6, 9 months with comparator (79)
0.6, 9 months without comparator (79)
Prescribing courses of antibiotic treatment can encourage the development of antimicrobial resistance and therefore must be kept to a minimum.

As a first step in the treatment of bacterial infections, use local measures. For example, drain pus if present in dental abscesses by extraction of the tooth or through root canals, and attempt to drain any soft-tissue pus by incision.

This should be the first step even if patients request antibiotics and even when time is short. Antibiotics are appropriate for oral infections where there is evidence of spreading infection, systemic involvement or persistent swelling despite local treatment.

Use antibiotics in conjunction with, and not as an alternative to, local measures.

If you would like to discuss any part of this feedback please contact: Dr Paula Elouafkaoui, Tel: 01382 740913, e-mail: TRiaDS@nes.scot.nhs.uk.
Predicted percentage of adults with no teeth

Summary of findings for the main comparison. Chlorhexidine (mouthrinse or gel) versus placebo/usual care for critically ill patients to prevent ventilator-associated pneumonia (VAP)

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Placebo or usual care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes</td>
<td>Illustrative comparative risks* (95% CI)</td>
</tr>
<tr>
<td></td>
<td>Assumed risk</td>
</tr>
<tr>
<td>VAP</td>
<td>242 per 1000 (136 to 157)</td>
</tr>
<tr>
<td>Mortality</td>
<td>238 per 1000 (215 to 303)</td>
</tr>
<tr>
<td>Duration of ventilation</td>
<td>The mean duration of ventilation in the control groups ranged from 7 to 9 days</td>
</tr>
<tr>
<td>Duration of ICU stay</td>
<td>The mean duration of ICU stay in the control groups ranged from 10 to 24 days</td>
</tr>
</tbody>
</table>

*The basis for the assumed risk (e.g., the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).

GRADE Working Group grades of evidence

High quality: Further research is very unlikely to change our confidence in the estimate of effect
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate
Low quality: Further research is very likely to have important impact on our confidence in the estimate of effect and is likely to change the estimate
Very low quality: We are very uncertain about the estimate

2 studies at high risk of bias, 11 at unclear risk of bias and 4 at low risk of bias.

Assumed risk is based on the outcomes in the control groups of the included studies.

Summary of findings 2 Tooth brushing (±chlorhexidine) versus no tooth brushing (±chlorhexidine) for critically ill patients to prevent
How to Choose?

The APEASE Criteria

- Affordability
- Practicability
- Effectiveness and cost-effectiveness
- Acceptability
- Side effects/safety
- Equity

- COM-B and TDF can only guide intervention design need to consider other factors