Routine scale and polish for periodontal health in adults (Review)

Worthington HV, Clarkson JE, Bryan G, Beirne PV

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in The Cochrane Library 2013, Issue 11

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# Table of Contents

- **Header** .......................... 1
- **Abstract** .......................... 1
- **Plain Language Summary** ........... 2
- **Summary of Findings for the Main Comparison** .......... 4
- **Background** ......................... 5
- **Objectives** .......................... 6
- **Methods** ............................ 6
- **Results** .............................. 9
  - Figure 1 ............................. 12
  - Figure 2 ............................. 13
- **Additional Summary of Findings** ......... 16
- **Discussion** ......................... 19
- **Authors’ Conclusions** ............... 21
- **Acknowledgements** .................. 21
- **References** .......................... 28
- **Characteristics of Studies** ............ 43
- **Data and Analyses** .................. 43
  - Analysis 1.1. Comparison 1 Scale and polish versus no scale and polish (control), Outcome 1 Gingivitis at 24 months. 44
  - Analysis 1.2. Comparison 1 Scale and polish versus no scale and polish (control), Outcome 2 Calculus at 24 months. 45
  - Analysis 1.3. Comparison 1 Scale and polish versus no scale and polish (control), Outcome 3 Plaque at 24 months. 46
  - Analysis 2.1. Comparison 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of perio, Outcome 1 Gingivitis at 24 months. 46
  - Analysis 2.2. Comparison 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of perio, Outcome 2 Plaque at 24 months. 47
  - Analysis 2.3. Comparison 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of perio, Outcome 3 Pocket depth at 24 months. 47
  - Analysis 3.1. Comparison 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval, Outcome 1 S&P: 3-monthly versus 6-monthly (with OHI). 48
  - Analysis 3.2. Comparison 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval, Outcome 2 S&P: 3-monthly versus 12-monthly (with OHI). 49
  - Analysis 3.3. Comparison 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval, Outcome 3 S&P: 3-monthly versus 12-monthly (without OHI). 50
  - Analysis 3.4. Comparison 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval, Outcome 4 S&P: 6-monthly versus 12-monthly (with OHI). 51
  - Analysis 4.1. Comparison 4 Scale and polish at a fixed interval with OHI versus scale and polish without OHI at the same fixed interval, Outcome 1 S&P every 3 months with OHI versus without OHI. 52
  - Analysis 4.2. Comparison 4 Scale and polish at a fixed interval with OHI versus scale and polish without OHI at the same fixed interval, Outcome 2 S&P every 12 months with OHI versus without OHI. 53
- **Additional Tables** .................. 53
- **Appendices** ........................ 63
- **What’s New** .......................... 66
- **History** .............................. 66
- **Contributions of Authors** .......... 66
- **Declarations of Interest** ............. 67
- **Sources of Support** ................. 67
- **Differences Between Protocol and Review** ............. 67
- **Index Terms** ......................... 68

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**Routine scale and polish for periodontal health in adults (Review)**

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Routine scale and polish for periodontal health in adults

Helen V Worthington¹, Jan E Clarkson¹ ², Gemma Bryan¹, Paul V Beirne³

¹Cochrane Oral Health Group, School of Dentistry, The University of Manchester, Manchester, UK. ²Dental Health Services Research Unit, University of Dundee, Dundee, UK. ³Department of Epidemiology and Public Health, University College Cork, Cork, Ireland

Contact address: Helen V Worthington, Cochrane Oral Health Group, School of Dentistry, The University of Manchester, Coupland III Building, Oxford Road, Manchester, M13 9PL, UK. helen.worthington@manchester.ac.uk.

Editorial group: Cochrane Oral Health Group.

Publication status and date: New search for studies and content updated (no change to conclusions), published in Issue 11, 2013.

Review content assessed as up-to-date: 15 July 2013.


ABSTRACT

Background

Many dentists or hygienists provide scaling and polishing for patients at regular intervals, even if those patients are considered to be at low risk of developing periodontal disease. There is debate over the clinical effectiveness and cost effectiveness of ‘routine scaling and polishing’ and the ‘optimal’ frequency at which it should be provided for healthy adults.

A ‘routine scale and polish’ treatment is defined as scaling or polishing or both of the crown and root surfaces of teeth to remove local irritational factors (plaque, calculus, debris and staining), that does not involve periodontal surgery or any form of adjunctive periodontal therapy such as the use of chemotherapeutic agents or root planing.

Objectives

The objectives were: 1) to determine the beneficial and harmful effects of routine scaling and polishing for periodontal health; 2) to determine the beneficial and harmful effects of providing routine scaling and polishing at different time intervals on periodontal health; 3) to compare the effects of routine scaling and polishing with or without oral hygiene instruction (OHI) on periodontal health; and 4) to compare the effects of routine scaling and polishing provided by a dentist or dental care professional (dental therapist or dental hygienist) on periodontal health.

Search methods

We searched the following electronic databases: the Cochrane Oral Health Group’s Trials Register (to 15 July 2013), CENTRAL (The Cochrane Library 2013, Issue 6), MEDLINE via OVID (1946 to 15 July 2013) and EMBASE via OVID (1980 to 15 July 2013). We searched the metaRegister of Controlled Trials and the US National Institutes of Health Clinical Trials Register (clinicaltrials.gov) for ongoing and completed studies to July 2013. There were no restrictions regarding language or date of publication.

Selection criteria

Randomised controlled trials of routine scale and polish treatments (excluding split-mouth trials) with and without OHI in healthy dentate adults, without severe periodontitis.

Data collection and analysis

Two review authors screened the results of the searches against inclusion criteria, extracted data and assessed risk of bias independently and in duplicate. We calculated mean differences (MDs) (standardised mean differences (SMDs) when different scales were reported) and 95% confidence intervals (CIs) for continuous data and, where results were meta-analysed, we used a fixed-effect model as there were fewer than four studies. Study authors were contacted where possible and where deemed necessary for missing information.
Main results

Three studies were included in this review with 836 participants included in the analyses. All three studies are assessed as at unclear risk of bias. The numerical results are only presented here for the primary outcome gingivitis. There were no usable data presented in the studies for the outcomes of attachment change and tooth loss. No studies reported any adverse effects.

- Objective 1: Scale and polish versus no scale and polish

Only one trial provided data for the comparison between scale and polish versus no scale and polish. This study was conducted in general practice and compared both six-monthly and 12-monthly scale and polish treatments with no treatment. This study showed no evidence to claim or refute benefit for scale and polish treatments for the outcomes of gingivitis, calculus and plaque. The MD for six-monthly scale and polish, for the percentage of index teeth with bleeding at 24 months was -2% (95% CI -10% to 6%; P value = 0.65), with 40% of the sites in the control group with bleeding. The MD for 12-monthly scale and polish was -1% (95% CI -9% to 7%; P value = 0.82). The body of evidence was assessed as of low quality.

- Objective 2: Scale and polish at different time intervals

Two studies, both at unclear risk of bias, compared routine scale and polish provided at different time intervals. When comparing six with 12 months there was insufficient evidence to determine a difference for gingivitis at 24 months SMD -0.08 (95% CI -0.27 to 0.10). There were some statistically significant differences in favour of scaling and polishing provided at more frequent intervals, in particular between three and 12 months for the outcome of gingivitis at 24 months, with OHI, MD -0.14 (95% CI -0.23 to -0.05; P value = 0.003) and without OHI MD -0.21 (95% CI -0.30 to -0.12; P value < 0.001) (mean per patient measured on 0-3 scale), based on one study. There was some evidence of a reduction in calculus. This body of evidence was assessed as of low quality.

- Objective 3: Scale and polish with and without OHI

One study provided data for the comparison of scale and polish treatment with and without OHI. There was a reduction in gingivitis for the 12-month scale and polish treatment when assessed at 24 months MD -0.14 (95% CI -0.22 to -0.06) in favour of including OHI. There were also significant reductions in plaque for both three and 12-month scale and polish treatments when OHI was included. The body of evidence was once again assessed as of low quality.

- Objective 4: Scale and polish provided by a dentist compared with a dental care professional

No studies were found which compared the effects of routine scaling and polishing provided by a dentist or dental care professional (dental therapist or dental hygienist) on periodontal health.

Authors’ conclusions

There is insufficient evidence to determine the effects of routine scale and polish treatments. High quality trials conducted in general dental practice settings with sufficiently long follow-up periods (five years or more) are required to address the objectives of this review.

Plain Language Summary

Routine scale and polish for periodontal health in adults

Review question

Scaling and polishing of the teeth may reduce deposits (plaque and calculus), as well as bleeding and inflammation of the gums (gingivitis). Over time a reduction in gingivitis (a milder form of gum disease) will reduce progression to periodontitis (a severe gum disease).

This review examines the evidence for the effects of routine scale and polish treatment. It has been carried out by authors of the Cochrane Oral Health Group to assess the benefits or otherwise of routine scale and polish treatments for healthy adults; to establish whether different time intervals between treatments influence these; to assess if the treatment is more effective if given together with instruction on how best to maintain healthy gums, and to compare the effectiveness of the treatment when given either by a dentist or by a dental therapist or hygienist.

Background

Routine scale and polish for periodontal health in adults (Review)

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Many dentists or hygienists provide regular scaling and polishing for most patients at regular intervals even if they are considered to be at low risk of developing gum disease. There is debate about the clinical effectiveness of scaling and polishing and what is the best time interval between treatments.

For the purposes of this review a ‘routine scale and polish’ is scaling and polishing of both the crown and root surfaces to remove deposits of (mainly) bacteria called plaque, and also hardened plaque known as calculus (tartar). Calculus is so hard it cannot be removed by toothbrushing alone and this along with plaque, other debris and staining on the teeth is removed by the scale and polish treatment. Scaling or removal of hardened deposits is done with specially designed dental instruments or ultrasonic scalers and polishing is done mechanically with special pastes.

In this review scaling above and below the gum level is included, however any surgical procedure on the gums, any chemical washing of the space between gum and tooth (pocket) and more intense (root planing) scraping of the root than simple scaling is excluded.

**Study characteristics**

The evidence on which this review is based was correct as of 15 July 2013.

Three trials with 836 participants were included in this review, ranging from 61 to 470 in each trial. Participants in two trials were adults aged 18 to 73, in the other trial young air force cadets.

One study included patients attending three general dental practices for check-up appointments. Only patients with calculus or bleeding on probing and pockets between teeth and gums less than 3.5 mm were included. One study included young adult male US Air Force cadets and the other patients attending a dental school hygiene clinic. All participants had varying degrees of gingivitis but no evidence of loss of the bone that the teeth are anchored in (alveolar bone) which is caused by periodontitis.

**Key results**

The most pertinent result found was from one study which was based in general practice, the most appropriate setting. This study did not show either a benefit or harm for regular six or 12-month scale and polish treatments when compared to no scale and polish. However, the study on young air force cadets compared scale and polish treatments at different time intervals and did find some differences for gingivitis, plaque and calculus when three-month treatments were compared with annual treatments, favouring the three-month treatments. This study also looked at whether the treatment should include both scale and polish and oral hygiene instruction. There were reductions in gingivitis, plaque and calculus. No studies compared dentists with other oral health professionals.

Scaling is an invasive procedure and associated with a number of adverse effects including damaged to tooth surfaces and tooth sensitivity. This information was not captured or reported on by the included studies.

None of the studies included in this review reported on patient-centred outcomes such as quality of life or economic outcomes.

**Quality of the evidence**

Given the considerable resources involved in providing this treatments for adults in many countries it is disappointing that there is so little good quality, reliable research evidence available to inform clinical practice. The quality of the evidence was generally low, with one of the included studies being more appropriate than the others.
**SUMMARY OF FINDINGS FOR THE MAIN COMPARISON**

Routine scale and polish compared with no treatment for periodontal health

**Patient or population:** Healthy dentate adults  
**Settings:** General dental practice  
**Intervention:** Routine scale and polish (either 6-monthly or 12-monthly)  
**Comparison:** No treatment

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Relative effect (95% CI)</th>
<th>No of participants (studies)</th>
<th>Quality of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Gingivitis (proportion of index sites bleeding) at 24 months  
6-monthly scale and polish  
Mean proportion in control group is 0.40 sites | MD -0.02 (-0.10 to 0.06) | 1 study^1^ (207 participants) | ⊕⊕⊕ low | The results for 12-monthly scale and polish were similar and also not significant |
| Calculus (mean depth in mm at index sites) at 24 months  
6-monthly scale and polish  
Mean in control group is 0.95 mm | MD -0.24 (-0.51 to 0.03) | 1 study^1^ (207 participants) | ⊕⊕⊕ low | The results for 12-monthly scale and polish were similar and also not significant |
| Plaque (proportion of index sites with plaque) at 24 months  
6-monthly scale and polish  
Mean proportion in control group is 0.44 sites | MD -0.04 (-0.13 to 0.05) | 1 study^1^ (207 participants) | ⊕⊕⊕ low | The results for 12-monthly scale and polish were similar and also not significant |

CI: confidence interval; MD: mean difference

**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 Single study at unclear risk of bias
BACKGROUND

Description of the condition

‘Periodontal (gum) disease’ is a broad term that encompasses a cluster of diseases that result in inflammatory responses and chronic destruction of the tissues that surround and support the teeth, namely the gingiva, periodontal ligament, cementum and alveolar bone (collectively referred to as the ‘periodontium’). Dental plaque is the principal aetiological factor in the pathogenesis of periodontal disease. Plaque is necessary but is not sufficient for periodontal disease to occur. The host response, the modifying effect of various risk factors and the bacterial attack from dental plaque can account for a variety of disease patterns, both between different individuals and between different sites in the mouth within the same individual. Calculated plaque (calculus) does not have a major role in the pathogenesis of periodontal disease, although it does act as a ‘retention web’ for bacteria (Ismail 1994) and reduces the effectiveness of personal oral hygiene control.

Plaque-induced periodontal disease has traditionally been divided into two general categories: gingivitis and periodontitis. Gingivitis is a reversible disease and can be defined as the presence of gingival inflammation (where the gum can appear reddened and swollen and may bleed easily) without loss of connective tissue attachment. Gingivitis is a precursor to periodontitis in some individuals - that is, gingivitis does not inevitably progress to periodontitis. Periodontitis can be defined as the presence of gingival inflammation at sites where there has been a pathological loss of attachment (AAP 2003). This loss of attachment contributes to pocket formation and the denuded cementum may become contaminated by microorganisms and their products (Jenkins 2003).

The rate of progression of periodontitis is neither predictable nor steady. The disease is considered to progress in relatively short episodes of rapid tissue destruction, sometimes followed by some repair, and mostly by prolonged periods of quiescence (Pilot 1997). Some diseased sites may progress by as much as three mm per year (Haasfajee 1991; Lindhe 1989). Epidemiological studies of periodontal diseases are difficult to interpret due to the diversity of measures used to describe and quantify disease and the absence of uniform definition and classification. This is reflected in the World Health Organization Global Data Bank estimates (WHO 2004) which state that the prevalence of moderate severity disease ranges from 2% to 67% and that advanced disease occurs in 1% to 79% of the population. Gingivitis is highly prevalent in most populations and at most ages (Albandar 2002; Corbet 2002; Sheiham 1986) with global values ranging from 50% to 90%. In the UK, it was reported in the 1998 Adult Dental Health Survey (Kelly 2000) that 54% of dentate adults had some periodontal pocketing of 4 mm or more and 5% had deep pocketing (of 6 mm or more); 43% had some loss of attachment of 4 mm or more and 8% had loss of attachment of 6 mm or more. The prevalence of pocketing and loss of attachment increased with age. For example, the proportion of dentate adults with some loss of attachment increased from 14% among those aged 16 to 24 years to 85% of those aged 65 and over.

The goals of periodontal therapy have been defined in many different ways. Some authors have defined the ultimate aim of periodontal treatment as being to control disease progression or achieve a rate of progression which is compatible with a functional dentition for the lifetime of the individual (Pilot 1980; Sheiham 2002; Wennstrom 1990). Others have defined the key goals as improving periodontal health and thereby satisfying a patient’s aesthetic and functional needs or demands. Currently accepted clinical signs of a healthy periodontium include the absence of inflammatory signs of disease such as redness, swelling, suppuration, and bleeding on probing; maintenance of a functional periodontal attachment level; minimal or no recession in the absence of interproximal bone loss; and, where present, functional dental implants (AAP 2001). A fundamental component of the preventive management of periodontal disease is the control of dental plaque by the patient. Hence patient education and training in personal oral hygiene should form an integral part of any treatment plan for a patient with periodontal disease. Conventional periodontal therapy also includes non-surgical treatment as well as a variety of surgical approaches (Needleman 2002). The precise choice of intervention may be influenced by the clinical severity of the disease, with surgery generally reserved for cases of advanced disease to allow for adequate access to, and full debridement of, areas with deep pocketing.

Description of the intervention

Scaling and polishing of the teeth by a dentist or a dental care professional (DCP) (dental therapist or dental hygienist) is a non-surgical intervention that is intended to supplement (and is not a substitute for) the patient’s home-care plaque control. This is frequently provided as part of the dental recall appointment (Beirne 2005a). Scaling is the removal of plaque, mineralised plaque deposits (also referred to as calculus or tartar), debris and staining from the crown and root surfaces of the teeth. Specially designed sharp dental instruments (‘hand scalers’) or ultrasonic scalers can be used to perform the scaling procedure. Polishing is the mechanical removal of any residual extrinsic stains and deposits, typically undertaken by using a rubber cup or bristle brush loaded with a prophylaxis paste. Scaling and polishing can be used with or without a variety of adjuncts such as antimicrobial agents (either topical or systemic), gingival crevice irrigation and root planing. Root planing is a procedure for smoothening the root surface of a tooth that involves the “removal of cementum or surface dentin that is rough or impregnated with calculus, toxins or microorganisms” (Greenstein 1992). The rationale for root planing is to allow the gingival tissue to heal close to the root, shrinking the tissue and reducing the depth of the pocket that has formed (Bonito 2004).
Within the confines of this Cochrane review a ‘routine scale and polish’ is defined as scaling or polishing or both of the crown and root surfaces of teeth to remove local irritational factors (plaque, calculus, debris and staining), that does not involve periodontal surgery or any form of adjunctive periodontal therapy such as the use of chemotherapeutic agents or root planing. The definition includes both supragingival and subgingival scaling. The term ‘routine’ is simply used to indicate that the scale and polish is “a regular course or procedure” (Oxford Dict 1995) i.e. that the scale and polish is an intervention that is intended to be provided at ‘regular intervals’ to patients (without any one particular frequency e.g. every month, every six months, every nine months, every 12 months, etc. at which patients may receive this intervention).

How the intervention might work
Scaling and polishing of the teeth may reduce plaque, calculus, bleeding and gingival inflammation over time, to reduce gingivitis and therefore progression to or progress of periodontitis.

Why it is important to do this review
Scaling and polishing of the teeth is a commonly provided intervention in general dental practice. In the United Kingdom approximately 50% of all adult courses of treatment provided under the National Health Service (NHS) (General Dental Services) regulations “consist of the patient having nothing more than an exam” (DoH 2000). In 1999/2000, approximately 13 million scale and polishes were provided for NHS patients in England at a gross cost to the NHS of GBP 122 million (DoH 2000). In a survey of general dental practitioners preventive recommendations in western New York State, 86% of respondents stated that they would recommend scaling and polishing every six months for ‘low risk’ patients of all ages (a ‘low risk’ patient was defined as a patient having “adequate brushing and flossing habits” and “no history of periodontal disease”) (Frame 2000). There has been debate over the clinical effectiveness and cost effectiveness associated with the routine scaling and polishing of teeth and the frequency with which it should be provided for patients. This debate is complicated by the fact that a ‘routine scale and polish’ is not a precisely defined intervention in periodontal disease management and there is no universally accepted definition of the term. In the United States the term ‘oral prophylaxis’ is most often used and has been defined as “the removal of plaque, calculus and stain from exposed and unexposed surfaces of the teeth by scaling and polishing as a preventive measure for the control of local irritational factors” (AAP 1992). The role and contribution of DCPs (dental hygienists and dental therapists) in maintaining periodontal health has increased in recent years. Any differences in treatment outcome following intervention by a dentist or DCP are not well understood and require investigation. This is an update of this review (Beirne 2005b; Beirne 2007).

OBJECTIVES
1. To determine the beneficial and harmful effects of routine scaling and polishing for periodontal health.
2. To determine the beneficial and harmful effects of providing routine scaling and polishing at different time intervals on periodontal health (which could be determined by tests).
3. To compare the beneficial and harmful effects of routine scaling and polishing with or without oral hygiene instruction.
4. To compare the beneficial and harmful effects of routine scaling and polishing provided by dentists or dental care professionals (dental therapist or dental hygienist) on periodontal health.

METHODS

Criteria for considering studies for this review

Types of studies
We included randomised controlled trials with at least six months follow-up. We excluded split-mouth studies as this design does not reflect a routine scale and polish.

Types of participants
Healthy dentate adults. We included trials where participants had mild to moderate gingivitis at baseline. We excluded trials where participants were described as having severe periodontal disease (e.g. alveolar bone loss involving most teeth, or individuals requiring referral for specialist (surgical) periodontal treatment). We also included trials where participants had undergone specialist periodontal treatment in the six months prior to the study and were in the maintenance phase.

Types of interventions
We included trials where the intervention group(s) received scale and polish treatments with or without oral hygiene instruction delivered at planned regular intervals by a dentist, dental hygienist or dental therapist. We excluded trials where patients were given only a single scale and polish treatment.
We included trials where the comparison or control group received either:
• no scale and polish (e.g. dental examination or oral health instruction only or both);
• scale and polish in response to signs and symptoms of developing gingival or periodontal disease.

We also included trials directly comparing routine scale and polish treatments delivered at different time intervals (e.g. every six months versus every 12 months).

Types of outcome measures
We included trials reporting clinical status, patient-centred and economic cost outcomes.

Primary outcomes
Periodontal disease, assessed by gingivitis indices (both inflammatory and bleeding).

Secondary outcomes
Clinical status factors
• Calculus and plaque indices.
• Changes in probing depth.
• Changes in attachment level.
• Periodontal indices.
• Tooth loss.
• Adverse events.

Patient-centred factors
• Halitosis.
• Patient satisfaction with oral comfort.
• Patient satisfaction with appearance (including gingival recession).
• Patient satisfaction with actual care received.
• Patient satisfaction with provider of care (i.e. dentist, therapist or hygienist).

Economic cost factors
• Economic and resource cost of scale and polish.

Search methods for identification of studies
For the identification of studies included or considered for this review, detailed search strategies were developed for each database searched. These were based on the search strategy developed for MEDLINE (Appendix 1) but appropriately revised for each database to take account of differences in syntax rules and controlled vocabulary. The search strategy used a combination of controlled vocabulary and free text terms and was linked with the Cochrane Highly Sensitive Search Strategy (CHSSS) for identifying randomised trials (RCTs) in MEDLINE; sensitivity maximising version (2008 revision) as referenced in Chapter 6.4.11.1 and detailed in box 6.4.c of the Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011) (Higgins 2011). The search of EMBASE was linked to the Cochrane Oral Health Group filter for identifying RCTs (Appendix 2).

Electronic searches
The following databases were searched.
• The Cochrane Oral Health Group’s Trials Register (to 15 July 2013) (Appendix 3).
• The Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2013, Issue 6) (Appendix 4).
• MEDLINE via OVID (1946 to 15 July 2013) (Appendix 1).
• EMBASE via OVID (1980 to 15 July 2013) (Appendix 2).

Only handsearching carried out as part of the Cochrane Worldwide Handsearching Programme and uploaded to CENTRAL was included in the search (see the Cochrane Masterlist of journals searched to date).

We searched for ongoing and completed trials using the following trial registries (Appendix 5):
• The metaRegister of Controlled Trials (to July 2013) (www.controlled-trials.com)
• The US National Institutes of Health Clinical Trials Register (to July 2013) (www.clinicaltrials.gov).

Searching other resources
The reference lists of related review articles and all articles obtained were checked for further trials. The author(s) of some eligible studies published and any researchers involved in the ongoing debate on recall intervals were contacted, where possible and when considered necessary, to obtain the information on additional published or unpublished studies possibly eligible for inclusion.

Data collection and analysis
Selection of studies
Two review authors independently assessed titles, keywords and abstracts. The review authors remained unblinded regarding the author(s), their institutional affiliations and the site of publication of reports. The full report was obtained for all studies appearing to meet the inclusion criteria or in instances where there was insufficient information from the title, keywords and abstract to make a clear decision. All of the potentially relevant studies were assessed independently for eligibility by both review authors. Instances of
disagreement in the study selection process were referred to the other members of the review team and ultimately resolved by mutual discussion among all review team members. Studies rejected at this or subsequent stages were recorded in a table of excluded studies, and reasons for exclusion noted. All of the studies meeting the inclusion criteria were subjected to risk of bias assessment and data extraction.

Data extraction and management

All randomised controlled trials which appeared to meet the inclusion criteria for this review were assessed by at least two review authors to confirm eligibility, assess risk of bias and extract data using a piloted data extraction form. The following data were recorded.

- Study design, location, funding, number of centres.
- Inclusion and exclusion criteria, number of patients recruited, number of patients randomised to each group, number of patients withdrawn, numbers evaluated.
- Intervention(s), comparator, provider characteristics (dentist, hygienist, dental therapist or other), diagnostic criteria and diagnostic thresholds used.
- Primary and secondary outcomes, times measured, numbers of patients included in the outcome evaluation, direct and indirect cost (where provided).
- Whether a sample size calculation was performed.

Information was entered into the table of characteristics of included studies and additionally into an Excel spreadsheet from which a summary of the characteristics of the studies was made. Where the published paper was unclear concerning aspects of trial design, attempts were made to contact the study authors for clarification or more information or both.

Assessment of risk of bias in included studies

This was conducted using the recommended approach for assessing the risk of bias in studies included in Cochrane reviews (Higgins 2011). We used the two-part tool, addressing six specific domains (namely sequence generation, allocation concealment, blinding of outcome assessment, incomplete outcome data, selective outcome reporting and other bias). Each domain included one specific entry in a ‘Risk of bias’ table. Within each study, the first part of the tool involved describing what was reported to have happened in the study. The second part of the tool involved assigning a judgement relating to the risk of bias for that entry. This was achieved by answering a pre-specified question about the adequacy of the study in relation to the entry, such that a judgement of ‘low’ indicated low risk of bias, ‘high’ indicated high risk of bias, and ‘unclear’ indicated unclear or unknown risk of bias. All of the domains of sequence generation, allocation concealment, incomplete outcome data, selective outcome reporting and other sources of bias were each addressed in the tool by a single entry for each study. It is not possible to blind patients to which intervention they are receiving. Scale and polish visits can be considered to be a ‘complex intervention’ as the delivery of the clinical care may have impact on oral hygiene behaviour in between scale and polish visits leading to different clinical outcomes. Blinding of participants was not therefore considered as a risk of bias domain, only blinding of outcome assessor. Where the patients self assessed the outcomes to the trial this was noted.

The risk of bias assessments were undertaken independently and in duplicate by two review authors as part of the data extraction process. After taking into account the additional information provided by the authors of the trials, studies were grouped into the following categories.

- Low risk of bias (plausible bias unlikely to seriously alter the results) for all key domains.
- Unclear risk of bias (plausible bias that raises some doubt about the results) if one or more key domains were assessed as unclear.
- High risk of bias (plausible bias that seriously weakens confidence in the results) if one or more key domains were assessed to be at high risk of bias.

A ‘Risk of bias’ table was completed for each included study. The results were also presented graphically.

Measures of treatment effect

For continuous outcomes, means and standard deviations were used to summarise the data for each group (standardised mean differences were used when different scales, measuring the same concept, were reported). For dichotomous outcomes, the estimates of effect were expressed as risk ratios together with 95% confidence intervals.

Dealing with missing data

Where data were missing from the published report of a trial we attempted to contact the author(s) to obtain the data and clarify any uncertainty. The analysis generally included only the available data (ignoring missing data) however, methods for estimating missing standard deviations in section 7.7.3 of the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011) were used if necessary. Otherwise we did not intend to undertake any imputations nor to use statistical methods to allow for missing data.

Assessment of heterogeneity

We planned to assess heterogeneity by inspection of the point estimates and confidence intervals on the forest plots. The variation in treatment effects was to be assessed by means of Cochran’s test for heterogeneity and quantified by the $I^2$ statistic. Heterogeneity was to be considered statistically significant if P value is < 0.1. A rough
guide to the interpretation of $I^2$ given in the *Cochrane Handbook for Systematic Reviews of Interventions* is: 0% to 40% might not be important, 30% to 60% may represent moderate heterogeneity, 50% to 90% may represent substantial heterogeneity, 75% to 100% considerable heterogeneity (Higgins 2011).

### Assessment of reporting biases

If there had been sufficient numbers of trials (more than 10) in any meta-analysis, publication bias would have been assessed according to the recommendations on testing for funnel plot asymmetry (Egger 1997) as described in the *Cochrane Handbook for Systematic Reviews of Interventions* 5.1.0 (Higgins 2011). If asymmetry were identified we would have examined possible causes.

### Data synthesis

A meta-analysis was only to be conducted if there were studies of similar comparisons reporting the same outcome measures. A fixed-effect model was used where there were fewer than four studies.

### Subgroup analysis and investigation of heterogeneity

We planned to investigate clinical heterogeneity. Providing there were sufficient studies of each intervention and outcome, we planned a priori to conduct subgroup analyses for age, sex, smoking, oral cleanliness and degree of periodontal disease at baseline and different groups of systemically compromised adults.

### Sensitivity analysis

Provided there were sufficient studies for each outcome and intervention, we planned to undertake sensitivity analysis based on the trials at low risk of bias.

### Summary of results

The results for each objective of the review are presented in a ‘Summary of findings’ table, with the GRADE assessment of the quality of the body of evidence.

### RESULTS

### Description of studies

### Results of the search

All titles and abstracts retrieved through the search strategy were scanned for relevance and the full texts of 88 papers considered potentially relevant to the review were obtained. Seven of these papers were either partially or fully translated in order to determine their eligibility for the review (four German (Grimm 1986; Katay 1990; Sandig 1981 (partially translated); Schulz 1989 (fully translated)); one Finnish (Ketomaki 1993) (partially translated); one Norwegian (Lunder 1994) (fully translated) and one Japanese (Tsuboi 2003) (partially translated)).

### Included studies

Following detailed assessment of all of the potentially relevant papers, five papers reporting three studies (Jones 2011; Lightner 1971; Listgarten 1985) were judged to have satisfied the eligibility criteria for the review.

### Characteristics of the trial settings and investigators

See Characteristics of included studies table for further details. Of the three included studies, two were conducted in North America (Lightner 1971; Listgarten 1985), and one in the UK (Jones 2011). The studies were conducted in different settings: dental school/hospital (Listgarten 1985), general dental practice (Jones 2011) and US Air Force Academy (Lightner 1971). Treatment was provided by dental hygienists in Lightner 1971 and in Listgarten 1985, and using a pool of nine therapists and hygienists in Jones 2011.

### Characteristics of the participants

See Characteristics of included studies table for further details. The three trials included 836 participants in the analyses, ranging from 61 to 470 in each trial. Participants were adults aged 18 to 73 (Jones 2011), adults aged 20 to 73 (Listgarten 1985) whereas in the third study (Lightner 1971) participants were young air force cadets with an average age of 22 years.

One study was conducted on patients attending one of three general dental practices for check-up appointments (Jones 2011). This study only included patients with calculus or bleeding on probing and no pockets greater than 3.5 mm. Another study (Lightner 1971) was conducted on young adult male US Air Force Academy cadets. The third study (Listgarten 1985) was conducted on patients attending a dental hygiene clinic at a dental school. All participants had varying degrees of gingivitis, but no evidence of alveolar bone loss. Some, but not all of the subjects had been receiving periodontal prophylaxes at intervals of three to six months (no further information on the latter point was provided in this paper).
Heterogeneity of participants

As can be seen from the descriptions provided above and from the Characteristics of included studies table there was considerable heterogeneity in the characteristics of the participants included in different studies.

Characteristics of the interventions

See the Characteristics of included studies table for further details.

Comparison 1: Scale and polish versus no scale and polish

In one study (Jones 2011) all participants received a scale and polish at baseline, and then were randomly allocated to a further scale and polish every six months, or every 12 months or to no further scale and polish during the study period (two years).

Comparison 2: Scale and polish at a fixed interval versus scale and polish in response to the signs or symptoms or both of periodontal disease

In the study by Listgarten 1985, the control group received a 'periodontal prophylaxis' every six months (no further details were given of the precise nature of the prophylaxis, however, it was assumed to fall within the definition of 'routine scale and polish' used in this review). In the experimental group, periodontal prophylaxes were administered according to a variable schedule, based on the outcome of differential dark-field microscopy (DDFM) tests. For participants with negative DDFM tests, recall intervals were gradually extended from one to two, to three, to six, to 12, to 24 months (see Characteristics of included studies table for further details of the DDFM test and subsequent assignment of recall intervals on the basis of the test). Eleven subjects in the experimental group reached the end of the study without receiving a single prophylaxis over the three-year duration of the trial.

Comparison 3: Scale and polish at a fixed interval versus scale and polish at a different fixed interval

There were two studies (Jones 2011; Lightner 1971) that made this comparison. One study (Lightner 1971) compared scale and polish treatments provided at three-month, six-month and 12-month intervals (see Characteristics of included studies table for further details of the precise interventions provided). In Jones 2011 all the participants received a thorough scale and polish followed by a baseline examination. Patients were then allocated to groups having no scale and polish, one every six months and one every 12 months.

Comparison 4: Scale and polish with oral hygiene instruction (OHI) at a fixed interval versus scale and polish without OHI at the same fixed interval

Only one study (Lightner 1971) provided data for this comparison. The comparisons made were:

- scale and polish treatment with OHI at three-month intervals versus scale and polish treatment without OHI at three-month intervals;
- scale and polish treatment with OHI at 12-month intervals versus scale and polish treatment without OHI at 12-month intervals.

(See Characteristics of included studies table for further details of the precise interventions provided.)

Comparison 5: Scale and polish by a dentist versus scale and polish by a dental care professional

No studies were found for this comparison.

Heterogeneity of interventions

As can be seen from the descriptions provided above and from the Characteristics of included studies table there was considerable heterogeneity in the characteristics of the interventions provided in different studies. The OHI components also varied, with some studies (Lightner 1971) giving toothbrushing instruction only, where the participants in those groups who received OHI were instructed to use the Bass technique for the lingual surface of the mandibular molars but the modified Roll technique for all other areas. In one study (Listgarten 1985) the intervention was described as a "periodontal prophylaxis" and there was no indication given regarding the delivery or otherwise of OHI to the participants. In Jones 2011 the participants were allocated a 15-20 minute appointment for oral hygiene advice plus intervention, however additional time was permitted as required. In Lightner 1971 the duration of the scale and polish given to comparison groups varied from 30 to 50 minutes, with or without an additional 10 minutes of oral hygiene instruction. Only one study (Jones 2011) stated they used an ultrasonic scaler.

Characteristics of the outcome measures

Details of the different indices used in each individual trial to record the outcomes are presented in Additional Table 1 'Indices used in trials.'

Details of the outcomes recorded in different studies, the time points when measured, and the frequency of provision of scale and polish for each of the three comparisons (scale and polish versus no scale and polish; scale and polish versus scale and polish in response to signs or symptoms or both of periodontal disease; scale and polish versus scale and polish at a different interval), are presented in Additional Table 2, Table 3, and Table 4 respectively.
No studies reported any adverse effects.

**Patient-centred factors and economic cost factors**

One study (Jones 2011) reported some patient-centred factors. No economic cost outcomes were reported in any of the included studies.

**Handling of data/data assumption made in review**

In one study (Lightner 1971) there were five comparison groups (groups 1, 2, 3, 4A and 4B) (see Characteristics of included studies table for full details of the interventions provided). For Compari-son 3 we compared groups 2, 3 and 4A with each other (where oral hygiene instruction (OHI) was provided alongside the scale and polish), and compared groups 4B and 1 with each other (where no OHI was provided). We did not make comparisons between groups that did and did not receive OHI alongside the scale and polish in Comparison 3. For Comparison 4 we compared group 4A (scale and polish with OHI at three-month intervals) with group 4B (scale and polish without OHI at three-month intervals) and group 2 (scale and polish with OHI at 12-month intervals) with group 1 (scale and polish without OHI at 12-month intervals). In this study, group 2 received one scale and polish treatment per year given in two 30-minute appointments, five to 11 days apart. Similarly, group 3 received two scale and polish treatments per year, the first of which was provided over two visits, five to 11 days apart. In our comparisons and analyses, groups 2 and 3 have been described as '12-month interval' and 'six-month interval' groups respectively and no distinction has been drawn between the 'two-visit' and 'one-visit' scale and polish treatments.

In Listgarten 1985 no standard deviations for the data were given in the paper. In order to use the data we made the assumption that the standard deviations would be similar to those from the Listgarten 1986. To be conservative we assumed a common standard deviation for the test and control groups based on the control group standard deviation for the Listgarten 1986 study that was larger than that for the test. As no statistically significant differences were found, an analysis assuming larger standard deviations than this would not affect the results and conclusions for this study.

**Excluded studies**

Of the 88 potentially relevant papers considered, 83 study reports (of 75 studies) were excluded. Although many studies could be excluded for more than one reason, in general only the main reason for exclusion has been recorded in the Characteristics of excluded studies table.

- Not routine scale and polish (27 studies: Addy 1988; Axelsson 1987; Bonner 2005; Brown 2002; Chapple 1995;...


• Length of follow-up less than six months (four studies: Aldridge 1995; Tan 1978; White 1996; Zanatta 2011).

• Children with mixed dentition at baseline (four studies: Ashley 1981; Axelsson 1977; Bellini 1981; Poulsen 1976).

• All patients received scale and polish (two studies: Hellström 1996; Zimmerman 1993).


• No scale and polish (one study: Sato 2008).

• None of the primary outcomes specified in our review were measured in this study (one study: Adachi 2002).

• Patients had partial dentures (one study: Katay 1990).

• Patients had severe periodontal disease, or had periodontal treatment and were in maintenance phase (five studies: Glavind 1977; Listgarten 1986; Nyman 1975; Rosling 1976; Westfelt 1983).

Ongoing studies
There is one ongoing study funded by the National Health Service in the UK, ISRCTN56465715, which will be included in a future version of this review (Characteristics of ongoing studies). The trial should be published in 2016/17.

Risk of bias in included studies
The review authors’ judgements about each risk of bias item presented as percentages across all included studies is given in Figure 1, and the review authors’ judgements about each risk of bias item for each included study is given in Figure 2.

Figure 1. Risk of bias graph: review authors’ judgements about each risk of bias item presented as percentages across all included studies.
**Figure 2.** Risk of bias summary: review authors’ judgements about each risk of bias item for each included study.

<table>
<thead>
<tr>
<th></th>
<th>Random sequence generation (selection bias)</th>
<th>Allocation concealment (selection bias)</th>
<th>Blinding of outcome assessment (detection bias)</th>
<th>Incomplete outcome data (attrition bias)</th>
<th>Selective reporting (reporting bias)</th>
<th>Other bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones 2011</td>
<td>+</td>
<td>+</td>
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<td>+</td>
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<td>?</td>
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</table>

**Allocation**

**Random sequence generation**

One study was judged to be at low risk of bias for random sequence generation, as a computer generated sequence was used (Jones 2011). The other two studies were judged to be at unclear risk of bias for this. Listgarten 1985 gave no more information than that they were “randomised” and Lightner 1971, that patients were “randomly assigned.”

**Allocation concealment**

One study described the randomisation as centrally randomised and was judged as at low risk of bias (Jones 2011). Neither of the other studies described adequate methods of allocation concealment and were therefore classified as being at unclear risk of bias for this domain.

**Blinding**

Participant blinding was not possible in any of the studies and was not considered as part of the risk of bias assessment. We assessed blinding for the outcome assessors. Two studies described adequate outcome assessor blinding and were therefore classified as being at low risk of bias for this domain.
Incomplete outcome data

Jones 2011 was considered to be at low risk of attrition bias due to approximately equal numbers withdrawing from each treatment group and full explanations provided of reasons for withdrawal. Risk of attrition bias was assessed as unclear in the other two trials due to either high attrition or lack of reporting of reasons.

Selective reporting

All three studies reported all the outcomes planned in the methods section in full and were all assessed as at low risk of reporting bias (Jones 2011; Lightner 1971; Listgarten 1985).

Other potential sources of bias

All three studies were assessed as being at unclear risk of bias for this domain for different reasons. There was possible bias resulting from the withdrawal of patients with Basic Periodontal Examination (BPE) > 3 in one study (Jones 2011). In the other two studies, there was baseline imbalance in important prognostic factors (Lightner 1971; Listgarten 1985).

Overall risk of bias

We judged the risk of bias for all three studies as unclear (Jones 2011; Lightner 1971; Listgarten 1985).

Effects of interventions

See: Summary of findings for the main comparison; Summary of findings 2; Summary of findings 3; Summary of findings 4

Comparison 1: Scale and polish versus no scale and polish (Objective 1)

Only one study at unclear risk of bias provided data for this comparison (Jones 2011), where both a six-monthly scale and polish and a 12-monthly scale and polish treatments are compared with no scale and polish. The clinical data are shown graphically as forest plots for the three outcomes of gingivitis, calculus and plaque at 24 months (Analysis 1.1; Analysis 1.2; Analysis 1.3).

Six-monthly scale and polish versus no scale and polish

- MD = -0.02 (95% CI -0.10 to 0.06) for gingivitis (mean proportion of bleeding sites per patient); P value = 0.65.

12-monthly scale and polish versus no scale and polish

- MD = -0.04 (95% CI -0.13 to 0.05) for plaque (mean proportion of sites with plaque per patient); P value = 0.35.

Patient-centred outcomes

At 24 months, participants in the no scale and polish group were significantly less likely (P value < 0.001) to report a 'high' level of oral cleanliness (29%, odds ratio (OR) 0.36; 95% CI 0.20 to 0.65) compared to the six-month group (52%), or the 12-month group (47%, OR 0.45; 95% CI 0.25 to 0.81).

There is little evidence from this study that scale and polish at six-monthly or 12-monthly intervals was beneficial when compared with no scale and polish.

Comparison 3: Scale and polish at a different fixed interval versus scale and polish at a different fixed interval (Objective 2)

One study assessed as at unclear risk of bias provided data for this comparison (Listgarten 1985). A six-monthly scale and polish was compared with a variable scale and polish interval determined by the results of a differential dark-field microscopy (DDFM) test. The data for the three outcomes reported (gingivitis, plaque and pocket depth) are shown for all time points measured (6, 12, 18, 24, 30, and 36 months) in Additional Table 5. There was no evidence that six-monthly scale and polish was better than or worse than variable interval scale and polish for the outcomes of gingivitis, plaque or pocket depth. The mean differences for each outcome at 24 months are given below:

Six-monthly scale and polish versus no scale and polish

- MD = -0.02 (95% CI -0.10 to 0.06) for gingivitis (mean proportion of bleeding sites per patient); P value = 0.65.

Comparison 3: Scale and polish at a different fixed interval versus scale and polish at a different fixed interval (Objective 2)
Two studies at unclear risk of bias provided data for this comparison comparing different fixed intervals of treatment (Jones 2011; Lightner 1971). The data are shown for gingivitis, calculus and plaque at all time points measured in Additional Table 6. As both studies provided data at the 24-month follow-up assessment, these data are also shown in forest plots (Analysis 3.1; Analysis 3.2; Analysis 3.3; Analysis 3.4). The results for each individual comparison are summarised below.

### Three months versus six months

Only one study at unclear risk of bias (Lightner 1971) provided data and there was no evidence of any differences in gingivitis, calculus or plaque comparing three and six-monthly scale and polish treatments. The 24-month outcome data are presented below:

- MD -0.10 (95% CI -0.20 to 0.00) gingivitis (mean per patient based on 0-3 scale); P value = 0.04
- MD 0.00 (95% CI -0.13 to 0.13) calculus (mean per patient based on 0-3 scale); P value = 1.00
- MD 0.05 (95% CI -0.08 to 0.18) plaque (mean per patient based on 0-3 scale); P value = 0.44.

For scale and polish alone, without oral hygiene instruction (OHI) in either group, there are consistent statistically significant differences favouring three-monthly scale and polish compared to 12-monthly scale and polish for the outcomes of gingivitis, calculus and plaque. The 24-month outcome data are presented below:

- MD -0.21 (95% CI -0.30 to -0.12) gingivitis (mean per patient based on 0-3 scale); P value < 0.001
- MD -0.18 (95% CI -0.30 to -0.06) calculus (mean per patient based on 0-3 scale); P value = 0.005
- MD -0.15 (95% CI -0.27 to -0.03) plaque (mean per patient based on 0-3 scale); P value = 0.02.

### Three months versus 12 months

Only one study at unclear risk of bias (Lightner 1971) provided data for this comparison. Levels of gingivitis, calculus and plaque were consistently lower in the three-month scale and polish treatment group compared to the 12-month group. The outcome data after 24 months of follow-up are presented below:

- MD -0.14 (95% CI -0.23 to -0.05) gingivitis (mean per patient based on 0-3 scale); P value = 0.003
- MD -0.13 (95% CI -0.25 to -0.01) calculus (mean per patient based on 0-3 scale); P value = 0.04
- MD -0.02 (95% CI -0.14 to 0.10) plaque (mean per patient based on 0-3 scale); P value = 0.75.

### Six months versus 12 months (with OHI)

Most of these results (Additional Table 6) were based on a single study (Lightner 1971), but outcome data for this comparison for 24 months of follow-up were based on the meta-analysis of two studies (Jones 2011; Lightner 1971) (Analysis 3.4), both assessed as at unclear risk of bias. A standardised mean difference (SMD) was used to combine the different scales used for all three outcome measurements:

- SMD -0.08 (95% CI -0.27 to 0.10) gingivitis; P value = 0.38
- SMD -0.25 (95% CI -0.44 to -0.06) calculus; P value = 0.009
- SMD -0.16 (95% CI -0.35 to 0.03) plaque; P value = 0.10.

There is some weak evidence that calculus is reduced for the six-monthly scale and polish treatment, but no difference between scale and polish at six-month and 12-month intervals for the outcomes of gingivitis and plaque.

### Patient-centred outcomes

Jones 2011 reported some patient-centred outcome data. At 24 months there was no significant difference between the 12-month group (47%, OR 0.95; 95% CI 0.53 to 1.70) and the six-month group.

### Comparison 4: Scale and polish with OHI at a fixed interval versus scale and polish without OHI at the same fixed interval (Objective 3)

This comparison is to evaluate the effect of combining oral hygiene instruction with the scale and polish treatment. One study (Lightner 1971) provided data comparing a three-monthly scale and polish treatment with or without OHI for the outcomes of gingivitis, calculus and plaque. This study also compared 12-monthly scale and polish treatment with or without OHI. The data are shown for gingivitis, calculus and plaque at all time points measured in Additional Table 7. These data are also shown in forest plots (Analysis 4.1; Analysis 4.2). The results for each individual comparison are summarised below.

### Three-monthly scale and polish treatment

After 24 months there was evidence of a difference favouring three-monthly scale and polish with OHI being associated with significantly lower plaque levels. There was no evidence of a difference in the outcomes of gingivitis or calculus for this comparison. The results for the 24-month assessment are given below:

- MD -0.07 (95% CI -0.18 to 0.04) gingivitis (mean per patient based on 0-3 scale); P value = 0.20
- MD -0.02 (95% CI -0.16 to 0.12) calculus (mean per patient based on 0-3 scale); P value = 0.78
- MD -0.17 (95% CI -0.31 to -0.03) plaque (mean per patient based on 0-3 scale); P value = 0.02.
12-monthly scale and polish treatment

There was evidence of a difference favouring 12-monthly scale and polish with OHI being associated with lower gingivitis and plaque levels after 24 months of follow-up. The results for the 24-month assessment are given below:

- MD -0.14 (95% CI -0.22 to -0.06) gingivitis (mean per patient based on 0-3 scale); P value < 0.001
- MD -0.07 (95% CI -0.18 to 0.04) calculus (mean per patient based on 0-3 scale); P value = 0.20
- MD -0.30 (95% CI -0.41 to -0.19) plaque (mean per patient based on 0-3 scale); P value < 0.001.

Comparison 5: Scale and polish by a dentist versus scale and polish by a dental care professional (Objective 4)

No studies were found for this comparison.
### ADDITIONAL SUMMARY OF FINDINGS

#### Routine scale and polish at different frequencies for periodontal health

**Patient or population:** Healthy dentate young adults  
**Settings:** Air Force Academy  
**Intervention:** Routine scale and polish every 6 months with oral hygiene instruction  
**Comparison:** Routine scale and polish every 12 months with oral hygiene instruction

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Relative effect (95% CI)</th>
<th>No of participants (studies)</th>
<th>Quality of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gingivitis different indices used</strong></td>
<td>SMD -0.08 (-0.27 to 0)</td>
<td>2 studies¹ (438 participants)</td>
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<td>The results for comparing 3 versus 12 months are significant but based on only 1 study</td>
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</tr>
<tr>
<td><strong>Plaque different indices used</strong></td>
<td>SMD -0.16 (-0.35 to 0)</td>
<td>2 studies¹ (438 participants)</td>
<td>⊕⊕⊕⊕ low</td>
<td>The results for comparing 3 versus 12 months are generally not significant</td>
</tr>
</tbody>
</table>

CI: confidence interval; MD: mean difference; SMD: standardised mean difference

**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.

¹2 studies at unclear risk of bias

#### Routine scale and polish with and without oral hygiene instruction for periodontal health

**Patient or population:** Healthy dentate young adults  
**Settings:** Air Force Academy  
**Intervention:** Routine scale and polish with oral hygiene instruction  
**Comparison:** Routine scale and polish without oral hygiene instruction

<table>
<thead>
<tr>
<th>Outcomes</th>
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CI: confidence interval; MD: mean difference

GRADE Working Group grades of evidence

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**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.

\(^1\) Single study at unclear risk of bias
DISCUSSION

The three studies included in this review were clinically and methodologically heterogeneous, one being conducted in general practice, one in a dental school and the third on US Air Force cadets, however they did provide some limited data for three of the four objectives of the review. Only two studies compared the same outcomes for the same comparison and could be included in a meta-analysis.

Summary of main results

Objective 1: Routine scale and polish versus no scale and polish

One study (Jones 2011) provided data for the comparison between scale and polish versus no scale and polish. The patient population and setting for Jones 2011 were most appropriate to answer the questions posed by this review, and this study was assessed as at unclear risk of bias. Jones 2011 provides a comparison between six-monthly and 12-monthly scale and polish treatments with no treatment, with a follow-up of 24 months. This study was conducted in general dental practice and included patients attending for check-up appointments who had no pockets greater than 3.5 mm. After 24 months of follow-up there were no clinically important differences between scale and polish treatments and no treatment for the outcomes of gingivitis, calculus and plaque. This body of evidence (a single study, at unclear risk of bias), was considered to be of low quality and should be interpreted with caution.

Objective 2: Routine scale and polish at different time intervals on periodontal health (based on a test for periodontal disease)

One study (Listgarten 1985) provided data for the comparison between scale and polish at a fixed interval versus scale and polish in response to the signs or symptoms or both of periodontal disease. This study compared scale and polish provided at six-monthly intervals with scale and polish provided in response to bacterial assessments. No statistically significant differences were observed between treatment (scale and polish in response to bacterial assessments) and control (six-monthly scale and polish) groups at any time point over the course of this three-year trial. Participants in the treatment group were initially recalled more frequently than those in the control group, however, by the end of the trial, recall intervals for scaling and polishing were considerably extended for many participants in the treatment group and 11 participants had not received a scale and polish by the end of the study. Despite this extension of recall interval, the periodontal health of participants in the test group (as measured using the outcomes gingivitis, plaque and pocket depth) was not adversely affected compared to the control group. However, neither treatment nor control regimen was successful in preventing gingivitis and mean gingival index scores in control and test groups generally increased at each time point over the course of the trial.

Two studies (Jones 2011; Lightner 1971) provided data for the comparison between scale and polish at a fixed interval versus scale and polish at a different fixed interval. The studies were conducted in two distinct populations - regular attenders in general practice (Jones 2011) and young adult males aged 17 to 22 years (Lightner 1971). As already mentioned the patient population and setting for Jones 2011 were most appropriate to answer some of the questions posed by this review. There were consistent results in Lightner 1971 towards improved outcomes (lower levels of plaque, calculus...
and gingivitis) in more frequent interval groups compared with less frequent interval groups. However, the differences generally only reached statistical significance when comparisons were made between the most frequent interval groups (scale and polish delivered at three or four-monthly intervals) with the least frequent interval groups (scale and polish delivered at 12-monthly intervals). We have reported the comparison between six-monthly and 12-monthly scale and polish intervals combined with oral hygiene instruction (Analysis 3.4) in the summary of findings table. The body of evidence was assessed as of low quality.

**Objective 3: Scale and polish with and without oral hygiene instruction (OHI)**

Only one study (Lightner 1971) provided data for the comparison between scale and polish with OHI at a fixed interval versus scale and polish without OHI at the same fixed interval. The provision of OHI in conjunction with three-monthly and 12-monthly scale and polish treatments was associated with significantly lower plaque levels and significantly lower plaque and gingivitis levels respectively after 24 months of follow-up. However, the effect sizes were generally small. The body of evidence for comparing scale and polish treatments with and without OHI was assessed as of low quality.

**Objective 4: Scale and polish provided by a dentist compared with a dental care professional**

No included studies provided data for this objective.

**Overall completeness and applicability of evidence**

One of the included studies (Jones 2011) was more appropriate than the others for answering many of the questions posed by this review. This study was conducted on adults attending their dentist in general dental practice for check-ups. More trials in a primary care setting including a more representative group of participants with higher levels of disease would enhance the evidence base for answering the questions posed by this review. The other two older studies were not conducted in primary care, and included patients who were either young, or who had had or were referred for treatment for periodontal disease. It is difficult to envisage how the experimental intervention in Listgarten 1985 could reasonably be used in general practice and its applicability in different patient populations with varying levels of risk for destructive periodontitis is uncertain.

Three of the four objectives were addressed by at least one included trial, however there were no trials addressing the fourth objective comparing scale and polish provided by a dentist with a professional complementary to dentistry.

**Outcomes reported**

The outcomes used in different studies were measured using different indices. The three included studies reported: three different gingivitis indices, two different calculus indices, three different plaque indices and probing depth was only reported in one study. Many primary and secondary outcomes were not reported in any of the three studies: tooth loss, attachment change, adverse events and economic cost factors. It is important that trials measure the harms as well as the benefits of interventions. Scaling is an invasive procedure and has been associated with a number of adverse effects, including damaged enamel surfaces by repeated scaling, tooth sensitivity and gingival recession (Brothwell 1998). It is also recognised that subgingival scaling of shallow pockets can cause permanent loss of periodontal attachment (Brothwell 1998). The latter would have been captured in ‘attachment change’ data but these were not reported in any of the trials included in this review. It would undoubtedly be advisable for future randomised controlled trials assessing the effects of scaling and polishing to report on adverse events to allow for a more balanced appraisal of benefits and harms.

It is increasingly recognised that the signs and symptoms of periodontal disease can impact on patients’ oral health related quality of life (Needleman 2004). Therefore, interventions designed to ameliorate these signs and symptoms might be expected to have a positive impact on a patient’s quality of life. However, studies of the effects of periodontal therapy have only rarely used patient-centred outcome measures (Elley 2000; Needleman 2004) and none of the trials included in this review reported such outcomes. We are therefore unable to make any statements regarding the impact of routine scaling and polishing (as defined in this review) on patients’ quality of life.

Similarly, although economic cost outcomes (such as time foregone to attend for appointments and provider costs) are relevant to the debate regarding the merits and demerits of routine scaling and polishing, such outcomes were not reported in any trials included in this review.

Again, it would be advisable for future trials to include quality of life and economic cost outcomes to allow for a full evaluation of the beneficial and harmful effects of this intervention.

**Quality of the evidence**

Given the considerable resources involved in providing routine scale and polish treatments for adults in many countries (DoH 2000; Frame 2000), it is disappointing that there is a paucity of good quality, reliable research evidence to inform clinical practice. Only three studies met the inclusion criteria for this review, all judged to be at unclear risk of bias. It is impossible to blind patients to the timing of scale and polish treatments, and as having a scale and polish treatment may influence personal oral hygiene behaviour, participant blinding was not included in the risk of bias assessment. The quality of the body of evidence available for each
outcome (gingivitis, calculus and plaque) for three of the four objectives of this review was found to be low (Summary of findings for the main comparison; Summary of findings 2; Summary of findings 3; Summary of findings 4). Therefore the results presented in this review should be interpreted cautiously.

Potential biases in the review process

A sensitive search strategy was used for this review. Every effort was made to identify all relevant studies. No studies were excluded due to language restrictions.

Data collection and analysis were done by two review authors independently, and any disagreement between review authors was resolved by discussion to minimise/exclude bias during the review process.

It is possible not all relevant studies have been identified for inclusion in this review due to grey literature bias and the publication of studies in non-indexed journals. In addition, post-hoc changes to a protocol may potentially bias the results of a review. For this updated review we made some important alternations to the selection criteria specified in the original protocol. Firstly, we excluded split-mouth studies as this design does not reflect the manner in which routine scaling and polishing is provided in practice. Secondly, we excluded trials where participants were described as having severe periodontal disease (e.g. alveolar bone loss involving most teeth or individuals requiring referral for specialist periodontal treatment).

We also excluded trials where participants had undergone specialist periodontal treatment in the six months preceding the trial and who were in the ‘maintenance phase.’ These exclusions were made because best clinical practice would suggest that these categories of patients should receive more advanced periodontal treatment than the ‘routine scale and polish’ as defined in this review. Finally, we also excluded trials where only a single scale and polish treatment was provided as, once again, this does not reflect the manner in which ‘routine scaling and polishing’ is provided in practice. As specified in the Background section of our review, a ‘routine scale and polish’ is an intervention that is intended to be provided at regular intervals to patients, and not as a ‘stand alone’ intervention provided at a single point in time.

We consider that these adjustments to the selection criteria have resulted in a review that will ultimately be more useful to practitioners who are providing ‘routine scale and polish treatments’ and patients who are receiving this intervention.

Agreements and disagreements with other studies or reviews

We did not find any other reviews that addressed the specific objectives of this Cochrane review. Reviews of oral health promotion and dental health education have demonstrated that, in general, oral hygiene instruction can induce limited behaviour change in patients and reduce plaque levels in the short term, but there is no lasting effect (Brown 1994; Kay 1996; Kay 1998; Sprod 1996). In our review only one trial (Lightner 1971) evaluated the effects of providing oral hygiene instruction in conjunction with scale and polish treatments on plaque levels. The provision of oral hygiene instruction with three-monthly and 12-monthly scale and polish treatments was associated with small but statistically significant reductions in plaque at 24 and 48 months when compared with three-monthly and 12-monthly scale and polish treatments without oral hygiene instruction.

Authors’ conclusions

Implications for practice

There is insufficient evidence to determine the effects of routine scale and polish treatments.

Implications for research

There is a need for well conducted trials in this area which include a sufficient number of patients to detect a true difference, if any, and that are of sufficient duration (five years or more). Given that scaling and polishing is a commonly provided intervention in dental practice, we would recommend that additional trials should be conducted in primary care settings and considered as a complex intervention with oral hygiene instruction. Outcomes should include clinical measures (such as those reported in the trials included in this review) and tooth loss, patient-centred factors and economic factors. As one of the principal known aetiological agents (plaque) is the same for gingivitis and periodontitis, long-term studies may also include caries outcomes. In addition, studies should be carried out to determine the clinical effectiveness and cost effectiveness of routine scaling and polishing provided by different dental personnel. We would also recommend that due attention be given in future studies to what levels of improvement in various outcomes should be considered clinically significant. Such information is needed to help guide changes in actual dental practice. It is also recommended that all trials should be reported according to the Consolidated Standards of Reporting Trials (CONSORT) guidelines (www.consort-statement.org/).

Acknowledgements

We acknowledge the contribution of Andrew Forgie to the protocol of the review. We wish to thank Anne Littlewood (Cochrane Oral Health Group) for her assistance with literature searching; Luisa Fernandez MauleFinch and Phil Riley (Cochrane Oral Health Group) for their help with the preparation of this review; Regina Mitezki for translating three German articles; Mikako
Hayashi for translating a Japanese study; Lowell Smith, Ram Nanda, Jan Lindhe and Lim Lum Pen for responding to our requests for information on specific trials. The review authors are also grateful for the comments of members of the Guideline Development Group on recall intervals between routine dental examinations conducted under the auspices of the National Institute for Health and Care Excellence (NICE) and co-ordinated by the National Collaborating Centre for Acute Care. In particular the review authors would like to thank Jacqueline Dutchak and Nigel Pitts.

REFERENCES

References to studies included in this review

Jones 2011 [published data only]


Lightner 1971 [published data only]

Listgarten 1985 [published data only]


References to studies excluded from this review

Adachi 2002 [published data only]

Addy 1988 [published data only]

Aldridge 1995 [published data only]

Ashley 1981 [published data only]


Axelsson 1975 [published data only]

Axelsson 1977 [published data only]


Axelsson 1981 [published data only]

Axelsson 1987 [published data only]

Axelsson 2004 [published data only]

Axelsson P, Lindhe J. Effect of controlled oral hygiene procedures on caries and periodontal disease in adults:


Badersten 1984 [published data only]

Bellini 1981 [published data only]

Bonner 2005 [published data only]
Bonner BC, Young L, Smith PA, McCombes W, Clarkson JE. A randomised controlled trial to explore attitudes to routine scale and polish and compare manual versus ultrasonic scaling in the general dental service in Scotland (ISRCTN99609795). *BMC Oral Health 2005;5:3.

Brown 2002 [published data only]

Budtz-Jorgensen 2000 [published data only]

Chapple 1995 [published data only]

Chawla 1975 [published data only]

Cutress 1993 [published data only]

Feldman 1988 [published data only]

Glavind 1977 [published data only]


Godin 1976 [published data only]

Greenwell 1985 [published data only]

Grimm 1986 [published data only]

Gunay 1998 [published data only]

Hellström 1996 [published data only]

Hill 1981 [published data only]

Hoffman 2005 [published data only]

Hou 1989 [published data only]

Huber 1987 [published data only]

Hugoson 2007 [published data only]
* Hugoson A, Lundgren D, Askew B, Borgklint G. Effect of three different dental health preventive programmes on
Routine scale and polish for periodontal health in adults (Review)

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Kaldahl 1988 *(published data only)*

Katay 1990 *(published data only)*

Ketomaki 1993 *(published data only)*

Kinane 2000 *(published data only)*

Klein 1985 *(published data only)*

Knöfler 2007 *(published data only)*

Kwan-Yat 2006 *(published data only)*

Lee 2009 *(published data only)*

Lembariti 1998 *(published data only)*

Lim 1996 *(published data only)*

Listgarten 1986 *(published data only)*

Loesche 2002 *(published data only)*

Lopez 2005 *(published data only)*

Lunder 1994 *(published data only)*

Mishkin 1986 *(published data only)*

Moëte 2010 *(published data only)*

Mojon 2000 *(published data only)*
Nyman 1975 [published data only]

Poulsen 1976 [published data only]

Powell 1999 [published data only]

Rosen 2004 [published data only]

Rask 1988 [published data only]

Rosen 2004 [published data only]

Rosling 1976 [published data only]

Rosling 1983 [published data only]

Saliba 1997 [published data only]

Sandig 1981 [published data only]

Sato 2008 [published data only]

Schlagenhauf 1989 [published data only]

Schulz 1989 [published data only]

Serrano 2011 [published data only]

Shaw 1991 [published data only]

Smulow 1983 [published data only]

Suomi 1971 [published data only]

Suomi 1973 [published and unpublished data]

Tan 1978 [published data only]

Tsuei 2003 [published data only]

Van der Weijden 1994 [published data only]
Routine scale and polish for periodontal health in adults (Review)

Additional references

IQUAD (unpublished data only)
IQUAD: Improving the Quality of Dentistry. Ongoing study 2012.

References to ongoing studies

IQUAD (unpublished data only)
IQUAD: Improving the Quality of Dentistry. Ongoing study 2012.

Wang 1992 (published data only)

Wennström 2011 (published data only)

Westfelt 1983 (published data only)

Westfelt 1998 (published data only)

White 1996 (published data only)

Zanatta 2011 (published data only)

Zee 2006 (published data only)

Zimmerman 1993 (published data only)

References to ongoing studies

IQUAD (unpublished data only)
IQUAD: Improving the Quality of Dentistry. Ongoing study 2012.

Additional references

AAP 1992

AAP 2001

AAP 2003

Albandar 2002

Bearne 2000

Beirne 2005a

Bentley 1983

Bonito 2004

Brothwell 1998

Brown 1994

Corbet 2002

DoH 2000
Routine scale and polish for periodontal health in adults (Review)

Kelly 2000

Lindhe 1989

Loo 1967

Needleman 2002

Needleman 2004

O’Leary 1967

Oxford Dict 1995

Pilot 1980

Pilot 1997

Ramfjord 1959

Sheiham 1986

Sheiham 2002

Sprod 1996

Wennstrom 1990

WHO 2004
World Health Organization. Periodontal country profiles: an overview of CPITN data in the WHO Global Oral Data

References to other published versions of this review

Beirne 2005b

Beirne 2007

Forgie 2004

* Indicates the major publication for the study
## Characteristics of Studies

### Characteristics of included studies  [ordered by study ID]

**Jones 2011**

| Methods | Randomised controlled trial conducted in: UK  
Number of centres: 3 dental practices  
Recruitment period: Not stated  
Design: Parallel group 3-arm RCT |
|---|---|
| Participants | Adults (18-60 years) attending practice for scheduled dental check-up appointment. Generally fit and well with minimum of 20 natural teeth. All participants had scale and polish at baseline  
Number of participants: 369 allocated, 305 analysed |
| Interventions | **Group 1: Scale and polish every 6 months**  
n = 125 allocated; n = 106 in analysis  
**Group 2: Scale and polish every 12 months**  
n = 122 allocated; n = 100 in analysis  
**Group 3: No scale and polish**  
n = 122 allocated; n = 99 in analysis  
9 hygienists and therapists performed the interventions in this study  
Oral hygiene advice was given every 6 months to all participants |
| Outcomes | See Additional Table 1 for further details of indices used to measure outcomes  
**Plaque**: Visual presence of plaque on 6 Ramfjord teeth (dichotomised)  
**Gingivitis**: Gingival bleeding on 6 Ramfjord teeth (dichotomised)  
**Calculus**: 1 measurement in mm confined to the lingual surfaces of the mandibular incisor and canine teeth  
2 independent examiners undertook the outcome assessment in this study  
Outcomes measured at 24-month follow-up |
| Notes | Sample size calculation: Yes  
Funding source: Oral Health Unit, The University of Manchester  
Consort flow diagram recording reasons for loss to follow-up |

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
</table>
| Random sequence generation (selection bias) | Low risk | Quote: “randomised, 3 arm parallel clinical trial”  
Quote: “Treatment allocation was by minimization and carried out by the trial manager using MINIM, an MS-DOS program”  
Comment: Probably done |
| Allocation concealment (selection bias) | Low risk | Comment: Central method of randomisation  
| Comment: Probably adequate |
| Blinding of outcome assessment (detection bias) | All outcomes | Low risk | Quote: “Participants were asked not to disclose their allocation group to their dentist or to the outcome examiner”  
| Quote: “the same two examiners carried out all of the follow-up examinations blind to the allocation”  
| Comment: Possibility of accidental disclosure by patient |
| Incomplete outcome data (attrition bias) | All outcomes | Low risk | 369 patients were randomised. Consort diagram and text explanation of withdrawals/drop-outs |
| Selective reporting (reporting bias) | Low risk | All outcomes stated in the methods presented in the results |
| Other bias | Unclear risk | Patients who had BPE > 3 at any interim exam were withdrawn and the outcome data for these patients not collected (total numbers varied in months 15, 17 and 19, but more in the no scale and polish group). Authors note an overall deterioration in gingival health of the trial population, which the authors suggest may be a result of inter-examiner variation |

**Lightner 1971**

| Methods | Randomised controlled trial conducted in: USA  
| Number of centres: 1 US Air Force Academy  
| Recruitment period: 1965/1966  
| Design: Parallel group 4-arm RCT |
| Participants | Young male US Air Force Academy cadets (mean age at final examination was 22 years)  
| Number of participants: 713 recruited, 470 in analysis |
| Interventions | **Group 1: Scale and polish every 12 months without OHI**  
| Subdivided further into Groups 1A and 1B. 1 50-minute preventive treatment (scale and polish) per year with no instruction in toothbrushing. Groups (1A and 1B) were treated 1 month apart. In this review when testing for treatment effects, a single group mean was employed for Groups 1A and 1B. Number of participants in analysis is 108  
| **Group 2: Scale and polish every 12 months with OHI**  
| 1 preventive treatment per year given in 2 30-minute appointments, 5 to 11 days apart and 10 minutes of toothbrushing instruction at each of their 2 appointments. Number |
of participants in analysis is 121

**Group 3: Scale and polish every 6 months with OHI**

2 scale and polish treatments per year, given 6 months apart: the first given in 2 30-minute appointments, 5 to 11 days apart, with an additional 10 minutes of toothbrushing instruction at each session; the second given in 1 30-minute appointment, plus 10 minutes of brushing instruction. Number of participants in analysis is 110

**Group 4A: Scale and polish every 3 months with OHI**

**Group 4B: Scale and polish every 3 months without OHI**

Individuals in groups receiving toothbrushing instruction received the instruction at each appointment prior to preventive treatment. Disclosing solution was used to disclose plaque. If only small plaque accumulation was noted, patients were instructed how to modify their technique to clean teeth effectively. If patient had no effective technique, they were instructed to use modified Roll technique in all areas, with the exception of the lingual surface of the mandibular molars, for which they were instructed to use the Bass technique.

Toothbrushes were provided to all participants throughout the course of the study. Each participant received 2 brushes every 90 days, either at a scheduled appointment or via postal delivery.

Due to graduation of participants in June 1969, the treatment schedule for the final year of the study had to be revised for Groups 3, 4A and 4B. However, the participants in Group 1A, 1B and 2 received their regular treatments at the customary times. Participants in Group 3 received their second preventive treatment after only 4 months instead of 6 months. The participants in Groups 4A and 4B received 3 instead of 4 preventive treatments. Number of participants in analysis is 64 in 4A and 67 in 4B.

All treatment was provided by 3 dental hygienists.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>See Additional Table 1 for further details of indices used to measure outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaque</td>
<td>0-3 scale</td>
</tr>
<tr>
<td>Gingivitis</td>
<td>0-3 scale</td>
</tr>
<tr>
<td>Calculus</td>
<td>0-3 scale</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes</th>
<th>Sample size calculation: Not stated</th>
</tr>
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<tr>
<td>Funding source</td>
<td>Not stated</td>
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</table>

### Risk of bias

<table>
<thead>
<tr>
<th>Bias</th>
<th>Authors’ judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
</table>
| Random sequence generation (selection bias) | Unclear risk | Quote: “randomly assigned to one of four treatment groups”  
Comment: Random component not described |
| Allocation concealment (selection bias) | Unclear risk | Insufficient information |
| Blinding of outcome assessment (detection bias) | Low risk | Quote: “the dentist was unaware of the treatment groups to which the participants were assigned”  
Comment: Dentist unaware of treatment |
Lightner 1971  (Continued)

| Incomplete outcome data (attrition bias) | Unclear risk | 712 participants entered the trial and 121, 74 and 42 participants lost in years 1, 2 and 3 respectively. Patients withdrew because they were moved to a different airbase. Total rate of withdrawal was 33%. However, this was unlikely to be related to intervention group |
| Selective reporting (reporting bias) | Low risk | Planned outcomes of plaque, gingivitis and calculus reported |
| Other bias | Unclear risk | Baseline imbalance: Calculus scores at baseline were lower in the control group |

Listgarten 1985

Methods
- Randomised controlled study conducted in: USA
- Number of centres: 1 (the Dental Hygiene Clinic at the University of Pennsylvania School of Dental Medicine)
- Recruitment period: Not stated
- Design: Parallel group 2-arm RCT

Participants
- Healthy adults, at least 18 years of age, in good general health, recruited from the Dental Hygiene Clinic at the University of Pennsylvania School of Dental Medicine
- Mean age of participants:
  - Group 1 (control): 36 years (range 20-67)
  - Group 2 (test): 38 years (range 20-73)
- Sex:
  - Group 1: Male n = 14; female n = 17
  - Group 2: Male n = 13; female n = 17
- All subjects had at least 5 teeth per quadrant, but no periodontal pockets probable to a depth of 6 mm or more. They had varying degrees of gingivitis but no evidence of alveolar bone loss. Some, but not all subjects, had been receiving periodontal prophylaxes at intervals of 3 to 6 months (no further information given in the report on the latter point)
- 61 (of original 69) participants completed the 3-year study
- Number of participants: 69 randomised, 61 in analysis

Interventions
- **Group 1: Scale and polish every 6 months**
  - Clinical examination (every 6 months), periodontal prophylaxis every 6 months (after every examination). Number of participants in analysis is 31
- **Group 2: Scale and polish at variable schedule based on DDFM tests**
  - Clinical examination (every 6 months). Prophylaxes administered according to a variable schedule, based on the outcome of differential dark-field microscopy (DDFM) tests. For negative DDFM tests (less than 15% spirochetes or motile rods, or less than 20%
spirochetes plus motile rods) recall intervals were gradually increased from 1 to 2, to 3, to 6, to 12, to 24 months. 1 month after the baseline examination, the test was negative the recall interval was extended to 2 months and no prophylaxis was given. If at that time the test was still negative the interval was increased to 3 months, and so on. By the time a 12-month interval was assigned, a subject may already have gone 12 months without a prophylaxis. If at a given recall (e.g. 3 months) a test was positive, a prophylaxis was given and the patient kept on the same recall interval (in this case, 3 months). If 3 months later the test was still positive, the prophylaxis was repeated and the patients recall interval reduced to the next lower interval, in this case 2 months. No patients were assigned recall intervals of less than 1 month. (Note: the latter description of the DDFM test was given in an earlier paper by the authors (Listgarten 1982 (for full reference see 'Additional references')). In the experimental group, the authors state that 25 out of 30 subjects achieved recall intervals of 12 to 24 months within the 3-year experimental period. 11 subjects in the experimental group reached the end of the study without receiving a single prophylaxis over the 3-year duration of the trial. Number of participants in analysis is 30

Provider characteristics: Dental therapist/hygienist

Outcomes

See Additional Table 1 for further details of indices used to measure outcomes

Plaque: Modified Plaque Index (Loe 1967)
Gingivitis: Modified Gingival Index (Loe 1967)
Probing depth: Mean probing depth recorded in mm
Attachment change: Gingival recession recorded to the nearest mm

Mean percentages of motile rods, spirochetes (this outcome was not used as it was deemed not relevant to this review)

It is unclear who (dentist, hygienist, other) performed the outcome assessment in this study

Notes

Funding source: NIDR grant DE-02623 to the Centre for Oral Health Research and a grant from the Colgate-Palmolive company
Sample size calculation: Not stated

Risk of bias

<table>
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<tr>
<th>Bias</th>
<th>Authors' judgement</th>
<th>Support for judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random sequence generation (selection bias)</td>
<td>Unclear risk</td>
<td>Quote: “Assignment to the C or T group was randomised” Comment: Random component not described</td>
</tr>
<tr>
<td>Allocation concealment (selection bias)</td>
<td>Unclear risk</td>
<td>Insufficient information</td>
</tr>
<tr>
<td>Blinding of outcome assessment (detection bias) All outcomes</td>
<td>Unclear risk</td>
<td>Insufficient information</td>
</tr>
</tbody>
</table>
**Listgarten 1985 (Continued)**

<table>
<thead>
<tr>
<th>All outcomes</th>
<th>Unclear risk</th>
<th>69 patients randomised. 61 patients completed the study (31 in the intervention arm and 30 in the control arm). No reasons given for withdrawal or drop-outs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selective reporting</td>
<td>Low risk</td>
<td>Plaque index, gingival index, probing depth recession, recall interval and microbiology outcomes planned and reported</td>
</tr>
<tr>
<td>Other bias</td>
<td>Unclear risk</td>
<td>Quote: “despite randomisation of the patients... into two groups some differences were observed at baseline”</td>
</tr>
</tbody>
</table>

Comment: Baseline imbalances

BPE = Basic Periodontal Examination; mm = millimetre; OHI = oral hygiene instruction; RCT = randomised controlled trial

### Characteristics of excluded studies [ordered by study ID]

<table>
<thead>
<tr>
<th>Study</th>
<th>Reason for exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adachi 2002</td>
<td>None of the primary outcomes specified in our review were measured in this study. This study evaluated the effectiveness of professional tooth cleaning once a week for 24 months in a group of elderly subjects living in 2 nursing homes. Outcomes: fevers of 37.8°C, prevalence of aspiration pneumonia, numbers of <em>Staphylococcus</em> species and <em>Candida albicans</em> in oral swab samples and the amount of methylmercaptan exhaled</td>
</tr>
<tr>
<td>Addy 1988</td>
<td>Not routine scale and polish. Antimicrobial strips were used in 3 out of 4 treatment groups. The remaining treatment group received root planing</td>
</tr>
<tr>
<td>Aldridge 1995</td>
<td>Length of follow-up less than 6 months. Data from 2 studies presented in this paper. In study 1, 41 patients were randomly allocated to receive oral hygiene instruction (small loop flossing, Bass technique brushing, scaling and adjustment of restorative margins) or no treatment. Patients in the intervention group returned for re-enforcement 1 month later. This study was excluded as it employed less than 6 months follow-up (follow-up was 2 months). In study 2, 23 patients were randomised to receive non-surgical treatment (Bass technique brushing, flossing, scaling and root planing under local anaesthesia) or no-treatment control. This study was excluded due to the use of root planing (not routine scale and polish)</td>
</tr>
<tr>
<td>Ashley 1981</td>
<td>Children with mixed dentition at baseline. This study recruited schoolgirls aged between 11 and 12 years old at baseline. Girls in the intervention arm were randomly assigned by class to visit the hygienist every 2 weeks during term time for 3 years for oral hygiene reinforcement and professional prophylaxis. Girls in the control group received the oral hygiene instruction normally given at the school</td>
</tr>
</tbody>
</table>
### Axelsson 1975
Unclear if randomised. This study examined the effect of fluoride on caries in a programme involving meticulous plaque control. 82 patients of both genders were recruited (41 in each arm). Prophylactic treatment was administered once every 2 weeks. During these sessions an abrasive paste containing 5% sodium monofluorophosphate was used in the control group. While in the test group, a paste which did not contain fluoride was used.

### Axelsson 1977
Children with mixed dentition at baseline. In this study 216 Swedish schoolchildren aged between 7 and 14 years old were divided into test and control groups. Once monthly children in the control group brushed their teeth with a 0.2% sodium fluoride solution under the supervision of a dental nurse. While patients in the treatment group received detailed information on the prevention of gingivitis, periodontitis and caries. During the first 2 years of the trial, patients in the treatment group also received detailed oral hygiene instruction and professional prophylaxis (including the application of sodium monofluorophosphate) at a dental nurse clinic every 2 weeks.

### Axelsson 1981
Not a randomised controlled trial. 90 patients referred for treatment of advanced periodontal disease were recruited by the authors. For the first 2 months after surgery (Widman flap technique), the patients were recalled once every 2 weeks for professional tooth cleaning. Every third patient was then referred back to the care of their dentist for maintenance. While the remaining 2 out of 3 were enrolled in a maintenance care programme at a university clinic (patients were recalled every 2-months and received oral health instruction, scaling and tooth cleaning). Patients were re-examined 3 years and 6 years after baseline examination.

### Axelsson 1987
Not routine scale and polish. This study involved 2 treatment groups (Groups 1 and 2) and 1 control group (Group 3). Group 1: received oral hygiene instruction, professional mechanical tooth cleaning including tongue scraping and chlorhexidine mouthrinse followed by application of 1% chlorhexidine gel (excluded from review due to adjunctive use of chlorhexidine). The entire prophylactic regimen was performed on days 1, 3, 5 and 8, followed by 1 single treatment every 6 months throughout the experimental period. Group 2 received only oral hygiene instructions - given on days 1, 3, 5 and 8 for approximately 10 minutes on each occasion (excluded from review as no scale and polish provided). The instructions were repeated every 6 months. The ‘control’ group (Group 3) did not receive any treatment additional to the one based on individual needs given by the local dental health officers.

### Axelsson 2004
Not a randomised controlled trial. The authors refer to an earlier paper (Axelsson 1978) for further details of the study participants. This paper was retrieved by the review team. Participants were recruited using the recall list of 3 general private practitioners and the waiting list of 3 large public dental health clinics. Potential participants for the test group were informed by letter of the purpose of the study and asked to volunteer for the trial. Potential members for the control group were informed that if they agreed to receive a very detailed oral examination they would be recalled for dental treatment to the public dental health clinic once a year during the next 3 years. Only those volunteers who had sought and received dental treatment annually during the last 5 years were selected.

### Badersten 1984
Unclear if randomised. In this study the incisors, cuspids and premolars received plaque control and supragingival debridement using hand or ultrasonic scaling in a split-mouth design.

### Bellini 1981
Children with mixed dentition at baseline. This study examined the effect of monthly professional tooth cleaning on gingivitis in children aged between 7 and 11 years old.

### Bonner 2005
Not routine scale and polish. Study compared 2 different methods of scaling (manual versus ultrasonic scaling).
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown 2002</td>
<td>Not routine scale and polish. This study evaluated the effects of routine and intensified dental care and disease prevention in persons with human immunodeficiency virus (HIV). Study involved 1 control group ('standard care group') and 1 treatment group ('enhanced care group'). The standard care group received free professional dental treatment as needed and desired, including semi-annual professional prophylaxes and checkups (3 per subject, at baseline, 6 months and 1 year). The enhanced care group received standard care plus additional free professional prophylaxes (every 2 months) and twice-daily chlorhexidine antiseptic mouthrinses (excluded from review due to adjunctive use of chlorhexidine)</td>
</tr>
<tr>
<td>Budtz-Jorgensen 2000</td>
<td>Not a randomised controlled trial. Study examined the effects of an oral health programme on the occurrence of oral candidosis in residents in a long-term care facility. 2 groups of residents were formed in this study. The authors state that random allocation was 'ruled out' and all the residents of each ward were assigned to 1 of the 2 groups. The study appears to have been carried out in the same long-term care facility as Mojon 1998</td>
</tr>
<tr>
<td>Chapple 1995</td>
<td>Not routine scale and polish. Split-mouth design: full power versus half power ultrasonic scaling</td>
</tr>
<tr>
<td>Chawla 1975</td>
<td>Randomisation not mentioned. One of the study authors was contacted by the review team but failed to respond to a second e-mail request for further information</td>
</tr>
<tr>
<td>Cutress 1991</td>
<td>Not a randomised controlled trial. This study was a field trial of a community-based periodontal disease prevention programme in a developing nation. The authors state that allocation of villages to periodontal disease prevention programmes was on an 'arbitrary basis' and was also dependent on the facilities available</td>
</tr>
<tr>
<td>Feldman 1988</td>
<td>Not a randomised controlled trial. This study examined the long-term impact of 2 dental delivery systems on children's oral health. It was not possible to determine any differences in the provision of scale and polish treatments to both groups. On reviewing an earlier paper (Bentley 1983) describing the procedure for forming the 2 study groups, it became evident that the randomisation procedure used was compromised. After first siblings were randomly assigned, their brothers or sisters or both were removed from the subsequent assignment process and given the same assignment</td>
</tr>
<tr>
<td>Glavind 1977</td>
<td>Study included periodontal patients in maintenance phase.</td>
</tr>
<tr>
<td>Godin 1976</td>
<td>Not routine scale and polish. Patients randomised to receive the intervention were taught to self scale using a dentiscope, a large plane mouth mirror and a scaler. The control group received scaling and oral hygiene instruction limited to 3 hours over 4 or 5 visits</td>
</tr>
<tr>
<td>Greenwell 1985</td>
<td>Not routine scale and polish. This study compared the effectiveness of 2 oral hygiene regimens ('Keyes’ method' versus 'conventional oral hygiene instruction')</td>
</tr>
<tr>
<td>Grimm 1986</td>
<td>Not a randomised controlled trial. In this study the treatment and control groups were formed according to the age of participants</td>
</tr>
<tr>
<td>Gunay 1998</td>
<td>Not a randomised controlled trial. This study was a 3-phase prospective study examining the effects of a long-term preventive programme for mothers and children starting during pregnancy - there were no randomised comparison groups</td>
</tr>
<tr>
<td>Hellström 1996</td>
<td>All patients received a scale and polish. No control group.</td>
</tr>
<tr>
<td>Study</td>
<td>Details</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hill 1981</td>
<td>Not routine scale and polish. In this study each quadrant of a participating patient’s dentition was randomly assigned to 1 of 4 treatment types: Quadrant 1 (surgical pocket elimination); Quadrant 2 (modified Widman flap surgery); Quadrant 3 (subgingival curettage); Quadrant 4 (thorough scaling and root planing by the periodontist as a principally ‘non-surgical’ control area)</td>
</tr>
<tr>
<td>Hoffman 2005</td>
<td>Not routine scale and polish. This study compared the use of a Vector™ scaling system and a piezo-electric scaler</td>
</tr>
<tr>
<td>Hou 1989</td>
<td>Not a randomised controlled trial. In this study only 1 group of patients was formed and all received the same level of treatment (ultrasonic scaling and root planing)</td>
</tr>
<tr>
<td>Huber 1987</td>
<td>Not a randomised controlled trial. Study used a split-mouth experimental design. However, allocation to ‘test’ and ‘control’ sides was not random</td>
</tr>
<tr>
<td>Hugoson 2007</td>
<td>Interventions confounded by other things. 1 group had a scale and polish on 2 quadrants so a split-mouth design</td>
</tr>
<tr>
<td>Kaldahl 1988</td>
<td>Not routine scale and polish. In this study coronal scaling was used as a ‘control’ in 1 quadrant (Quadrant A) for 3 ‘treatment’ quadrants: Quadrant B: coronal and subgingival scaling and root planing; Quadrant C: coronal and subgingival scaling and root planing followed by modified Widman surgery; Quadrant D: coronal and subgingival scaling and root planing followed by flap with osseous resection surgery</td>
</tr>
<tr>
<td>Katay 1990</td>
<td>Patients had partial dentures.</td>
</tr>
<tr>
<td>Ketomaki 1993</td>
<td>Not a randomised controlled trial. In this study participants were assigned (not a random assignment) either to ‘individualised recall’ or to ‘annual recall’ examinations</td>
</tr>
<tr>
<td>Kinane 2000</td>
<td>Not routine scale and polish. In this study participants were randomised to 4 treatment groups: 1) scaling and root planing alone, 2) scaling and root planing plus antimicrobial therapy (minocycline gel), 3) scaling and root planing plus antimicrobial therapy (tetracycline fibres), and 4) scaling and root planing plus antimicrobial therapy (metronidazole gel)</td>
</tr>
<tr>
<td>Klein 1985</td>
<td>Not a randomised controlled trial. This study examined the cost and effectiveness of various types and combinations of school-based preventive dental care procedures. Schools (rather than individual children) were assigned to regimens in a way that balanced baseline decay level, numbers of children and racial mix across treatment regimens</td>
</tr>
<tr>
<td>Knöfler 2007</td>
<td>Not routine scale and polish. This study compared scaling and root planing to full mouth scaling in a sample of 37 male subjects with moderate chronic periodontitis</td>
</tr>
<tr>
<td>Kwan-Yat 2006</td>
<td>Not routine scale and polish. This study compared oral hygiene instructions alone or in combination with metronidazole 25% gel or subgingival scaling with or without metronidazole gel in the treatment of new, residual or recurrent periodontal pockets in patients previously treated for periodontitis</td>
</tr>
<tr>
<td>Lee 2009</td>
<td>Not a randomised controlled trial. Pseudo-randomised: order of outpatient visits used to randomly assign patients to intervention and control groups</td>
</tr>
<tr>
<td>Lembariti 1998</td>
<td>Randomised split-mouth design on contralateral quadrants, single intervention given once</td>
</tr>
<tr>
<td>Study (Year)</td>
<td>Details</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>Lim 1996</td>
<td>Unclear if randomised. 550 employees of both sexes aged between 25 and 44 were selected using “stratified random sampling criteria”. Patients were then “divided” into 4 groups. Group A: oral hygiene group (n = 195), group B: scaling (n = 148), Group C: scaling and oral hygiene (n = 145), group D: control (n = 62)</td>
</tr>
<tr>
<td>Listgarten 1986</td>
<td>Study included patients with treated periodontal disease and were on different maintenance schedules</td>
</tr>
<tr>
<td>Loesche 2002</td>
<td>Not routine scale and polish. Patients were randomly assigned (following debridement) to receive either metronidazole or doxycycline or placebo</td>
</tr>
<tr>
<td>Lopez 2005</td>
<td>Not routine scale and polish. This study randomised 870 pregnant women with gingivitis to periodontal treatment before 28 weeks gestation or a control group who received periodontal treatment after delivery. Periodontal therapy consisted of plaque control, scaling and daily rinsing with 0.12% chlorhexidine. Maintenance therapy was provided every 2 or 3 weeks until delivery. Excluded due to the use of chlorhexidine</td>
</tr>
<tr>
<td>Lander 1994</td>
<td>Not a randomised controlled trial. Participants were allocated to treatment (18-month recall) and control (12-month recall) groups alphabetically according to their surname. Authors also state that “when allocating the children into the 2 groups geography and caries-activity was taken into consideration.”</td>
</tr>
<tr>
<td>Mishkin 1986</td>
<td>Not routine scale and polish. Split-mouth. Scale and polish versus waterjet</td>
</tr>
<tr>
<td>Moimaz 2000</td>
<td>Randomisation not mentioned (abstract). This study divided patients into 2 groups. Group 1 received prophylaxis and maintained usual oral hygiene while group 2 carried out usual oral hygiene only</td>
</tr>
<tr>
<td>Mojon 1998</td>
<td>Not a randomised controlled trial. The aim of this study was to evaluate the effectiveness of a comprehensive oral health programme for residents of a long-term care facility. 2 groups were formed: 1 group comprised of residents from 5 wards; the other group comprised of residents from 7 wards. The assignment of wards to each group took into account the location of the ward. 1 of the groups was then randomly selected as the experimental group. The study appears to have been carried out in the same long-term care facility as Budtz-Jorgensen 2000.</td>
</tr>
<tr>
<td>Moëne 2010</td>
<td>Not routine scale and polish. This study compared the subgingival application of amino acid glycerine powder to scaling and root planing</td>
</tr>
<tr>
<td>Nyman 1975</td>
<td>Study included patients post-periodontal surgery.</td>
</tr>
<tr>
<td>Poulsen 1976</td>
<td>Children with mixed dentition at baseline. This study randomised 7-year old children to 2 groups: the intervention group received mechanical tooth cleaning every 2 weeks while the control group were untreated</td>
</tr>
<tr>
<td>Powell 1999</td>
<td>Not routine scale and polish. In this study subjects were randomly assigned to 1 of 4 experimental groups or a control group. The control group (Group 1) received ‘usual care’ from a public health department or private practitioner. Group 2 received an educational programme of 2 hours duration implemented twice a year. Group 3 received the educational programme plus a chlorhexidine rinse weekly. Group 4 received the education and chlorhexidine interventions and a fluoride varnish application by a dental hygienist twice a year. Group 5 received all of the above interventions as well as scaling and root planing by a dental hygienist every 6 months throughout the 3-year study</td>
</tr>
<tr>
<td>Author</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Rask 1988</td>
<td>Interventions not relevant. This randomised controlled trial was designed to test the effectiveness (in high caries risk patients) of an intensified preventative regimen. The effects of scaling and polishing were not examined in this trial</td>
</tr>
<tr>
<td>Rosen 2004</td>
<td>Not a randomised controlled trial. In this study, following the initial examination, 391 subjects were divided into 4 experimental groups. First, 3 age groups were formed and within each of these age groups equal numbers of individuals were matched into the 4 experimental groups based on the number of remaining teeth, number of decayed and filled tooth surfaces, number of decayed surfaces, full mouth plaque scores and mean probing depth</td>
</tr>
<tr>
<td>Rosling 1976</td>
<td>Study included patients with advanced periodontal disease.</td>
</tr>
<tr>
<td>Rosling 1983</td>
<td>Not routine scale and polish. 2 studies. In study 1 (2-year clinical study), 75 patients were randomly distributed into intervention (professional cleaning) and control groups. Patients were additionally randomly distributed to receive 1 of 5 surgical procedures: the apically repositioned flap operation including elimination of bony fragments, the apically repositioned flap operation including curettage of bony defects but without removal of bone, the Widman flap technique including elimination of bony defects, the Widman flap technique including curettage of bony defects but without removal of bone and gingivectomy. After surgery, the teeth of patients in the intervention arm were professionally cleaned once a fortnight during a 2-year period. The patients in the control arm were recalled once a year for supragingival scaling and polishing. No data from this study are reported in this article. Only the 50 patients in the treatment arm of the 2-year clinical study progressed to the 6-year clinical study, while the 25 control patients were withdrawn</td>
</tr>
<tr>
<td>Saliba 1997</td>
<td>Randomisation not mentioned (abstract). In this study 45 schoolchildren were divided into 3 groups. Group A received toothbrushing and dental floss use under supervision. Group B received professional prophylaxis. Group C received non-supervised toothbrushing</td>
</tr>
<tr>
<td>Sandig 1981</td>
<td>Unclear if study was randomised (paper in German). This study was partially translated (Material and methods section) with a view to determining its eligibility. However, we were unable to ascertain if it was a randomised trial. The authors state that “2 comparable groups of 18 or 20 patients were studied. A year ago those patients were treated with cast removable partial dentures at the department of Stomatology of the medical academy Erfurt.”</td>
</tr>
<tr>
<td>Sato 2008</td>
<td>No scale and polish. This study compared professional oral care performed by a hygienist (15 minutes of instructions on mouth cleaning and on Bass toothbrushing method) with toothbrushing and mouth rinsing by patients themselves</td>
</tr>
<tr>
<td>Schlagenhauf 1989</td>
<td>Not routine scale and polish. The purpose of this study was to evaluate the effect of subgingival scaling versus subgingival pocket irrigation with 0.1% chlorhexidine or saline controls</td>
</tr>
<tr>
<td>Schulz 1989</td>
<td>Unclear if study was randomised. Unable to contact authors to determine if the study was a randomised controlled trial (paper in German). This study was fully translated with a view to determining its eligibility. However, we were unable to ascertain if it was a randomised trial. In addition the interventions and comparison groups were poorly described. The authors state that “55 test persons participated in this study. They had gingivitis caused by plaque at the age 15 and 25 years (17.7 years on average). Not included were pregnant women, patients with internal diseases, with prosthetic restorations and untreated caries. 15 test persons took part in 3 different programmes, over a period of 3 months that had the following objectives: oral hygiene instructions and...</td>
</tr>
</tbody>
</table>
motivation (dental nurse) as well as professional tooth cleaning (dentist). 1 group made up of 10 test persons (group IV) served as the control group. The programme of group III with 1 motivation session without teeth cleaning training was designed to check which results the frequent examination with an oral hygiene pass/check book produces. From the results of the test group we expected indications of the motivating effect of the professional teeth cleaning and of the importance for the reduction of gingivitis as such.”

### Serrano 2011
- Not routine scale and polish. The purpose of this study was to compare three protocols for non-surgical periodontal therapy. Patients were randomised to receive either scaling and root planing quadrant by quadrant at weekly intervals (control group), full mouth scaling and root planing performed over 2 consecutive days (FM group), or full mouth scaling and root planing performed over 2 consecutive days combined with the administration of antibiotics (FMa group).

### Shaw 1991
- 4 centres randomised to 4 interventions. Cluster randomised controlled trial with single cluster per intervention so unable to use data at all.

### Smulow 1983
- Not routine scale and polish. Patients were randomised to 4 groups. Group 1 received initial scaling and daily polishing, group 2 received daily polishing without initial scaling, group 3 received initial scaling without daily polishing and group 4 received no treatment.

### Suomi 1971
- Not a randomised controlled trial. This study was carried out “to test the hypothesis that the development and progression of gingival inflammation and destructive periodontal disease are retarded in an oral environment in which high levels of hygiene are maintained.” 2 groups (experimental and control) were matched on the basis of periodontal and oral hygiene status, past caries experience, age and sex. The experimental group were given a series of frequent oral prophylaxes combined with oral hygiene instruction and dental health education. Subjects in the control groups received no attention from the study team except for annual examinations.

### Suomi 1973
- Unclear how groups were formed, unlikely to be randomised.

### Tan 1978
- Follow-up less than 6 months. In this study 120 Dutch army recruits in 2 camps were randomised to receive no treatment (group A), professional prophylaxis (group B), dental health instruction (group C) or both prophylaxis and dental health instruction (group D). Patients were examined at initiation of the study, after 1 month and 3 months.

### Tsuboi 2003
- Not a randomised controlled trial (after translation from Japanese).

### Van der Weijden 1994
- No scale and polish. This study looked at the effect of pre-experimental maintenance on the development of gingivitis.

### Wang 1992
- Interventions not relevant. In this randomised controlled trial participants were randomly allocated to recall examination at either 12 months or 24 months. Scale and polish treatments (if any) provided at recall were not reported in this paper. Outcomes reported were clinical examination time, treatment time and the DMFS increment during the 2-year study period.

### Wennström 2011
- Not routine scale and polish. This study compared air polishing to ultrasonic instruments in a split-mouth study.

### Westfelt 1983
- Included patients had periodontal surgery.
Westfelt 1998
Not routine scale and polish. Split-mouth study. 2 quadrants of each patient were designated test group, while the other 2 were identified as control. Patients in the test arm received supragingival plaque control. While patients in the control arm received subgingival scaling and root planing.

White 1996
Length of follow-up less than 6 months. Single episode of scaling. Participant characteristics not presented. This study examined the efficiency of 2 professionals (1 dentist, 1 dental hygienist) in removing supragingival calculus. Participants were concomitantly participating in a tartar control dentifrice trial. Outcomes: total developed force, average force per stroke, total strokes and Volpe-Manhold-Index (VMI) grading.

Zanatta 2011
Length of follow-up less than 6 months. Split-mouth study. 67 patients received supragingival scaling on the 6 mandibular teeth. Quadrants were then randomly selected to be polished or not with a rubber cup and pumice. Outcomes assessed at 1, 2 and 3 weeks post-treatment.

Zee 2006
Not routine scale and polish. Split-mouth study. Active treatment included subgingival scaling, metronidazole 25% gel and subgingival scaling plus metronidazole 25% gel. A control group was also employed.

Zimmerman 1993
All patients received scale and polish. This study examined the effectiveness of 1 versus 2 preventive advice sessions. Both treatment and control groups were given 30-minute scale and polish treatments.

Characteristics of ongoing studies [ordered by study ID]

IQUAD

Trial name or title | IQUAD: Improving the Quality of Dentistry
--- | ---
Methods | A 5-year multicentre, randomised, open trial with blinded outcome evaluation based in dental primary care in Scotland and the North East of England. Dental practices are cluster randomised to provide routine oral hygiene advice or personalised oral hygiene advice. Both dentists and DCPs will undertake the scale and polish treatments. To test the effects of Periodontal Instrumentation each participant will be randomised to 1 of 3 groups: no periodontal instrumentation, 6-monthly periodontal instrumentation (current practice), or 12-monthly periododontal instrumentation.
Participants | Dentate adults with BPE <= 3
Interventions | No periodontal instrumentation, 6-monthly periodontal instrumentation (current practice), or 12-monthly periodontal instrumentation
Outcomes | Primary outcomes: Clinical: gingival inflammation/bleeding on probing at the gingival margin measured by the Gingival Index of Loe. Patient-centred: oral hygiene self efficacy
Economic: net benefits (mean willingness to pay minus mean costs). Measured at 3 years
Starting date | 2012
Contact information | j.e.clarkson@dundee.ac.uk
| Notes | HTA funded ISRCTN56465715. A multicentre randomised controlled trial comparing oral hygiene advice and periodontal instrumentation for the prevention and management of periodontal disease in dentate adults attending dental primary care |

BPE = Basic Periodontal Examination; DCPs = dental care professionals
### DATA AND ANALYSES

#### Comparison 1.  Scale and polish versus no scale and polish (control)

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gingivitis at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>1.1 6-monthly S&amp;P</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>1.2 12-monthly S&amp;P</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>Calculus at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>2.1 6-monthly S&amp;P</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>2.2 12-monthly S&amp;P</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>Plaque at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>3.1 6-monthly S&amp;P</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>3.2 12-monthly S&amp;P</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
</tbody>
</table>

#### Comparison 2.  Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of perio

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gingivitis at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>2. Plaque at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>3. Pocket depth at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
</tbody>
</table>

#### Comparison 3.  Scale and polish at a fixed interval versus scale and polish at a different fixed interval

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P: 3-monthly versus 6-monthly (with OHI)</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>1.1 Gingivitis at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>1.2 Calculus at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>1.3 Plaque at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>S&amp;P: 3-monthly versus 12-monthly (with OHI)</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>2.1 Gingivitis at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>2.2 Calculus at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>2.3 Plaque at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
<tr>
<td>S&amp;P: 3-monthly versus 12-monthly (without OHI)</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
</tr>
<tr>
<td>3.1 Gingivitis at 24 months</td>
<td>1</td>
<td></td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
</tr>
</tbody>
</table>
3.2 Calculus at 24 months
Mean Difference (IV, Fixed, 95% CI) 0.0 [0.0, 0.0]

3.3 Plaque at 24 months
Mean Difference (IV, Fixed, 95% CI) 0.0 [0.0, 0.0]

4 S&P: 6-monthly versus 12-monthly (with OHI)
Mean Difference (IV, Fixed, 95% CI) 0.0 [0.0, 0.0]

4.1 Gingivitis at 24 months
Std. Mean Difference (IV, Fixed, 95% CI) -0.08 [-0.27, 0.10]

4.2 Calculus at 24 months
Std. Mean Difference (IV, Fixed, 95% CI) -0.25 [-0.44, -0.06]

4.3 Plaque at 24 months
Std. Mean Difference (IV, Fixed, 95% CI) -0.16 [-0.35, 0.03]

Comparison 4. Scale and polish at a fixed interval with OHI versus scale and polish without OHI at the same fixed interval

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 S&amp;P every 3 months with OHI versus without OHI</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
<td></td>
</tr>
<tr>
<td>1.1 Gingivitis at 24 months</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
</tr>
<tr>
<td>1.2 Calculus at 24 months</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
</tr>
<tr>
<td>1.3 Plaque at 24 months</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
</tr>
<tr>
<td>2 S&amp;P every 12 months with OHI versus without OHI</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>Totals not selected</td>
<td></td>
</tr>
<tr>
<td>2.1 Gingivitis at 24 months</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
</tr>
<tr>
<td>2.2 Calculus at 24 months</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
</tr>
<tr>
<td>2.3 Plaque at 24 months</td>
<td>1</td>
<td>Mean Difference (IV, Fixed, 95% CI)</td>
<td>0.0 [0.0, 0.0]</td>
<td></td>
</tr>
</tbody>
</table>

Analysis 1.1. Comparison 1 Scale and polish versus no scale and polish (control), Outcome 1 Gingivitis at 24 months.

Review: Routine scale and polish for periodontal health in adults

Comparison: 1 Scale and polish versus no scale and polish (control)

Outcome: 1 Gingivitis at 24 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>%S&amp;P</th>
<th>Control</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>IV,Fixed,95% CI</td>
<td>IV,Fixed,95% CI</td>
</tr>
<tr>
<td>1 6-monthly %S&amp;P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones 2011</td>
<td>107</td>
<td>0.379 (0.303)</td>
<td>-0.02 [-0.10, 0.06]</td>
<td></td>
</tr>
<tr>
<td>2 12-monthly %S&amp;P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones 2011</td>
<td>100</td>
<td>0.388 (0.307)</td>
<td>-0.01 [-0.09, 0.07]</td>
<td></td>
</tr>
</tbody>
</table>

Routine scale and polish for periodontal health in adults (Review) 44

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Analysis 1.2. Comparison 1 Scale and polish versus no scale and polish (control), Outcome 2 Calculus at 24 months.

Review: Routine scale and polish for periodontal health in adults

Comparison: 1 Scale and polish versus no scale and polish (control)

Outcome: 2 Calculus at 24 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>%P</th>
<th>Control</th>
<th>Mean Difference</th>
<th>IV/Fixed, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 6-monthly %P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones 2011</td>
<td>107</td>
<td>0.71 (1)</td>
<td></td>
<td>-0.24 [-0.51, 0.03]</td>
</tr>
<tr>
<td>2 12-monthly %P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones 2011</td>
<td>100</td>
<td>0.89 (0.99)</td>
<td></td>
<td>-0.06 [-0.33, 0.21]</td>
</tr>
</tbody>
</table>
### Analysis 1.3. Comparison 1 Scale and polish versus no scale and polish (control), Outcome 3 Plaque at 24 months.

**Review:** Routine scale and polish for periodontal health in adults

**Comparison:** 1 Scale and polish versus no scale and polish (control)

**Outcome:** 3 Plaque at 24 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Variable interval</th>
<th>Fixed interval</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>N</td>
<td>IV, Fixed, 95% CI</td>
<td>IV, Fixed, 95% CI</td>
</tr>
<tr>
<td>Jones 2011</td>
<td>107</td>
<td>100</td>
<td>0.394 (0.342)</td>
<td>0.44 (0.324)</td>
</tr>
<tr>
<td>Jones 2011</td>
<td>100</td>
<td>100</td>
<td>0.435 (0.347)</td>
<td>0.44 (0.324)</td>
</tr>
</tbody>
</table>

### Analysis 2.1. Comparison 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of perio, Outcome 1 Gingivitis at 24 months.

**Review:** Routine scale and polish for periodontal health in adults

**Comparison:** 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of perio

**Outcome:** 1 Gingivitis at 24 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Variable interval</th>
<th>Fixed interval</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>N</td>
<td>IV, Fixed, 95% CI</td>
<td>IV, Fixed, 95% CI</td>
</tr>
<tr>
<td>Listgarten 1985</td>
<td>30</td>
<td>31</td>
<td>0.67 (0.26)</td>
<td>0.62 (0.26)</td>
</tr>
</tbody>
</table>
Analysis 2.2. Comparison 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of periodontal disease, Outcome 2 Plaque at 24 months.

Review: Routine scale and polish for periodontal health in adults
Comparison: 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of periodontal disease
Outcome: 2 Plaque at 24 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Variable interval</th>
<th>Fixed interval</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
<td>N</td>
</tr>
<tr>
<td>Listgarten 1985</td>
<td>30</td>
<td>0.59 (0.24)</td>
<td>31</td>
</tr>
</tbody>
</table>

-1 -0.5 0 0.5 1
Favours variable interval Favours fixed interval

Analysis 2.3. Comparison 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of periodontal disease, Outcome 3 Pocket depth at 24 months.

Review: Routine scale and polish for periodontal health in adults
Comparison: 2 Scale and polish at a fixed interval versus scale and polish in response to the signs and/or symptoms of periodontal disease
Outcome: 3 Pocket depth at 24 months

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Variable interval</th>
<th>Fixed interval</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
<td>N</td>
</tr>
<tr>
<td>Listgarten 1985</td>
<td>30</td>
<td>1.65 (0.17)</td>
<td>31</td>
</tr>
</tbody>
</table>

-1 -0.5 0 0.5 1
Favours variable interval Favours fixed interval
Analysis 3.1. Comparison 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval, Outcome 1 S&P: 3-monthly versus 6-monthly (with OHI).

Review: Routine scale and polish for periodontal health in adults

Comparison: 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval

Outcome: 1 S&P: 3-monthly versus 6-monthly (with OHI)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>3 months</th>
<th>6 months</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>1 Gingivitis at 24 months</td>
<td>Lightner 1971</td>
<td>64 1.33 (0.31)</td>
<td>110 1.43 (0.31)</td>
<td>-0.10 [-0.20, 0.00]</td>
</tr>
<tr>
<td>2 Calculus at 24 months</td>
<td>Lightner 1971</td>
<td>64 0.27 (0.41)</td>
<td>110 0.27 (0.41)</td>
<td>0.0 [-0.13, 0.13]</td>
</tr>
<tr>
<td>3 Plaque at 24 months</td>
<td>Lightner 1971</td>
<td>64 1.82 (0.41)</td>
<td>110 1.77 (0.41)</td>
<td>0.05 [-0.08, 0.18]</td>
</tr>
</tbody>
</table>
**Analysis 3.2. Comparison 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval, Outcome 2 S&P: 3-monthly versus 12-monthly (with OHI).**

Review: Routine scale and polish for periodontal health in adults

Comparison: Scale and polish at a fixed interval versus scale and polish at a different fixed interval

Outcome: 2 S&P: 3-monthly versus 12-monthly (with OHI)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>3 months</th>
<th>12 months</th>
<th>Mean Difference</th>
<th>IV/Fixed, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>1 Gingivitis at 24 months</td>
<td>64</td>
<td>1.33 (0.31)</td>
<td>121</td>
<td>1.47 (0.31)</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Calculus at 24 months</td>
<td>64</td>
<td>0.27 (0.41)</td>
<td>121</td>
<td>0.4 (0.41)</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Plaque at 24 months</td>
<td>64</td>
<td>1.82 (0.41)</td>
<td>121</td>
<td>1.84 (0.41)</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

-1 -0.5 0 0.5 1
Favours 3 months Favours 12 months
### Analysis 3.3. Comparison Scale and polish at a fixed interval versus scale and polish at a different fixed interval, Outcome 3 S&P: 3-monthly versus 12-monthly (without OHI)

**Review:** Routine scale and polish for periodontal health in adults

**Comparison:** 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval

**Outcome:** 3 S&P: 3-monthly versus 12-monthly (without OHI)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>3 months</th>
<th>12 months</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
</tr>
<tr>
<td>1 Gingivitis at 24 months</td>
<td>Lightner 1971</td>
<td>67</td>
<td>1.4 (0.31)</td>
<td>108</td>
</tr>
<tr>
<td>2 Calculus at 24 months</td>
<td>Lightner 1971</td>
<td>67</td>
<td>0.29 (0.41)</td>
<td>108</td>
</tr>
<tr>
<td>3 Plaque at 24 months</td>
<td>Lightner 1971</td>
<td>67</td>
<td>1.99 (0.41)</td>
<td>108</td>
</tr>
</tbody>
</table>

---

**Favours 3 months**

**Favours 12 months**
### Analysis 3.4. Comparison 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval, Outcome 4 S&P: 6-monthly versus 12-monthly (with OHI).

**Review:** Routine scale and polish for periodontal health in adults

**Comparison:** 3 Scale and polish at a fixed interval versus scale and polish at a different fixed interval

**Outcome:** 4 S&P: 6-monthly versus 12-monthly (with OHI)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>6 months</th>
<th>12 months</th>
<th>Std. Mean Difference</th>
<th>Weight</th>
<th>95% CI</th>
<th>Std. Mean Difference</th>
<th>Weight</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
<td>Mean(SD)</td>
<td>IV, Fixed, 95% CI</td>
<td>N</td>
<td>Mean(SD)</td>
<td>IV, Fixed, 95% CI</td>
</tr>
<tr>
<td>I Gingivitis at 24 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones 2011</td>
<td>107</td>
<td>0.38 (0.3)</td>
<td>100</td>
<td>0.39 (0.31)</td>
<td>47.3 %</td>
<td>-0.03 [ -0.31, 0.24 ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>110</td>
<td>1.43 (0.31)</td>
<td>121</td>
<td>1.47 (0.31)</td>
<td>52.7 %</td>
<td>-0.13 [ -0.39, 0.13 ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>217</strong></td>
<td><strong>221</strong></td>
<td></td>
<td></td>
<td><strong>100.0 %</strong></td>
<td><strong>-0.08</strong> [ <strong>-0.27, 0.10</strong> ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Chi² = 0.25, df = 1 (P = 0.62); I² = 0.0%</td>
<td>Test for overall effect: Z = 0.87 (P = 0.38)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|                  | N        | Mean(SD)  | N                    | Mean(SD) | IV, Fixed, 95% CI | N                    | Mean(SD) | IV, Fixed, 95% CI |
|                  |          |          |                      |         |                |                      |         |                |
| II Calculus at 24 months |           |           |                      |         |              |                      |         |              |
| Jones 2011       | 107      | 0.71 (1)  | 100                  | 0.89 (0.99) | 47.5 %       | -0.18 [ -0.45, 0.09 ] |        |              |
| Lightner 1971    | 110      | 0.27 (0.41) | 121                  | 0.4 (0.41) | 52.5 %       | -0.32 [ -0.58, -0.06 ] |        |              |
| **Subtotal (95% CI)** | **217** | **221** |                      |         | **100.0 %** | **-0.25** [ **-0.44, -0.06** ] |        |              |
| Heterogeneity: Chi² = 0.50, df = 1 (P = 0.48); I² = 0.0% | Test for overall effect: Z = 2.62 (P = 0.0088) |

|                  | N        | Mean(SD)  | N                    | Mean(SD) | IV, Fixed, 95% CI | N                    | Mean(SD) | IV, Fixed, 95% CI |
|                  |          |          |                      |         |                |                      |         |                |
| III Plaque at 24 months |           |           |                      |         |              |                      |         |              |
| Jones 2011       | 107      | 0.39 (0.34) | 100                  | 0.44 (0.35) | 47.3 %       | -0.14 [ -0.42, 0.13 ] |        |              |
| Lightner 1971    | 110      | 1.77 (0.41) | 121                  | 1.84 (0.41) | 52.7 %       | -0.17 [ -0.43, 0.09 ] |        |              |
| **Subtotal (95% CI)** | **217** | **221** |                      |         | **100.0 %** | **-0.16** [ **-0.35, 0.03** ] |        |              |
| Heterogeneity: Chi² = 0.02, df = 1 (P = 0.89); I² = 0.0% | Test for overall effect: Z = 1.65 (P = 0.099) |
### Analysis 4.1. Comparison 4 Scale and polish at a fixed interval with OHI versus scale and polish without OHI at the same fixed interval, Outcome 1 S&P every 3 months with OHI versus without OHI.

**Review:** Routine scale and polish for periodontal health in adults

**Comparison:** Scale and polish at a fixed interval with OHI versus scale and polish without OHI at the same fixed interval

**Outcome:** S&P every 3 months with OHI versus without OHI

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>With OHI</th>
<th>Without OHI</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
<td>N</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>1 Gingivitis at 24 months</td>
<td>Lightner 1971</td>
<td>64</td>
<td>1.33 (0.31)</td>
<td>67</td>
</tr>
<tr>
<td>2 Calculus at 24 months</td>
<td>Lightner 1971</td>
<td>64</td>
<td>0.27 (0.41)</td>
<td>67</td>
</tr>
<tr>
<td>3 Plaque at 24 months</td>
<td>Lightner 1971</td>
<td>64</td>
<td>1.82 (0.41)</td>
<td>67</td>
</tr>
</tbody>
</table>

-1 -0.5 0 0.5 1

Favours OHI Favours without OHI
Analysis 4.2. Comparison 4 Scale and polish at a fixed interval with OHI versus scale and polish without OHI at the same fixed interval, Outcome 2 S&P every 12 months with OHI versus without OHI.

Review: Routine scale and polish for periodontal health in adults

Comparison: Scale and polish at a fixed interval with OHI versus scale and polish without OHI at the same fixed interval

Outcome: 2 S&P every 12 months with OHI versus without OHI

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>With OHI</th>
<th>Without OHI</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean(SD)</td>
<td>N</td>
</tr>
<tr>
<td>1 Gingivitis at 24 months</td>
<td>Lightner 1971</td>
<td>121</td>
<td>1.47 (0.31)</td>
</tr>
<tr>
<td>2 Calculus at 24 months</td>
<td>Lightner 1971</td>
<td>121</td>
<td>0.4 (0.41)</td>
</tr>
<tr>
<td>3 Plaque at 24 months</td>
<td>Lightner 1971</td>
<td>121</td>
<td>1.84 (0.41)</td>
</tr>
</tbody>
</table>

ADDITIONAL TABLES

Table 1. Indices used in trials

<table>
<thead>
<tr>
<th>Study</th>
<th>Notes/ references</th>
<th>Plaque</th>
<th>Calculus</th>
<th>Gingivitis/ bleeding</th>
<th>Pocket depth</th>
<th>Attachment change</th>
<th>Periodontal indices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones 2011</td>
<td>For references to index teeth used in trial see Ramfjord 1959</td>
<td>Visual presence of any plaque on the 6 (Ramfjord) index teeth according to a dichotomous scale: plaque present/not present</td>
<td>Measurement of calculus in mm: 1 measurement, confined to the lingual surfaces of the mandibular incisor and canine teeth. A PCP-10 probe was used to measure along the vertical axis of the tooth with bleeding from the gingival margin of 6 (Ramfjord) index teeth. Bleeding was detected by running a blunt-ended (PCP-10) probe gently around the gingival margin of the tooth at a 60° angle, in con-</td>
<td>Not reported</td>
<td>Not reported</td>
<td>Not reported</td>
<td></td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>For references to indices used in trial see O’Leary 1967. The examination system used was the Periodontal Screening Examination (O’Leary 1967). The mouth is divided into 6 segments. The highest score found for any tooth in a segment is recorded as the score for the segment</td>
<td>Plaque index (no description of the precise criteria used). Plaque scores range from 0 to 3. Data reported as mean plaque index scores</td>
<td>Hard deposit index. Hard deposit scores range from 0 to 3 (precise criteria not described). Data presented as mean hard deposit index scores</td>
<td>Gingival index (precise criteria not described). Gingival scores range from 0 to 3. Data reported as mean gingival index scores</td>
<td>Not reported</td>
<td>Loss of epithelial attachment. Data reported as mean attachment loss (mm). Reported data not used in this review as no standard deviations provided</td>
<td>Peri-odontal index. Possible scores of 0, 4, 5 or 6 (criteria described in full in the paper). To simplify the statistical handling of data, scores 4, 5 and 6 were transformed to 1, 2 and 3 respectively. Reported data were not used in this review as presented in an inappropriate format</td>
</tr>
<tr>
<td>Listgarten 1985</td>
<td>For references to indices used in trial see Loe 1967</td>
<td>Modified plaque index. Index based on a 0-3 score (Loe 1967). Each tooth was scored on the mid-buccal and mid-lingual</td>
<td>Not reported</td>
<td>Modified gingival index (Loe 1967). Index is based on a 0-3 score. Data reported as mean gingival index scores for control and test</td>
<td>Probing depth. Data reported as mean probing depth (mm). Probing depth recorded to the nearest mm with uniform probes</td>
<td>Recession recorded to the nearest mm as the distance from the gingival margin to the cemento-enamel</td>
<td>Not reported</td>
</tr>
</tbody>
</table>
Table 1. Indices used in trials  
(Continued)

<table>
<thead>
<tr>
<th>Surfaces as well as on the mesial buccal surface. The mean values for the whole mouth obtained by adding all mid-buccal and mid-lingual and the doubled value of the mesial buccal scores and dividing by the number of surfaces at risk. Data reported as mean plaque index scores for control and test groups.</th>
<th>Calibrated in mm, with a tip diameter of 0.35 mm.</th>
<th>Measurement of the cemento-enamel junction (only when a distinct cemento-enamel junction was identifiable).</th>
</tr>
</thead>
</table>

mm = millimetre

Table 2. Comparison 1: Scale and polish versus no scale and polish (outcomes, data points, scale and polish frequency)

<table>
<thead>
<tr>
<th>Frequency of scale and polish</th>
<th>Data points</th>
<th>Plaque</th>
<th>Calculus</th>
<th>Gingivitis/bleeding</th>
<th>Pocket depth</th>
<th>Attachment change</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months</td>
<td>24</td>
<td>Jones 2011</td>
<td>Jones 2011</td>
<td>Jones 2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 months</td>
<td>24</td>
<td>Jones 2011</td>
<td>Jones 2011</td>
<td>Jones 2011</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Comparison 2: Scale and polish versus scale and polish in response to gingivitis/periodontitis (outcomes, data points, scale and polish frequency)

<table>
<thead>
<tr>
<th>Frequency of scale and polish</th>
<th>Data points</th>
<th>Plaque</th>
<th>Calculus</th>
<th>Gingivitis/bleeding</th>
<th>Pocket depth</th>
<th>Attachment change</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months</td>
<td>6</td>
<td>Listgarten 1985</td>
<td>Listgarten 1985</td>
<td>Listgarten 1985</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 months</td>
<td>12</td>
<td>Listgarten 1985</td>
<td>Listgarten 1985</td>
<td>Listgarten 1985</td>
<td></td>
<td></td>
</tr>
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</table>
Table 3. Comparison 2: Scale and polish versus scale and polish in response to gingivitis/periodontitis (outcomes, data points, scale and polish frequency)  (Continued)

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<th>Gingivitis/bleeding</th>
<th>Pocket depth</th>
<th>Attachment change</th>
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Table 4. Comparison 3: Scale and polish versus scale and polish at different intervals (outcomes, data points, scale and polish frequency)

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<th>Pocket depth</th>
<th>Attachment change</th>
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Table 5. Comparison 2: Results for scale and polish at fixed interval (6 months) versus in response to signs/symptoms

| Outcome measured (months) | Variable interval | Fixed interval | | | | | |
|---------------------------|-------------------|---------------|---|---|---|---|---|---|
|                           | Mean | SD  | n  | Mean | SD  | n  | MD (95% CI) | P value |
| Gingivitis                |      |     |    |      |     |    |            |         |
| 6 months                  | 0.3  | 0.26| 30 | 0.26 | 0.26| 31 | 0.01 (-0.12, 0.14) | 0.88     |
| 12                        | 0.4  | 0.26| 30 | 0.42 | 0.26| 31 | -0.02 (-0.15, 0.11) | 0.76     |
| 18                        | 0.52 | 0.26| 30 | 0.59 | 0.26| 31 | -0.07 (-0.20, 0.06) | 0.29     |
| 24                        | 0.67 | 0.26| 30 | 0.62 | 0.26| 31 | 0.05 (-0.08, 0.18)  | 0.45     |
| 30                        | 0.7  | 0.26| 30 | 0.7  | 0.26| 31 | 0.00 (-0.13, 0.13)  | 1.00     |
| 36                        | 0.63 | 0.26| 30 | 0.67 | 0.26| 31 | -0.04 (-0.17, 0.09) | 0.55     |
| Plaque                    |      |     |    |      |     |    |            |         |
| 6 months                  | 0.43 | 0.24| 30 | 0.53 | 0.24| 31 | -0.10 (-0.22, 0.02) | 0.10     |
| 12                        | 0.55 | 0.24| 30 | 0.62 | 0.24| 31 | -0.07 (-0.19, 0.05) | 0.25     |
| 18                        | 0.6  | 0.24| 30 | 0.7  | 0.24| 31 | -0.10 (-0.22, 0.02) | 0.10     |
| 24                        | 0.59 | 0.24| 30 | 0.69 | 0.24| 31 | -0.10 (-0.22, 0.02) | 0.10     |
| 30                        | 0.68 | 0.24| 30 | 0.74 | 0.24| 31 | -0.06 (-0.18, 0.06) | 0.33     |
| 36                        | 0.6  | 0.24| 30 | 0.68 | 0.24| 31 | -0.08 (-0.20, 0.04) | 0.19     |
| Pocket depth              |      |     |    |      |     |    |            |         |
| 6 months                  | 1.65 | 0.19| 30 | 1.7  | 0.19| 31 | -0.05 (-0.15, 0.05) | 0.19     |
| 12                        | 1.65 | 0.19| 30 | 1.7  | 0.19| 31 | -0.05 (-0.15, 0.05) | 0.19     |
| 18                        | 1.65 | 0.17| 30 | 1.7  | 0.17| 31 | -0.05 (-0.14, 0.04) | 0.17     |
| 24                        | 1.65 | 0.17| 30 | 1.7  | 0.17| 31 | -0.05 (-0.14, 0.04) | 0.17     |
Table 5. Comparison 2: Results for scale and polish at fixed interval (6 months) versus in response to signs/symptoms (Continued)

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<th>MD (95% CI)</th>
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CI = confidence interval; MD = mean difference; SD = standard deviation

Table 6. Comparison 3: Results from Lightner 1971 and Jones 2011 for scale and polish comparing different time intervals (48 months)

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Outcome measured (months)</th>
<th>Variable interval</th>
<th>Fixed interval</th>
<th>MD (95% CI)</th>
<th>P value</th>
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<td>Mean 1.7 SD 0.17 n 30</td>
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<td>0.31</td>
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<td>0.31</td>
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<td>1.34</td>
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<tr>
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<td>1.25</td>
<td>0.31</td>
<td>64</td>
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Table 6. Comparison 3: Results from Lightner 1971 and Jones 2011 for scale and polish comparing different time intervals (48 months)  (Continued)

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<th>0.01 (-0.12, 0.14)</th>
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<td>64</td>
<td>1.58</td>
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<td>110</td>
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<td>64</td>
<td>1.47</td>
<td>0.41</td>
<td>110</td>
<td>0.01 (-0.12, 0.14)</td>
<td>0.88</td>
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</table>

3 versus 12 months (with OHI)

| Lightner 1971 | 24 | 1.33 | 0.31 | 64 | 1.47 | 0.31 | 121 | -0.14 (-0.23, -0.05) | 0.003 |
| Lightner 1971 | 36 | 1.27 | 0.31 | 64 | 1.39 | 0.31 | 121 | -0.12 (-0.21, -0.03) | 0.01 |
| Lightner 1971 | 48 | 1.25 | 0.31 | 64 | 1.4 | 0.31 | 121 | -0.15 (-0.24, -0.06) | 0.002 |

Calculus

| Lightner 1971 | 24 | 0.27 | 0.41 | 64 | 0.4 | 0.41 | 121 | -0.13 (-0.25, -0.01) | 0.04 |
| Lightner 1971 | 36 | 0.22 | 0.41 | 64 | 0.32 | 0.41 | 121 | -0.10 (-0.22, 0.02) | 0.11 |
| Lightner 1971 | 48 | 0.13 | 0.41 | 64 | 0.26 | 0.41 | 121 | -0.13 (-0.25, -0.01) | 0.04 |

Plaque

| Lightner 1971 | 24 | 1.82 | 0.41 | 64 | 1.84 | 0.41 | 121 | -0.02 (-0.14, 0.10) | 0.75 |
Table 6. Comparison 3: Results from Lightner 1971 and Jones 2011 for scale and polish comparing different time intervals (48 months)  

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3 versus 12 months (without OHI)

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Calculus

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Plaque

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Routine scale and polish for periodontal health in adults (Review)  
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Table 6. Comparison 3: Results from Lightner 1971 and Jones 2011 for scale and polish comparing different time intervals (48 months) (Continued)

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<td></td>
<td>-0.06 (-0.14, 0.02)</td>
<td>-0.11 (-0.22, -0.00)</td>
</tr>
</tbody>
</table>

CI = confidence interval; MD = mean difference; OHI = oral hygiene instruction; SD = standard deviation
Table 7. Comparison 4: Results from Lightner 1971 comparing scale and polish (at 3 and 12 months) with and without OHI at different time intervals

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Outcome measured (months)</th>
<th>OHI</th>
<th>Without OHI</th>
<th>MD (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scale and polish every 3 months</strong></td>
<td></td>
<td>Lightner 1971</td>
<td>Lightner 1971</td>
<td>Lightner 1971</td>
<td></td>
</tr>
<tr>
<td>Gingivitis</td>
<td></td>
<td>Lightner 1971</td>
<td>Lightner 1971</td>
<td>Lightner 1971</td>
<td></td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>12</td>
<td>1.58</td>
<td>1.65</td>
<td>-0.07 (-0.18, 0.04)</td>
<td>0.20</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>24</td>
<td>1.33</td>
<td>1.4</td>
<td>-0.07 (-0.18, 0.04)</td>
<td>0.20</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>36</td>
<td>1.27</td>
<td>1.41</td>
<td>-0.14 (-0.25, -0.03)</td>
<td>0.01</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>48</td>
<td>1.25</td>
<td>1.34</td>
<td>-0.09 (-0.20, 0.02)</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Calculus</strong></td>
<td></td>
<td>Lightner 1971</td>
<td>Lightner 1971</td>
<td>Lightner 1971</td>
<td></td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>12</td>
<td>0.26</td>
<td>0.31</td>
<td>-0.05 (-0.19, 0.09)</td>
<td>0.49</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>24</td>
<td>0.27</td>
<td>0.29</td>
<td>-0.02 (-0.16, 0.12)</td>
<td>0.78</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>36</td>
<td>0.22</td>
<td>0.29</td>
<td>-0.07 (-0.21, 0.07)</td>
<td>0.33</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>48</td>
<td>0.13</td>
<td>0.19</td>
<td>-0.06 (-0.20, 0.08)</td>
<td>0.40</td>
</tr>
<tr>
<td><strong>Plaque</strong></td>
<td></td>
<td>Lightner 1971</td>
<td>Lightner 1971</td>
<td>Lightner 1971</td>
<td></td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>12</td>
<td>1.85</td>
<td>2.12</td>
<td>-0.27 (-0.41, -0.13)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>24</td>
<td>1.82</td>
<td>1.99</td>
<td>-0.17 (-0.31, -0.03)</td>
<td>0.02</td>
</tr>
<tr>
<td>Lightner 1971</td>
<td>36</td>
<td>1.53</td>
<td>1.9</td>
<td>-0.37 (-0.51, -0.23)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>
Table 7. Comparison 4: Results from Lightner 1971 comparing scale and polish (at 3 and 12 months) with and without OHI at different time intervals (Continued)

<table>
<thead>
<tr>
<th>Lightner 1971</th>
<th>Scale and polish every 12 months</th>
<th>Gingivitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>1.48</td>
<td>0.41</td>
</tr>
<tr>
<td>64</td>
<td>1.75</td>
<td>0.41</td>
</tr>
<tr>
<td>67</td>
<td>-0.27 (-0.41, -0.13)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lightner 1971</th>
<th>Calculus</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>0.4</td>
</tr>
<tr>
<td>0.41</td>
<td>121</td>
</tr>
<tr>
<td>0.47</td>
<td>0.41</td>
</tr>
<tr>
<td>121</td>
<td>0.4</td>
</tr>
<tr>
<td>108</td>
<td>-0.07 (-0.18, 0.04)</td>
</tr>
<tr>
<td>0.20</td>
<td>0.02</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lightner 1971</th>
<th>Plaque</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>1.84</td>
</tr>
<tr>
<td>0.41</td>
<td>121</td>
</tr>
<tr>
<td>2.14</td>
<td>0.41</td>
</tr>
<tr>
<td>108</td>
<td>-0.30 (-0.41, -0.19)</td>
</tr>
<tr>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

CI = confidence interval; MD = mean difference; OHI = oral hygiene instruction; SD = standard deviation
APPENDICES

Appendix 1. MEDLINE (OVID) search strategy
1. exp Periodontal Diseases/
2. (periodonti$ or (periodont$ adj3 disease$)).ti,ab.
3. gingivitis.ti,ab.
4. ((gingiva$ or gum$) adj5 (inflamm$ or disease$ or bleed$ or swell$)).ti,ab.
5. Dental plaque/
6. Dental calculus/
7. ((tooth or teeth or dental) adj5 (plaque or calculus)).ti,ab.
8. or/1-7
9. exp Dental prophylaxis/
10. ((dental or tooth or teeth) and (scal$ or polish$ or prophylax$)).ti,ab.
11. (periodont$ adj5 scal$).ti,ab.
12. or/9-11
13. 8 and 12
The above subject search was linked to the Cochrane Highly Sensitive Search Strategy (CHSSS) for identifying randomised trials in MEDLINE: sensitivity maximising version (2008 revision) as referenced in Chapter 6.4.11.1 and detailed in box 6.4.c of the Cochrane Handbook for Systematic Reviews of Interventions, Version 5.1.0 [updated March 2011] (Higgins 2011).
1. randomized controlled trial.pt.
2. controlled clinical trial.pt.
3. randomized.ab.
4. placebo.ab.
5. drug therapy.fs.
6. randomly.ab.
7. trial.ab.
8. groups.ab.
9. or/1-8
10. exp animals/ not humans.sh.
11. 9 not 10

Appendix 2. EMBASE (OVID) search strategy
1. exp Periodontal Disease/
2. (periodonti$ or (periodont$ adj3 disease$)).ti,ab.
3. gingivitis.ti,ab.
4. ((gingiva$ or gum$) adj5 (inflamm$ or disease$ or bleed$ or swell$)).ti,ab.
5. Tooth plaque/
6. Tooth calculus/
7. ((tooth or teeth or dental) adj5 (plaque or calculus)).ti,ab.
8. or/1-7
9. ((dental or tooth or teeth) and (scal$ or polish$ or prophylax$)).ti,ab.
10. (periodont$ adj5 scal$).ti,ab.
11. 9 or 10
12. 8 and 11
The above subject search was linked to the Cochrane Oral Health Group filter for identifying RCTs in EMBASE via OVID:
1. random$.ti,ab.
2. factorial$.ti,ab.
3. (crossover$ or cross over$ or cross-over$).ti,ab.
4. placebo$.ti,ab.
5. (doubl$ adj blind$).ti,ab.
6. (singl$ adj blind$).ti,ab.

Routine scale and polish for periodontal health in adults (Review)
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Appendix 3. Cochrane Oral Health Group’s Trials Register search strategy

From July 2013, searches of the Cochrane Oral Health Group’s Trials Register were undertaken using the Cochrane Register of Studies and the search strategy below:

#1 ((routine* or recall* or regular* or periodic* or “six month*” or six-month* or “3 month*” or three-month*):ti,ab) AND (INREGISTER)
#2 ((scaling or “scale and polish” or “dental prophylaxis” or “oral prophylaxis”):ti,ab) AND (INREGISTER)
#3 (#1 and #2) AND (INREGISTER)

Searches previous to July 2013 were undertaken using the Procite software and the search strategy below:

(((scaling OR “scale and polish” OR “dental prophylaxis” OR “oral prophylaxis” OR periodont*) AND (periodic* OR routine* OR recall* OR six-month* OR three-month*)) OR ( (“periodic check-up*” OR “regular check-up” OR “regular examination” OR “regular care” OR “routine care” OR “routine recall*” OR “six-month* check-up” OR “six-month* inspect*” OR “six-month* recall*” OR “6 month* check-up*” OR “6 month* inspect*” OR “6 month* recall*” OR “three-month* check-up*” OR “three-month* inspect*” OR “three-month* recall*” OR “3 month* check-up” OR “3 month* inspect*” OR “3 month* recall*”)))

Appendix 4. Cochrane Central Register of Controlled Trials (CENTRAL) search strategy

#1 MeSH descriptor Periodontal Diseases explode all trees
#2 (periodont* in Title, Abstract or Keywords or (periodont* in Title, Abstract or Keywords near/3 disease* in Title, Abstract or Keywords) )
#3 gingivitis in Title, Abstract or Keywords
#4 ( (gingiva* in Title, Abstract or Keywords near/5 inflam* in Title, Abstract or Keywords) or (gingiva* in Title, Abstract or Keywords near/5 disease* in Title, Abstract or Keywords) or (gingiva* in Title, Abstract or Keywords near/5 bleed* in Title, Abstract or Keywords) )
#5 ( (gum* in Title, Abstract or Keywords near/5 inflam* in Title, Abstract or Keywords) or (gum* in Title, Abstract or Keywords near/5 disease* in Title, Abstract or Keywords) or (gum* in Title, Abstract or Keywords near/5 swell* in Title, Abstract or Keywords) )
#6 MeSH descriptor Dental plaque this term only
#7 MeSH descriptor Dental calculus this term only
#8 ( (tooth in Title, Abstract or Keywords near/5 plaque in Title, Abstract or Keywords) or (teeth in Title, Abstract or Keywords near/5 plaque in Title, Abstract or Keywords) or (dental in Title, Abstract or Keywords near/5 plaque in Title, Abstract or Keywords) )
#9 ( (tooth in Title, Abstract or Keywords near/5 calculus in Title, Abstract or Keywords) or (teeth in Title, Abstract or Keywords near/5 calculus in Title, Abstract or Keywords) or (dental in Title, Abstract or Keywords near/5 calculus in Title, Abstract or Keywords) )
#10 (#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9)
#11 MeSH descriptor Dental prophylaxis explode all trees
#12 ( (dental in Title, Abstract or Keywords near/5 scal* in Title, Abstract or Keywords) or (tooth in Title, Abstract or Keywords near/5 scal* in Title, Abstract or Keywords) or (teeth in Title, Abstract or Keywords near/5 scal* in Title, Abstract or Keywords) )

Routine scale and polish for periodontal health in adults (Review)

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Appendix 5. The metaRegister of Controlled Trials and NLM Clinical Trials Register search strategy

The metaRegister of Controlled Trials (www.controlled-trials.com) and NLM Clinical Trials Register (www.clinicaltrials.gov) were searched using the following keyword searches:

- scale or scaling
- polish or polishing

WHAT’S NEW

Last assessed as up-to-date: 15 July 2013.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 November 2013</td>
<td>New citation required but conclusions have not changed</td>
<td>New methods including risk of bias implemented. Inclusion criteria modified to exclude patients with severe periodontitis, split-mouth studies and studies that included only a single visit for scale and polish treatment. 1 new study and only 2 of the original included studies now included in the review. Summary of findings tables added</td>
</tr>
<tr>
<td>15 July 2013</td>
<td>New search has been performed</td>
<td>Search strategy amended and updated to July 2013.</td>
</tr>
</tbody>
</table>

HISTORY

Protocol first published: Issue 1, 2004
Review first published: Issue 1, 2005

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 June 2008</td>
<td>Amended</td>
<td>Converted to new review format.</td>
</tr>
<tr>
<td>10 August 2007</td>
<td>New citation required and conclusions have changed</td>
<td>Substantive amendment. 1 new trial (Westfelt 1983) has been included in this update bringing the total number of included trials up to 9</td>
</tr>
</tbody>
</table>
CONTRIBUTIONS OF AUTHORS
Paul Beirne (PB), Helen Worthington (HW), Jan Clarkson (JC) and Andrew Forgie (AF) wrote the protocol. For the initial review PB and AF decided which studies were eligible. All four current authors have been involved in the final decisions on inclusion/exclusion. Risk of bias assessments were made by Gemma Bryan (GB) and Helen Worthington (HW). Data extraction and analysis were undertaken by PB, JC and HW. The review update was written by HW, JC and GB.

DECLARATIONS OF INTEREST
Helen V Worthington: no interests to declare.
Jan E Clarkson: no interests to declare.
Gemma Bryan: no interests to declare.
Paul V Beirne: no interests to declare.

SOURCES OF SUPPORT
Internal sources
- The School of Dentistry, The University of Manchester, UK.
- The University of Dundee, UK.
- NHS Education for Scotland, UK.
- University College Cork, Ireland.
- Manchester Academic Health Sciences Centre (MAHSC), UK.
The Cochrane Oral Health Group is supported by MAHSC and the NIHR Manchester Biomedical Research Centre.

External sources
- National Institute for Health and Care Excellence, UK.
- Cochrane Fellowship - Health Research Board, Ireland.
- Department of Health Cochrane Review Incentive Scheme, UK.
- Cochrane Oral Health Group Global Alliance, UK.
All reviews in the Cochrane Oral Health Group are supported by Global Alliance member organisations (British Association of Oral Surgeons, UK; British Orthodontic Society, UK; British Society of Paediatric Dentistry, UK; British Society of Periodontology, UK; Canadian Dental Hygienists Association, Canada; National Center for Dental Hygiene Research & Practice, USA; Mayo Clinic, USA; New York University College of Dentistry, USA; and Royal College of Surgeons of Edinburgh, UK) providing funding for the editorial process (http://ohg.cochrane.org/).
- National Institute for Health Research (NIHR), UK.
CRG funding acknowledgement:
The NIHR is the largest single funder of the Cochrane Oral Health Group.
Disclaimer:
The views and opinions expressed therein are those of the authors and do not necessarily reflect those of the NIHR, NHS or the Department of Health.
DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We have tightened up the inclusion criteria to exclude split-mouth studies, studies including participants with severe periodontal disease, participants who had been referred for specialist treatment, or who had undergone specialist periodontal treatment and were in the maintenance phase. We also excluded studies with only a single scale and polish treatment. In a previous version the search strategy was amended and the primary and secondary outcomes altered.

INDEX TERMS

Medical Subject Headings (MeSH)

Dental Plaque [prevention & control]; Dental Polishing [*adverse effects]; Dental Prophylaxis [*adverse effects]; Dental Scaling [adverse effects]; Gingivitis [prevention & control]; Periodontal Diseases [*prevention & control]; Randomized Controlled Trials as Topic; Time Factors

MeSH check words

Adult; Humans