

# Producing guidance for the management of patients with chronic periodontal disease in general dental practice

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## VERIFIABLE CPD PAPER

The vast majority of patients will experience gingival-related disease at some point in their life, and up to a quarter of those are susceptible to advanced periodontal disease. This makes its effective management an important part of general dental practice. This paper provides guidance on management which incorporates periodontal assessment, management and recall according to patient's oral hygiene and modifiable risk factors. This has been produced in flow diagram format to aid non-surgical management of chronic gingival and periodontal disease in general dental practice.

### IN BRIEF

- Highlights that diagnosis and effective management of chronic periodontal disease is needed on a daily basis in general dental practice.
- Suggests there is limited detailed guidance for chronic periodontal disease management in practice.
- Provides guidance for the management of chronic periodontal disease based around patients' oral hygiene and risk factors so they receive tailored management.

## INTRODUCTION

The vast majority of patients will experience gingival-related disease at some point in their life, and of those '10–15% are susceptible'<sup>1,2</sup> to advanced periodontal disease. Undiagnosed untreated periodontal disease is one of the fastest growing areas of litigation in dentistry<sup>3</sup> and there is limited guidance available for its management.

'Dental plaque is the principle aetiological factor in the pathogenesis of periodontitis. The host response, the modifying effect of various risk factors and the bacterial challenge from dental plaque can account for a variety of disease patterns and diagnoses'.<sup>4</sup> Chronic periodontal diseases (chronic gingivitis and chronic periodontitis) are the most common forms of periodontal disease. With 'the population ageing chronic periodontitis represents a significant and growing healthcare burden with 85% of adults over 65-years-old exhibiting chronic periodontal destruction'.<sup>5</sup>

The aim of this paper is to produce guidance for the non-surgical management of chronic periodontal diseases in general dental practice. The guidance formulated is tailored around the patient's risk factors and oral hygiene (OH). As 'the process of chronic periodontal disease is closely related to the amount of dental plaque',<sup>2,6–9</sup> 'success in chronic periodontal treatment is dependent upon the ability and willingness of the patient

to maintain good oral hygiene'.<sup>5</sup> So the guidance is largely OH led, as it is well recognised that effective OH is paramount to prevent and control chronic periodontal disease.<sup>2,5,10–12</sup>

## BASIC PERIODONTAL EXAMINATION

The basic periodontal examination (BPE) is a simple screening tool that is used to rapidly detect periodontal disease, indicate the level of examination needed and to provide basic guidance on treatment need. The BPE is recorded using a World Health Organisation/Community Periodontal Index of Treatment Needs probe which is 'walked around'<sup>13</sup> the gingivae using a light probing force (20–25g).<sup>13</sup>

'The dentition is divided into six sextants (Table 1), the gingivae surrounding each tooth in the sextant is examined (except the third molars). The sextant must contain at least two teeth. If only one tooth is present the score for that tooth is included in the recording for the adjoining sextant'.<sup>13</sup>

BPE is scored according to Table 2. The highest score is recorded for each sextant. Both the code and \* should be documented if a furcation is detected, an example of a scoring is given in Table 3. BPE scores should be taken for every new patient and at each examination appointment.<sup>14</sup> The BPE gives a broad representation of the level of the disease; it does not provide a diagnosis.<sup>13</sup> Table 4 highlights how the same BPE code can lead to very different diagnoses.

## DIAGNOSIS OF PERIODONTAL DISEASE

This paper focuses on the management of chronic periodontal disease, management of

**Table 1** The teeth involved in each of the six sextants

7–4	3–3	4–7
7–4	3–3	4–7

**Table 2** Clinical criteria for determining BPE score

BPE code	Clinical features
0	No pockets over 3.5 mm No plaque retentive factors No bleeding after gentle probing
1	No pockets over 3.5 mm No plaque retentive factors Bleeding after gentle probing
2	No pockets exceeding 3.5 mm Plaque retentive factors
3	Periodontal probing 3.5–5.5 mm (blackband of WHO probe partially visible) on one or more sites
4	Periodontal probing greater than 5.5 mm (blackband of WHO probe disappears into pocket) on one or more sites
*	Furcation involvement

**Table 3** Example of a BPE scoring

3*	3	4*
3	2	2*

other forms of periodontitis are different so the correct diagnosis is important.

In order to diagnose the disease a thorough history and clinical examination is required. Periodontal diseases are classified by G. C. Armitage.<sup>15</sup> The different periodontal diagnoses and their diagnostic criteria are shown in Table 5.<sup>2</sup>

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**Table 4 Examples of different periodontal diagnoses under the same BPE code**

BPE score	
2	Gingivitis with calculus Gingivitis with overhanging restoration
3	Acute necrotising ulcerative gingivitis Chronic hyperplastic gingivitis Generalised early chronic periodontitis
4	Localised aggressive periodontitis Generalised advanced chronic periodontitis

The BPE will help determine if periodontal assessments and radiographs are justified. These are primarily to monitor the disease however they also help provide additional diagnostic information, for example; determining extent, severity - which is determined with clinical attachment loss (CAL - pocket depth plus recession) (Table 5) - and identifying local risk factors.

**RISK FACTORS FOR PERIODONTAL DISEASE**

‘The degree of damage caused by the host response can be related to the levels of plaque on patients’ teeth; however there are other local and systemic risk factors that can exacerbate susceptibility and severity of the problem’.<sup>5</sup> The patient history and clinical examination will help highlight these local and systemic risk factors for periodontal disease. Systemic risk factors include medical conditions (unstable diabetes and leukaemia), medications (phenytoin, cyclosporine and calcium channel blockers), stress, smoking and any family history of periodontal disease. The clinical examination should highlight local factors such as overhanging restorations, calculus, root cavities and enamel pearls.

**FORMULATING GUIDANCE FOR THE MANAGEMENT OF CHRONIC PERIODONTAL DISEASES**

The British Society of Periodontology offer some guidance on interpretation of BPE scores which outlines basic management (Table 6). This paper aims to build on this, providing further guidance on assessment, management and recall which is tailored to patients’ risk factors and which is displayed in a diagrammatical format making it easy to follow.

Root surface debridement (RSD) is ‘the removal of bacterial plaque biofilm and calculus deposits from the root surfaces and from within the pocket’.<sup>16</sup> Use of sonic or ultrasonic scalers are considered more favourable for patient and clinician over hand scalers for RSD due to efficiency, however both methods give comparable results.<sup>17-19</sup> RSD should be completed for any pockets 4mm and over.

**Table 5 Periodontal diseases and their diagnostic criteria<sup>2,5</sup>**

Diagnoses	Diagnostic criteria
Chronic gingivitis	Plaque-induced inflammation of the gingivae Gingival erythema and oedema Gingival bleeding on brushing or probing Occasionally detachment of the gingivae from the teeth May be exacerbated by various factors: hormonal changes
Acute necrotising ulcerative gingivitis	Painful ulceration of the tips of the interdental papillae Grey necrotic sloughing tissue – visible on the surface of the ulcers May cause loss of interdental papillae Spontaneous gingival bleeding Halitosis Submandibular lymph nodes may be tender and palpable Fever, malaise Common among smokers and patients with poor oral hygiene.
Gingival hyperplasia	Gross enlargement of gingival tissue Induced by irritation from plaque and calculus, repeated friction or trauma Induced by medications- calcium channel blockers, cyclosporin, phenytoin Mouth breathing can exacerbate
Chronic periodontitis	Related to the amount of dental plaque/ local factors Slow to moderate rate of progression Subgingival calculus is a frequent finding Most prevalent in adults Susceptibility can be linked to factors: smoking, diabetes, family history
Aggressive periodontitis	Approximately 1/1,000 of susceptible patients suffer more rapid attachment loss Patient otherwise healthy Rapid rate of progression and alveolar bone destruction Individuals usually under 35 years May be localised to some of the teeth, or generalised, involving all the teeth. It is characterised by vertical bone defects on radiographs Microbial deposits inconsistent with amount of tissue destruction Smoking significant risk factor Attachment loss maybe self-arresting
Acute necrotising periodontitis	The same features as Necrotising ulcerative gingivitis with the presence of attachment loss
Periodontal abscess	An acute infection in a periodontal pocket It is important to distinguish between a peri-apical and periodontal abscess, this may be difficult if both conditions are present at the same time. Abscesses can be acute or chronic and asymptomatic if freely draining. If there is no endodontic component, the tooth will be vital
Periodontitis associated with endodontic lesions	These lesions may be independent or coalescing, and may originate either from the gingiva or the apex The tooth will not be vital

Extent		Severity	
Localised	<30% of sites involved	Early	CAL 1-2 mm
Generalised	>30% of sites involved	Moderate	CAL 3-4 mm
		Advanced	CAL >5 mm

Patients’ oral hygiene can also be used to help identify those who will benefit most from RSD. Performance of optimal oral hygiene practices is an inseparable principle to be observed with any protocol of mechanical debridement.<sup>20</sup> Oral hygiene education (OHE) should be the foundation of management in patients with moderate or poor oral hygiene.<sup>21-23</sup> Therefore a large part of the care pathway uses OH to help determine what form of management will benefit the patient most- whether that is predominantly OHE, RSD or both.

As the severity and extent of the disease can also be linked to other risk factors the guidance also covers assessing and addressing these.

**ASSESSING AND ENHANCING PATIENT COMPLIANCE**

Patient responsibility and compliance is essential if they are to benefit from treatment.<sup>24</sup> ‘Improving patients’ adherence to oral hygiene instructions essentially requires changing patients behaviour’.<sup>5</sup> Oral hygiene instruction (OHI) is an integral part of management; this

**Table 6 British Society of Periodontology – guidance on interpretation of BPE scores**

0	No need for periodontal treatment
1	OHI
2	OHI, removal of plaque retentive factors, including all supra- and subgingival calculus
3	OHI, RSD
4	OHI, RSD. Assess the need for more complex treatment; referral to a specialist may be indicated
*	OHI, RSD. Assess the need for more complex treatment; referral to a specialist may be indicated

OHI: oral hygiene instruction; RSD: root surface debridement  
As a general rule, radiographs to assess alveolar bone levels should be obtained for teeth or sextants where BPE codes three or four are found.

**Table 8 Guidance for the management of patients with chronic periodontal disease**

Categorising OH	
Determining levels of oral hygiene	Patients oral hygiene regime Plaque levels Gingival inflammation
Examples	
<b>Good</b>	Brushes twice a day, ID cleaning once a day Nil/minimal visible plaque at gingival margin/PS under 15% Pink stippled gingivae/BS under 15%
<b>Moderate</b>	Brushes – twice a day, ID cleaning once a week Visible plaque at gingival margins of teeth/PS 15-50% BOP, marginal erythema, BS 15-50%
<b>Poor</b>	Brushes once a day, no ID cleaning Plaque and debris generalised/PS over 50% Spontaneous BOP, BS over 50%

**Key:**  
Follow the flow chart for the highest BPE score recorded.  
Please note, when determining an overall recall other patient factors should also be included.  
Recurrent DNAs/poor compliance – follow red paths.  
(If code \* occurs with BPE code one, two or three, manage as code one, two or three).

should include tailored instruction on tooth brushing and interdental cleaning. OHE is for those patients with continuing poor oral hygiene, this incorporates OHI and involves implementing behaviour change. Methods to improve oral hygiene behaviours include: goal setting, self-monitoring, understanding the diagnosis and importance of management, regular recall to reinforce, visual motivators and use of the oral hygiene TIPPS (talk, instruct, practice, plan, support).<sup>25</sup>

Patients' gingival bleeding, plaque levels and home care regime can all be assessed quickly and easily to provide a good overall picture of patients oral hygiene.

Plaque and bleeding indices aid detection of gingival inflammation and plaque levels. When used together they give an idea of patients' immediate and long term plaque control.

There are different plaque and bleeding indices available. This protocol uses a plaque scoring system by O'Leary *et al.*<sup>26</sup> as it is quick to score, easy to use and explain to patients, is less subjective than more quantitative scores and serves as a good visual motivator.

The O'Leary index marks presence or absence of plaque at four points on each

tooth – mesial, distal, buccal, palatal or lingual. Every tooth present is assessed. 'A suitable disclosing solution such as plaque search liquid or similar is painted onto all exposed tooth surfaces'.<sup>26</sup> After a single rinse the teeth are assessed and any amount of disclosed plaque visible is scored and the score is worked out as a percentage (Table 7).

The percentage can be easy for the patient to understand and can be used to set goals. Setting the goal for a patient to aim for must be tailored and realistic, therefore depending on what the patients initial score is it may be sensible to aim for the patient to quarter or half their score initially rather than expect optimum plaque score next time it is assessed. Disclosing tablets or solutions may also be used by the patient at home to periodically self-assess.

Plaque scoring can be used not only for increasing compliance but also to help guide when a patient may get the best response from a course of RSD. A plaque score for good pocket response should be less than 25%, an optimal plaque score would be less than 10%.<sup>27,28</sup> With this in mind 15% is advised as the maximum a plaque and

**Table 7 Equation for working out a plaque or bleeding score**

Plaque or bleeding index scoring	Number of surfaces with plaque/total number of surfaces	× 100
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bleeding score should be before RSD to get a more favourable response.

## DESCRIBING THE PROTOCOL

The guidance formulated (Table 8, Figs 1–3) has been produced in flow diagrams style for each BPE score, following the diagnosis of either chronic gingivitis or periodontitis.

Risk factors should be assessed at the initial appointment. Any modifiable risk factors should be addressed by advice given during OHI or OHE. This should include, where appropriate, smoking cessation, referral to the GMP if there is an associated medical condition or contributing medication.

Assessing patients' oral hygiene is usually done automatically during the examination appointment. This should include looking at gingival health, plaque levels and noting the patients' home care. Following this, the patient's oral hygiene should be classed as good, moderate or poor and this will dictate the path of management followed. Table 8 gives a guide on how to categorise a patient's oral hygiene.

Periodontal assessments include clinical attachment loss, mobility, furcation, suppuration and bleeding. Any sextants scoring a BPE code four indicate a need for periodontal assessment. As BPE code three can represent either chronic gingivitis with false pocketing or early periodontal disease, patients level of oral hygiene and radiographs should be used to help determine if there is true or false pocketing thus determining the need for a periodontal assessment. Should a BPE code three persist following removal of local factors a periodontal examination should be conducted.

## Radiographs

Radiographs, where justified, need to show the horizontal bone level, any vertical bone defects and furcation involvements completely. For baseline most of the time bitewing radiographs will be sufficient to show bone levels in posterior sextants. Vertical bitewings can be helpful where bone loss has already occurred.

More localised views are justified when the bone level is not completely visible on a bitewing, or if the code four is on the anterior sextants. Long cone periapicals are advised for the localised views.<sup>2</sup> Further radiographs are only required if clinically justified.

## Treatment flow charts

Treatment flow charts (Table 8, Figs 1–3)

should be followed for the highest BPE code scored in those patients who have consented to management.

BPE three has two stages, the first stage is done to resolve any false pocketing and remove gross calculus deposits which would impede accurate periodontal examination. At the three month review if there is still a code three, stage two is followed.

BPE four also has two stages; the first stage involves an initial course of RSD regardless of OH. 'Providing an initial course of RSD in patients who appear motivated but have sub-optimal oral hygiene can be beneficial and encouraging. A single session of full mouth ultrasonic disinfection is a justified initial treatment approach that offers tangible benefits for the chronic periodontitis patient'.<sup>29</sup> Subsequent management should be guided by patients' ongoing oral hygiene (via plaque and bleeding scores) and motivation. This guidance advises RSD when a plaque or bleeding score is 15% or below, over this and OHE is the advised management. Patient preferences and other treatment required should be taken into consideration when deciding on full mouth disinfection or split mouth management. Outcome is not affected by the type of management is chosen.<sup>30</sup>

**Recall intervals**

Recall intervals have also been suggested based on oral hygiene and significant modifiable risk factors.<sup>24</sup> The table format is a 'simplified way of placing patients into a recall category, the lowest recall should be selected. This is also colour coded: red - high risk, short recall interval; green - low risk, longer recall interval'.<sup>24</sup> There are also more advanced methods available of determining risk, progression and treatment modalities such as the 'PreViser RiskCalculator'.<sup>24</sup> When deciding on a recall this should be discussed with the patient and it should be 'stressed that they can modify their own disease risk (improving their OH or with smoking cessation) and those which do, need not be recalled as frequently'.<sup>24</sup> 'In those patients with non-modifiable risk factors it would be wise to see them more often'.<sup>24</sup> Please note that when determining an overall recall other patient factors should also be included in line with NICE guidance on dental recall.<sup>31</sup>

At the recall examination the assessments start again as do the flow charts depending on the BPE scored. Patients who frequently miss appointments or have poor compliance, management should follow the red colour coded paths on the flow chart. The flow diagrams are merely guidance on treatment and should never supersede clinical judgement.

Once the periodontal condition is stable (pockets 4 mm or less, good oral hygiene

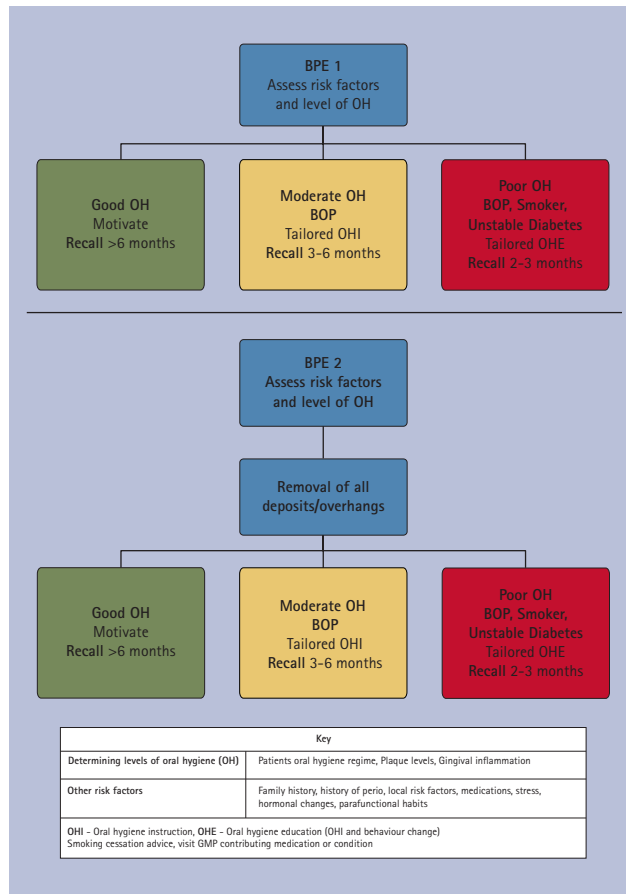


Fig. 1 Guidance for the management of patients with chronic periodontal disease - BPE one and two

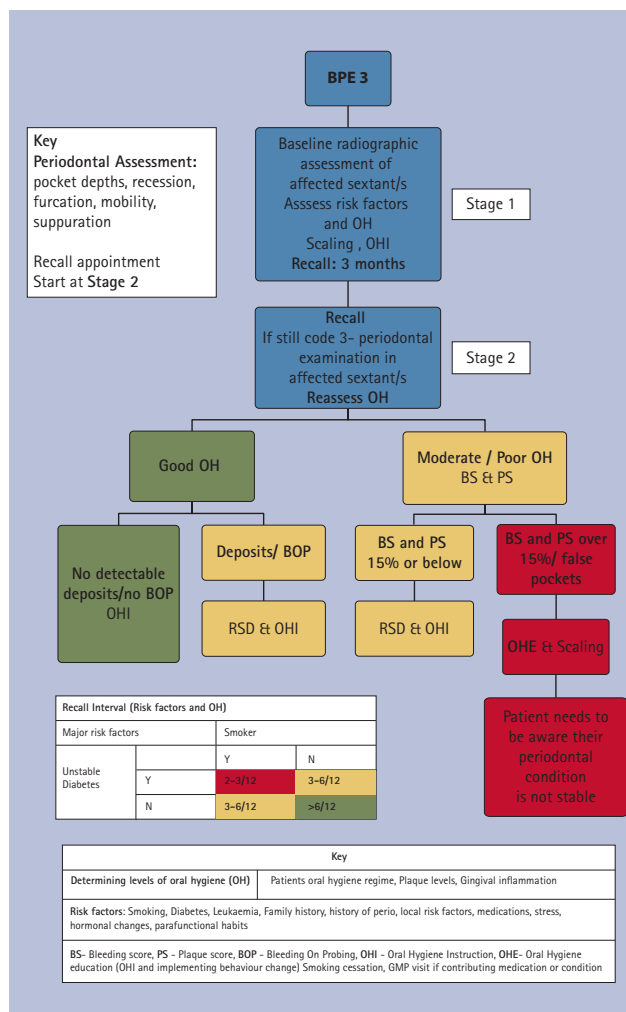
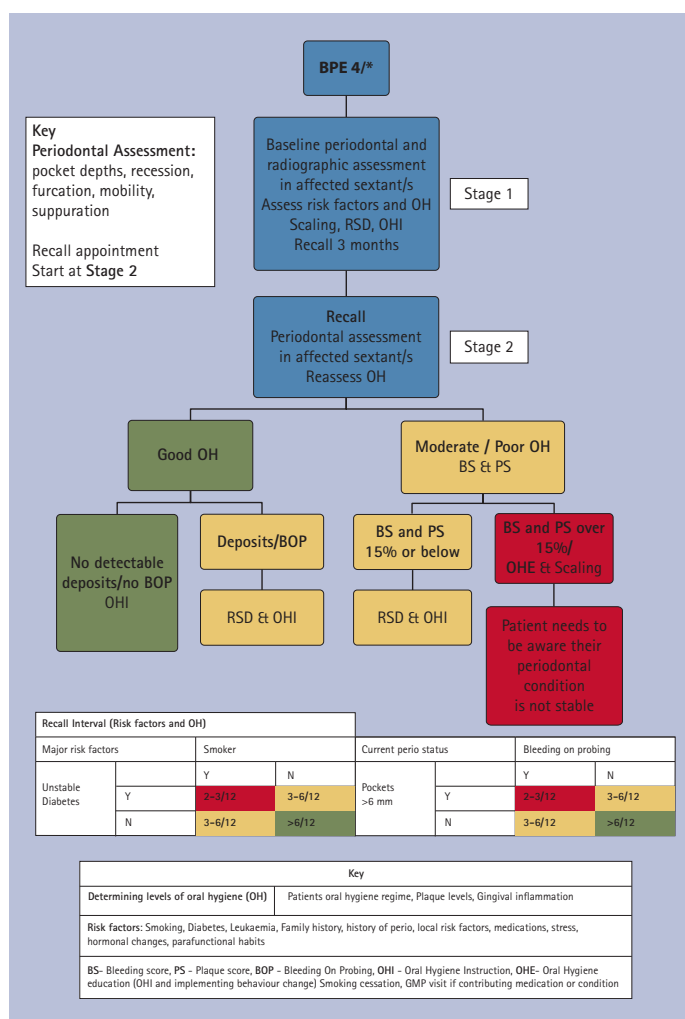


Fig. 2 Guidance for the management of patients with chronic periodontal disease - BPE three. Note: Table reproduced with permission from: Darcey J, Ashley M. *Br Dent J* 2011; 211: 379-385



**Fig. 3 Guidance for the management of patients with chronic periodontal disease – BPE four. Note: Table reproduced with permission from: Darcy J, Ashley M. *Br Dent J* 2011; 211: 379–385**

with plaque and bleeding scores under 15%), the patient needs to be put onto a maintenance regime to ensure long term stability.

Referral to secondary or tertiary care should be considered for motivated patients with optimal OH who have had lack of improvement following management. This might be due to persistent deep pocketing, vertical bone defects or furcation involvement on strategic teeth.

## TIPS FOR PRACTICE

- Share the duties of your periodontal management with your team. Train your nurses in oral hygiene education and plaque scoring; they can then complete this at a separate appointment or at the beginning or end of appointments.
- Note writing forms your defence in the case of any allegations made against you.<sup>3</sup> 'Whether such allegations are made in the form of a complaint, or a claim of negligence, two questions always arise: did the dentist in question properly diagnose, treat and monitor the periodontal disease? Did the critical discussions and explanations occur between the dentist and the patient?'<sup>3</sup> Notes need to include BPE, diagnosis and

consent process. Consent includes: what periodontal disease is, its process and how it is managed, options of treatment, the lifelong input required, risk factors and any side effects of treatment. Patients who decline management, frequently miss appointments or have poor compliance must be made aware of the consequences of their unstable periodontal condition and this must be documented.

## IN SUMMARY

Guidance has been suggested in flow diagram format to aid the clinician in non-surgical management of chronic periodontal diseases in general dental practice. The guidance includes assessment, management and recall which is based on patients' oral hygiene and risk factors so they get tailored management that benefits them most.

*Thank you to Dr M Prideaux, Dr B Ashton and all the staff at Mount Wise Dental Practice.*

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## Erratum

Practice article (*BDJ* 2015; 218: 337–342)

*Restorative dentistry for the older patient cohort*

In the above practice article, the caption of Figure 6 was incorrect. The caption should have read as follows:

Fig. 6 a) An older patient with resorption affecting the lower edentulous ridge, resulting in difficulty wearing a conventional complete denture. b) A different older patient who has received two dental implants with Locator® attachments in the anterior mandible. This improved denture retention significantly and the patient was able to function satisfactorily

We apologise to the authors for this error and to readers for any confusion caused.