The Diagnosis and Examination of Periodontal Disease

Why Screen For Periodontal Disease

Periodontal disease affects a huge section of the population and poses a significant threat to the adult population. Various epidemiological studies over the years have estimated that 10-15% of the population are susceptible enough to periodontal disease that it will result in the loss of a significant number of teeth. It may account for as much as 35% of all tooth loss.

An interesting study by Hugoson (J Clin Periodontol 2008; 35: 405–414) looked at the prevalence and severity of periodontal disease in a Swedish population over a 30 year period. Looking at a sample drawn up of adults in all age groups, he found that there have been improvements in the numbers of healthy individuals. There has been a concomitant reduction in patients with gingivitis and early periodontitis, but a persistent 10-15% with moderate to advanced disease. To be fair, this may also be in part a reflection in a reduction in the overall number of edentulous adults.

Of course it is worth stressing that the earlier that chronic periodontitis is diagnosed, simpler and more predictable the treatment. We cannot assume that it is a disease of older age. Chronic periodontitis does take time to develop, but the more aggressive forms such as localized of generalized aggressive can start in young adults and lead to a rapid progression of bone loss.

Fig 2 Advanced bone loss in a 28 year old non-smoker with aggressive disease.
Patients are far more litigious than they used to be and the Defence Societies are well aware of the number and costs associated with missed periodontal disease, but ultimately it is our duty of care as dentists to screen, diagnose and inform our patients for all forms of relevant oral disease and the periodontal diseases form a very basic part of this.

**How to Screen For Periodontal Disease**

Patients should be screened for periodontal disease at every routine dental check-up. One way of screening for periodontal disease is the BPE, using a 0.5mm ball ended (WHO) probe, it is similar to the CPITN, but involves examining every surface of every tooth, with the exception of the third molars. Details of the BPE and its use can be found on the British Society of Periodontology (BSP) website:


Recently the BSP collaborated with the British Society of Paediatric Dentistry to produce guidelines on periodontal screening and management of children and young adults.


The BPE provides a useful tool for the dentist. It is relatively quick to perform and very simple to use. Each code represents a clinical presentation from health, through gingivitis to moderate and advanced chronic periodontitis, and points the practitioner down an appropriate treatment path. It does have limitations, and it should be stressed that it is only designed as a screening tool. It gives very limited information. Just six numbers represent the periodontal state of the entire mouth. It also does not include enough detail to allow close monitoring of longitudinal changes in probing depths, or indeed response to treatment. For example, a sextant with a single 6mm site in it will have a BPE score of 4, as would a sextant where all sites are measured at, for example, 9 or 10mm. Once a code of 3, 4 or * have been found, the BPE suggests a more detailed periodontal examination is required. This will allow the true extent and severity of the disease to be assessed, and give the relevant information to allow progression and response to treatment to be monitored.

**The Full Periodontal Assessment**

The BPE suggests that when a code 3 is scored, a 6 point probing pocket chart should be taken for that sextant. It might well be worth recording the whole mouth since it should be examined anyway. Where a code 4 or * is scored, a full mouth periodontal probing chart should be recorded. A full periodontal assessment would include other clinical factors that may aid diagnosis or have an influence on the periodontal prognosis.
**Periodontal Probe**

The WHO probe used for the BPE is not designed for recording periodontal probing depths. There are many patterns of suitable probes, such as the Williams probe that has millimeter markings up to 10mm, or the UNC15 that measures up to 15mm. The diameter of the tip will influence the ability to pass the probe down the pocket, so it is important to use probes with similar dimensions for all periodontal pocket recordings.

Over the years, much time has been spent trying to improve the reproducibility of periodontal probing. Modifications such as constant force probes and computerized probes such as the Florida probe have been developed to try to improve the reproducibility.

**Plaque**

The fact that plaque is the primary aetiological factor in the onset of chronic periodontitis is well established. Plaque control is an essential, if not the most essential, part of the treatment and long-term management of chronic periodontitis. It is an oversimplification of course, but the more susceptible a patient is to periodontitis, the less room there is for compromise on plaque control.

Many different indices for the measurement the presence and amount of plaque exist. In terms of periodontal treatment it may be more appropriate to simplify to a percentage plaque score that records either the presence or absence of plaque on four surfaces of the tooth, mesial, distal, buccal and lingual/ palatal.

The timing of recording plaque scores is worth considering. If a patient admits to not undertaking regular interdental plaque control, then they will have a plaque score in excess of 50%. Recording this will be of little clinical significance, however it may be a useful tool in educating and motivating the patient. Further reductions in the plaque score can help keep a patient involved in their part of the treatment.

Following initial therapy, the patient’s ability to achieve and maintain excellent levels of plaque control may become critical in treatment decisions. Certainly complex treatment options, such as periodontal or regenerative surgery, are contra-indicated in the absence of meticulous plaque control. Objective scores such as a percentage plaque scores are a better way to make decisions rather than on a subjective opinion. Light but frequent plaque deposits can make it appear that a patient is doing well with their plaque control, however the percentage plaque score can be far in excess of the 15% or less that we are aiming for.

**Probing chart and the assessment of attachment levels**
Much is made of the periodontal probing chart, but it should be remembered that
the probing depth does not necessarily represent the actual state of the
periodontal attachment. False pocketing will result from excessive amounts of
gum above the cement-enamel junction leading to probing depths that are too
high, and gingival recession will lead to probing depths that underestimate the
amount of periodontal destruction that has occurred.

The probing chart is usually recorded at six sites per tooth, however the probe
should be ‘walked’ around the tooth to try and find the deepest probing depths
on the distal, mid and mesial parts of both the buccal and lingual/palatal aspects
of the tooth. This will also help detect deep narrow defects as can be associated
with fractured teeth or draining periapical abscesses.

What we are most interested in is attachment levels, and this is best judged by
recording not only the probing depth, but also the gingival recession.

Figure 3 shows a UNC No15 periodontal probe in a periodontal pocket and the 4-
5mm black band is just visible at the gingival margin. This pocket could be
recorded as 4mm or possible 5mm. The actual periodontal ligament attachment
started at the cement-enamel junction, so the overall attachment that has been
lost is represented by the probing depth added to the gingival recession.

The most accurate way of scoring the gingival recession is to record it on a six-
point basis similar to probing depths. This is not to be confused with the Miller
classification of gingival recession, which takes into account the adjacent tissue
type and height. The Miller classification is designed to assist in the planning of
gingival coverage procedures.

The periodontal chart will give a map of how much pocketing and attachment
loss there is around the mouth. This does allow us to classify the extent and
severity of the disease, but it is worth stressing at this point that radiographic
examination is also required to estimate how long the roots are and what
percentage of attachment remains.

**Bleeding on Probing**
Bleeding on probing can represent two distinct pathological processes and it is important that the clinician is aware of the difference to be able to interpret the significance.

Bleeding on or after probing can be a result of inflammation at the gingival margin, and represents a clinical manifestation of gingivitis, whether or not this is associated with a deep periodontal pocket. This will often be responsible for many of the bleeding sites in a patient presenting with untreated periodontal disease due to an inadequate level of oral hygiene and the presence of plaque retentive factors. As such, improvements in the gingival health by simple oral hygiene instruction and the removal of such plaque retentive factors will reduce the tendency for the superficial tissues to bleed. Patients who put in extra effort with their oral hygiene when they visit a dentist may well be given away by the presence of superficial inflammation and marginal bleeding on gently probing.

The second type of bleeding is bleeding from the depths of the pocket. This may represent inflammation at the depth of the pocket where it could be associated with disease progression. Once the superficial tissues are healthy, bleeding is more likely to be related to inflammation deeper down, and some bleeding indices allow 30 seconds for the blood to present at the gingival margin.

A percentage bleeding score is a useful tool to monitor the amount of overall inflammation. This is usually based on a dichotomous score, bleeding is either present or absent at each site, after a six point pocket chart has been recorded. Overall, we are trying to get patients bleeding scores down to 15% or less as an indication of overall acceptable levels. Individual sites with increased probing depths and persistent bleeding are considered at risk of disease progression and this is can be used as an indication of sites that need active treatment in the longer term monitoring of periodontal patients.

**Mobility**

The mobility of the teeth should be recorded as this will aid diagnosis of both the periodontal disease and also other factors that might be contributing. Where increased mobility is present, it can be recorded according to the classification system:

- Grade I: Horizontal mobility >0.2mm <0.5mm
- Grade II: Horizontal mobility >0.5mm <1mm
- Grade III: Horizontal mobility >1mm or vertical movement

It is out of the scope of this article to discuss the causes and management of increased tooth mobility. In the context of periodontal disease, we are often looking at mobility as a reflection of historic loss of bone vertically. This would be in a situation of healthy periodontal support. As such the mobility occurs because the tooth has lost bone and hence the crest of bone is more towards the apex. Hence mobility may not be a pathological process. In such a situation, the
longitudinal monitoring, looking for increasing mobility, may be a better diagnostic tool.

The occlusion can be a significant factor in the formation and persistence of pathological mobility. Again it is out of the scope of this article to consider this in detail, however where abnormal mobility is found, the occlusion should be checked for abnormal contacts that could be contributing.

**Furcation Involvements**

The presence and extent of furcation involvements has a huge influence on the prognosis of multi-rooted teeth. It is important to try and assess the clinical extent of bone loss into the furcations, but this can be difficult as access is not always straightforward. The Nabers furcation probe is designed to access furcations, but even this can be limited where the furcation entrance is interproximal, such as in the case of a two rooted upper second premolar, or where a long root trunk means that the furcation involvement develops some way subgingival.

A common furcation involvement system is:

Class I: Horizontal probing into the furcation < 3mm
Class II: Horizontal probing > 3mm, but not though and through
Class III: Through and through probing

It should be remembered that teeth have the same number of furcations as they have roots and an attempt should be made to assess all the furcations on a tooth.

![Figure 4- Furcation probe in-situ in the buccal furcation of a lower first molar](image)

**Summary**

Once the examination has been done, the clinician should be in a position to decide on what further investigations are required before making a diagnosis. This will allow the prognosis, both at the patient and individual tooth levels, to be considered. This article has not considered the risk factors that might
influence a patient’s susceptibility to periodontal disease, but that is not to undermine their importance.

The importance of periodontal disease in a primary care setting cannot be understated. There can be no excuse for routinely missing chronic periodontal disease, and this should not occur if a suitable screening process is applied at each dental examination. The progression of bone loss is usually, but not always, slow and chronic, however there will be a point when the probing depths can be detected as pathological. The earlier the detection, the more straightforward and predictable the outcome of treatment.

The nature of treating periodontal disease means that reassessments are relatively common. The information outlined above should be gathered and interpreted within the context of what has been done previously. The significance of certain factors, such as bleeding on probing or plaque control, may increase in importance after initial therapy or in the long-term periodontal maintenance of patients after treatment.