

September 2020: the information on furcation involvements on pages 101 and 107 was updated to link to the revised BPE guidelines.

Appendix F – Restorations, Diagnostic Accuracy and Caries Epidemiology

F1 What Factors influence the Longevity in Primary Care of Dental Restorations in Children and Adults?

Over 60% of all restorative dentistry is for the replacement of restorations. The longevity of permanent dental restorations has generally increased since the 1970's although is still heavily dependent on a number of factors see Figure 1. Studies that assess the survival rates of restorations tend to be carried out under optimal clinical conditions, suffer from poor study design and reporting. The longevity reported from these studies therefore, is unlikely to be achieved in routine dental practice (Sheldon et al. 1999). This section will firstly discuss amalgam restorations before moving on to direct methods and finally indirect methods.

FIGURE 1: Factors Affecting the Longevity of Dental Restorations (taken from 'Caries: The Disease and its Clinical Management')

- > Caries risk status
- > Type and size of restoration
- > Restorative material
- > Oral hygiene
- > Fluoride availability
- > Age of restoration

F1.1 Amalgam Restorations:

F1.1.1 INTRODUCTION:

Dental amalgam is an alloy of mercury, powered silver and a tin alloy, although there may be additions of copper, zinc, palladium, indium and

selenium. The choice of alloy will influence the clinical handling of the material and may influence long term performance (Sheldon et al. 1999).

F1.1.2 RESULTS:

Two systematic reviews which considered the literature on the relative longevity of routine intra-coronal dental restorations note that such studies tended to have a high degree of variability which impacted on the conclusions they came to (Downer et al. 1999; Sheldon et al. 1999). Studies measuring survival rates tend to select patients with intact dentition, good oral hygiene and absence of active periodontal disease, therefore the results reported will be biased towards the most favourable. Inter-clinician variability: the skill of the operator in addition to the level of agreement between whether to replace a restoration also varied both within and between studies (Downer et al. 1999; Sheldon et al. 1999).

Amalgams demonstrated good rates of survival compared with most other materials. The Effective Health Care bulletin reports that at 3 years no study showed failure and at 10 years less than 10% of restorations had been replaced (although there was no data on 52% of the restorations placed) (Sheldon et al. 1999). Downer et al (Downer et al. 1999) in addition, report a lower figure of 72% of amalgams survived at 10 years. One review also noted that there were no differences in survival between larger amalgams versus smaller ones or polished and unpolished amalgams over the 36 months of follow-ups and that the evidence that 2 surface restorations survive longer than 3 surface restorations is inconclusive (Sheldon et al. 1999). On the other hand, Downer et al concluded that occlusal

amalgams lasted significantly longer than multi-surface amalgams (Downer et al. 1999) and there is some evidence to suggest that dispersed phase, high copper alloy amalgams were associated with greater survival than other types (Sheldon et al. 1999).

F1.2 Composite Resins

F1.2.1 INTRODUCTION:

Composite restorations are a tooth coloured mixture of filler particles of translucent glass in a resin matrix. The loading of the matrix with filler particles in addition to the size of the particles may have an influence on the long term performance of this restoration (Sheldon et al. 1999). Generally the median survival of composite restoration was 17 years (at 10 years 56% of composites still survived) and that single surface composites last significantly longer than multi-surface composites (Downer et al. 1999).

This section will be split into studies that looked at composite resins with dentine bonding and those that looked at composites without.

F1.3 Composites without dentine bonding

The Effective Health Care bulletin reported the results of 48 studies which looked at composite restorations without dentine bonding. Many of these studies failed to adequately report the number of subjects, teeth/tooth types, material and type of cavity in addition to survival data. This systematic review showed good short term survival (2/3 years) although poor results were attributed to poor techniques/unconventional cavity design (Sheldon et al. 1999). Studies with at least 5 years follow-up showed signs of failure especially in multi-centre studies. In addition, material type influenced survival of composite – light-cured, microfilled and densified filled materials being more successful between 6.5 and 8.5 years. Older auto polymerising microfilled composites were more successful up to 6.5 years. Studies did not present data needed to analyse impact of operator factors and other effect modifiers.

F1.4 Composite Resins with Dentine Bonding

Twenty five studies looked at restorations with dentine bonding systems. In the majority of cases,

cervical cavities had retention of restorations which relied exclusively on bonding mechanism to resist loss. These studies rarely reported the site of the filling and therefore it was impossible to assess whether survival is different for composites placed in front or back teeth. Dentine bonding materials have often been tested in cervical cavities and in this situation the failure of these materials is rapid, beginning within 1 year (this figure is based on a combination of included studies of cervical restorations by the type of dentine binding system used).

Many of the studies incorporated into this review were poorly designed and it must be taken into account that occlusal factors may have an influence on retention. The lack of detail in the paper (especially relating to losses to recall and technique used should also be noted when interpreting this data.

Groups that used an acid primer demonstrated good survival against those which didn't and there was little difference between phosphoric acid and other acids although the former studies tended to have a shorter follow-up (Downer et al. 1999; Sheldon et al. 1999).

Results of these studies suggest that enamel etching is clinically effective for long-term retention and that mechanical retention is also effective for retention of restoration. The use of all dentine bonding systems reduced patient pain after placement.

F1.5 Amalgam versus Composites

The comparison of amalgam versus composite falls into 2 sections; those studies which made this comparison in unpaired teeth (i.e. teeth from different patients) and those which made this comparison in paired teeth.

In those studies which looked at unpaired teeth, amalgam was superior and always had a better survival. In studies using paired teeth the difference was still in favour of amalgams but the difference between the two restorations was smaller but still significant (Sheldon et al. 1999).

F1.6 Other Materials

The Effective Health Care bulletin review included 44 studies comparing a number of other materials. These studies tended to be small and occur over a short duration.

Glass Ionomer Cements (GIC) are tooth coloured restorations consisting of filler particles imbedded in a matrix. There is insufficient evidence to conclude the restoration rate although those inserted using which removes caries using hand instruments (ART) may lead to 'reasonable retention rates'(Sheldon et al. 1999). 2 studies also concluded that the conditioning of dentine does not seem to affect longevity (Sheldon et al. 1999). Downer and co-workers also report that glass ionomers have a shorter durability than composite resin and should not be considered for posterior occlusal or approximal restorations (Downer et al. 1999). When used in the composite/GIC sandwich technique, these restorations were reported to having low survival rates although improvement it's the physical property of the material may lead to increased survival rates.

Stainless steel crowns are a traditional but resource intensive way of restoring primary molars the use of which is supported by some clinical evidence. There is, however, a current and ongoing controversy surrounding the optimal methods for restoring (or not restoring) primary teeth and a dearth of high quality evidence to reconcile the divergent views on the appropriateness and long term outcomes of the different care philosophies.

F1.7 Indirect methods

The Effective Health Care bulletin retrieved 27 studies that looked at ceramics, gold and composites. These studies involved had small numbers of patients and many were based on a weak design, which made no comparison to their intervention. The results of this review showed that there was no difference between porcelain and composite inlays and that in those studies (1 of which compared both materials) found that some types of porcelain inlays had significantly longer survival than composite inlays (Sheldon et al. 1999). In addition, there is limited evidence to support the use of a resin versus GIC as luting cements. There is some evidence to support the use of heat cure and light cure in composite inlays.

There are some reports of post-op pain with inlays which needs further investigation and that 1 study found that porcelain inlays versus amalgam inlays had an identical survival at 2 years but there was no long term data to support this (Sheldon et al. 1999).

F1.8 Summary and implications of longevity of dental restorations

The material reviewed here provides estimates of the relative success of methods of restoring carious teeth. Caution is needed in interpreting the results as there are concerns that the studies rigorous enough to be included in the Effective Health Care bulletin systematic review may not be generalisable to routine dental primary care. The pace of development of new dental materials, which are introduced before long term results of their predecessors are available, is another difficulty in this area

What is evident from the literature is that, even under optimal conditions, restorations alone are an imperfect treatment for dental caries and unlikely to be permanent. Primary prevention and preventive disease management should aim to prevent the need for restorations in the first place and to extend their longevity once they have been placed. Recall intervals should take three factors into account.

F2 What is the accuracy of the basic diagnostic methods used by clinicians for detecting carious lesions in primary and permanent teeth?

As the understanding of dental caries has advanced, several methods of diagnosing this chronic infectious disease have developed. The spectrum of disease experienced from patient to patient can fluctuate and therefore, establishing the most effective method to diagnose caries on all surfaces of both primary and permanent teeth is an important aspect of everyday clinical practice.

A systematic review presented at the last NIH Conference (Bader et al. 2001b) covered the performance of all currently available diagnostic methods for carious lesions for primary and permanent teeth, occlusal, smooth, coronal and root surfaces. There are few assessments of any diagnostic methods for primary or anterior teeth and no

assessments of performances on root surfaces.

In addition, the current available evidence on such diagnostic modalities suffers from weak design and variability of examination calibration (National Institutes of Health 2001).

F2.1 Results

The NIH review covered visual, visual tactile, radiographic, electrical conductance, FOTI, Laser Fluorescence and combination visual/radiographic methods and the evidence did not support the superiority of either visual or visual tactile methods. While for all but electrical conductance, the specificity of the diagnostic tools was greater than sensitivity, the number of available assessments was small and there was substantial variation among reports for each of the methods. Electrical conductance may offer heightened sensitivity on occlusal surfaces but, for fixed frequency technologies, at the expense of specificity.

While the evidence is not conclusive, some digital radiographic methods may offer small gains in sensitivity against conventional film radiography on both proximal and occlusal tooth surfaces. While existing diagnostic modalities appear to have satisfactory sensitivity and specificity in diagnosing substantial, cavitated dentinal caries, specifically radiographic methods are essential in diagnosing approximal carious lesions. These modalities however, do not appear to have sufficient diagnostic ability to accurately diagnose non-cavitated caries, root surface caries or secondary caries.

The National Institute of Health Consensus Development conference statement on the diagnosis and management of caries (2001) also stated that the use of sharp explorers adds little to diagnostic information and actually may be detrimental to the patient. Studies employing receiver operating characteristics (ROC) analyses have shown radiology to have acceptable diagnostic efficacy in detecting larger cavitated lesions in vitro and in vivo studies.

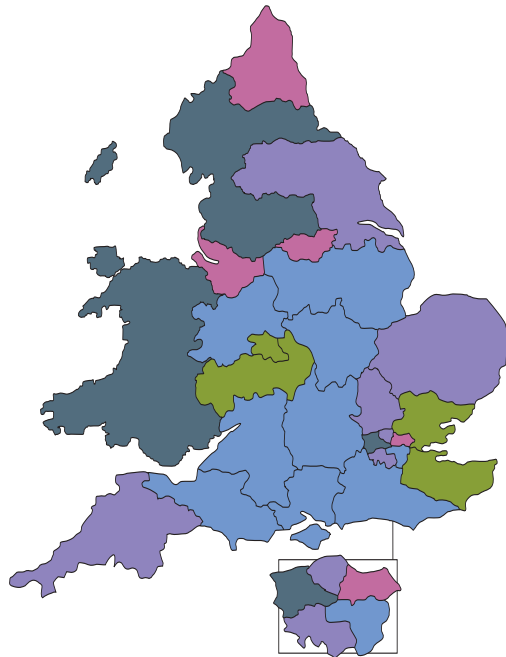
F2.2 Summary and implications of accuracy of the basic diagnostic methods

The evidence shows that a meticulous examination of dental caries is important and that although basic diagnostic methods can detect significant dentinal lesions, their performance is inadequate for non-cavitated caries, root surface caries or secondary caries. Radiography is still indicated for the detection of approximal lesions and the use of sharp probes should be reduced as it adds no diagnostic benefit but may cause harm by increasing the risk of subsequent caries progression. Dentists and their patients should be aware of the imperfection of caries diagnosis and the requirement to balance the risks of false positive (a sound tooth classified as decayed) and false negative (a decayed tooth classified as sound) results.

DENTAL CARIES EXPERIENCE OF 5-YEAR OLDS

The term caries experience refers to a measurement of a combination of caries, restorations (fillings) and teeth missing owing to decay. The British Association for the Study of Community Dentistry (BASCD), in combination with the NHS has carried out a series of surveys which describe the dental experience of populations of 5 yr olds and 12 yr olds, applying their criteria which recognise only established lesions clinically penetrating into the dentine. The criteria use a diagnostic threshold used excludes all enamel and precavitation lesions and diagnostic aids. Such surveys will therefore always produce lower estimates of caries experience than are found when clinically detectable enamel lesions are scored and when diagnostic aids are used, as in a dental practice setting. Within each area of England and Wales a designated NHS epidemiology co-ordinator was responsible for the local delivery of the programme assisted by a regional trainer. Representative samples were drawn from participating health authorities and boards according to the agreed BASCD guidelines.

FIGURE 2. The Geographical Variation of Caries Experience

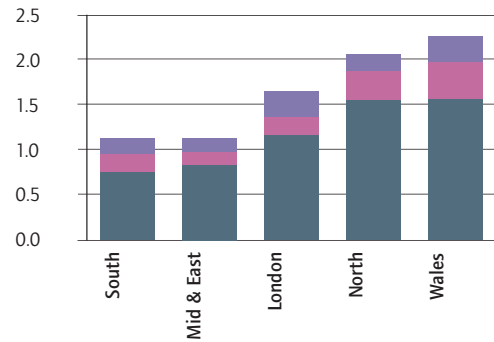


■ >2 ■ 1.5-2 ■ 1.25-1.50 ■ 1.01-1.24 ■ <1

Source: Pitts, N. B., Boyles, J., Nugent, Z. J., Thomas, N., and Pine, C. M. The dental caries experience of 5 year old children in England and Wales: surveys co-ordinated by the British Association for the Study of Dentistry 2001/2002. <http://www.dundee.ac.uk/dhsru/cdh/text2008.htm> . 2002. 1-12-2003.

Figure 2 illustrates the geographical variation of caries experience in children. The lower levels of mean caries prevalence (D_3MFT this is decayed into dentine, missing, filled teeth) of <1.5 were found towards the south and west of England, although parts of London join the north and west, Wales and the Isle of Man with mean values of greater than 1.5 (95% confidence intervals).

FIGURE 3. Dental Caries Experience (D_3MFT and 95% confidence intervals) of 5 year old children in the current English regions and Wales



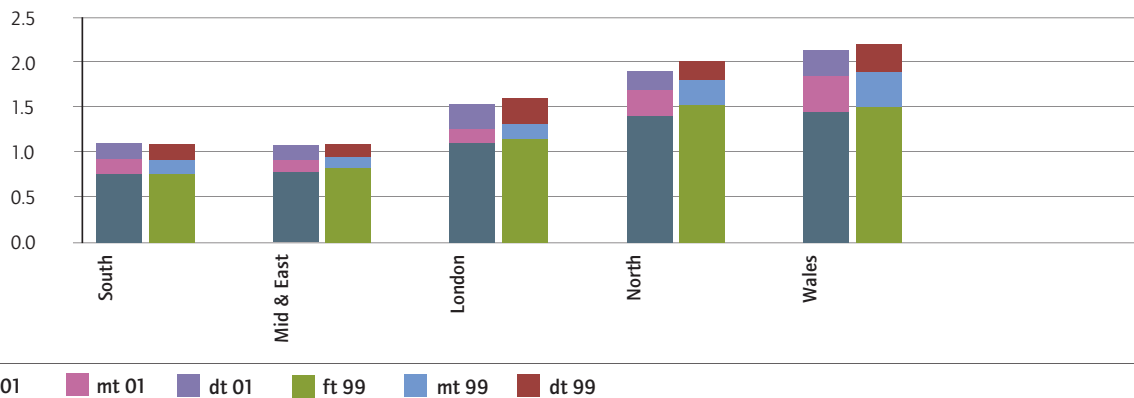
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Source: Pitts, N. B., Boyles, J., Nugent, Z. J., Thomas, N., and Pine, C. M. The dental caries experience of 5 year old children in England and Wales: surveys co-ordinated by the British Association for the Study of Dentistry 2001/2002. <http://www.dundee.ac.uk/dhsru/cdh/text2008.htm> 2002. 1-12-2003.

Figure 3 presents the mean D_3MFT information for 5 year olds as a bar chart, ranking regions including 95% confidence intervals. This bar chart reveals that southern areas currently experience the lowest rates of caries within this population through to the fluoridated Midlands, the north and finally Wales has the highest rates.

Figure 4 shows a comparison between the mean D_3MFT results from 2000/1 with the results of the previous survey in 1999/2000. The rank ordering of areas has not changed in the two year period but while London and the north has increased slightly, the results for the south, Midlands and Eastern areas were virtually unchanged.

FIGURE 4. Comparison of Caries Experience (D₃MFT and components) of 5 year old children in the current English regions and Wales in 1999/2000 and 2001/2002



Source: Pitts, N. B., Boyles, J., Nugent, Z. J., Thomas, N., and Pine, C. M. The dental caries experience of 5 year old children in England and Wales: surveys co-ordinated by the British Association for the Study of Dentistry 2001/2002. <http://www.dundee.ac.uk/dhsru/cdh/text2008.htm> . 2002. 1-12-2003.

RESULTS

A total of 171,791 five year old children from England, Wales, Isle of Man and Jersey were examined – this was 11% less than in the 1999/2000 survey. This represents approximately 29% of the total population of this age group.

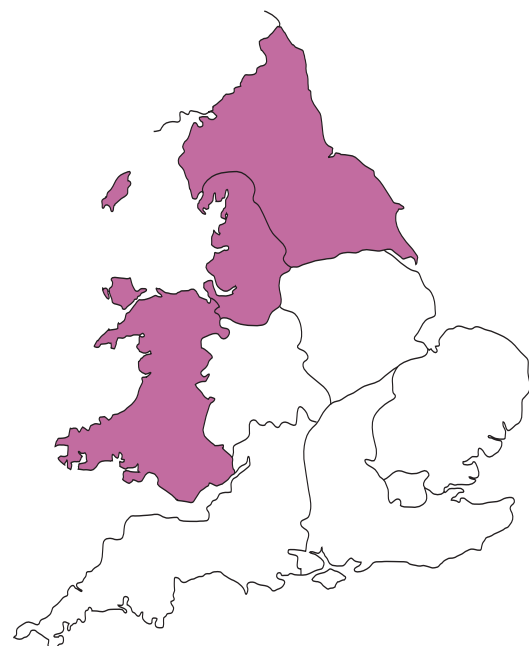
The results demonstrated a wide variation in prevalence across England and Wales. Mean values for D₃MFT for regions and counties ranged from 0.75 in Jersey and 0.84 in Kent and Medway to 2.73 Gwent and 2.47 in Greater Manchester. The mean number of decayed missing filled teeth in England and Wales is 1.52.

F3 Dental Caries Experience of 12-Year Olds

Again, BASCD criteria were applied and the dental caries was detected using clinical visual diagnostic criteria at D₃ threshold.

Figure 5 illustrates the geographical variation of caries experience for this age group. The lower levels of mean caries prevalence were mainly in the south, the west and the midlands while the rest of England, Wales and the Isle of Man had mean D₃MFT values between 1.01 and 1.50.

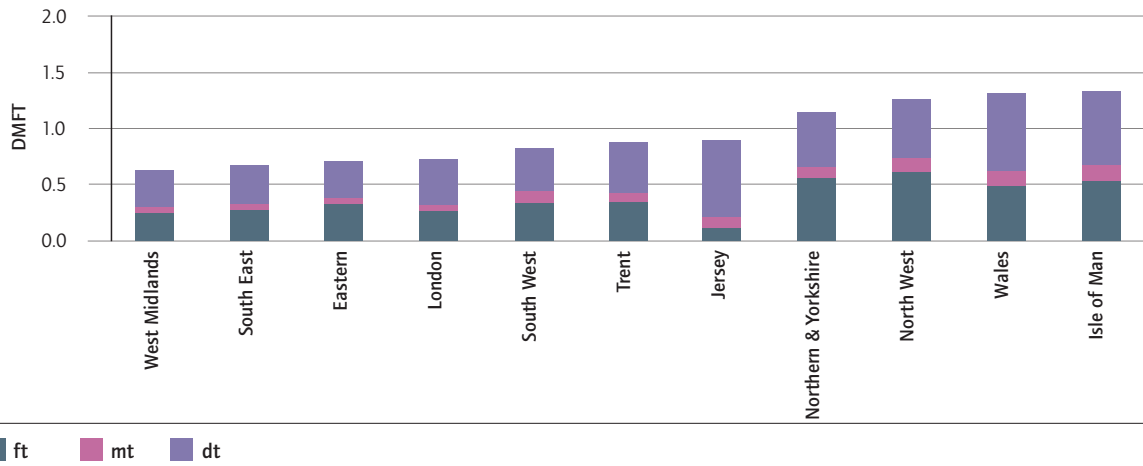
FIGURE 5. Dental Caries experience (D₃MFT) of 12 year old children in England and Wales



DMFT ■ < 1.0 1.0-1.5

Source: Pitts, N. B., Evans, D. J., Nugent, Z. J., and Pine, C. M. The dental caries experience of 12-year-old children in England and Wales. Surveys coordinated by the British Association for the Study of Community Dentistry in 2000/2001. <http://www.dundee.ac.uk/dhsru/cdh/text1908.htm> 2002. 1-12-2003.

FIGURE 6. Dental Caries Experience (D_3 MFT and 95% confidence intervals) of 12 year old children in the current English Regions, Wales, the Isle of Man and Jersey.

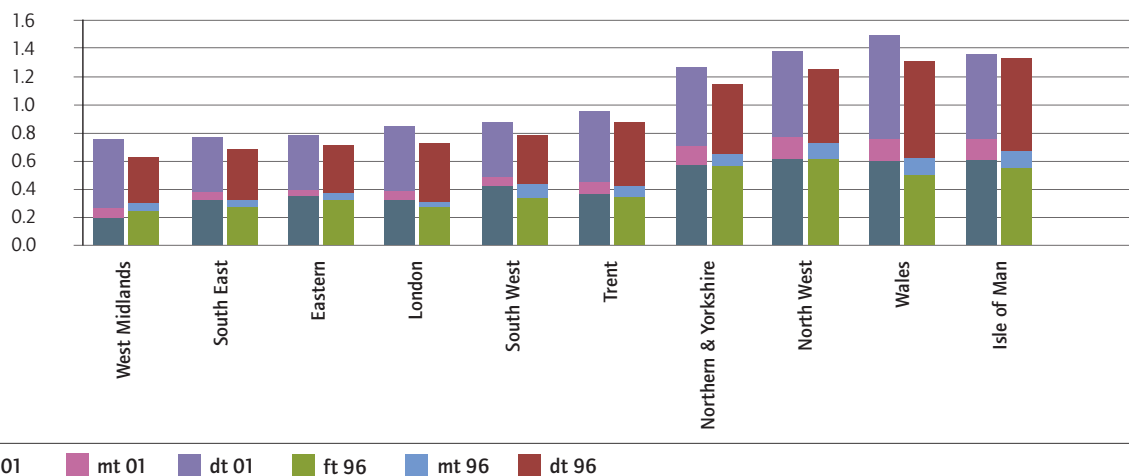


Source: Pitts, N. B., Evans, D. J., Nugent, Z. J., and Pine, C. M. The dental caries experience of 12-year-old children in England and Wales. Surveys coordinated by the British Association for the Study of Community Dentistry in 2000/2001. <http://www.dundee.ac.uk/dhsru/cdh/text1908.htm> 2002. 1-12-2003.

Figure 6 presents the mean D_3 MFT information as a bar chart ranking overall the regions including 95% confidence intervals. The 6 southern areas have a mean D_3 MFT values less than 1.0, while Wales and 2 more northerly English areas plus the Isle of Man have a mean D_3 MFT between 1.0 and 1.5.

Figure 7 illustrates the comparison of the mean D_3 MFT results from 2000/2001 with those from the 1996/7 survey which suggest that caries experience is improving overall (95% confidence intervals).

FIGURE 7. Comparison of Dental Experience (D_3 MFT) and previous English regions, Wales and Isle of Man on 200/2001 and 1996/1997



Source: Pitts, N. B., Evans, D. J., Nugent, Z. J., and Pine, C. M. The dental caries experience of 12-year-old children in England and Wales. Surveys coordinated by the British Association for the Study of Community Dentistry in 2000/2001. <http://www.dundee.ac.uk/dhsru/cdh/text1908.htm> 2002. 1-12-2003.

Summary and implications of caries epidemiology in children:

A total of 105, 979 12-year olds from England, Wales, Isle of Man and Jersey were examined. This was 7% less than in the 1999/2000 survey. This roughly represents 17% of the total population of this age group. The results demonstrated a wide variation in caries prevalence across England and Wales. Mean values for D₃MFT for regions and counties ranged from 0.63 in West Midlands to 1.31 in Wales. The mean number of decayed missing filled teeth in England and Wales is 0.86. The overall mean number of filled teeth was low at 0.43.

These surveys quantify the current level of decay in children in England and Wales and demonstrate that, despite improvements in recent years, dental caries still presents a problem for children in the 21st Century. They also show that the scale of the problem differs in different parts of the country. Within this population perspective, dentists in practices and clinics will encounter a range of decay experience in children presenting for dental care. An increasing proportion have low disease levels and a relatively low level of risk to new dental decay, an unfortunate minority have active decay and are at high risk of developing new carious lesions and having existing lesions progress. The recall intervals required for the individuals in different areas and with different levels of disease experience will in turn be different.

Appendix G – Implementing the Clinical Recommendations – selecting the appropriate recall interval for an individual patient

G1 How to identify the risk factors

G1.1 Introduction

The selection of an appropriate recall interval for a patient is a multifaceted clinical decision that is difficult, if not impossible, to evaluate mechanistically. In making that decision, dentists must integrate their own clinical expertise with the best available clinically relevant scientific evidence relating to a patient's oral and general health. This guideline aims to assist dentists in this decision-making process by:

- > **advocating that dentists should carry out a risk assessment for each patient.**
- > **identifying specific factors that should be taken into account when assigning a recall interval for each patient.**

The frequency and type of oral health supervision needed by a patient depends on the likelihood that specific diseases or conditions may develop. When carrying out a risk assessment for a patient, dentists should examine the patient for risk factors that may have a negative impact on oral health and protective factors that may promote oral health. By carrying out a risk assessment for each patient every time they attend for an Oral Health Review, the dental professional will be better positioned to make specific preventive and treatment recommendations, and to assign a recall interval for the patient that is particular to their individual needs.

The 'checklist' in this Appendix lists factors to consider when carrying out a risk assessment. This 'checklist' is merely intended as a guide to assist the dental team and is not an exhaustive list of all factors that may influence the choice of a recall

interval for a patient. There is insufficient evidence to assign a 'weight' to individual factors included in the checklist and dentists must use their clinical judgement to weigh the risk and protective factors for each patient.

Further research will be needed to explore the most effective and practical mechanisms for implementing the key recommendations contained in this guideline in general dental practice. Any proposed delivery mechanism, such as the checklist, must be rigorously piloted and evaluated. This checklist is presented as a preliminary guide to assist the dental team in assigning recall intervals. Dentists may use this checklist as it is or may modify it to develop their own electronic records or patient questionnaire. It would be appropriate for patients to receive a copy of their checklist on request.

The checklist is accompanied by an explanatory text that clarifies each individual heading and entry in the checklist. The assessment of a patient's medical history is first discussed and a Table is then presented which provides details of the remaining factors included in the checklist. References are given in this Table to the sections of the full guideline where these factors have been considered in greater detail. A further section then explains how this checklist can be used as part of a risk assessment process for each patient.

Notes

G1.2 Explaining the Checklist

The headings 'Medical history', 'Social history', 'Dietary habits' and so on, are presented in the order in which the dentist would normally acquire and record information at an Oral Health Review. The various entries in the checklist that appear under each of these headings are factors that may influence a patient's risk of or from dental disease and have been included based on the evidence reviewed for this guideline and take into account the collective expert opinion of the GDG.

G1.2.1 MEDICAL HISTORY

Medically compromised patients may be at increased risk of or from dental disease and more frequent recalls may be required. If the dental team are concerned about aspects of a patient's medical history, they should consult with the patient's doctor or specialist when deciding on the delivery of appropriate care.

It is considered advisable for clinicians to assess a patient's medical history under the three headings identified in the checklist:

Conditions where dental disease could put the patient's general health at increased risk, such as:

- > congenital/acquired cardiovascular disease carrying an increased risk of infective endocarditis
- > haematological conditions/bleeding disorders/anti-coagulant therapy (for example, haemophilia, von Willebrands disease, homozygous sickle cell anaemia, thalassaemia, cyclic neutropenia)
- > immunosuppression (for example, HIV/AIDS, transplant patients).

More frequent recalls may be needed for these patients and emphasis should be placed on primary prevention (the prevention of oral disease before it occurs) and secondary prevention (limiting the progression and effect of oral diseases at as early a stage as possible after onset), to minimise the need for operative intervention.

Conditions that increase the patient's risk of developing dental disease, such as:

- > Diabetes. People with diabetes (both type I and type II) are at increased risk of developing destructive periodontal disease. This may be due to an altered periodontal tissue response to plaque. Therefore, individuals with diabetes may need a more frequent recall. Inadequate plaque control and the presence of other risk factors will modify the recall interval further.
- > Xerostomia or 'dry mouth' can occur as a side-effect of cancer treatments such as head and neck radiotherapy. It may also be associated with specific conditions such as Sjögrens Syndrome or particular drug therapies (for example, anti-cholinergics, tricyclic anti-depressants, anti-psychotics, tranquillizers, hypnotics, anti-hypertensives, diuretics, anti-parkinsonian drugs, appetite suppressants, muscle relaxants, expectorants). Patients with inadequate salivary function and reduced salivary flow rate are at increased risk to dental caries because of the loss of cleansing and buffering action of saliva, and may require more frequent oral health supervision.
- > Conditions requiring the use of long-term medications containing glucose, sucrose or fructose. Extended recall intervals are contraindicated in such patients because of the potential for rapid progression of caries.
- > Epilepsy. In patients with epilepsy, gingival overgrowth may occur as a side effect of drug therapy, specifically phenytoin. The risk factor most associated with gingival overgrowth in such patients is poor oral hygiene. Such patients may benefit from more frequent recalls to deliver, monitor compliance with, and to reinforce oral hygiene instruction. However, although improved plaque control may treat the inflammatory component of gingival overgrowth, it may be of little benefit for reducing the fibrous component.

- > Acid reflux into the mouth increases a patient's risk of developing tooth surface wear, and is associated with disorders such as gastro-oesophageal reflux and eating disorders, especially bulimia. Such patients may benefit from more frequent recall to monitor the state of the teeth and to reinforce preventive advice (for example, advising patients that they should not brush immediately after vomiting or acid reflux).

Conditions that may complicate dental treatment or the patient's ability to maintain their oral health, such as:

- > special needs (a person with special needs has a mental or physical impairment which has a substantial and long-term adverse effect on their ability to carry out normal day-to-day activities)
- > cleft lip/palate, severe malocclusion
- > anxious/nervous/phobic conditions.

In these cases, emphasis should be placed on primary and secondary prevention, thus minimising the need for operative intervention, which may require a general anaesthetic (with its attendant risks) in a hospital setting. For extremely anxious, nervous, or phobic patients, more frequent recalls may provide an opportunity for primary prevention and allow for gradual acclimatization to dental procedures via non-invasive preventive interventions.

Heading and entries in checklist	Evidence Source (Chapter in full guideline where discussed)	Rationale for inclusion in checklist and explanatory notes
Social History		
Caries in mothers and siblings	Review of caries risk assessment and prediction literature (Chapter Three Section 3.1.1)	Applies to children only. The presence of caries in mothers and siblings is an indicator of increased caries risk for an individual child.
Tobacco use	Review of risk factors for periodontal disease and oral cancer (Chapter Three Sections 3.2.3 and 3.3.3)	Tobacco use is the most significant modifiable risk factor for periodontal disease. Smokers have been shown to have between a two-fold and seven-fold increase in risk for having periodontitis and/or periodontal tissue loss than non-smokers. Tobacco use (both smoking and smokeless tobacco[i.e. chewing tobacco, chewing tobacco with betel quid, snuff]) also a risk factor for oral cancer.
Excessive alcohol use	Review of risk factors for oral cancer (Chapter Three Section 3.3.3)	Excessive alcohol consumption is a risk factor for the development of oral cancer. Current UK recommendations are that men should not drink more than 21-28 units of alcohol per week and women should not drink more than 14-21 units. Tobacco use and alcohol consumption are associated with oral cancer in a dose response fashion and have a synergistic effect when combined. Clinicians should maintain a high level of vigilance where these factors are associated with clinical evidence of potentially malignant lesions. Clinicians should also be aware that cases of oral cancer have been reported in young people who have little or no exposure to tobacco or alcohol, emphasising the importance of perpetual vigilance and of carrying out a thorough systematic examination of the oral mucosa for every patient as an integral part of their Oral Health Review, regardless of the presence or absence of risk factors
Family history of chronic or aggressive (early onset/juvenile) periodontitis	Review of risk factors for periodontal disease (Chapter Three Section 3.2.3) and GDG expertise.	Studies of genetic factors show that periodontitis, particularly aggressive periodontitis occurs in families. This is less clear for chronic periodontitis although there is a substantial genetic influence. Clinicians should consider the impact of a positive family history, especially if the stability of the periodontal status is not yet demonstrated.

Heading and entries in checklist	Evidence Source (Chapter in full guideline where discussed)	Rationale for inclusion in checklist and explanatory notes
Dietary Habits		
High and/or frequent sugar intake	Review of caries risk assessment and prediction literature (Chapter Three, Section 3.1.1)	High sugar intake increases caries risk. The frequency, amount and consistency of sugar containing foods and drinks consumed may impact on a patient's caries risk. Long-term regular low doses of medications containing glucose, fructose or sucrose may also increase caries risk (see also Medical History section above). The National Clinical Guidelines (1997) produced by the Faculty of Dental Surgery, suggest that greater than three sugary intakes daily is indicative of an increased caries risk.
High and/or frequent dietary acid intake	Expert opinion of GDG	Many commonly available soft drinks have a low pH (acidic) and may contain considerable amounts of simple sugars. Hence they have both erosive and cariogenic potential (see entry below for 'erosion and tooth surface loss').
Exposure to Fluoride		
Use of fluoride toothpaste	Review of caries risk assessment and prediction literature (Chapter Three Section 3.1.1)	Regular brushing with a fluoride containing toothpaste reduces caries risk.
Other sources of fluoride e.g. live in a fluoridated area	Evidence from McDonagh and coworkers (2000), Cochrane reviews by Marinho and coworkers (2003 and 2004) supplemented by GDG opinion	The dental team should be aware of the fluoride status of local water supplies and adjust their caries risk assessments accordingly. Teams in fluoridated areas must, however, be sensitive to the risk status of individuals who have not had life long residence in fluoridated areas and also be alert for those individuals for whom the overall cariogenic challenge is abnormally high.
Recent and Previous Caries Experience		
New lesions since last check-up	Review of caries risk assessment and prediction literature (Chapter Three, Section 3.1.1).	The most consistent predictor of caries risk is past caries experience (clinical evidence of previous disease). Patients with clinical evidence of new initial lesions (white or brown spots) or other new lesions, anterior caries or restorations, premature extractions due to caries, past root caries or large number of exposed roots or who have a heavily restored dentition, can be considered as being at increased risk of developing future disease.
Anterior caries or restorations	Individual entries (new lesions etc.) are based on the expert opinion of GDG and 'risk assessment tables' in the following publications (Faculty of General Dental Practitioners 1998; Kidd 1998; Scottish Intercollegiate Guideline Network 2000)	
Premature extractions due to caries		
Past root caries or large number of exposed roots		
Heavily restored dentition		

Heading and entries in checklist	Evidence Source (Chapter in full guideline where discussed)	Rationale for inclusion in checklist and explanatory notes
<p>Recent and previous periodontal disease experience</p> <p>Previous history of periodontal disease</p> <p>Evidence of gingivitis</p> <p>Presence of periodontal pockets (Basic Periodontal Examination (BPE) code 3 or 4) and/or bleeding on probing</p> <p>Presence of furcation involvements or advanced attachment loss (Basic Periodontal Examination (BPE) code *. BPE code * is used when attachment loss is ≥ 7mm and/or furcation involvements are present)</p>	<p>Review of periodontal disease literature (Chapter Three Section 3.2). Basic Periodontal Examination is devised by the British Society of Periodontology (Mosedale et al, 2001)</p>	<p>A previous history of periodontitis clearly identifies an individual at increased susceptibility and risk of future disease.</p> <p>Whilst only a minority of individuals with gingivitis will progress to periodontitis, gingivitis remains a risk factor for periodontitis. In addition, a continuous absence of gingival bleeding is a reliable predictor of periodontal health.</p> <p>Sites with existing/advanced periodontitis are at greater risk of future breakdown than healthy sites</p>
<p>Mucosal Lesion</p>	<p>Review of oral cancer literature, including survival rates from oral cancer and stage at initial presentation (Chapter Three, Section 3.3.2) risk factors for oral cancer (Chapter Three, Section 3.3.3) and potentially malignant lesions and conditions (Chapter Three, Section 3.3.6)</p>	<p>Oral cancer often apparently arises de novo from clinically normal mucosa. However, there are a number of clinically identifiable precursor lesions and conditions, principally leukoplakia, erythroplakia, oral lichen planus and oral submucous fibrosis. Erythroplakia has a high potential for malignant transformation. The reported rates of malignant transformation of leukoplakias in the international literature range from 0.3 to 17.5%. Estimates of the percentage of leukoplakias that regress to normal vary between 4.6% per year to 28.6%. Leukoplakia lesions on the floor of the mouth, lateral tongue and lower lip are most likely to show dysplastic or malignant change.</p> <p>Clinicians should maintain a high index of suspicion for all intra-oral areas that appear unusual. Patients whose cancer is detected at an early stage generally have improved survival times than those presenting with late stage disease and in addition will usually require less radical treatment.</p>

September 2020: The entry in the checklist relating to BPE code * has been updated to bring it up to date with the [2016 BPE guidelines from The British Society for Periodontology](#). These state that BPE* code indicates furcation involvement.

Heading and entries in checklist	Evidence Source (Chapter in full guideline where discussed)	Rationale for inclusion in checklist and explanatory notes
<p>Plaque</p> <p>Poor level of oral hygiene Plaque retaining factors</p>	<p>Review of caries risk assessment and prediction literature (Chapter Three, Section 3.1.1). Review of risk factors for periodontal disease (Section 3.2.3)</p>	<p>Dental plaque is a key aetiological factor in the development of dental caries and periodontal diseases. Plaque retaining factors include appliances (orthodontic appliances, partial dentures), status of existing restorations, crowded teeth, deep fissures.</p>
<p>Saliva</p> <p>Low saliva flow rate</p>	<p>Review of caries risk assessment and prediction literature (Chapter Three Section 3.1.1).</p>	<p>See Sections 3.1.1 and Section on Medical History above.</p>
<p>Erosion and tooth surface loss</p>	<p>Expert opinion of GDG</p>	<p>See section on 'acid reflux' in Medical History above. Tooth wear is usually due to a combination of processes, abrasion, attrition and erosion. The preventive management of tooth wear in an individual depends on the aetiology and which of these processes predominates. Management may include appropriate oral hygiene instruction, provision of occlusal protection, dietary assessment and counselling, determination of any reflux activity. Adequate follow up is required to determine whether the dentition is stable or deteriorating (Shaw 2003).</p>

G1.3 Using the checklist as part of a risk assessment for each patient

This checklist forms part of a three-stage risk assessment process:

1. **Identification** (identifying the risk and protective factors present in each patient)
2. **Evaluation** (evaluating the impact of these factors in the context of the patient's past and current disease experience)
3. **Prediction** (using all of this information to predict the potential future occurrence of disease in the patient and to assign an appropriate recall interval)

G1.3.1 IDENTIFYING RISK AND PROTECTIVE FACTORS

The first stage in the risk assessment process involves using the checklist to identify aspects of the patient's medical and social history and behavioural habits that may impact on their oral health. The usefulness of some of these factors in assessing a patient's risk may be limited by inaccurate self-reporting of dietary habits, oral hygiene practices, smoking and alcohol consumption.

A number of the factors identified in the checklist are 'necessary' but are not 'sufficient' to produce dental disease. For example, although dental plaque is recognised as a key aetiological factor in both periodontal disease and dental caries, not all patients with poor oral hygiene and plaque control will develop periodontal disease and dental caries. In the case of periodontal disease, the attack from dental plaque, the response of the host and the modifying effect of risk factors will account for a variety of disease patterns. Dental caries is also a multifactorial disease and it is the combination of factors present in a patient rather than individual factors per se that are important in terms of their potential impact on that patient's oral health. The second stage in the risk assessment process involves 'weighing and evaluating' the impact (both past and present) of these combinations of factors.

G1.3.2 EVALUATING THE IMPACT OF THESE FACTORS ON A PATIENT'S ORAL HEALTH

Having identified what factors are present in an individual patient, the clinician must relate this information to the patient's past and current disease experience, by carrying out a thorough clinical examination. The patient's past disease experience essentially represents the cumulative effect of all risk and protective factors, known and unknown, to which he or she has been exposed over their lifetime. Past caries experience is the most reliable predictor of future caries experience. However, as exposure to risk and protective factors and hence disease activity may vary over time, the predictive power of past disease experience may be reduced at the individual level. For example, if a patient has had no caries experience in the past but has developed new carious lesions since their last oral health review, there must have been recent exposure to risk factors sufficient to initiate and produce the disease process. In this situation, the absence of disease in the past has not acted as a reliable predictor of the absence of future disease. This emphasises the importance of carrying out a risk assessment to detect any changes in behavioural or other modifying factors and to evaluate their impact every time a patient attends for an oral health review.

G1.3.3 PREDICTING THE PATIENT'S FUTURE RISK OF DISEASE

By integrating all of the collected information, the dentist can use his or her clinical judgement to predict what the patient's future disease experience is likely to be. The dentist can then choose an appropriate recall interval that is tailored to meet the patient's individual needs. A review of the caries risk assessment literature suggests that the dentist's clinical judgement and ability to combine risk factors is as good as, or better than, any other method of predicting caries risk. The ability of the clinician to predict the likely occurrence of future disease and assign an appropriate recall interval for a patient will improve over time as the clinician builds up an accurate record of the patient's disease experience and determines the rate at which disease is progressing in that individual. In this context, the longevity of the professional relationship between dentist and patient can be considered as having an important input into the choice of recall interval.

The greatest uncertainty regarding what recall interval to assign for a patient will thus exist where the dentist is unfamiliar with the patient's disease experience (for example, when the patient is a new or recent patient). In such circumstances, it is good practice to adopt a precautionary approach and assign a conservative recall interval initially and then progressively alter this interval over time (where appropriate) on the basis of the clinical evidence obtained at each oral health review. For example, a dentist will be unable to determine if a 'white spot lesion' in a new patient has recently appeared or has been present without progressing for years. In such a situation, it is good practice for the clinician to apply topical fluoride, give preventive advice and assign a short recall interval initially to monitor the lesion. If the lesion fails to progress over time, the recall interval can be increased.

The same principles will apply for new patients with a medical history that may influence their risk of or from dental disease or for patients who have recently developed such conditions. A conservative recall interval should be assigned initially and extended over time in accordance with the clinical evidence and other data obtained at each oral health review.

It is advisable to inform patients (and/or their parents, guardians or carers) that the same interval may not be appropriate at every stage in their life – it may vary if their risk and protective factors alter. Both clinician and patient should attempt to reduce the patient's risk factors and enhance protective factors, and alter the recall interval accordingly.

With experience, clinicians should be able to carry out a risk assessment quickly, easily and intuitively as part of an oral health review.

G1.4 The process of recall interval selection

The following diagram has been developed by the GDG to illustrate to the dentist and dental team the sequential process used to select a recall interval appropriate to a particular patient at a particular time. This diagram may ultimately be used as a leaflet, poster, model or interactive computer graphic.

Overview of how the interval between oral health reviews is set		If the patient is younger than 18 years	If the patient is 18 years or older
Step 1	> Consider the patient's age; this sets the range of recall intervals	3 months 12 months	3 months 24 months
Step 2	> Consider modifying factors (see checklist on page 2) in light of the patient's medical, social and dental histories and findings of the clinical examination	3 months 12 months	3 months 24 months
Step 3	> Integrate all diagnostic and prognostic information, considering advice from other members of the dental team where appropriate > Use clinical judgement to recommend interval to the next oral health review	3 months 12 months	3 months 24 months
Step 4	> Discuss recommended interval with the patient > Record agreed interval or any reason for disagreement	discussion	discussion
Step 5	> At next oral health review, consider whether the interval was appropriate > Adjust the interval depending on the patient's ability to maintain oral health between reviews	reassessment	reassessment

The first step is to consider the patient's age and the corresponding upper and lower limits stipulated in this guidance.

The second step involves considering the checklist of modifying factors carefully in the context of the patient's histories (medical, social and dental) and the evidence obtained during the clinical examination.

The third step requires the dentist (advised on many occasions by other members of the dental team) to integrate all the diagnostic and prognostic information available at this particular time and to use their clinical judgement to recommend a specific recall interval between now and the next Oral Health Review.

The fourth step involves discussing the recommended interval with the patient and exploring their preferences and expectations. An agreed interval should result and this will be recorded and a recall appointment advised. If for any reason the patient is unable to accept the recommendation, this should also be recorded.

The final step involves reconsidering the appropriateness of the chosen interval at the next Oral Health Review in order to learn from the patient's responses to the oral care provided and the health outcomes achieved. In this way, the next interval may be adjusted depending on the patient's ability to maintain oral health between Oral Health Reviews.

September 2020: The [BPE guidelines from The British Society for Periodontology](#) have changed since these scenarios were written. BPE* code indicates furcation involvement only and can be combined with other BPE codes e.g. BPE code 2*.

The interval may be maintained at the same level if it is achieving its aims. For someone with low disease activity, it may be possible to gradually extend the interval out towards the 24-month maximum period – once the patient and the dental team are confident that this is satisfactory. Patients whose disease activity continues unabated may need a shorter interval and may need more intensive preventive care and closer supervision.

G1.5 Examples of clinical scenarios involving recall interval selection

A number of clinical scenarios devised by the Guideline Development Group are presented on the following pages. These scenarios have been created in order to illustrate the process of assigning a recall interval for a patient on the basis of an assessment of their risk of or from oral disease. The scenarios are for illustrative purposes only and are by no means intended to capture every conceivable clinical situation that a dentist may encounter. Furthermore, although a specific recall interval will be agreed at the end of an oral health review, patients should be encouraged to seek advice from a dentist in the interim if there are any significant changes in their medical history, dietary habits, oral hygiene practices etc that may influence their risk of or from oral disease. In this context, it should be appreciated that (as is the case with the current 6-month recall regime) no guarantee can be given to patients that new disease will not develop between recall visits.

PATIENT A

Age: 4 years.

Attendance record: Attending your practice for the first time (for an oral health assessment).

Medical history: None of note.

Social history: Two older siblings aged 7 and 10 years, who have been patients of yours for the past 2 years. Both have no decayed, missing or filled teeth and have good oral hygiene.

Dietary habits: Apparently healthy; no risk factors for caries.

Use of fluoride: Brushes twice daily with a fluoride-containing toothpaste.

Clinical evidence/ dental history: No caries or fillings and no other factors that may increase caries risk.

Plaque: Good oral hygiene; minimal plaque deposits.

Saliva: Normal.

Other: None.

Recall interval recommended for next oral health review: 6 months.

Rationale: The history and examination reveal no medical or social history of note and the patient has no cavities and good oral hygiene and dietary practices. However, this is a new patient with no established dental history, so you assign a conservative recall interval of 6 months initially.

PATIENT B

Age: 14 years.

Attendance record: Has attended your practice for regular reviews since the age of 5 years.

Medical history: None of note.

Social history: One younger sibling aged 11 who is caries free. The patient's mother is also caries free.

Dietary habits: Apparently healthy; no risk factors for caries.

Use of fluoride: Brushes twice daily with a fluoride-containing toothpaste.

Clinical evidence/ dental history: No previous history of dental caries and no other risk factors for caries; healthy gingiva.

Plaque: Good oral hygiene; minimal plaque deposits.

Saliva: Normal.

Other: None.

Recall interval recommended for next oral health review: 12 months.

Rationale: This patient is a regular attender with known past history. There is no current evidence or past history of dental disease, the medical history is clear and there are no additional risk factors. Hence the patient is considered to be at low risk and a review interval of 12 months seems reasonable.

Subsequent history: The patient develops new caries in two molars at the age of 16 years. She has developed a habit of frequent consumption of sugar-containing foods and drinks between meals and her oral hygiene has deteriorated. The recall interval is reduced to 6 months. After intensive prevention, the

lapses in dietary practices and oral hygiene are reversed and no new caries is subsequently seen.

PATIENT C

Age: 11.5 years.

Attendance record: Attending your practice for the first time (for an oral health assessment).

Medical history: None of note.

Social history: Two older siblings aged 13 and 15 years, who have been patients of yours for the past 2 years. Both siblings have had decay in the primary and permanent dentition. The patient's mother also has a high DMFT (decayed, missing and filled teeth) score.

Dietary habits: Consumes carbonated soft drinks at least three times a day.

Use of fluoride: Irregular brushing; lives in an area with sub-optimal levels of fluoride in the water.

Clinical evidence/ dental history: Three restorations in primary teeth and there is one carious lesion in a first permanent molar requiring restoration; gingival inflammation in all areas.

Plaque: Oral hygiene is poor.

Saliva: Normal.

Other: None.

Treatment plan: Preventive advice and restoration of first permanent molar.

Recall interval recommended for next oral health review: 3 months.

Rationale: The patient has a large number of risk factors and this is his first visit to the practice so a short recall interval is appropriate.

Subsequent history: After pro-active prevention, the patient reduces consumption of carbonated drinks between meals, improves oral hygiene and uses a fluoride-containing toothpaste regularly twice daily. Over subsequent visits no new caries is seen and the recall interval is initially extended to 6 months.

PATIENT D

Age: 35 years.

Attendance record: Has attended your practice regularly for 6 years.

Medical history: None of note.

Social history: Non-smoker and drinks alcohol occasionally at the weekends.

Dietary habits: Healthy diet with plenty of fresh fruit and vegetables and rarely consumes sugar-containing foods and drinks.

Use of fluoride: Brushes twice a day with a fluoride-containing toothpaste.

Clinical evidence and dental history: No missing teeth, five occlusal amalgam fillings in permanent molar teeth. These were placed 15 years ago and have not needed replacement, all are still in excellent condition. Bitewing radiographs taken 12 months ago revealed no interproximal lesions. On examination, the patient's periodontal health is excellent (Basic Periodontal Examination [BPE] code 0 all sextants).

Plaque: Brushes twice a day and uses dental floss once a day. Has not needed oral hygiene instruction or debridement for three years.

Saliva: Normal.

Other: None

Recall interval recommended for next oral health review: 24 months.

Rationale: Over a 6-year period at your dental practice, this patient has not required any restorative intervention. The patient has not had any new carious lesions over a 15-year period and has excellent oral hygiene and dietary habits. The patient's periodontal health is excellent and dental status appears stable, suggesting that a recall interval of 24 months is appropriate.

PATIENT E

Age: 20 years.

Attendance record: Has attended your practice every 12 months for 5 years.

Medical history: None of note.

Social history: Non-smoker, consumes alcohol occasionally at the weekends.

Dietary habits: Healthy diet with low frequency of intake of sugar-containing foods and drinks.

Use of fluoride: Brushes twice a day with a fluoride-containing toothpaste.

Clinical evidence and dental history: Two occlusal amalgam fillings present in permanent molar teeth. The fillings were placed 6 years ago and are still in excellent condition. Bitewing radiographs taken 12 months ago revealed no signs of interproximal lesions.

Plaque: Brushes twice a day and uses dental floss once a day. Excellent oral hygiene and has not needed oral hygiene instruction or any debridement for three years.

Saliva: Normal.

Other: None.

Recall interval recommended for next oral health review: 24 months.

Rationale: Over a 5-year period at your dental practice, this patient has not required any restorative intervention. The patient's past caries experience is minimal and he has not had any new carious lesions over a 6-year period. He has good oral hygiene and dietary practices, and his periodontal health is also excellent. His dental status is judged to be stable, suggesting that a recall interval of 24 months is appropriate.

Subsequent history: The patient returns for an oral health review after 24 months. He has been living away from home for the past 18 months, having just started college. His dietary habits have changed, and he is now consuming a lot of carbonated soft drinks and 'junk food'. Oral hygiene has deteriorated – he is brushing irregularly, does not always use fluoride-containing toothpaste, and flosses 'occasionally'. One new carious lesion (requiring restorative intervention) has developed on the occlusal surface of one molar tooth. Bitewing radiographs reveal one interproximal lesion. Two 'white spot' lesions are present on the buccal surfaces of two molar teeth. There is evidence of gingivitis in all sextants with calculus deposits on the lingual surfaces of the lower anterior teeth (BPE codes 1-2). The patient undergoes a course of treatment involving restoration of the carious lesions, oral hygiene instruction, debridement of all plaque and calculus, dietary advice, and the application of

topical fluoride to white spot lesions. Recall interval for next oral health review is shortened to 6 months. He is advised that a longer interval may be recommended in the future if subsequent oral health reviews reflect improvements in dietary habits and oral hygiene.

PATIENT F

Age: 45 years.

Attendance record: Has attended your practice every 6 months for 3 years.

Medical history: None of note.

Social history: Non-smoker and a 'moderate' drinker.

Dietary habits: Healthy, balanced diet and, following dietary advice given at previous oral health reviews, confines intake of sugar-containing foods and drinks to mealtimes with no between meal snacking.

Use of fluoride: Brushes twice a day with a fluoride-containing toothpaste.

Clinical evidence and dental history: The patient required considerable restorative work when first attending 3 years ago and oral hygiene at that time was poor. However, the patient has not experienced any new carious lesions since then, nor has any restorative work needed further attention. The patient's oral hygiene has improved significantly. Bitewing radiographs reveal no approximal lesions and good alveolar bone support. The BPE demonstrates gingival bleeding in two sextants but no pocketing or attachment loss (BPE code 1).

Plaque: Brushes twice a day and uses dental floss occasionally. Oral hygiene is satisfactory, although there are plaque deposits around the cervical margins of the upper and lower molar teeth.

Saliva: Normal.

Other: None.

Treatment plan: Further oral hygiene advice, followed by debridement of plaque deposits.

Recall interval recommended for next oral health review: 12 months.

Rationale: Over a 3-year period at your dental practice, this patient has not required any further restorative intervention after the initial course of treatment. The patient has shown good compliance

with dietary and oral hygiene advice given, although the patient should be helped to improve oral hygiene around the molar teeth. Although the patient's dental status appears relatively stable at this time, you do not think it is advisable to increase the interval beyond 12 months because you feel it may be necessary to review oral hygiene.

PATIENT G

Age: 55 years.

Attendance record: Has attended your practice for 1 year.

Medical history: None of note.

Social history: Smokes 35 cigarettes a day and drinks alcohol daily. Has tried to give up smoking in the past but without success.

Dietary habits: Apparently healthy diet.

Use of fluoride: Uses a fluoride-containing toothpaste twice daily.

Clinical evidence/ dental history: Wears an upper partial denture. The remaining dentition is sound. No obvious mucosal disease.

Plaque: Good oral hygiene.

Saliva: Normal.

Other: None.

Recall interval recommended for next oral health review: 6 months.

Rationale: The patient has two recognised factors associated with oral cancer and would therefore benefit from regular review of the oral mucosa.

PATIENT H

Age: 65 years.

Attendance record: Has attended your practice for 5 years.

Medical history: Asthmatic and uses a steroid inhaler.

Social history: Non-smoker and has occasional alcohol.

Dietary habits: Apparently healthy diet.

Use of fluoride: Brushes twice a day with a fluoride-containing toothpaste.

Clinical evidence/ dental history: The patient is edentulous and has full dentures that are 3 years old. There is a white patch on the right lateral

margin of the tongue that was assessed by biopsy in a specialist unit 5 years before and reported as a non-dysplastic leukoplakia. The patient was discharged back to the practice for ongoing care.

Plaque: Maintains good denture hygiene.

Saliva: Normal.

Other: The patient has suffered from recurrent candidal infections associated with inhaler therapy.

Recall interval recommended for next oral health review: 6 months.

Rationale: The patient has a recognised potentially malignant condition at a high-risk site in the mouth. Review of the mucosa at 6-monthly intervals would increase the likelihood of early detection of any malignant change.

PATIENT I

Age: 56 years.

Attendance record: First attended your practice 6 months ago and has been compliant in completing a course of non-surgical periodontal therapy.

Medical history: Taking low-dose aspirin due to family history of coronary heart disease.

Social history: Non-smoker; moderate alcohol intake of approximately 14 units per week.

Dietary habits: Mix of rushed meals during the week and a reasonably balanced diet at weekends.

Use of fluoride: Brushes twice a day with a fluoride-containing tooth-whitening toothpaste.

Clinical evidence and dental history: The teeth are heavily restored with a mix of large amalgam restorations and a few crowns. Although there used to be some moderately deep pockets (BPE code 3) in most sextants, only four 5 mm pockets remain, without bleeding on probing, following non-surgical periodontal therapy. Gingival health is otherwise excellent.

Plaque: Brushes twice a day and uses interdental brushes two to three times per week. The plaque score is reasonably low (25%) and is mainly limited to lingual or palatal molar surfaces.

Saliva: Normal.

Other: None.

Treatment plan: The patient receives advice in home-care plaque control and enters supportive periodontal maintenance on a 3-monthly recall.

Recall interval recommended for next oral health review: 3 months.

Rationale: The response to periodontal therapy is good, although plaque control is not adequate. Because you have no measure of periodontal stability, the patient's periodontal status should be re-examined in 3 months.

PATIENT J

Age: 23 years

Attendance record: Has attended your practice regularly from a young age.

Medical history: None of note.

Social history: Non-smoker; a moderate drinker.

Dietary habits: Healthy diet and rarely consumes confectionary.

Use of fluoride: Brushes three times a day with a fluoride-containing toothpaste.

Clinical evidence and dental history: The patient has never required restorative intervention and her periodontal health is excellent (BPE code 0 all sextants).

Plaque: Excellent oral hygiene, brushes three times a day and uses dental floss once a day.

Saliva: Normal.

Other: None.

Recall interval recommended for next oral health review: 18 months.

Rationale: Given the patient's long established dental history of no restorations and excellent oral hygiene, a recall interval of 24 months might be appropriate. However, recognising that at the patient's age lifestyles can change suddenly and dramatically, you decide to be cautious and recall in 18 months.

PATIENT K

Age: 21-years.

Attendance record: Has attended your practice regularly for 6 years.

Medical history: None of note and, apart from the contraceptive pill, is taking no medication.

Social history: Non-smoker; a moderate drinker.

Dietary habits: Consumes one can of carbonated soft drink per day and one bar of chocolate a day.

Use of fluoride: Brushes twice a day with a fluoride-containing toothpaste.

Clinical evidence and dental history: No decayed, missing or filled teeth and bitewing radiographs reveal no approximal lesions and good alveolar bone support. The BPE demonstrates gingival bleeding, but no pocketing (BPE code 1) in five sextants with calculus present around the lower anterior teeth (BPE code 2).

Plaque: Brushes twice a day but does not use dental floss. Oral hygiene is unsatisfactory.

Saliva: Normal.

Other: None.

Treatment plan: The patient receives oral hygiene advice and professional debridement of plaque and calculus.

Recall interval recommended for next oral health review: 12 months. Clinician recommends review of oral hygiene with debridement if needed in 6 months.

Rationale: Although the patient has some risk factors for dental caries, she has not required restorative intervention and you consider a recall interval of 12 months to be appropriate for the next oral health review. In view of the patient's oral hygiene and periodontal status you recommend a review of oral hygiene with debridement if needed in 6 months.

PATIENT L

Age: 67 years.

Attendance record: The patient had full upper and lower dentures fitted by you 2 years ago and subsequently attended twice for easing of the lower denture.

Medical history: None of note.

Social history: Non-smoker and non-drinker.

Dietary habits: Healthy diet (lots of fresh fruit and vegetables).

Use of fluoride: N/A.

Clinical evidence and dental history: Healthy oral mucosa with no evidence of any mucosal lesions. Both upper and lower dentures fit and function well. Plaque: Dentures are free of plaque deposits and the patient rinses them immediately after meals and soaks them in a cleansing solution overnight.

Saliva: Normal.

Other: None.

Recall interval recommended for next oral health review: 24 months.

Rationale: This edentulous patient has been fitted with satisfactory dentures and subsequent follow-up has been uneventful. The patient's healthy oral mucosa and established denture-cleansing regime influence your decision to recall in 24 months. The patient is advised to reattend if there are any problems with the dentures or any change in the oral mucosa.

PATIENT M

Age: 69 years.

Attendance record: Has attended your practice regularly for 5 years.

Medical history: Taking a diuretic and a beta-blocker for blood pressure.

Social history: Heavy smoker; you suspect he may be a heavy drinker.

Dietary habits: No information available.

Use of fluoride: Brushes twice a day with a fluoride-containing toothpaste.

Clinical evidence and dental history: White patches present that have been biopsied by a specialist and found to be non-malignant keratotic lesions associated with his tobacco habit. No new

carious lesions in the past 5 years. A number of areas with moderate pockets of 4-6 mm (BPE code 3) and/or some sextants with furcation involvements or attachment loss of 7 mm or more.

Plaque: Poor oral hygiene; does not use interproximal aids such as interdental brushes or floss.

Saliva: Normal.

Other: None.

Treatment plan: Arrangements are made for the patient to have periodontal care with the hygienist.

Recall interval recommended for next oral health review: 6 months.

Rationale: The patient has risk factors for oral cancer (mucosal lesions, heavy tobacco use and alcohol consumption). The 'white patches' were biopsied and found to be non-malignant and the patient was referred back to you for continuing care and review. However, it is the patient's periodontal status, rather than his risk factors for oral cancer, that is the main determinant of your choice of recall interval. The patient's oral mucosa will be checked as part of the next oral health review in 6 months.

PATIENT N

Age: 48 years.

Attendance record: Has attended your practice regularly for 7 years.

Medical history: Taking HRT; otherwise none of note.

Social history: Quit smoking 9 years ago; drinks on average seven units of alcohol per week.

Dietary habits: Healthy, balanced diet.

Use of fluoride: Brushes twice a day with a fluoride-containing toothpaste.

Clinical evidence and dental history: The teeth are heavily restored but restoration margins are accessible and intact. Although there used to be moderately deep pockets on most teeth (BPE code 3), only three 5 mm pockets remain following non-surgical periodontal therapy, which was completed 5 years ago. These have remained unchanged since and the patient has been attending for supportive periodontal maintenance visits every 3 months. Gingival health is otherwise excellent.

Plaque: Brushes twice a day with a fluoride-containing toothpaste and uses interdental brushes every day. There are minimal plaque deposits.

Saliva: Normal.

Other: None.

Treatment plan: The patient should continue on 3-monthly supportive periodontal maintenance visits.

Recall interval recommended for next oral health review: 12 months.

Rationale: The previous history of periodontitis highlights the need for continuing supportive therapy every 3 months. In view of the stability of the disease at present, the next oral health review should be in 12 months time.

PATIENT O

Age: 18 years.

Attendance record: Attending your practice for the first time and has attended another practice irregularly over the past 10 years.

Medical history: Has Down's syndrome. No other medical history of note.

Social history: Lives at home with his parents.

Clinical evidence and dental history: Microdontia with short, small clinical crowns and roots. Large amalgam restorations are present in six permanent molar teeth. There are no other restorations or caries lesions present. The patient has already lost two first molar teeth. The gingival health is poor with inflammation present at a number of interproximal sites but there is no significant mobility or drifting of any teeth. Periodontal screening reveals a BPE code of 4 with a number of pockets deeper than 3.5 mm and several around the remaining first molar teeth deeper than 5.5 mm. There is widespread bleeding on probing.

Plaque: Brushes twice a day but does not use any interproximal cleaning aids.

Saliva: Normal.

Other: None.

Treatment plan: The patient receives advice in home-care plaque control (this advice is also given to the patient's parents, who are asked to supervise the patient's oral hygiene) and a course of non-surgical

periodontal therapy. The patient is placed on 3-monthly supportive periodontal maintenance visits.

Recall interval recommended for next oral health review: 3 months.

Rationale: The patient has multiple risk factors for the development of periodontal disease. The patient's dental status appears unstable, suggesting that a recall interval of 3 months is appropriate to monitor compliance with oral hygiene advice and the overall response to treatment.