# How UK Orthodontists Advise Patients on Oral Hygiene

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**Abstract.** *In 1993, 1038 UK orthodontists (all the members of the British Association of Orthodontists and the British Society for the Study of Orthodontics) were asked by questionnaire about the oral hygiene advice they gave to patients undergoing routine orthodontic treatment. All the orthodontists gave advice on tooth brushing. Most (89·5 per cent) gave dietary advice and (84 per cent) used disclosing tablets. A fluoride rinse was recommended by 73 per cent and a chlorhexi - dine mouthwash by 41·9 per cent. Many orthodontists advocate appropriate oral hygiene measures, but the efficacy of such methods is determined by the patient's motivation. The orthodontist therefore requires skills in behavioural management. Oral hygiene measures may be more cost-effective when undertaken by trained auxiliaries.*

*Index words:* Oral hygiene, Orthodontics.

## Introduction

A high standard of oral hygiene is essential for patients undergoing orthodontic treatment. Without good oral hygiene, plaque accumulates around the appliance, causing gingivitis and decalcification of the enamel. To avoid such problems, the orthodontist has a double obligation: to advise the patient about methods of plaque control and, at routine visits, to monitor the effectiveness of the oral-hygiene regime.

Most papers on the management of oral hygiene in patients undergoing orthodontic treatment have concentrated on the effects of different oral-hygiene regimes (Yeung *et al.*, 1989. Lundstrom, 1985; Denes and Gabris, 1991), and on the efficacy of various oral-hygiene aids in plaque control and reduction of gingival inflammation (Wilcoxon *et al.*, 1991; Jackson 1991). Manual tooth brushing, one of the oldest methods of plaque removal, remains the mainstay of oral hygiene and plaque control. It is often used as the standard or control against which other methods of plaque removal are assessed (Jackson, 1991; Wilcoxon *et al.* 1991).

Chlorhexidine mouthwashes, as an adjunct to tooth brushing (Brightman *et al.*, 1991), have been found effective in the control of gingival inflammation, although prolonged use may cause problems with staining. More recently, pre-brushing rinses have been introduced, though these show no difference in effect on plaque accumulation or gingival health (Pontier *et al.*, 1990).

Fluoride mouth rinses significantly reduce the extent of enamel decalcification and gingival inflammation during orthodontic treatment (Denes and Gabris, 1991; Boyd 1992, 1993; Boyd and Chun, 1994).

A number of studies have evaluated the effect of mechanical aids, as compared with manual tooth brushing, on oral hygiene in orthodontic patients (Jackson, 1991; Wilcoxon *et al.*, 1991). They found the use of electric toothbrushes brought a significant improvement in oral hygiene. Apart from studies on the management of oral hygiene for patients at risk from infective endocarditis (Gaidry *et al.*, 1985; Hobson and Clark, 1995), no information was available about the advice orthodontists routinely give to their patients. The study described here was undertaken to gain more information about this aspect of orthodontic care.

## Materials and Methods

In early January 1993, 1038 questionnaires were distributed with an explanatory letter and a prepaid Freepost envelope for return of the questionnaire. The questionnaire was sent to all members of the British Society for the Study of Orthodontics (BSSO) and the British Association of Orthodontists (BAO), now united to form the British Orthodontic Society (BOS).

Part of a larger study on the management of orthodontic patients 'at risk' from infective endocarditis (Hobson and Clark, 1995), the questionnaires gathered information about the practitioner's qualifications, present post- and oral-hygiene advice and aids routinely recommended to orthodontic patients.

## Results

In all, 518 questionnaires were returned. Of these 38 were incomplete or spoilt. This left 480 usable replies (46 per cent of the questionnaires distributed). Table 1 shows the different oral-hygiene options listed in the questionnaire, together with the percentages of respondents who advised or did not advise their use.

The participants' area of practise are given in Table 2. A number of orthodontists practise in more than one area, e.g. hospital and specialist practice, thus the total exceeds 100 per cent. Most participants (86 per cent) were specialist orthodontists.

The survey shows that all participants (100 per cent) advise routine use of a toothbrush for oral hygiene. Dietary

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TABLE 1 *Oral hygiene advice given to orthodontic patients*

| Option | Use advised (%) | Not advised (%) |
|---|---|---|
| Tooth-brushing | 100 | 0 |
| Floss | 22·0 | 78·0 |
| Disclosing tablets | 84·1 | 15·9 |
| Dietary advice | 89·5 | 10·5 |
| Chlorhexidine mouthwash | 41·9 | 58·1 |
| Fluoride rinse | 73·6 | 26·4 |
| Other methods | 20·3 | 78·7 |

TABLE 2 *Practice commitment of respondents*

| | |
|---|---|
| Genera dental practice | 20% |
| Specialist orthodontic practice | 59% |
| Community service | 14% |
| Hospital service | 51% |
| University | 8% |

advice is recommended by most respondents (89·5 per cent). There may be two reasons: to reduce the risk of appliances being broken by inappropriate foodstuffs (e.g. toffees), and to reduce the risk of enamel decalcification. Almost as many participants (84·1 per cent) recommended the use of disclosing tablets to reinforce the importance of oral hygiene. Fluoride mouth rinses were recommended by 73·6 per cent and chlorhexidine mouthwash by 41·9 per cent. The routine use of floss as a cleaning aid was prescribed by 22·0 per cent. A small number of participants (20·3 per cent) recommended alternative means of cleaning: inter-space/inter-dental brushes (9·3 per cent), water jet or water pic (2·9 per cent), electric toothbrush (8·1 per cent).

## Discussion

Patients with an orthodontic appliance are more susceptible to gingival inflammation and enamel decalcification (Welbury and Carter, 1993). In particular, appliances increase the number of plaque retention areas. The only effective method of control is oral hygiene. Advice on hygiene, given to the patient undergoing appliance therapy, has three objectives: to prevent enamel decalcification, to reduce gingival inflammation, and to reduce appliance breakage.

Most British orthodontists aim, through their advice, to establish a standard of oral hygiene sufficient to prevent enamel decalcification and gingival inflammation. Efficient mechanical removal of plaque has been shown to be the best means of plaque control (Basker, 1993). Such plaque removal was advocated by all respondents. However, despite receiving appropriate advice, many patients undergoing orthodontic treatment fail to maintain an adequate standard of plaque control: they suffer from gingival inflammation and enamel decalcification.

Macgregor *et al.* (1994) investigated the tooth-brushing motivation of over 7000 English patients aged 14 and 15. They found that most (67·2 per cent cleaned their teeth twice a day. The girls cleaned their teeth more frequently than the boys and for different reasons. The male motivation was 'good appearance and avoidance of bad breath'. The motivation of females was 'to make their teeth clean'. That male emphasis on appearance is interesting. It appears to contradict the finding (Gosney, 1986) that more females present for orthodontic treatment than males, because females rate their dental appearance more highly.

It is important that the orthodontist is able to communicate the importance of oral hygiene to motivate patients to maintain a satisfactory standard of oral hygiene during orthodontic treatment. McGlynn *et al.* (1987) compared two oral-hygiene programmes in orthodontic practice. The first programme used a self-management oral-hygiene booklet and was monitored by the orthodontist. In the second programme, patients were provided with oral hygiene aids and 'lectured' repeatedly by the orthodontist on the benefits of good oral hygiene. The second group showed some improvement in oral hygiene, but there was a greater improvement in the first group, due to behavioural self-management. This result supports the likelihood that the prescription of disclosing tablets, a self-motivation tool, may improve oral hygiene.

The effect of regular professional prophylaxis and oral-hygiene instruction on the periodontal health of orthodontic patients was investigated by Huber *et al.* (1987). They found that regular monthly oral-hygiene instruction and professional prophylaxis of the teeth significantly reduced the amount of plaque accumulation and gingival enlargement associated with fixed appliances.

The work of Huber *et al.* (1987) and McGlynn *et al.* (1987) suggests that regular visits to hygienist, for instruction and prophylaxis, would improve the standard of oral hygiene for patients undergoing orthodontic treatment. It would be more cost effective to use dental auxiliaries rather than orthodontists to deliver such instruction and prophylaxis.

Body *et al.* (1989) compared the effectiveness of electric (rotary) and manual toothbrushes in patients wearing fixed appliances. The patients who used an electric toothbrush showed significantly less plaque accumulation and gingival inflammation during an 18-month period. Few orthodontists (only 20 per cent) routinely recommend electric toothbrushes to their patients—perhaps due to the relatively high cost of such toothbrushes.

Dietary advice is given by 89·5 per cent of orthodontists. The primary reason may be to avoid damage caused to appliances by such foodstuffs as toffees or chewing-gum. However, correctly given and followed dietary advice—including information on reducing or eliminating the intake of carbonated drinks, decreasing consumption of high-carbohydrate foodstuffs and reducing between-meals snacks—will reduce enamel damage.

Mouthwashes were recommended by a significant number of orthodontists—chlorhexidine (42 per cent) and fluoride (76·3 per cent). However, evidence to support their regular use in healthy patients is poor. Fluoride mouth rinses have a number of benefits, including the reduction of enamel decalcification, of plaque and of gingivitis. They are particularly effective when used in conjunction with mechanical plaque removal (Boyd and Chun, 1994).

Stirrups *et al.* (1981) studied how chlorhexidine mouthwash reduced plaque and gingivitis scores. They found that regular use did reduce plaque and gingivitis scores but the clinical significance was limited in healthy

patients. Mouthrinses should not be recommended as a substitute for effective use of the toothbrush—rinses should be an adjunct to thorough mechanical cleaning. The use of chlorhexidine mouthwash daily, and immediately prior to any adjustment of orthodontic appliances, is recommended by Hobson and Clark (1995) to reduce bacteraemias in orthodontic patients 'at risk' from infective endocarditis.

## Conclusion

All British orthodontists routinely recommend manual tooth-brushing. Although electric toothbrushes are more effective in maintaining and improving oral hygiene with fixed appliances, they were not widely recommended. Orthodontists also recommend a wide range of other oral-hygiene aids. However, recommendation alone does not improve oral hygiene. Further research is required to investigate the factors that determine patients' motivation and how their behaviour pattern can be modified.

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