

Periodontal examination and diagnosis

- **Periodontal Examination:**
 - **suppuration**
 - **Probing depth**
 - **Probing around implants**
 - **Bleeding on probing**
 - **Attachment loss and level**
 - **Attached gingiva**
 - **Wasting disease of the teeth**
 - **Tooth mobility**
 - **Furcation involvement**
 - **Trauma from occlusion**
 - **Pathologic migration of the teeth**

Gingival Recession

Gingival recession:- is the reduction of the height of the marginal gingiva to a location apical to the CEJ (cementoenamel junction) (a recession is a distance from the cementoenamel junction to the gingival margin)

The presence of recession indicates that attachment loss has occurred but not necessarily that inflammation is present,

Tactile Periodontal Examination

The tactile periodontal examination begins with the evaluation of the consistency of the gingiva and its adaptation to the tooth as well as the presence of marginal bleeding and suppuration. The gingival crevice is then probed to evaluate the subgingival environment. The tooth surface is carefully probed for aberrations, concavities, furcation, and subgingival calculus. The response of the gingival tissue to probing is appraised in terms of resistance to probe penetration, depth of probe penetration, bleeding on probing, and pain on probing.

Diagnosis of biofilm-induced inflammatory periodontal diseases is based on the presence of periodontal inflammation and attachment loss.

Tactile Examination of the Marginal Gingiva

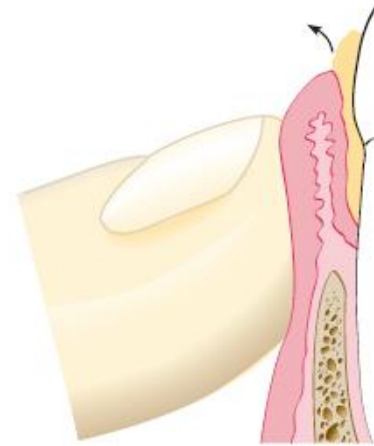
The marginal gingiva is palpated with a periodontal probe to assess its consistency and adaptation to the tooth. Healthy gingiva is firm, resilient, and well adapted to the tooth due to the presence of dense collagen fiber bundles in the lamina propria of the gingiva. When inflamed, the gingiva is edematous, spongy, and loosely adapted to the tooth surface due to the degradation of collagen and the influx of cells and fluid into the lamina propria. In cases of chronic inflammation and smokers, the gingival tissue may be fibrotic.

Marginal Bleeding

Marginal bleeding is associated with inflammatory changes in the marginal gingiva. Marginal bleeding can be evaluated by running an instrument such as a probe or rubber tip along the gingival margin. Under pressure, healthy gingival tissue will blanch and not bleed, whereas, in the presence of gingival inflammation, marginal bleeding may be observed. The ease and severity of marginal bleeding are correlated with the severity of gingival inflammation.

-Suppuration

Palpation of the marginal gingiva with a probe, or digitally by placing the ball of the index finger on the gingiva apical to the margin, and pushing coronally toward the gingival margin may squeeze a white-yellowish exudate from the gingival crevice. The presence of an abundance of neutrophils in the gingival fluid transforms it into a purulent exudate. Suppuration does not occur in all periodontal pockets, but pressure often reveals it in pockets where its presence is not suspected.



Several studies have evaluated

the association between suppuration and the progression of periodontitis and have reported that this sign is present in a very low percentage of diseased sites (i.e., 3% to 5%). Therefore, **the absence of suppuration does not indicate the absence of disease.**

Tactile Examination of the Gingival Crevice

The probe is inserted into the gingival crevice vertically with the tip of the probe touching and sliding down along the tooth surface to the bottom of the crevice.

It is the adhesion of the junctional epithelium to the tooth surface that stops probe penetration in healthy tissue The probe is “walked” circumferentially around each surface of each tooth to detect the areas of deepest penetration, irregularity or subgingival calculus, presence of periodontal defects, interdental craters, root surface concavities, and furcation invasion. Periodontal defects tend to be associated with deep probing depths and gingival inflammation To detect an interdental crater, the probe should be placed obliquely from both the facial and lingual surfaces to explore the deepest point of the pocket located beneath the contact point. The root surface should be carefully explored and probed to detect concavities and furcation invasion. The use of specially designed probes (e.g., Nabers probes)

Probing Around Implants

Because implants are susceptible to biofilm-induced inflammatory diseases, probing around them becomes part of the examination and diagnosis. A traditional periodontal probe may be used under light force (e.g., 0.25 N) without damaging the peri-implant mucosal seal

When Not to Probe

In the presence of severe gingival inflammation, accurate probing depth measurement is difficult to obtain without anesthesia due to the pain and discomfort inflicted on the patient with the insertion of the periodontal probe into the inflamed periodontal pocket.

In cases that require scaling and root planing with anesthesia, accurate probing depth measurement should be delayed until the scaling and root planing appointment.

After anesthesia has been administered and before root instrumentation occurs, Furthermore, in moderate and advanced cases, probing depths will change dramatically with improvement in biofilm control and scaling and root planing. As such, obtaining accurate probing depths at the reevaluation following nonsurgical therapy is much more important than obtaining accurate probing depths at the pretreatment periodontal examination.

Probing Depth

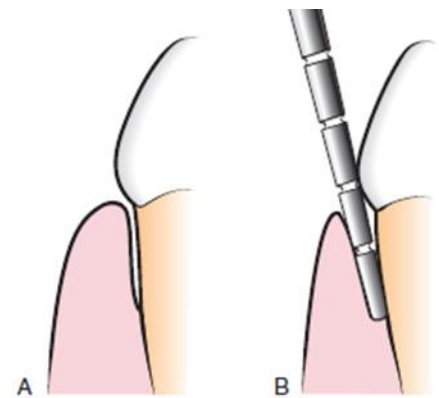
There are two different pocket depths:

- (1) **The biologic or histologic depth:-** is the distance between the gingival margin and the base of the gingival crevice (i.e., the coronal end of the junctional epithelium).

This can be measured only in carefully prepared and

Adequately oriented histologic sections.

- (2) **The clinical or probing depth:-** is the distance from the gingival margin to the bottom of the probable crevice (i.e., where the probe tip stops).



(A) The biologic or histologic pocket depth is the actual distance between the gingival margin and the attached tissues (i.e., the bottom of the pocket). (B) The probing or clinical pocket depth is the depth of prob penetration.

Probe penetration can vary depending on the **force of introduction, the shape and size of the probe tip, the direction of penetration, the resistance of the tissues, the convexity of the crown, and the degree of tissue inflammation.** Probing depth is generally ≤ 3 mm in gingival health and >3 mm in the presence of gingival inflammation.

In human periodontal pockets, the probe tip penetrates to the most coronal intact fibers of the connective tissue attachment. The depth of penetration of the probe in the connective tissue apical to the junctional epithelium in a periodontal pocket is about 0.3 mm. This is important when evaluating differences in probing depth before and after treatment because the

reduction in probe penetration may be a result of reduced inflammatory response rather than a gain in attachment. Probing depth may change from time to time, even in patients with untreated periodontal disease, as a result of changes in the position of the gingival margin. (The biologic/histologic pocket depth is always shallower than the clinical/probing pocket depth.)

Bleeding on Probing

To test for bleeding after probing, the probe is carefully introduced to the bottom of the pocket and gently moved laterally along the pocket wall. Sometimes bleeding appears immediately after the removal of the probe; other times it may be delayed for a few seconds. Therefore the clinician should recheck for bleeding 30 to 60 seconds after probing.

if the gingiva is inflamed and if the pocket epithelium is atrophic or ulcerated. Noninflamed sites rarely bleed. In most cases, bleeding on probing is an earlier sign of inflammation than gingival color changes. (The absence of bleeding on probing is an excellent predictor of periodontal stability)

As a single test, bleeding on probing is not a good predictor of progressive attachment loss, however, its absence is an excellent predictor of periodontal stability. When bleeding is present in multiple sites of advanced disease, bleeding on probing is a good indicator of progressive attachment loss.

Automatic and Electronic Periodontal Probing

The use of the periodontal probe is the classic method to detect probing depth and attachment loss. However, it presents some problems in terms of reproducibility of the measurements. Accuracy and reproducibility depend not only on root morphology and tissue changes but also, importantly, on the probing technique, the probing force, the size of the probe, the angle of insertion of the probe, and the precision of the probe's calibration

Probing Force

One of the main problems of reproducibility has been the variation of probing force, which several investigators have explored. A force of 0.75 N has been found to be well-tolerated and accurate. With forces of up to 30 g, the tip of the probe remains within the junctional epithelium, whereas forces of up to 50 g are necessary to reach the bone level.

The development of pressure-sensitive probes has helped to provide consistent probing force.

Probe Angulation

Standardization of the probe tip (i.e., <1 mm) and the addition of registration stents to maintain reproducible probe angulation have been used to overcome this error. New commercially available computer-assisted technology has been used to improve probing accuracy and reproducibility.

In addition to more accurate measurement, the data derived from automatic probing can become part of the electronic record. Once incorporated, clinical changes and patterns of disease activity can be easily determined. These records also provide feedback to patients

In addition to more accurate measurement, the data derived from automatic probing can become part of the electronic record. Once incorporated, clinical changes and patterns of disease activity can be easily determined. These records also provide feedback to patients. **The Florida Probe System² consists of a probe handpiece, a digital readout, a footswitch, a computer interface, and a computer, Several studies have been made comparing the Florida Probe with conventional probing**

- 1- The automatic probe appears to underestimate deep probing depths but shows less variability than conventional probing
- 2- The automatic probe also has the problem of providing little tactile sensitivity, thereby making it more difficult to “walk” the probe
- 3- Electronic systems such as the Interprobe and the Periprobe provide constant probing force and computer storage of data, but their reproducibility is only slightly better than that of conventional methods
- 4- The lack of standardization among probings by different individuals and at different times by the same individual depends not only on root morphology and tissue changes but also on the probing technique, the probing force, the size of the probe, the angle of insertion of the probe, and the

precision of the probe's calibration. For measurements of clinical attachment loss, it is necessary to identify the location of the cementoenamel junction, and this offers another hurdle for the standardization of measurements.

Pain on Probing

Gingival inflammation and periodontal disease, in general, are painless. probing of the gingival crevice can elicit pain in the gingival tissue, The presence of pain suggests that the gingival tissue is inflamed, and the level of pain is usually related to the severity of gingival inflammation. Unless gingival inflammation is generalized and severe, patients will not feel the same level of pain at every site.