

GUIDELINES FOR PERIODONTAL SCREENING AND MANAGEMENT OF CHILDREN AND ADOLESCENTS UNDER 18 YEARS OF AGE

Guidelines produced in conjunction with the British Society of Periodontology and British Society of Paediatric Dentistry

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Foreword

Following the British Society of Periodontology (BSP) Policy Statement in 2001 relating to the screening and management of periodontal problems in adults seen in primary dental care, and the update to the BSP's 'Referral Policy and Parameters of Care' and 'Basic Periodontal Examination' documents in 2011, the need for similar guidelines pertaining to children and adolescents is recognized.

This document sets out the joint recommendations of the BSP and the British Society of Paediatric Dentistry (BSPD) for the periodontal screening and management of children and adolescents under the age of 18 years in the primary dental care setting. It can be read alongside the original policy documents for adults from the BSP (www.bsperio.org.uk).

Introduction

There are many different forms of periodontal disease which can affect children and adolescents, based on the 1999 International Workshop for a classification of periodontal diseases and conditions (Armitage, 1999; Clerehugh *et al* 2004):

- Gingival diseases
- Chronic periodontitis
- Aggressive periodontitis
- Periodontitis as a manifestation of systemic diseases
- Necrotising periodontal diseases
- Abscesses of the periodontium
- Periodontitis associated with endodontic lesions
- Developmental or acquired deformities and conditions

Dental practitioners have an important role to play in the early recognition and diagnosis of gingival and periodontal diseases. This will ensure the greatest chance for successful treatment either within the primary dental care setting or by referral to appropriate specialist services.

Management needs to incorporate effective oral hygiene practices in childhood and adolescence which should extend into early adulthood and beyond.

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The aims of these guidelines are two fold:

- 1) To outline a method of screening children and adolescents for periodontal diseases during the routine clinical dental examination in order to detect the presence of gingivitis or periodontitis at the earliest opportunity.
- 2) To provide guidance on when it is appropriate to treat in practice or refer to specialist services, thus optimizing periodontal outcomes for children and young adolescents.

Features of a healthy periodontium

In children with a healthy gingival and periodontal status the gingival margin is several millimeters coronal to the cemento-enamel junction (CEJ). The gingival sulcus may be 0.5-3mm deep on a fully erupted tooth. In teenagers with a healthy periodontium the alveolar crest is situated between 0.4 - 1.9 mm apical to the CEJ (Hausmann *et al.*, 1991).

Gingivitis

Plaque induced gingivitis

As supragingival plaque is allowed to accumulate an inflammatory cell infiltrate develops in the gingival connective tissue and the attachment of the junctional epithelium is disrupted allowing apical migration of the plaque and an increase in the gingival sulcus depth, forming a false gingival pocket. With severe inflammation gingival swelling may occur, creating an even deeper false gingival pocket. At this stage the most apical extent of the junctional epithelium is still at the CEJ with no periodontal loss of attachment. This process is completely reversible with effective plaque removal.

Although dental plaque is the essential aetiological agent in periodontal disease, various local and systemic factors (risk factors) can modify the response of the individual to plaque accumulation and influence the development or progression of gingivitis to periodontitis.

Plaque-induced gingivitis can occur at any age from early childhood through the teenage years and beyond. Epidemiological studies report a low prevalence of gingivitis during preschool age, followed by a gradual increase in prevalence reaching a peak around puberty, perhaps due to changes in the bacterial composition of the dental plaque, the inflammatory cell response and hormonal changes (Bimstein & Matsson, 1999). The 2003 Child Dental Health Survey (White *et al.*, 2006) involved a representative sample of 5-, 8-, 12- and 15-year-olds in the United Kingdom and in total 10,381 children were examined. It demonstrated higher levels of plaque and gingival inflammation in children age 8 and 12 years than in a younger cohort. Only about one third of 5-year-olds in the epidemiological survey had gingival inflammation, compared to two thirds of 8- and 12-year-old children and half of 15-year-olds.

Necrotising Ulcerative Gingivitis

Necrotising periodontal diseases have characteristic features and a fusiform-spirochaetal microbial aetiology. They are more usually found in patients in developing countries who typically exhibit various risk factors, including smoking, immunosuppression, stress,

malnourishment and poor diet. They may be associated with HIV positive status or other underlying undiagnosed pathology in an immunosuppressed host:

- Necrotising Ulcerative Gingivitis (NUG):
 - pain is a key diagnostic feature
 - necrosis of the interdental papillae which have a “punched out” appearance, ulceration and spontaneous bleeding
 - secondary foetor oris
 - pseudomembrane may be present
 - may manifest in teenagers
- May progress to Necrotising Ulcerative Periodontitis (NUP)

Non-plaque-induced gingival lesions

Children may also present with non-plaque induced gingival lesions, a number of which are best referred (Table 1). Further details of the more unusual forms are provided elsewhere (Chapple, 2004).

Periodontitis

The key features of periodontitis are:

- Loss of attachment of the periodontal connective tissues to cementum
- Apical migration of the junctional epithelium (JE) beyond the cemento-enamel junction and transformation of the JE to pocket epithelium (often thin and ulcerated)
- Alveolar bone loss

There are different forms of periodontitis which can affect children and adolescents:

- Chronic periodontitis
- Aggressive periodontitis
- Necrotising ulcerative periodontitis
- Periodontitis associated with systemic diseases

Chronic periodontitis

A substantial proportion of adolescents begin to manifest loss of attachment of 1mm or more, consistent with the early stages of chronic periodontitis. Clerehugh *et al.* (1990) followed 167 teenagers longitudinally for 5 years and found that 3% had attachment loss of 1mm or more on at least one of the molar, premolar or incisor teeth when examined at age 14 years rising to a prevalence of 37 % at 16 years and 77% at 19 years. Periodontal pathogens typical of those found in the subgingival plaque of adults with chronic periodontitis have also been found in the subgingival microflora of adolescents with incipient chronic periodontitis namely *Porphyromonas gingivalis*, *Prevotella intermedia* and *Aggregatibacter actinomycetemcomitans* (Clerehugh *et al.* 1997). The presence of *Tannerella forsythia* has been associated with subsequent clinical attachment loss in a 3-year longitudinal study in adolescents (Hamlet *et al.*, 2004).

Aggressive periodontitis

The practitioner should be aware that a small proportion of adolescents may suffer from aggressive periodontitis. The Consensus Report of the 1999 International Workshop provided common and secondary features of aggressive periodontitis.

Common features generally present are:

- Patients are healthy except for periodontitis
- There is rapid attachment loss and bone destruction
- Familial aggregation

Secondary features generally present:

- Amounts of microbial deposits are inconsistent with the severity of destruction
- Elevated proportions of *A. actinomycetemcomitans* and in some populations, *P.gingivalis*
- Phagocyte abnormalities (host defence defects)
- Hyper-responsive macrophage phenotype, including elevated levels of PGE2 and IL-1 β
- Progression of attachment loss and bone loss may be self arresting

A localised form and a generalised form have been recognized each with specific features. Around 0.1% of white Caucasians and 2.6% of black Africans may suffer from localized aggressive forms of periodontitis (Jenkins & Papapanou, 2001):

- Onset around puberty
- Robust serum antibody response to infecting agent (*A. actinomycetemcomitans*)
- Localised first molar/incisor presentation with interproximal clinical attachment loss on at least two permanent teeth, one of which is a first molar, and involving no more than two teeth other than first molars/incisors.

The specific features of the generalized form are:

- Usually affects people under 30 years of age but they may be older. Occasionally occurs in teenagers
- Poor serum antibody response to infecting agents
- Pronounced episodic nature of the destruction of the attachment and alveolar bone
- Generalised interproximal attachment loss affecting at least 3 permanent teeth other than first molars and incisors

Aggressive forms of periodontitis should be referred to a specialist in periodontology or paediatric dentistry (Table 2; Figure 1).

Necrotising Ulcerative Periodontitis

Although uncommon in young people in developed countries like the UK, Necrotising Ulcerative Periodontitis (NUP):

- May be an extension of NUG
- Features necrosis of the gingival tissues, periodontal ligament and bone

Primary Dentition

Evidence from retrospective epidemiological data has shown radiographic bone loss around the primary dentition in some children reinforcing the notion that periodontitis can develop at an early age (Matsson, Hjerning & Sjödin, 1995; Matsson, Sjödin & Käson Blomquist, 1997).

Mixed Dentition

It is important that the practitioner is aware of false pocketing in the case of partially erupted teeth in the mixed dentition.

Permanent Dentition

Puberty gingivitis is the increased inflammatory gingival response to dental plaque mediated by the hormonal changes associated with puberty. The transition from gingivitis to the early stages of periodontitis can occur in early teenage years. It is characterised by 1-2mm loss of clinical attachment interproximally, periodontal pockets 4-5mm deep and crestal alveolar bone loss of about 0.5mm which is usually horizontal. Local and systemic factors can influence rate, severity and extent of progression.

Prevention and Treatment

The 2003 Children's Dental Health Survey (White *et al.*, 2006) has provided us with useful information regarding parental attitudes towards the care of children's teeth and gums, oral hygiene behaviours in childhood as well as clinical measures of hygiene and periodontal health. Toothbrushing occurred almost universally, with 80% of children using a manual toothbrush and between 48-65% of children in all age groups using an electric toothbrush. The use of dental floss, although small, was evident, with almost 20% of 15 year olds reporting its use. Mouthwash use was reported in all age groups with up to 50% of 15 year olds stating they regularly used a mouthwash. Oral health messages for the child population should incorporate relevant information about the use of these commonly used oral hygiene adjuncts.

As discussed in the original policy document from the BSP, several studies have demonstrated that, under optimal conditions, the careful and regular removal of dental plaque can prevent the occurrence and progression of early periodontal disease (Axelsson & Lindhe, 1977; Badersten, Egelberg & Koch, 1975; Agerbaek *et al.*, 1977; Hamp *et al.*, 1978; Ashley & Sainsbury, 1981). It is however recognized that attainment and maintenance of optimal oral hygiene requires reinforcement by dentists or professionals complementary to dentistry (Siam *et al.*, 1980).

Recording and Diagnosis

Recording and diagnosis are integral to the thorough history and examination (Figure 2).

Clinical Periodontal Examination

As in adults, the routine dental examination of children and adolescents should comprise an extra-oral examination and an intra-oral assessment which should include examination of the soft and hard tissues in addition to a general description of the periodontal condition. A note should be made of abnormal gingival colour, contour, swelling, the presence and location of inflammation, recession or suppuration. A qualitative assessment of oral hygiene status should be made and the presence of supragingival calculus deposits recorded. Local periodontal risk factors, e.g. plaque retention factors, location of high fraenal attachments, malocclusion, the presence of mouthbreathing and incompetent lip seal, should be identified. Mouthbreathing, increased lip separation and decreased upper lip coverage have all been associated with higher levels of plaque and gingival inflammation. The influence of mouthbreathing tends to be restricted to palatal sites while decreased lip coverage influences gingival inflammation at both palatal and labial sites (Wagaiyu and Ashley 1991). Radiographs and sensitivity tests may be necessary.

Periodontal screening using a simplified version of the BPE is appropriate for most children seen in dental practice, community and hospital settings.

Screening for Gingival and Periodontal Diseases

BSP and BSPD recommend that periodontal screening becomes a routine part of the dental clinical examination in all co-operative children and adolescents, in the same way that a brief extra-oral exam and evaluation of the intra-oral soft tissues should always accompany an examination and charting of the dentition. The system of periodontal screening recommended by the BSP in General Dental Practice for adults is the Basic Periodontal Examination (BPE) which was based on the Community Periodontal Index of Treatment Needs (CPITN). The BPE codes form the basis of the assessment in the under 18s:

BPE codes

- 0 Healthy (no bleeding on probing, calculus or pocketing \geq 3.5mm detected)
- 1 Bleeding on probing (no calculus or pocketing \geq 3.5mm detected)
- 2 Calculus or plaque retention factor (no pocketing \geq 3.5mm detected)
- 3 Shallow pocket (4 mm or 5 mm)
- 4 Deep pocket (\geq 6 mm)
- * Furcation

The BPE is performed using the WHO 621 probe with a light probing force of 20-25 g. This has a 0.5mm spherical ball on the tip and a black band at 3.5-5.5mm to delineate healthy sulcus depth (<3.5mm) and periodontal pockets (\geq 3.5mm).

There are, however, certain considerations that need to be taken into account in adapting this for use in children and adolescents. It needs to be quick, easy, well tolerated, and to avoid false pockets.

The presence of true and false pockets, with and without gingival bleeding on probing, was investigated by Ainamo, Nordblad & Kallio (1984) in groups of 7-, 12- and 17-year-old children and adolescents. False pockets were common around erupting first molars and incisors at 7 years of age, but significantly reduced by 12 years of age and almost non-existent by age 17 years. False pockets were still problematic around second molars at 17 years of age.

Analysis of full mouth versus partial mouth recordings was undertaken. The study findings are taken into account in recommending the use of a simplified Basic Periodontal Examination on six index teeth in all co-operative children and adolescents, incorporating the guidelines below (Clerehugh & Tugnait, 2001; Clerehugh, Tugnait & Chapple, 2004; Clerehugh, 2008):

1. A simplified Basic Periodontal Examination should be carried out on the following six index teeth: UR6, UR1, UL6, LL6, LL1 and LR6 (Figures 3 - 5).
2. Assessment of periodontal treatment needs should be started at 7 years of age as it is rare to experience problems below this age and the index teeth are often still unerupted. Identification of periodontal disease in the primary dentition is unusual and young children with unexplained premature exfoliation or gross mobility of primary teeth or red, oedematous gingivae and /or suppuration for which no other dental cause can be seen should be referred for specialist advice.
3. At 7-11 years of age, in the mixed dentition phase, the index teeth should only be examined for bleeding of the gingiva, calculus and/or overhangs of fillings ie BPE codes 1 and 2 only, to avoid the problem of false pockets. In this age group both the erupting first permanent molar and later, the exfoliating second primary molar could give the appearance of periodontal pocketing.
 - a. *Comment:* it would be uncommon to have any true periodontal pocket at this age. If a true pocket is present, referral is recommended.
 - b. *Comment:* bleeding on probing even from a false pocket is indicative of the need for oral hygiene instruction.
4. At 12-17 years of age, the full range of BPE codes can be used on the six index teeth.
 - a. *Comment:* it would be uncommon to find periodontal breakdown at other teeth without the index teeth being affected.
 - b. *Comment:* whenever periodontal pockets are recorded i.e. BPE code 3 or 4, the alveolar bone level should be checked. Bitewing radiographs are suitable for posterior teeth. Selected periapicals are indicated for the anterior teeth.

5. A simplified BPE should be undertaken prior to commencing orthodontic treatment in the under 18s.

Whether in the mixed or permanent dentition stage, the examination of these index teeth is quick, easy and well tolerated and is sufficient to identify children who would benefit from a more detailed examination. Ainamo, Nordblad & Kallio (1984) concluded that examination of these teeth would allow detection of cases of the condition we now call localized aggressive periodontitis. Although a brief periodontal examination similar to the BPE has been reported to be acceptable for children as young as 3 years of age (Rapp *et al.*, 2001), it would not normally need to be undertaken in the primary dentition.

The BPE provides a quick and simple method of screening patients for periodontal problems, giving the practitioner an indication of the need for periodontal treatment and the level of further periodontal examination required for differing disease levels. Screening using the simplified BPE can be used in the assessment of the periodontal condition of most children and its use is to be encouraged. It may not be appropriate for use in children with extreme dental anxiety or diminished understanding.

Guidelines on the frequency of undertaking periodontal screening are lacking for children and adolescents. Periodontal screening of all new child or adolescent patients is recommended in addition to all cases prior to orthodontic treatment.

As a guide:

- If BPE = 0, screen again at routine recall visit or within 1 year, whichever the sooner
- If BPE = 1 or 2, treat and screen again at routine recall or after 6 months, whichever the sooner
- If BPE = 3, record full probing depths (6 sites per tooth) on the index tooth and check other teeth in the sextant, treat (OHI and root surface debridement (RSD)) and review after 3 months
- If BPE = 4 or *, undertake full periodontal assessment and consider referral

Use of Radiographs

For a BPE code of 3, 4 or *, consideration should normally be given to a radiographic examination.

The normal healthy bony crest is 0.4-1.9mm from the CEJ around permanent teeth but may be greater than 2mm in primary teeth. It should also be remembered that this distance may also increase with facial growth and with the loss of an adjacent primary tooth or eruption of a neighbouring permanent tooth. Horizontal bitewing radiographs recommended for the detection of caries can also be very useful in assessing a young patient's periodontal condition (FGDP, 2004). Selected periapical films may be indicated. The opportunity to assess bone levels on introral or panoramic films should always be taken even if the film was not originally taken to assess the periodontal condition.

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Adjuncts to the BPE

The Marginal Bleeding Chart

It is now generally recognized that gingival inflammation should be estimated by gingival bleeding, as changes in colour and swelling can be somewhat subjective.

If the presence of bleeding (code 1) has been recorded from the simplified BPE, then it is worth undertaking a full assessment of marginal gingival bleeding (Appendix 1). It should be used in conjunction with a plaque score. A good motivational tool is to record surfaces free from bleeding and free from plaque so that a higher score reflects improvement. It can accordingly be used with ease in the primary mixed and permanent dentitions. It should be noted that a high percentage of bleeding on probing in relation to a low plaque index may warrant further investigation.

Plaque Free Chart

Completion of a Plaque Free chart, showing the distribution of plaque adjacent to the gingival margin may be of value in the process of patient motivation using an index such as the O'Leary Index (Appendix 1).

Oral Care Measures

Motivation

It has been shown that professional support to patients and parents in the form of preventive/ educational programmes improves patient motivation, leading to improved levels of oral health (Hochstetter *et al* 2007).

A review of the literature has suggested that oral health education programmes may reduce plaque and gingival bleeding in the short term only (Watt & Marinho 2005), however we have an ethical imperative to advise patients with regards to improving oral health (Hausen 2005). Longer-term studies are needed to evaluate whether the effects of oral health education programmes are sustainable.

Toothbrushing

Plaque-induced chronic gingivitis in children and adolescents can be managed by mechanical removal of plaque and good oral hygiene (Oh *et al* 2002) which, additionally, has further benefits in terms of reduction of caries risk. Department of Health Guidelines should be followed on Delivering Better Oral Health (2009). These recommend that toothbrushing commences as soon as the first primary tooth erupts. Children under 3 years of age should use a toothpaste containing no less than 1000ppm fluoride, whilst a family toothpaste (1350-1500ppm fluoride) is indicated for maximum caries control in patients above 3 years of age, with adequate parental supervision as the use of small amounts are stipulated. No particular technique of toothbrushing has been shown to be better than any other, rather the need to systematically clean all tooth surfaces should be emphasized by the clinician. The patient's existing toothbrushing technique may need to be modified to achieve this. It is recognized that disclosing tablets can help to indicate areas that are being missed.

It is recommended that toothbrushing is carried out twice a day with a fluoridated toothpaste.

Parental support

The 2003 Child Dental Health Survey asked parents of 5 and 8 year old children who actually brushed their child's teeth. For about 50% of 5 year olds and 15% of 8 year olds, an adult either brushed or helped with brushing of their teeth. It was found that a significantly higher proportion of 5 year old children who brushed their own teeth had plaque compared to those who had parental or other adult aid (White *et al* 2006). Practitioners are encouraged to recommend that adults continue to brush the teeth of children who do not have sufficient manual dexterity to carry out good plaque control for themselves. This will vary from child to child but it would be regarded as good practice for parents and carers to offer this level of support until children are at least 7 years old (Hinds & Gregory, 1995; Levine & Stillman-Lowe, 2009). In addition it has been shown that targeted daily supervised toothbrushing results in a significant reduction in caries increment (Curnow *et al* 2002; Bebermeyer, 2003).

Toothbrush type

In adults, it has been shown that systematic, twice daily manual toothbrushing is most effective with a small-headed toothbrush which has soft round-ended filaments in a compact, angled arrangement of long and short filaments and a handle which is comfortable (van der Weijden & Hioe, 2005). An appropriate sized toothbrush should be recommended for children and adolescents.

The 2003 Child Dental Health Survey has shown that the use of electric toothbrushes is widespread with between half and two-thirds of all children reporting their use. Indeed, in a Cochrane review, research has shown that powered toothbrushes with a rotation-oscillation action demonstrate a modest clinical benefit over manual toothbrushes (Robinson *et al.* 2003; Deery *et al.* 2004). This review did not include battery-powered brushes, perhaps more commonly used by children, as available published studies were too short term at the time (Niederman, 2003). The clinical benefit of powered toothbrushes has, however, not been consistently demonstrated (Silverman *et al.*, 2004). The practitioner can thus recommend good effective brushing with a manual or powered toothbrush twice daily using a fluoridated toothpaste. The choice of toothbrush may be influenced by patient preference.

Fixed orthodontic appliances:

It is essential to assess the periodontal condition of the young person before undertaking orthodontic treatment, and the simplified BPE provides a suitable tool.

High plaque accumulation has been described in patients undergoing therapy with fixed orthodontics (Atack, Sandy & Addy ,1996; Turkkahraman *et al.*, 2005). It is well recognized that plaque in association with fixed appliances can result in clinical problems such as demineralization of the adjacent enamel and gingival inflammation. Indeed it has been proposed that the clinical attachment level (sum of gingival recession and probing

pocket depth) is a good parameter for the objective and long term evaluation of oral health status, as it has been shown to have a close correlation with white spot lesion status (Lovrov, Hertrich & Hirschfelder, 2007). In a recent longitudinal prospective study of orthodontic patients the effect of appliances on gingival and periodontal health was noted to be transient, without irreversible destructive effects on deep periodontal tissues (Ristic *et al.*, 2007). Periodontal pathogens associated with gingival inflammation during orthodontic treatment can be significantly reduced by orthodontic appliance removal, professional prophylaxis and appropriate home care (Sallum *et al.*, 2004).

It is recommended that patients accepted for orthodontic treatment demonstrate an adequate level of oral hygiene, particularly in the case of those patients requiring fixed appliance therapy. Professional support and education of patients in oral hygiene practices is paramount. Toothbrushing using the Bass technique with supplementary use of approximal brushes is recommended by orthodontic specialists in the UK, although well designed randomized control trials are required to provide evidence for determining clinical practice in this area. The daily use of a fluoride mouthwash (225ppm) should be advised for patients undergoing fixed appliance therapy (Benson *et al.*, 2004).

The orthodontic specialist is responsible for monitoring the health of both teeth and periodontal structures during the course of treatment and can use treatment visits to re-emphasise the importance of good oral hygiene practices throughout the duration of fixed appliance therapy.

Whilst there has been interest in adjuncts to manual oral hygiene practices (Paschos *et al.*, 2008) for orthodontic patients, good toothbrushing practices cannot be underestimated (Goh, 2007).

Flossing

Whilst evidence relating to the effectiveness of flossing in children for the improvement in gingival and periodontal health is sparse, a comprehensive literature review has shown that regular flossing of children's teeth by a trained adult can dramatically reduce interproximal caries in those at high risk of caries (Hujoel *et al.*, 2006; Longbottom, 2006).

As for toothbrushing, with a fluoridated toothpaste, there is no doubt that the benefits of interdental flossing include a reduction in the caries experience of children and adolescents. It may be beneficial to recommend supervised flossing of children's teeth for those at high risk of caries.

Mouthrinses

Some mouthwashes have been shown to improve oral hygiene status and gingival health (Axelsson & Lindhe, 1987), however, their use is not recommended in young children who are unable to spit effectively. In addition, ethanol-containing products cannot be recommended for use in children on a long term basis as a result of long term safety concerns e.g. carcinogenesis. (FDI commission, 2002).

Implementation of good toothbrushing supported by professional prophylaxis and scaling is the mainstay for the maintenance of good gingival and periodontal health.

Gingival Overgrowth

Gingival overgrowth can be related to systemic and metabolic diseases, genetic factors, local factors and side effects produced by some medications (cyclosporin, phenytoin and calcium channel blockers).

A greater incidence of gingival overgrowth is seen in puberty and the severity is more intense in children than in adults with similar amounts of dental plaque (Tiainen, Asikainen & Saxen, 1992).

Treatment for gingival overgrowth should begin with rigorous home care and frequent appointments for scaling and professional plaque removal. Although this often leads to improvement, surgery may be necessary to correct the gingival contour, especially with respect to drug-induced gingival overgrowth, the management of which may require referral to Paediatric dental or Periodontal specialists who will liaise with appropriate medical colleagues.

Mucogingival Problems.

During the early years after eruption of the permanent tooth an increase in the width of the attached gingiva takes place (Bimstein & Eidelman, 1988). Findings from the literature do suggest that mucogingival surgery is not needed before the patient reaches adulthood (Bosnak *et al.*, 2002). Referral to a specialist in paediatric dentistry or periodontology should, however, be considered by the dental practitioner.

A proposed system of periodontal care in the Primary Dental Care Setting

All new patients under the age of 18 years and those undertaking orthodontic treatment in the mixed or permanent dentition with full eruption of index teeth (all four first permanent molars plus UR1, LL1) should have the simplified BPE recorded, where this is deemed to be appropriate, taking into account patient co-operation and level of anxiety. The following guide is intended to aid patient management (Table 3).

Management of index teeth according to simplified BPE Code

Code 0: No treatment required.

If BPE = 0, screen again at routine recall visit or within 1 year, whichever the sooner

Code 1: Oral hygiene instruction and prophylaxis

Code 2: Supra and subgingival scaling at selected sites in addition to oral hygiene instruction and prophylaxis. Remove plaque retention factors.

If BPE = 1 or 2, treat and screen again at routine recall or after 6 months, whichever the sooner

Code 3, 4, * Following full periodontal assessment, supplementary radiographs may be required to assist diagnosis, although the existence of false pocketing in the case of erupting teeth in the mixed and early permanent dentition must be considered as the gingival margin may be situated coronal to the cemento-enamel junction by a number of millimeters in young individuals. Other clinical signs of pathology e.g. bleeding, suppuration, tooth mobility will be pertinent to an accurate diagnosis.

After false pocketing is accounted for, young patients scoring Codes 3 should be treated as for code 2 except that more intensive treatment (including root surface debridement) may be indicated followed by a review after 3 months

Codes 4 and * are unusual in young patients and full periodontal assessment with a referral to a Specialist Periodontologist or Paediatric Dentist should be considered.

Conclusions

- Early detection of periodontal diseases in the child and adolescent population is of paramount importance for accurate diagnosis of dental, periodontal or possible underlying medical pathology and for the optimum outcome of treatment provided.
- The routine use of the simplified BPE on index teeth (first permanent molars, UR1 and LL1) for all co-operative child and adolescent patients under 18 years of age should form the basis of a suitable periodontal screening examination for use in the Primary Dental Care Setting when attending for the first time, at recall or prior to orthodontic therapy.
- In the case of the mixed and young permanent dentition false pocketing in a dynamically erupting dentition may make accurate diagnosis of periodontal problems challenging. This should be minimized by using the six index teeth. It should however be recognized that BPE Codes 4 and * are unusual in children and adolescents under 18 years of age, and these codes, particularly in the presence of bleeding, suppuration and/ or tooth mobility should prompt consideration for referral to Specialist Periodontal or Paediatric Dental Services.
- Identification of periodontal disease in the primary dentition is unusual and young children with unexplained premature exfoliation, gross mobility of primary teeth or red, oedematous gingivae and/ or suppuration for which no other dental cause can be seen should be referred for specialist advice.

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Table 1 Non-Plaque-Induced Gingival Conditions & Lesions in Young Patients

AETIOLOGY	SPECIFIC CAUSE	NAME OF CONDITION/LESION	GDP/REFER			
INFECTIVE LESIONS	VIRAL	Herpangina	GDP – r			
		Hand Foot & Mouth	GDP – r			
		Herpes Simplex I (primary)	GDP – r			
		Herpes Simplex I (secondary)	GDP – r			
		Molluscum Contageosum	Refer			
	FUNGAL	Candidosis	GDP – r			
	DEEP MYCOSES	ANATOMICAL VARIATIONS	Linear Gingival Erythema (Candidosis)	Refer		
			FIBROMATOSIS	Hereditary Gingival Fibromatosis	GDP – r	
			ANATOMICAL VARIATIONS	Delayed Gingival Retreat	GDP	
				Coeliac Disease	Refer	
SYSTEMIC DISEASES THAT MANIFEST WITHIN THE GINGIVAE			HAEMATOLOGICAL DISEASE	Benign conditions	Agranulocytosis	Refer
					Cyclical Neutropenia	GDP - r
		Familial Benign Neutropenia		GDP - r		
		Myelodysplastic Syndromes		Refer		
		Malignant conditions		Myeloid leukaemia	Refer	
			B-cell Lymphoma	Refer		
			Hodgkins Lymphoma	Refer		
	GRANULOMATOUS INFLAMMATIONS	IMMUNOLOGICAL CONDITIONS	Crohn's Disease	Refer		
			Sarcoidosis	Refer		
			Melkersson-Rosenthal syndrome	Refer		
Wegener's Granulomatosis			Refer			
T.B.			Refer			
Disseminated Pyogenic Granulomata			Refer			
		Hypersensitivity Reactions	GDP - r			
		Lichen Planus	Refer			
		C1-esterase Inhibitor Deficiency/ Dysfunction (angioedema)	Refer			
TRAUMA	THERMAL	Burns	GDP			
	CHEMICAL	Ulceration	GDP			
	PHYSICAL	Gingivitis artefacta	Refer			
DRUG-INDUCED	IMMUNE COMPLEX REACTIONS	Erythema multiforme	Refer			
		Lichenoid drug Reactions	GDP - r			
		CYTOTOXIC DRUGS	Methotrexate	Refer		
	PIGMENTING DRUGS	ANTI-RETROVIRAL DRUGS	Hydroxychloroquine	Refer		
			Doxycycline	GDP		
			Oral Contraceptive	GDP		
			Antimalarials	GDP		
			Anti-HIV Drugs (VII nerve neuropathy)	Refer		

GDP = manage in practice; GDP – r = manage in practice but refer if concerned or complications arise.
 From ILC Chapple Table 6.1 in Clerehugh V, Tugnait A, Chapple ILC. Periodontal management of children, adolescents and young adults. Quintessence Publishing Co. Ltd., London, 2004.

Table 2: Referring to specialist services

Consider referral

Diagnosis of aggressive periodontitis
Incipient chronic periodontitis not responding to treatment
Systemic medical condition associated with periodontal destruction
Medical history that significantly affects periodontal treatment or requiring multi-disciplinary care
Genetic conditions predisposing to periodontal destruction
Root morphology adversely affecting prognosis
Non-plaque-induced conditions requiring complex or specialist care
Cases requiring diagnosis/management of rare/complex clinical pathology
Drug-induced gingival overgrowth
Cases requiring evaluation for periodontal surgery

Table 3: BPE code and management options

BPE Code	Management Options
0	Appropriate preventive care.
1	Chart gingival bleeding. Disclose and chart plaque. Oral hygiene instruction. Prophylaxis.
2	Chart gingival bleeding. Disclose and chart plaque. Oral hygiene instruction. Remove defective margins, plaque retention factors. Scale & prophylaxis.
3	Manage as for Code 2, plus record probing depths & bleeding on probing on affected index tooth (6 sites) – should also check if any other teeth in sextant are affected. Treatment will take longer and include scale & root surface debridement (RSD). Consider referral if poor response.
4	Full periodontal charts. Oral hygiene instruction. Remove defective margins, plaque retention factors. Scale & RSD as appropriate. Consider referral to specialist.
* With 0,1,2	As for code 0,1,2 above, plus periodontal charts of furcation and treat as appropriate. Consider specialist referral.
* With 3,4	Full periodontal charts. Scale, prophylaxis & RSD as appropriate. Consider specialist referral.

Figure 1: The decision to treat or refer young cases in practice depends on a number of factors

Treat or refer

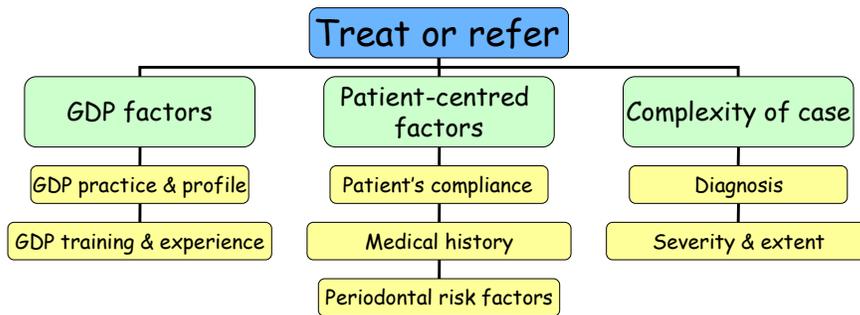


Figure 2: Recording and Diagnosis

Diagnosis

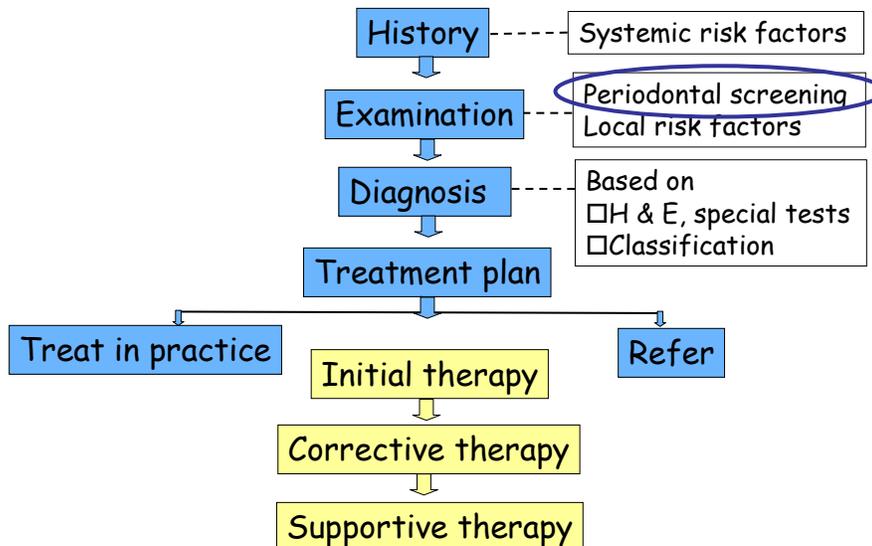
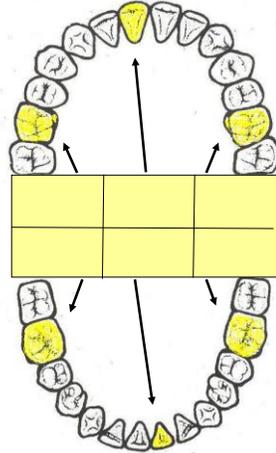


Figure 3: Simplified BPE

Periodontal screening – simplified BPE

- Simplified BPE
- Based on FDI recommendation in 1986 for a quick, dependable method of periodontal screening in practice
- Assess Index Teeth (based on WHO partial recording for adolescents):
 - UR6, UR1, UL6
 - LR6, LL1, LL6
- Assess 6 points per tooth:
 - db, b, mb, dl, l, ml



Use of WHO probe for simplified BPE on LL6

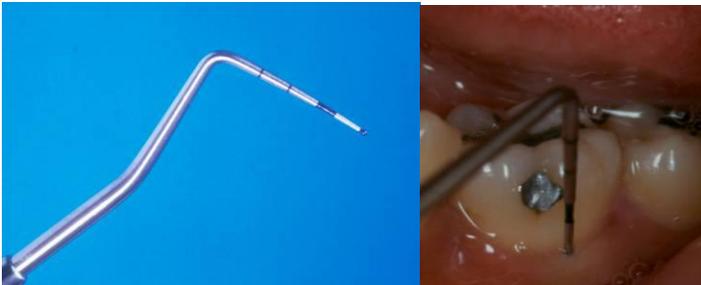


Figure 4: WHO probe and BPE Codes

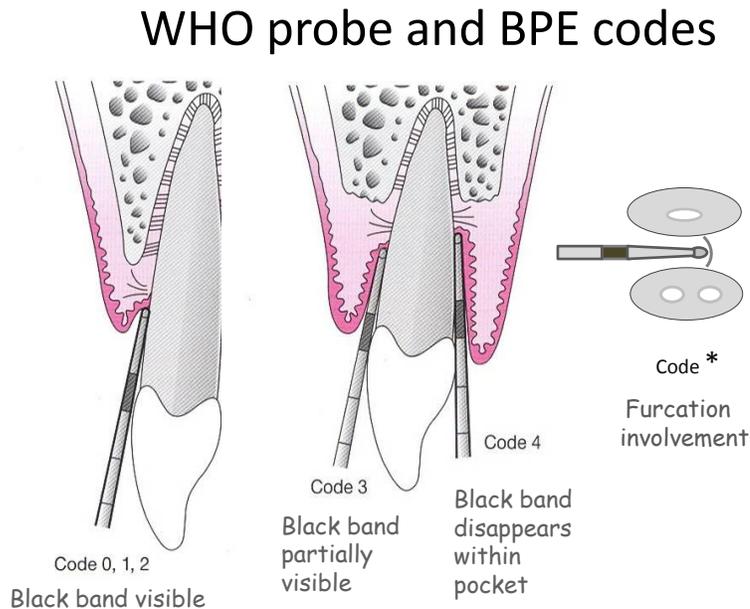


Figure 5: Simplified BPE

Periodontal screening – simplified BPE

0	Healthy	<ul style="list-style-type: none"> • Permanent teeth erupted, ages 12 -17 years: use full range of BPE codes 0,1,2,3,4,* • Mixed dentition stage, ages 7-11 years: use BPE codes 0,1,2 • Primary dentition: unusual to find disease; refer if unusual findings
1	Bleeding after gentle probing	
2	Calculus or plaque retention factor	
3	Shallow pocket 4mm or 5mm	
4	Deep pocket 6mm or more	
*	Furcation	

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Appendix 1

MARGINAL GINGIVAL BLEEDING

This is assessed by running a blunt periodontal probe such as the Hu Friedy PCP10 or Williams probe around the gingival margin and noting marginal gingival bleeding up to 20 seconds later. Bleeding indicates marginal gingival inflammation and therefore gingivitis of the gingival units. It is easier to record before disclosing the plaque.

Marginal Bleeding Free Score

The presence of gingival bleeding at the gingival margin is recorded for all teeth at 4 sites - mesio-buccal, buccal, disto-buccal, lingual/palatal, on the Plaque Free and Marginal Bleeding Chart (see chart). The total number of available tooth sites is calculated ie number of teeth present multiplied by 4 (as there are 4 sites / tooth). The number of marginal bleeding free sites is counted and expressed as a percentage of the total number of sites in the mouth allowing the child to get a higher score as the mouth becomes less inflamed.

PLAQUE

Many different plaque indices have been described for assessing a patient's oral hygiene status. The Plaque Free Score is based on the O'Leary Plaque Control Index, which enables an objective assessment of visible disclosed plaque at the gingival margin to be made. This allows the clinician to monitor the patient's level of oral cleanliness and the response to oral hygiene instruction and can be used to educate and motivate the patient.

Disclosing the teeth

A little petroleum jelly is applied to the child's lips with a cotton wool roll. The child is given a plaque disclosing tablet to chew it and then swish around the mouth for 30 seconds, then asked to rinse once. The plaque will be coloured and the patient is given a hand held mirror and shown the presence of the plaque.

Plaque free score

The presence of plaque at the gingival margin is recorded for all teeth at 4 sites: mesio-buccal, buccal, disto-buccal, lingual/palatal. The number of plaque free sites is expressed as a percentage of the total number of sites in the mouth to give a plaque free score. This allows the patient to get a higher score as the mouth becomes cleaner, indicating improved plaque control and tooth cleanliness. An example of a chart is appended.

Reference

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Plaque Free and Marginal Bleeding Free charts

Visit

Marginal Bleeding Free Chart														DATE			
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Sites
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Not Bleeding	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	%

Plaque Free Chart														DATE			
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Sites
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Plaque Free	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	%

Visit

Marginal Bleeding Free Chart														DATE			
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Sites
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Not Bleeding	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	%

Plaque Free Chart														DATE			
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Sites
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Plaque Free	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	%

Visit

Marginal Bleeding Free Chart														DATE			
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Sites
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Not Bleeding	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	%

Plaque Free Chart														DATE			
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Sites
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	Plaque Free	
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	%