



Prescribing good oral hygiene for adults

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Summary

Good oral hygiene is necessary to maintain a healthy mouth. This involves effective, mechanical removal of bacterial plaque from the teeth and from between the teeth every day. Patients need information and instruction about tooth brushing, flossing and interdental brushing for optimal self-care of the teeth and gums. Teeth should be brushed twice a day, with once-daily cleaning of the interdental spaces with floss or an interdental brush.

Key words: dental plaque, periodontal disease, toothbrushing.

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Introduction

Periodontal disease and dental caries are caused by oral bacteria which form biofilms, called 'dental plaque', on the surfaces of teeth. Good oral hygiene describes procedures which mechanically disrupt and remove dental plaque from the tooth surface in order to maintain a healthy dentition and periodontium. Since plaque is constantly forming, it needs to be removed every day by brushing and by the use of interdental cleaning aids such as dental floss or interdental brushes. Professional evaluation of dental health is required since self-performed oral hygiene alone is insufficient to treat the more severe form of periodontal disease – chronic periodontitis.

The dental plaque biofilm

The mouth has a diverse resident flora and over 700 different species of oral bacteria have been identified. The majority of these bacteria live in biofilms on the oral mucosa, gingiva and tooth surfaces. Desquamation of mucosal and gingival surface cells provides a mechanism for constant shedding of attached bacteria back into saliva and clearance by swallowing. However, biofilms which form on non-shedding surfaces such as teeth are not washed away by the action of saliva or by rinsing with fluids. Biofilms are complex structures of bacterial communities adhering to surfaces in aqueous environments. The bacteria are surrounded by an extracellular polysaccharide and protein matrix. This protects them by restricting diffusion of host antimicrobial factors, antiseptics and antibiotics¹, or by inactivating these agents within the biofilm. Dental plaque biofilms can only be removed from the tooth surface by mechanical means and therefore mechanical procedures are the mainstay of good oral hygiene.

Plaque formation

Following thorough cleaning of the tooth surface, bacteria from saliva begin re-attaching within minutes. It takes approximately 24–48 hours for sufficient plaque to form and be visible as macroscopic, milky-white, soft deposits on the tooth surface (Fig. 1). Plaque is a soft deposit so it can be easily removed with toothbrushes and interdental cleaning aids. However, when plaque becomes mineralised (calculus), it requires scaling for removal.

What is the best type of toothbrush?

Toothbrushes with soft bristles are recommended for effective plaque removal. They are able to splay beneath the edge of the gingival margin to remove plaque from the tooth surfaces in the crevice between tooth and gum. Hard bristle brushes should be avoided as these do not improve the efficiency of plaque removal and they can damage the gingival tissues and cause gum recession. They can also cause defects by abrading the tooth surface. Although manual toothbrushes can be purchased with soft, medium or hard bristles, all powered toothbrushes have only soft bristles. The head of the toothbrush should be small enough to allow access to all areas of the dentition, particularly the posterior teeth (Fig. 2). Most people do not clean the inner surfaces of the lower teeth effectively. A toothbrush with a small head helps in accessing these surfaces while the handle size and shape should suit the user's dexterity.

Are powered toothbrushes better than manual ones?

Powered brushes with a rotation oscillation action are the only type with adequate evidence of greater efficacy.² Compared with manual brushes, this type of powered toothbrush showed modest improvements in reducing plaque and gingival inflammation scores and was considered to be 'at least as effective' as manual brushes. Brushing for two minutes is the optimal duration necessary to achieve adequate plaque removal. A major advantage of powered toothbrushes is that individuals brush for longer with them as compared with manual brushing.³ Powered toothbrushes are helpful for individuals with dexterity or disability problems and for carers of the elderly and infirm.

How often should toothbrushes be replaced?

Toothbrush manufacturers recommend replacement every three months. Both manual and powered brushes which are three months old are still as effective as new brushes in plaque removal^{4,5} so toothbrush wear does not impede plaque control.

Fig. 1

Dental plaque



Deposits of bacterial plaque on the teeth are white in colour, but can be visualised with plaque disclosing rinses. Plaque forms quickly near the gum margin.

What is the most effective technique of toothbrushing?

No one technique has been shown to be consistently more effective than another. A recommended technique for manual brushes is to place the bristles at a 45° angle to the tooth surface at the gum edge and then move the bristles back and forth in short (tooth-wide) strokes or small circular movements. The tip of the brush is used in an up-and-down manner to clean the inner surfaces of the front teeth.⁶ Powered toothbrushes should be held against the tooth surface so that the bristles splay into the crevice between the gum and the tooth. Since the bristles are already moving, there is no need for back and forth actions. Instead, the bristles are held against each tooth in turn in a systematic fashion ensuring that all outer, inner and chewing surfaces are brushed. When using a powered toothbrush, a low brushing force is more effective than a high force in plaque removal.

Is brushing with toothpaste necessary?

Brushing with toothpaste does not remove more plaque than brushing without paste.⁷ However, toothpastes and gels are excellent vehicles for delivering fluoride to tooth surfaces to prevent dental caries, as well as delivering other agents to promote re-mineralisation or reduce sensitivity of tooth surfaces. Detergents and other additives in toothpaste may slow the rate of plaque formation. Although toothpastes can remove stains caused by tobacco or beverages, abrasive toothpastes can be harmful as they can cause tooth abrasion.

Is massaging of the gums required during brushing?

Massaging the gums does not resolve or prevent gum disease. This concept dates from an era before the causative role of dental plaque in periodontal disease had been identified and when it was thought that gingival tissues needed to be 'hardened' by physical stimulation to prevent absorption of

Fig. 2

Toothbrushes



Manual brushes with small heads and soft bristles, and rotation-oscillation type powered brushes are effective designs to remove plaque.

'toxins'. Periodontal disease is caused by plaque on the teeth and brushing the gums to 'massage' them does not remove this plaque, but can damage the gums and cause recession.

Does brushing clean between the teeth?

The interdental area is the site of rapid plaque development and the most common site for the onset of periodontal disease. It is also a common site for dental caries. Dental plaque cannot be effectively removed from this area with either a powered or a manual toothbrush since the ends of toothbrush bristles do not reach the tooth surfaces beneath the contact points of teeth. Dental flossing plus brushing removes more plaque from between teeth than brushing alone.⁸

How should flossing be performed?

Flossing is not merely about removing food from between the teeth. The aim is to 'wipe' the interdental tooth surfaces with floss or tape to mechanically dislodge the plaque biofilm. This is particularly important within the crevice between the gum and tooth between adjacent teeth. An effective technique⁶ involves gently moving floss through the contact area between the teeth with a back and forth action, ensuring that the floss does not suddenly slip through in an uncontrolled fashion and traumatise the top of the gum. The floss is then shaped into a C configuration so that it 'hugs' one proximal tooth surface and is then moved from the contact area to a position under the edge of the gum where it cannot penetrate any further and then back again to the contact area (Fig. 3). This up and down wiping action should be repeated several times and then the tooth surface on the other side of the interdental space cleaned in the same way.

Flossing can be a difficult exercise to master initially, and coaching and motivation are required. Studies have shown that floss-holding devices as well as various automated flossing

Fig. 3

Dental tape



Dental floss or dental tape is required for removing plaque from interdental tooth surfaces

devices are as effective as manual flossing and that patients often prefer these to manual flossing. These devices require only one hand for operation and are available with various handle configurations. They are often helpful for those with dexterity or disability problems or for carers responsible for the oral hygiene of the elderly and infirm.

Are there alternatives to flossing?

Although interdental woodsticks are effective for removing food particles, they are less effective than dental floss for interdental plaque removal. In contrast, interdental brushes are effective in plaque removal. These are spiral brushes that can be pushed forwards and backwards through an interdental space below the contact point of the teeth. The tips of the bristles then mechanically dislodge plaque from the proximal tooth surfaces (Fig. 4).

A randomised blinded crossover trial found interdental brushes to be more effective than floss in removing plaque from accessible interdental spaces.⁸ A three-month trial found that interdental brushes reduced plaque and gingival inflammation more than floss and that people became proficient in their use more quickly than with floss.⁹ Water jets and other irrigation devices cannot remove plaque from between teeth since the biofilm structure of plaque prevents it being washed off the tooth surface.

How often should oral hygiene be performed?

There is little scientific evidence regarding the optimal frequency of oral hygiene procedures. Although thorough removal of plaque once every 48 hours has been shown to preserve gingival health in a dentally aware group, most people only reduce their plaque scores by 50–60% when they brush. It is therefore recommended that the teeth be brushed twice per

Fig. 4

Interdental brush



Interdental brushes are effective for removing plaque from between teeth

day and interdental cleaning be performed once per day.¹⁰ Patients who are susceptible to periodontal disease and those with extensive treatment histories require regular professional evaluation and maintenance care.

Specialised oral hygiene

Patients with dental implants, bridges, crowns which are joined together or those with orthodontic brackets and wires on the teeth will require specialised instruction in how best to perform plaque control. Use of special floss with a firm tip at one end or use of floss threaders is required for flossing under bridges, joined crowns and between teeth with orthodontic wires. Interdental brushes are also helpful in these situations. Plaque also forms on denture surfaces and therefore dentures need to be brushed to remove plaque.

References

1. Stewart PS, Costerton JW. Antibiotic resistance of bacteria in biofilms. *Lancet* 2001;358:135-8.
2. Robinson PG, Deacon SA, Deery C, Heanue M, Walmsley AD, Worthington HV, et al. Manual versus powered toothbrushing for oral health. *Cochrane Database of Systematic Reviews* 2005, Issue 2. Art. No.: CD002281. DOI: 10.1002/14651858.CD002281.pub2.
3. Dentino AR, Derderian G, Wolf M, Cugini M, Johnson R, Van Swol RL, et al. Six-month comparison of powered versus manual toothbrushing for safety and efficacy in the absence of professional instruction in mechanical plaque control. *J Periodontol* 2002;73:770-8.
4. Tan E, Daly C. Comparison of new and 3-month-old toothbrushes in plaque removal. *J Clin Periodontol* 2002;29:645-50.
5. Hogan LM, Daly CG, Curtis BH. Comparison of new and 3-month-old brush heads in the removal of plaque using a powered toothbrush. *J Clin Periodontol* 2007;34:130-6.

6. American Dental Association. Oral health topics A–Z. Cleaning your teeth and gums (oral hygiene). 2008. www.ada.org/public/topics/cleaning_faq.asp#4 [cited 2009 May 5]
7. Paraskevas S, Timmerman MF, van der Velden U, van der Weijden GA. Additional effect of dentrifications on the instant efficacy of toothbrushing. *J Periodontol* 2006;77:1522-7.
8. Kiger RD, Nylund K, Feller RP. A comparison of proximal plaque removal using floss and interdental brushes. *J Clin Periodontol* 1991;18:681-4.
9. Jackson MA, Kellet M, Worthington HV, Clerehugh V. Comparison of interdental cleaning methods: a randomized controlled trial. *J Periodontol* 2006;77:1421-9.
10. Kinane D. The role of interdental cleaning in effective plaque control: need for interdental cleaning in primary and secondary prevention. In: Lang NP, Attstrom R, Loe H, editors. *Proceedings of the European workshop on mechanical plaque control*. Chicago: Quintessence; 1999. p. 156-68.

Conflict of interest: none declared

Self-test questions

The following statements are either true or false (answers on page 87)

5. Toothbrushes with hard bristles should be used for removing dental plaque.
6. Regular massage of the gums prevents periodontal disease.

Dental notes

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Immunosuppressive drugs

See article on page 68

There is an increased likelihood of advanced periodontal disease in patients on long-term immunosuppressive medication.¹

Many patients also suffer from profound salivary hypofunction related to these drugs.²

The long-term care of these patients' dentition requires excellent oral hygiene measures, often including adjunctive agents, such as topical fluoride application. Regular dental reviews, professional vigilance and a strong emphasis on preventive

dentistry are necessary for the stability of these patients' dental health. They may also often be taking other medicines, such as bisphosphonates, so dentists need to take time to undertake a thorough review of each patient's medical history and continually check which drugs are being used. For patients taking corticosteroids who require invasive procedures such as dental extractions, increasing the dose is recommended to minimise the risk of adrenal crisis.

References

1. Page RC, Beck JD. Risk assessment for periodontal diseases. *Int Dent J* 1997;47:61-87.
2. Guggenheimer J, Moore PA. Xerostomia: etiology, recognition and treatment. *J Am Dent Assoc* 2003;134:61-9.