# Home use of interdental cleaning devices and toothbrushing and their role in disease prevention

**Amanda Gallie**

## A commentary on

**Worthington H V, Macdonald L, Poklepovic Pericic T, Sambunjak D, Johnson T M, Imai P, Clarkson J E.**
Home use of interdental cleaning devices, in addition to toothbrushing, for preventing and controlling periodontal diseases and dental caries. *Cochrane Database Syst Rev* 2019; CD012018. DOI: 10.1002/14651858.CD012018.pub2.

## Practice point

The evaluation of interdental cleaning aids and their effectiveness is a potential area for practice- based research. Large amounts of prospective and retrospective data are gathered daily in the form of indices: bleeding scores, plaque scores, 6ppc periodontal chartings, radiographs and caries screening datasets. This routinely collected information could be utilised and analysed for the benefit of all.


## Abstract

**Objectives** The primary objective of this review was to determine the effectiveness of interdental cleaning per se as a stand-alone treatment, and then with the addition of tooth-brushing or a brushing device as a comparator. The ecological plaque model within which biofilm modification is key to stabilisation of periodontal inflammation. Thus, the control of plaque biofilms has a positive impact on reducing periodontal diseases and caries in the population.[1] A secondary objective of the review was to carry out cross-sectional analysis of the effectiveness of different interdental cleaning aid groups (ICA) to ascertain which ICA emerged as the most effective in removing bacterial plaque.

**Study selection criteria** Studies of a four-week duration or longer were included. Randomised controlled trials (RCTs) that compared tooth-brushing and a home-use interdental cleaning device versus tooth-brushing alone were selected.

**Data extraction and synthesis** No exclusion criteria regarding date or language were given. Two of the authors independently screened the search results, selected relevant studies, extracted data, assessed the primary studies for sources of bias and graded and assessed the quality of the evidence.

**Results** 35 RCTs (3929 randomised adult participants) were included in this review. The participants could not be blinded and therefore the level of performance bias was probably high. Only two of the RCT studies included could report low performance bias. The data was analysed and comparisons made between mean differences (MD)and standardised mean differences (SMDs).

The interdental cleaning aids (ICAs) included in this systematic review were:

1. Floss (15 trials)
2. Interdental brushes (2 trials)
3. Wooden sticks (2 trials)
4. Rubber/elastomer sticks (2 trials)
5. Oral irrigator (5 trials)

The evidence collected was relatively weak in terms of robustness and the studies were all of a fairly short duration. Interestingly, none of the studies adequately described the periodontal health of the participants and the base line diagnosis for the periodontal condition of these patients was noticeably absent. Baseline levels of inflammation were, however, recorded, and in the majority of the studies, participants exhibited low levels of gingival inflammation. Periodontal disease and status were not assessed and recorded in any of the studies. Gingivitis was recorded at base line and after testing, using the Silness and Loe scoring system. A percentage bleeding score was available in some of the included studies. None of the trials elicited interproximal caries status. Plaque levels were recorded at base line and completion using the Quigley Hein index. Measures of caries activity and presence of interproximal caries were absent.

**Conclusions** The question of whether interdental cleaning aids improve oral health cannot be answered by this systematic review. More work needs to be done to develop the tools to evidence whether caries and periodontal disease can be controlled by the use of interdental cleaning aids.

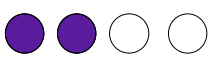
But from the results of this study we can ascertain that interdental cleaning aids are augmented in their effectiveness by the addition of a toothbrush; conversely a toothbrush has less effect on reducing plaque and inflammation levels when used alone. A combination of the brushing and interdental cleaning improves oral health outcomes.

The best performing interdental aid was the interdental brush (low certainty evidence), the use of which was associated with reduced inflammation and reduction in bleeding scores; statistically this gave slightly better results than other cleaning aids such as floss.

Floss (low-certainty evidence) showed some indication of reducing gingivitis at 1 month. However, the bleeding site and plaque score information was difficult to interpret.

An oral irrigator showed no real benefit over brushing alone at three months.

Rubber/elastomer sticks reduced plaque scores but not gingivitis at one month (very low certainty evidence.) Safety: None of the studies included in the review tested compared the degree of gingival irritation caused by the ICAs.


**GRADE rating** 

## Commentary

Although the evidence is very low to low in quality, we can elicit certain pieces of information from this review. We cannot however answer the question posed about the effect on caries as the data set was nil.

In cases of plaque induced supra-gingival inflammation, we can see that interdental brushes seem to be marginally superior at reducing gingivitis in a group of fairly healthy participants – and importantly are safe to use. The study reinforces the need for further investigation into the use of interdental cleaning tools in the management of patients with active periodontal disease. The patient groups in this review had low levels of disease, and low levels of inflammation at base line, and therefore the findings are not necessarily generalisable to patients exhibiting high levels of inflammation. A further problem is that the duration of the studies included are too short to allow any conclusions to be drawn regarding the long-term effects of any of the cleaning adjuncts.

Universally agreed classifications of periodontal disease and caries need to be used by the research and clinical communities. Researchers would benefit from adopting the new 2017 Periodontal Diseases Classification,[2] and ICCMS[3] caries classification in epidemiology so that data is collected and accumulated in a uniform and universal way. This review highlights problems with detectable diagnostic gaps and missed opportunities in the data collection.

**Author affiliation**

***King's College, London, UK***

## References

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*Evidence-Based Dentistry* (2019) **20**, 103-104.
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