Department of Periodontics

4th grade
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Periodontal indices

Many indicators have been used in research and clinical studies to measure the prevalence and severity of periodontal diseases.
Researchers define what constitutes gingival and periodontal disease by clinical assessment, using measurement scales known as indices (or indexes).

Assessment of inflammation of the periodontal tissues
Gingival index (Loe and Silness)
The presence of inflammation in the gingiva is usually recorded by the use of a probe, and often according to the principles outlined by Loe and Silness. This system measures the degree of gingival inflammation. Tissues surrounding each tooth are divided into 4 gingival scoring units: distal facial papilla, facial margin, mesial facial papilla, and lingual gingival margin.
The score of gingival indices:

- Score 0 Normal gingiva
- Score 1 Mild inflammation: a slight color change, slight edema. No bleeding on probing
- Score 2 Moderate inflammation: redness, edema, and glazing. Bleeding on probing
- Score 3 Severe inflammation: marked redness and edema. Ulceration. Tendency to spontaneous bleeding

The GI may be used for the assessment of the prevalence and severity of gingivitis in populations, groups, and individuals.

Modified Gingival Index
The **Modified Gingival Index** (MGI), devised by Lobene et al. (1986), introduced changes in the criteria of the **Gingival Index** (Löe and Silness, 1963) through a non-invasive (no probing) and resetting the rating for mild and moderate inflammation.

0 = Absence of inflammation
1 = Mild inflammation; slight change in color, little change in texture of any portion of but not the entire marginal or papillary gingival unit
2 = Mild inflammation; criteria as above but involving the entire marginal or papillary gingival unit
3 = Moderate inflammation; glazing, redness, edema, and/or hypertrophy of the marginal or papillary gingival unit
4 = Severe inflammation; marked redness, edema and/or hypertrophy of the marginal or papillary gingival unit, spontaneous bleeding, congestion, or ulceration

Plaque index (Silness and Loe)

Clinical plaque indices are used to evaluate the level and rate of plaqueformation on tooth surfaces, and to test the efficacy of oral care products for the removal and prevention of plaque deposits from these surfaces. Several different indices have been described which were introduced by Silness and Loe in 1964

- Used on all teeth (28, wisdom teeth are excluded) or selected teeth (6 teeth).
- No substitution for any missing tooth.
- Used on all surfaces (4) (M, B, D, L).
- This index measures the thickness of plaque on the gingival one-third of the teeth.

• **0** No plaque

• **1** A film of plaque adhering to the free gingival margin and adjacent area of the tooth, which cannot be seen with the naked eye. But only by using the disclosing solution or by using a probe.

• **2** Moderate accumulation of deposits within the gingival pocket, on the gingival margin and/ or adjacent tooth surface, which can be seen with the naked eye.

• **3** Abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin.

Gingival bleeding.

Gingival bleeding varies in severity, duration, and the ease with which it is provoked. Bleeding on probing is easily detectable clinically and therefore is of great value for the early diagnosis and prevention of more advanced gingival inflammation. Gingival bleeding on probing is one of the earliest visual signs of inflammation. It can appear earlier than color changes or any other visual signs of inflammation. It also provides an additional advantage, by being a more objective sign that requires less subjective estimation by the examiner. Gingival bleeding on probing also helps us to determine whether the lesions are in an active or inactive state.

Bleeding on probing (BOP) index

Bleeding after gentle probing to the base of the probable pocket has been a common way of establishing the occurrence of subgingival inflammation, characterized by the presence of an inflammatory infiltrate adjacent to the ulcerated pocket epithelium.

0. No bleeding occurs after probing.
1. Bleeding emerges within 15 seconds after probing.

calculate a percentage score for the whole mouth as follows:

% BOP score= Number of surfaces with bleeding X 100/
Total number of teeth X **6**

Plaque index (O'Leary et al. 1972)

Disclose and allow to rinse.

A probe may be used to confirm the presence of plaque.

Scores were recorded on four surfaces; distal, mid, and mesial points on the facial (buccal) and lingual (palatal) aspects.

Score as follows:

- 0 = no plaque (left blank)
- 1 = plaque present (recorded √)

Calculate the % of plaque as follows:

% **Pl** score= Number of surfaces with **Plaque** X 100/ Total number of teeth X **4**

Calculus Index (CI)

Calculus is mineralized material on the tooth surface. The calculus index refers to the amount of calculus on a tooth.

0 — No observable calculus.

1 — Scattered calculus covering less than one-third of the buccal tooth surface.

2 — Calculus covering between one- and two-thirds of the buccal tooth surface with minimal subgingival deposition.

3 — Calculus covering greater than two-thirds of the buccal tooth surface and extending sub-gingivally.

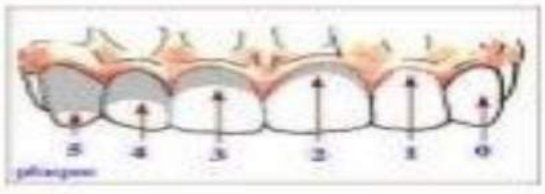
Plaque index (Quigely Hein)

An index that evaluates the plaque revealed on the buccal and lingual non restored surfaces of the teeth on a scale of 0 to 5, defined by Quigley and Hein in 1962.

SCORING CRITERIA:

QUIGLEY AND HEIN

Score	Criteria
0	no plaque
1	flecks of stain of the gingival margin
2	Definitive line of plaque on gingival margin
3	Gingival third of surface
4	Two- thirds of surface
5	Greater then 2/3rd of the surface



TURESKY et al

SCORE	CRITERIA
0	No plaque
1	Separate flecks of plaque at the cervical margin of the tooth
2	A thin continuous band of plaque at the cervical margin of the tooth
3	A band of plaque wider then 1mm covering less than 1/3rd of the crown of the tooth
4	Plaque covering at least 1/3rd but less then 2/3rd of the crown of the tooth
5	Plaque covering 2/3rd or more of the crown of the tooth

Assessment of loss of periodontal tissue support

Depth of sulcus.

The sulcus depth usually remains at 1–3 mm irrespective of the level of clinical attachment. Pseudopocket‖ may be present in cases of slightly increased probing depth

without concomitant attachment and alveolar bone loss and presence/absence of bleeding on probing

Destructive changes in periodontal tissues

Signs of destructive changes in periodontal tissues are as follows:

1. Attachment loss.
2. Periodontal pocket (depth of probing more than 4 mm), suppuration.
3. Tooth mobility.
4. Pathological migration of the teeth (fan-shaped divergence).

Periodontal Pockets

This is the distance between the base of the pocket and the gingival margin.

Type of pockets

- (suprabony or infrabony)
- (True and false pockets)

Examination for periodontal pockets must include their presence and distribution on each tooth surface, pocket depth, level of attachment on the root, and type of pocket (suprabony or Infrabony).

Signs and symptoms

Although probing is the only reliable method of detecting pockets, clinical signs, such as color changes (bluish red marginal gingiva or bluish red vertical zone extending from the gingival margin to the attached gingiva); a "rolled" edge separating the gingival margin from the tooth surface; or enlarged, edematous gingiva, may suggest their presence.

The presence of bleeding, suppuration and loose, extruded teeth may also denote the presence of a pocket. Periodontal pockets are generally painless but may give rise to symptoms such as localized or sometimes radiating pain or sensation of pressure after eating, which gradually diminishes. A foul taste in localized areas, sensitivity to hot and cold, and toothache in the absence of caries are also sometimes present.

Detection of Pockets

The only accurate method of detecting and measuring periodontal pockets is a careful exploration with a periodontal probe. Pockets are not detected by radiographic examination. The periodontal pocket is a soft tissue change. Radiographs indicate areas of bone loss in which pockets may be suspected, but they do not show pocket presence or depth

Assessment of probing pocket depth (PPD).

For effective treatment planning, the location, topography, and extent of periodontal lesions must be recognized in all parts of the dentition. It is, therefore, mandatory to examine all sites of all teeth for the presence or absence of periodontal lesions. The probe should be inserted parallel to the vertical axis of the tooth and "walked" circumferentially around each surface of each tooth to detect the areas of deepest penetration. This turn means that single-rooted teeth have to be examined at four sites at least (e. g. mesial, buccal, distal, and oral) and multirooted teeth at six sites at least (e. g. mesiobuccally, buccal, distobuccal, distooral, oral, and mesiooral) The probing

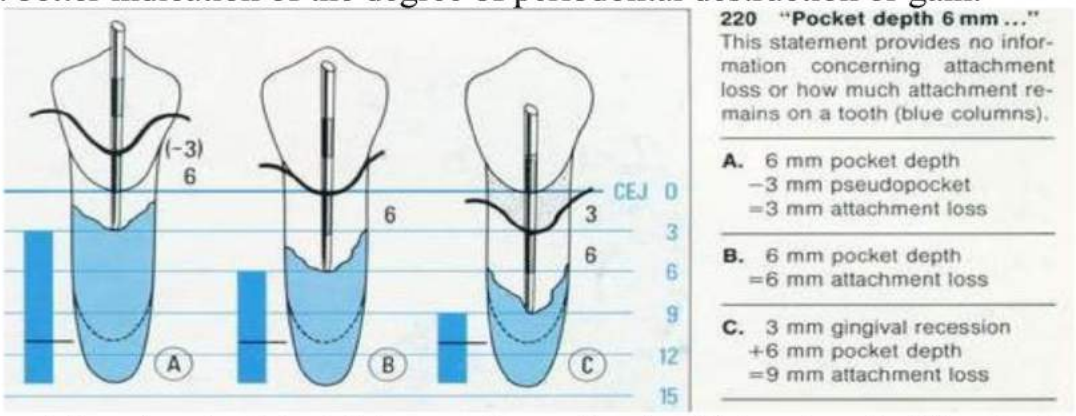
depth, that is the distance from the gingival margin to the bottom of the gingival sulcus/pocket, is measured to the nearest millimeters using a graduated periodontal probe.

Probe penetration can vary, depending on:

- The force of introduction.
- The shape and size of the probe tip.
- The direction of penetration
- Resistance of the tissues.
- Convexity of the crown.
- The degree of tissue inflammation

Clinical Attachment Level

The level of attachment, on the other hand, is the distance between the base of the pocket and a fixed point on the crown such as the cementoenamel junction (CEJ). Changes in the level of attachment can be the result of gain or loss of attachment and afford a better indication of the degree of periodontal destruction or gain.



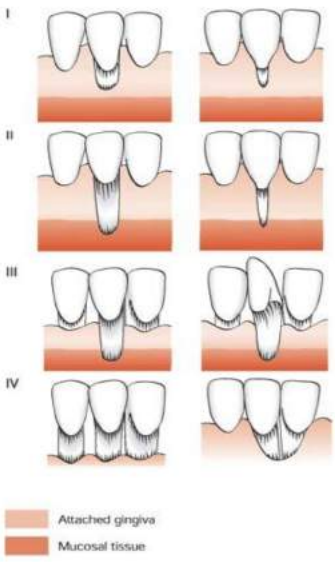
Interdental crater, to detect this area the probe should be placed obliquely from both the facial and lingual surfaces to explore the deepest point of the pocket located beneath the contact point.

Gingival recession

This measurement is taken with a PD probe from the CEJ to the gingival crest.

Miller in 1985 classified the GR into:

- Class I: recession not extending to the MGJ; no interdental bone loss. (100% root coverage)
- Class II: recession extending to or beyond the MGJ; no interdental bone loss. (100% root coverage)
- Class III: recession extending to or beyond the MGJ; interdental bone loss or mispositioning of the tooth. (50% to 70%)
- Class IV: recession extending to or beyond the MGJ; severe interdental bone loss or severe mispositioning of the tooth. (≤ 10%)



Cairo et al 2011 suggested the classification of recessions

buccal recession type 1 without interproximal attachment loss.

buccal recession type 2 is associated with interproximal attachment loss less than or equal to the buccal attachment loss.

buccal recession type 3 is associated with interproximal attachment loss greater than the buccal attachment loss.

Furcation involvement

In multirooted teeth. The use of specially designed probes allows an easier & more accurate exploration of the horizontal component of furcation lesions.

Classified into three degrees:

DI: Horizontal loss of supporting tissues not exceeding 1\3 of tooth width.

D2: Horizontal loss of supporting tissues exceeding 1\3 of tooth width but not including the total width of furcation area.

D3 – Through & through destruction of tissues in the furcation area.

BASIC PERIODONTAL EXAMINATION (BPE)

It was developed by the British Society of Periodontology (BSP) in 1986 and revised in 2011.

Careful assessment of the periodontal tissues is an essential component of patient management. The BPE is a simple and rapid screening tool that is used to indicate the level of examination needed and to provide basic guidance on treatment needs. Please note; that BPE does not provide a diagnosis.

How to record the BPE

1. The dentition is divided into 6 sextants:

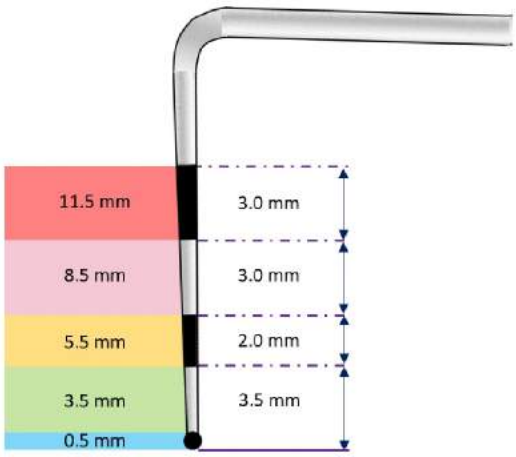
upper right (17 to 14), upper anterior (13 to 23), upper left (24 to 27)
lower right (47 to 44), lower anterior (43 to 33), lower left (34 to 37)

17-14	13-23	24-27
47-44	43-33	34-37

2. All teeth in each sextant are examined (except 3rd molars).

3. For a sextant to qualify for recording, it must contain at least 2 teeth. (If only 1 tooth is present in a sextant, the score for that tooth is included in the recording for the adjoining sextant).

4. A WHO BPE probe is used (World Health Organization probe). This has a "ball end" 0.5 mm in diameter, and a black band from 3.5 to 5.5 mm. Light probing force should be used (20-25 grams).
5. The probe should be "walked around" the sulcus/pockets in each sextant, and the highest score recorded. As soon as code 4 is identified in a sextant, the clinician may then move directly on to the next sextant, though it is better to continue to examine all sites in the sextant. This will help to gain a fuller understanding of the periodontal condition and will make sure that furcation involvements are not missed. If a code 4 is not detected, then all sites should be examined to ensure that the highest score in the sextant is recorded before moving on to the next sextant.



Probing force

A light probing force of 25 g, equivalent to the force required to blanch a fingernail, is used when probing the periodontal tissues

Scoring codes

0 No pockets >3.5 mm, no calculus/overhangs, no bleeding after probing (black band completely visible)

1 No pockets >3.5 mm, no calculus/overhangs, but bleeding after probing (black band completely visible)

2 No pockets >3.5 mm, but supra- or subgingival calculus/overhangs (black band completely visible)

3 Probing depth 3.5-5.5 mm (black band partially visible, indicating pocket of 4-5 mm)

4 Probing depth >5.5 mm (black band entirely within the pocket, indicating pocket of 6 mm or more)

* Furcation involvement

Both the number and the * should be recorded if a furcation is detected - e.g., the score for a sextant could be 3* (e.g.
indicating probing depth 3.5-5.5 mm PLUS furcation involvement in the sextant). **An example BPE score grid might look like this:**

2	1	X
3	2	4*

When to record the BPE

• All new patients should have the BPE recorded .
• For patients with codes 0, 1, or 2, the BPE should be recorded at least annually .
• For patients with BPE codes of 3 or 4, more detailed periodontal charting is required:
- Code 3: record full probing depths (6 sites per tooth) in the sextant(s) where code 3 was recorded, in addition to recording the BPE in those sextants with scores 0, 1, or 2
- Code 4: if there is a code 4 in any sextant, then record full probing depths (6 sites per tooth) throughout the entire dentition.
• BPE cannot be used to assess the response to periodontal therapy because it does not provide information about how sites within a sextant change after treatment. To assess the response to treatment, probing depths should be recorded at 6 sites per tooth pre- and post-treatment.
• For patients who have undergone initial therapy for periodontitis (i.e., who had pretreatment BPE scores of 3 or 4), and who are now in the maintenance phase of care, then full probing depths throughout the entire dentition should be recorded at least annually.

Guidance on the interpretation of BPE scores

Interpreting the BPE score depends on many factors that are unique to each patient. The clinician should use their skill, knowledge, and judgment when interpreting BPE scores. General guidance is indicated below. The BPE scores should be considered together with other factors when making decisions about whether to refer (as outlined in the companion BSP document "Referral Policy and Parameters of Care").

0 No need for periodontal treatment
1 Oral hygiene instruction (OHI)
2 OHI, removal of plaque retentive factors, including all supra- and subgingival calculus
3 OHI, root surface debridement (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.