

Periodontal Examination and Diagnosis

((Proper diagnosis is essential to intelligent treatment))

Periodontal diagnosis should first determine whether disease is present. It should then identify the disease, and its severity and extent. Finally, it should provide an understanding of the underlying pathologic processes and their causes.

1-Health history

((Most of the medical history is obtained in the first visit))

The importance of the health history should be clearly explained, because patients often forget information that they cannot relate to their dental problems.

The patient should be made aware of the following:

- (1) The possible impact of certain systemic diseases, conditions, behavioral factors, and medications on periodontal disease, its treatment, and treatment outcomes.
- (2) The presence of conditions that may require special precautions or modifications of the treatment procedure
- (3) The possibility that oral infections may have a powerful influence on the occurrence and severity of a variety of systemic diseases and conditions.

The health history should include reference to the following:

1. If the patient is under the care of a physician, the nature and duration of the problem and its therapy should be discussed.
2. Details regarding hospitalizations and operations, including the diagnosis, the type of operation, and any problematic events (e.g. Anesthetic, hemorrhagic, or infectious complications) should be provided.

3. All medical problems (e.g., cardiovascular, hematologic, endocrine), including infectious diseases, sexually transmitted diseases, high-risk behavior for human immunodeficiency virus infection, and possible occupational disease, should be questioned.
4. Abnormal bleeding tendencies, such as nosebleeds, prolonged bleeding from minor cuts, spontaneous ecchymosis, a tendency toward excessive bruising, and excessive menstrual bleeding, should be cited. These symptoms should be correlated with the medications that the patient is taking.
5. Information is needed for females regarding the onset of puberty, menopause, menstrual disorders, pregnancies, and miscarriages.
6. A list of all medications being taken. All of the possible effects of these medications should be carefully analyzed to determine their effect. Special inquiry should be made regarding the dosage and duration of therapy with **anticoagulants and corticosteroids**. Patients who are taking any of the family of drugs called **bisphosphonates** (e.g., Actonel, Fosamax, Boniva, Aredia, Zometa), which are often prescribed for osteoporosis, should be cautioned about possible problems **related to** osteonecrosis of the jaw after undergoing any form of oral surgery involving bone.
7. The patient's allergy history should be taken, including that related to hay fever, asthma, sensitivity to foods, sensitivity to drugs (e.g., aspirin, codeine, barbiturates, sulfonamides, antibiotics, procaine, laxatives), and sensitivity to dental materials (e.g., latex, eugenol, acrylic resins).
8. A family history should be taken, including that of bleeding disorders, cardiovascular disease, diabetes, or periodontal diseases.

9. Detailed information on current and history of alcohol, recreational drugs, and tobacco use, and desire to quit should be elicited.

2-Dental History

1. Visits to the dentist should be listed, including their frequency, the date of the most recent visit, the nature of the treatment, and oral prophylaxis or cleaning by a dentist or hygienist, including the frequency and date of most recent cleaning.

2. The patient's oral hygiene regimen should be described, including tooth brushing frequency, time of day, method, type of toothbrush and dentifrice, and interval at which brushes are replaced. Other methods for mouth care, such as mouthwashes, interdental brushes, other devices, water irrigation, and dental floss, should also be listed.

3. Any orthodontic treatment, including its duration and the approximate date of termination, should be noted.

4. If the patient is experiencing pain in the teeth or in the gingiva, the manner in which the pain is provoked, its nature and duration, and the manner in which it is relieved should be described.

5. Note the presence of any gingival bleeding, including when it first occurred; whether it occurs spontaneously, on brushing or eating, at night.

6. A bad taste in the mouth and areas of food impaction should be mentioned.

7. If the patient has any difficulty chewing, and whether there is any tooth mobility.

8. Note the patient's general dental habits, such as grinding or clenching of the teeth during the day or at night, tobacco smoking or chewing, nail biting.

9. Discuss the patient's history of previous periodontal problems, including the nature of the condition, and, if it was previously treated, the type of treatment received (surgical or nonsurgical).

10. Note whether the patient wears any removable prosthesis.

11. Does the patient have implants to replace any of the missing teeth

3-Social history

1) Details of habits such as tobacco use, including smokeless tobacco and alcohol consumption.

2) A social history may also give information about the patient's occupation that is both useful for interacting with the patient and may indicate specific dental issues.

4-Casts

Casts from dental impressions are useful adjuncts during the oral examination which show the :-

- The position of the gingival margins (recession).
- Indicate the position and inclination of the teeth.
- The proximal contact relationships.
- The food impaction areas.
- In addition, they provide a view of the lingual–cuspal relationships.
- Casts are important records of the dentition before it is altered by treatment.
- Finally, casts also serve as visual aids during discussions with the patient, and they are useful for pre-treatment and post-treatment

5- Intraoral Radiographic Survey

The radiographic survey should consist of a **minimum of 14 intraoral films and 4 posterior bite-wing films**. **Panoramic radiographs** are a simple and convenient method of obtaining a survey view of the dental arch and the surrounding structures. They are helpful for the detection of developmental anomalies, pathologic lesions of the teeth and jaws, and fractures as well as for the dental screening examinations of large groups. They provide an information about the distribution and severity of bone destruction with periodontal disease.

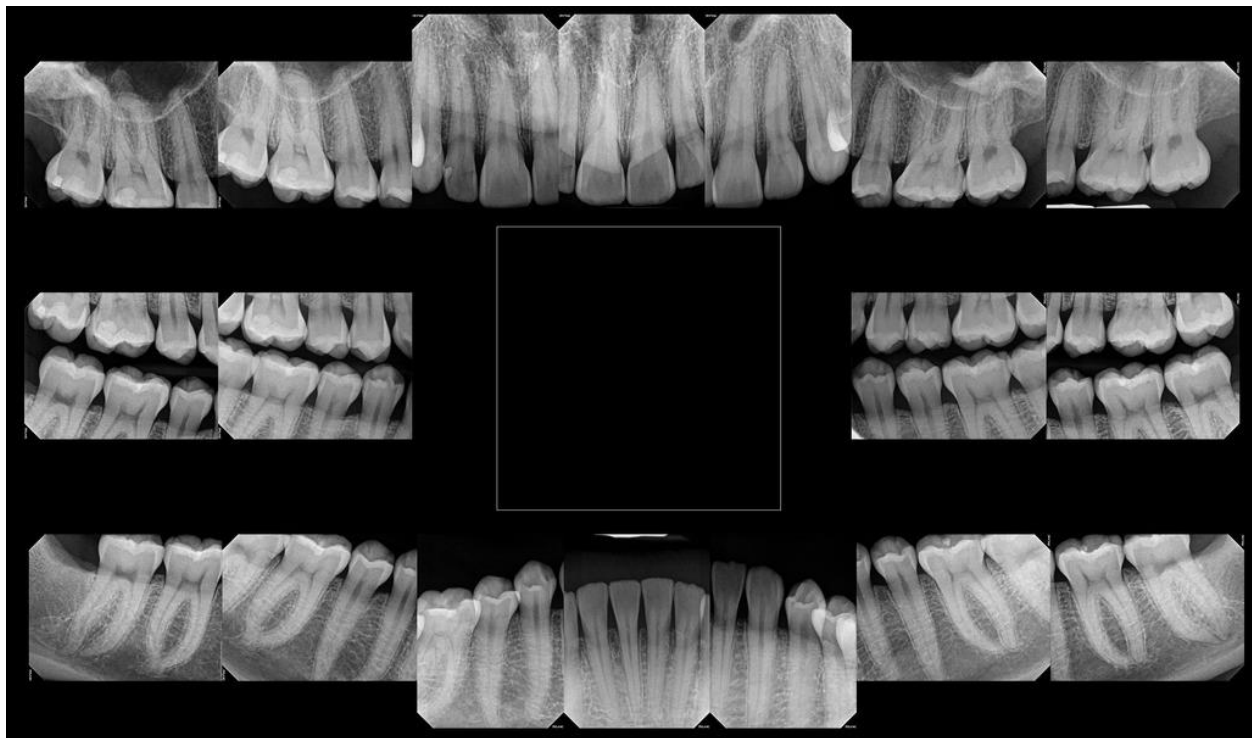


Fig. Intraoral radiographic survey

6-Clinical Photographs

Color photographs are useful for recording the appearance of the tissue before and after treatment.

Oral Examination

1) Oral Hygiene

The hygiene of the oral cavity is assessed in terms of **the extent of accumulated food debris, plaque, and tooth surface stains**. **Disclosing agent** may be used to detect plaque that would otherwise be unnoticed. The amount of plaque detected, however, **is not necessarily related** to the severity of the disease present. **For example**, aggressive periodontitis is a destructive type of periodontitis in which plaque is minimal. Qualitative assessments of plaque are more meaningful.

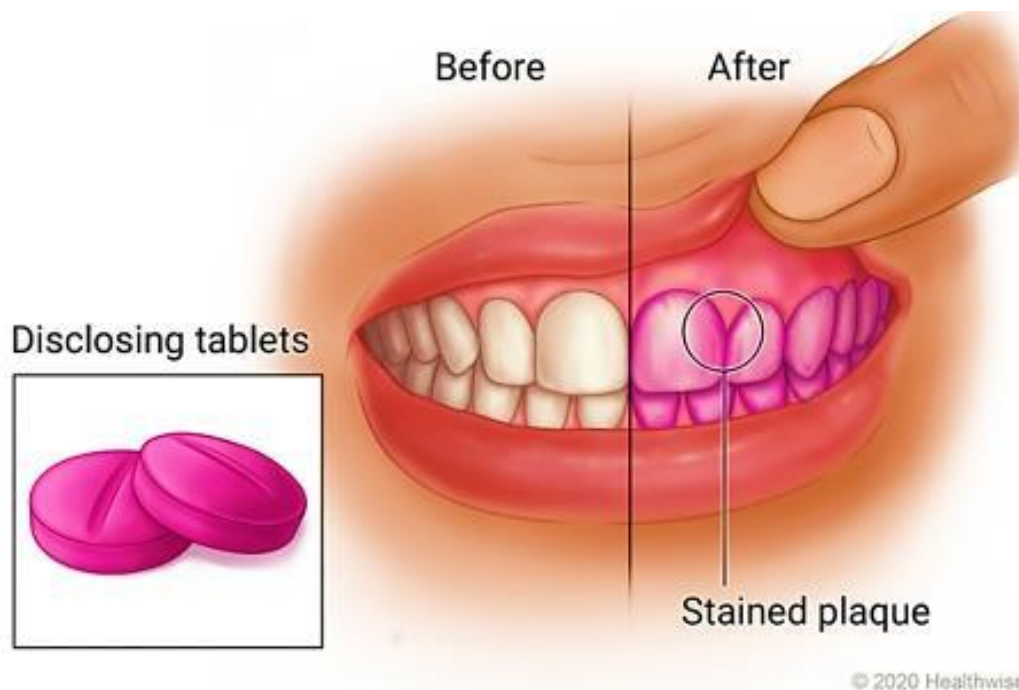


Fig. Disclosing tablets

2) Oral Malodor

Which is also termed **fetor ex ore, fetor oris, or halitosis**, is a foul or offensive odor that comes from the oral cavity. Halitosis may be a diagnostic significance, and their origin may be either oral or extraoral.

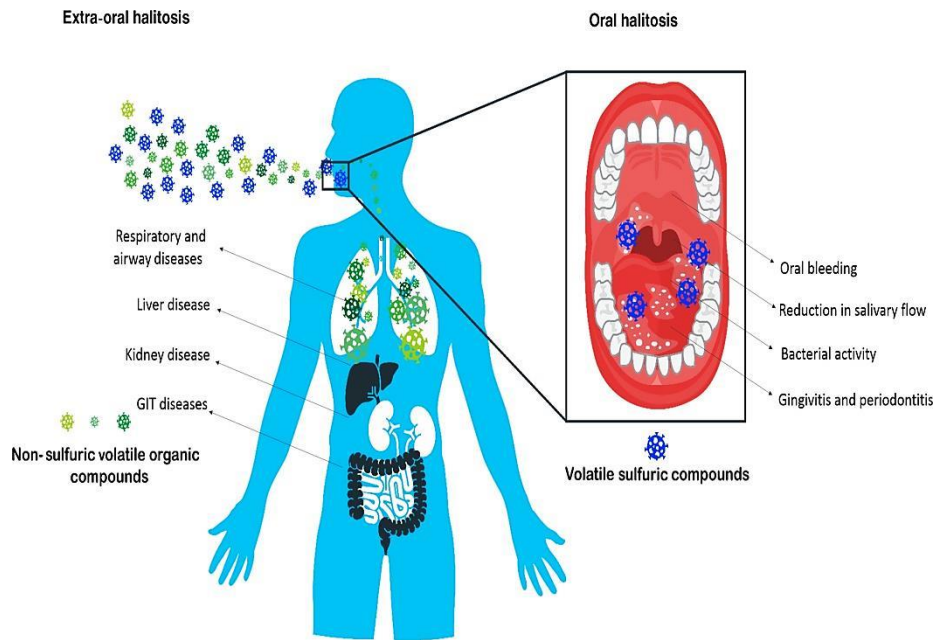


Fig. oral & extra-oral halitosis.

3) Examination of the Oral Cavity

- ❖ The entire oral cavity should be carefully examined.
- ❖ The examination should include the lips, the floor of the mouth, the tongue, the palate, and the oropharyngeal region as well as the quality and quantity of saliva.
- ❖ Although findings may not be related to the periodontal problem, the dentist should detect all pathologic changes that are present in the mouth.

4) Examination of the Lymph Nodes

- ☒ Because periodontal, periapical, and other oral diseases may result in lymph node changes, the diagnostician should routinely examine and evaluate the lymph nodes of the head and neck.
- ☒ Lymph nodes can become enlarged as a result of an infectious episode, malignant metastases, or residual fibrotic changes.

- ☒ Inflammatory nodes become enlarged, palpable, tender, and fairly immobile. The overlying skin may be red and warm. Patients are often aware of the presence of “swollen glands.”

Primary herpetic gingivostomatitis, necrotizing ulcerative gingivitis, and acute periodontal abscesses may produce lymph node enlargement.

- ☒ After successful therapy, lymph nodes return to normal in a matter of days to weeks.

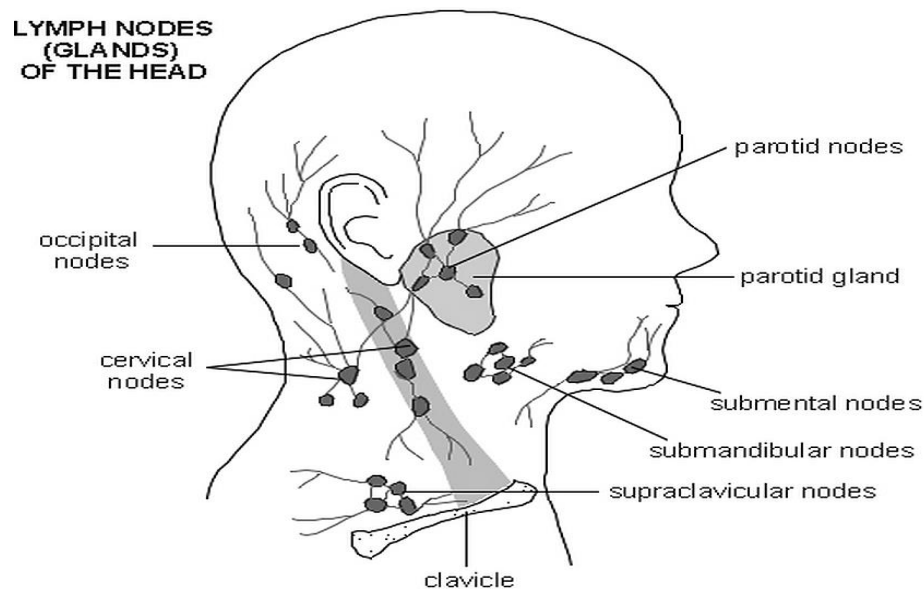


Fig. Head lymph nodes distribution.

5) Examination of the Teeth and Implants

- ❖ The teeth are examined for caries, poor restorations, developmental defects, anomalies of tooth form, wasting, hypersensitivity, and proximal contact relationships.
- ❖ The stability, position, and number of implants and their relationship to the adjacent natural dentition are also examined.

Peri-implantitis:- Can create pockets around implants. Probing is important in diagnosis. To prevent scratching the implant surface we should use plastic instrument.

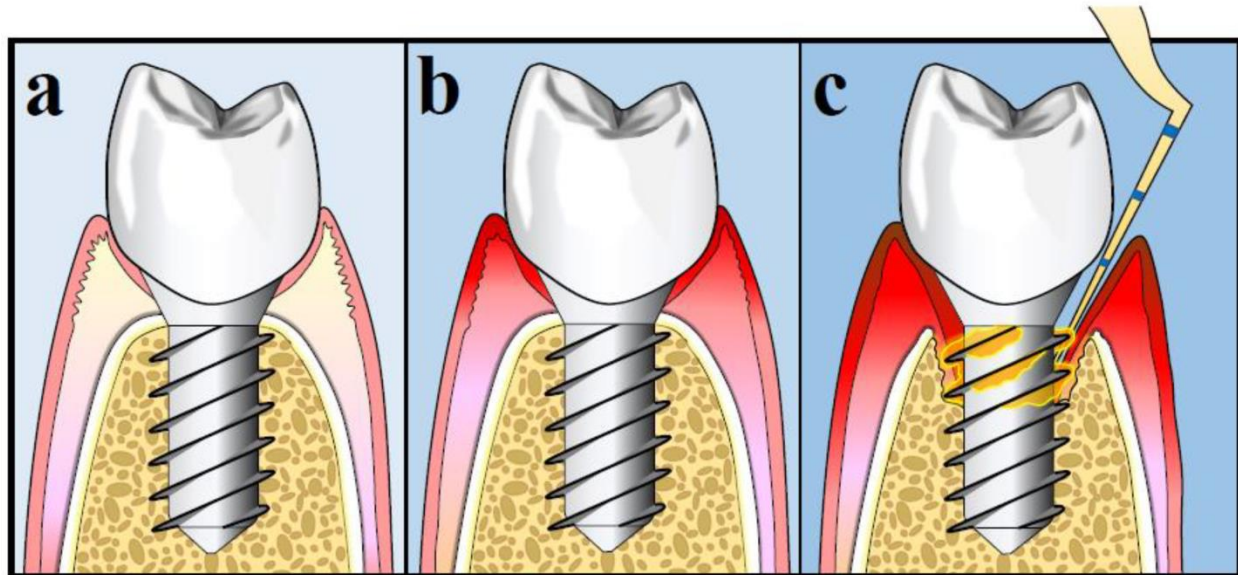


Fig. Peri-implant status, a. Healthy peri-implant tissue, b. Peri-implant mucositis, c. Peri-implantitis.

Wasting Disease of the Teeth

Wasting is defined as any gradual loss of tooth substance characterized by the formation of smooth, polished surfaces.

The forms of wasting are: **Erosion, Abrasion, Attrition & Abfraction.**

Erosion: also called corrosion, is a sharply defined wedge-shaped depression in the cervical area of the facial tooth surface. The surfaces are smooth, hard, and polished. Erosion generally affects a group of teeth. In the early stages, it may be confined to the enamel, but it generally extends to involve the underlying dentin, as well as the cementum. The etiology of erosion is **not known**. Decalcification by acidic beverages, or citrus fruits, combined with the effect of acid salivary secretion are **suggested causes**.

Abrasion: Refers to the loss of tooth substance induced by mechanical wear. Abrasion results in saucer-shaped or wedge shaped indentations with a smooth,

shiny surface. Abrasion starts on exposed cementum surfaces rather than on the enamel and extends to involve the dentin of the root. A sharp “ditching” around the cemento-enamel junction appears to be the result of the softer cemental surface, as compared with the much harder enamel surface. Tooth brushing with an abrasive dentifrice, Aggressive tooth brushing and hard tooth brush **are the most common causes**. Horizontal brushing at right angles to the vertical axis of the teeth results in the **severest** loss of tooth substance.

Attrition: Is occlusal wear resulting from functional contacts with opposing teeth. Such physical wear patterns may occur on incisal, occlusal, and approximal tooth surfaces. A certain amount of tooth wear is physiologic, but accelerated wear may occur when abnormal anatomic or unusual functional factors are present. Occlusal or incisal surfaces worn by attrition are called **facets**. When active tooth grinding occurs, the enamel rods are fractured and become highly reflective to light. Thus shiny, smooth, and curvilinear facets are usually the best indicator of ongoing frictional activity. If dentin is exposed, a yellowish brown discoloration is frequently present.

Facets are usually not sensitive to thermal or tactile stimulation. Attrition has been **correlated** with age when older adults are considered.

The angle of the facet on the tooth surface is potentially significant to the periodontium:-

**** Horizontal facets** tend to direct forces on the vertical axis of the tooth, to which the periodontium can adapt most effectively.

****Angular facets** direct occlusal forces laterally and increase the risk of periodontal damage.

Abfraction: Results from occlusal loading surfaces causing tooth flexure and mechanical microfractures and tooth substance loss in the cervical area.

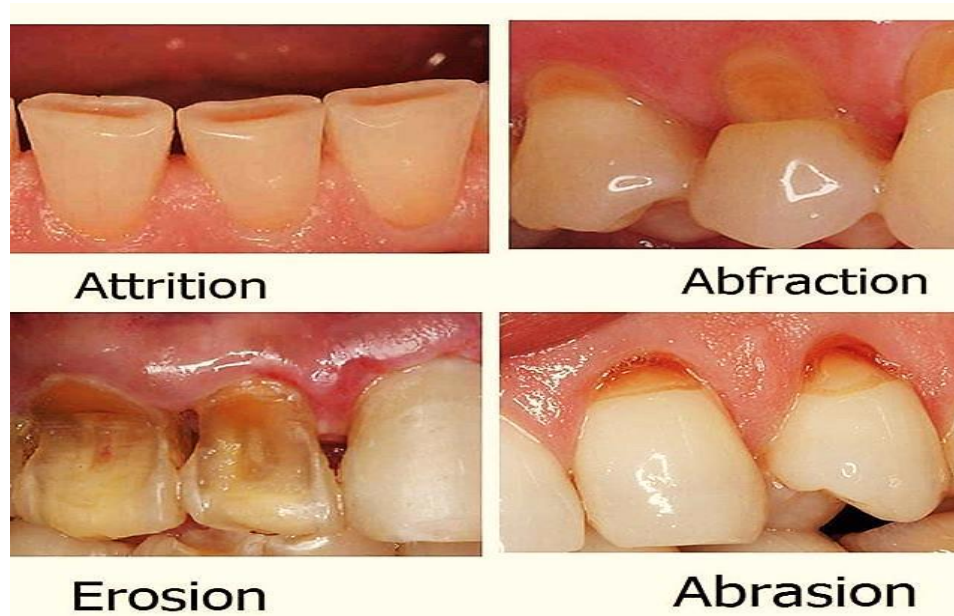


Fig. Wasting disease of the teeth

Dental Stains

Dental stains are pigmented deposits on the teeth. They should be carefully examined to determine their origin.

Hypersensitivity

Root surfaces exposed by gingival recession may be hypersensitive to thermal changes or tactile stimulation. Patients often direct the clinician to the sensitive areas. These may be located by gentle exploration with a probe or cold air.

Tooth Mobility

All teeth have a slight degree of **physiologic mobility**, which varies for different teeth and at different times of the day. It is **greatest** when arising in the morning, and it progressively decreases. The increased mobility in the morning is attributed

to slight extrusion of the tooth as a result of limited occlusal contact during sleep. During the waking hours, mobility is reduced by chewing and swallowing forces, which intrude the teeth in the sockets. These 24-hour variations are less marked in persons with a healthy periodontium than in those with occlusal habits such as bruxism and clenching.

***Single-rooted teeth have more mobility than multi-rooted teeth, with incisors having the most mobility.**

Mobility is scored according to the **Miller Index** as follows:

Grade I: is the mobility of the crown 0.2-1 mm in horizontal direction.

Grade II: mobility of the crown of the tooth exceeding 1mm in horizontal direction.

Grade III: mobility of the crown of the tooth in horizontal and vertical direction & the tooth becomes even depressed in its socket

Increased mobility is caused by one or more of the following factors:

1. Loss of tooth support (bone loss) can result in mobility

The amount of mobility depends on the severity and distribution of bone loss at individual root surfaces, the length and shape of the roots, and the root size as compared with that of the crown. A tooth with short, tapered roots is more likely to loosen than one with normal-size or bulbous roots with the same amount of bone loss.

2. Trauma from occlusion (i.e., injury produced by excessive occlusal forces or incurred as a result of abnormal occlusal habits such as bruxism and clenching)

3. Extension of inflammation from the gingiva or from the peri-apical into the periodontal ligament results in changes that increase mobility.
4. Periodontal surgery temporarily increases tooth mobility immediately after the intervention and for a short period.
5. Tooth mobility is increased during pregnancy, and it is sometimes associated with the menstrual cycle or the use of hormonal contraceptives.
6. Pathologic processes of the jaws that destroy the alveolar bone or the roots of the teeth can also result in mobility. Osteomyelitis and tumors of the jaws belong in this category.

Pathologic Migration of the Teeth.

Alterations in tooth position should be carefully noted, particularly with a view toward identifying abnormal forces, a **tongue-thrusting habit**, or other habits that may be contributing factors. **Premature tooth contacts in the posterior region** that deflect the mandible anteriorly contribute to the destruction of the periodontium of the maxillary anterior teeth and to pathologic migration. **The loss of posterior teeth** can lead to the facial “flaring” of the maxillary anterior dentition. This is due to the increased trauma that the mandibular anterior dentition places against the palatal surface of the maxillary anterior dentition. Pathologic migration of the **anterior teeth in young persons** may be a sign of localized aggressive (juvenile) periodontitis.

Sensitivity to Percussion.

Sensitivity to percussion is a feature of acute inflammation of the periodontal ligament. Gentle percussion of a tooth at different angles to the long axis often helps with the localization of the site of inflammatory involvement.

Examination of the Periodontium

The periodontal examination should be systematic, starting in the molar region in either the maxilla or the mandible and proceeding around the arch. It is important to detect the earliest signs of gingival and periodontal disease.

Plaque and Calculus

There are many methods available for assessing plaque and calculus accumulation. The presence of supragingival plaque and calculus can be directly observed, and the amount can be measured with a calibrated probe. For the detection of subgingival calculus, each tooth surface is carefully checked to the level of the gingival attachment with a **no. 17 explorer**. Warm air may be used to deflect the gingiva and to aid in the visualization of the calculus. Although radiographs may sometimes reveal heavy calculus deposits interproximally and even on the facial and lingual surfaces.

Plaque Index:

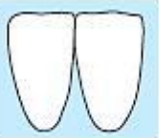

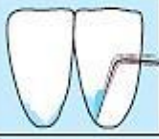
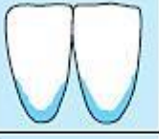
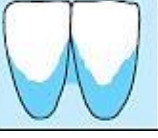
which was introduced by **Silness and Loe** in 1964

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.

Grade 0	No Plaque		
1	Thin plaque layer at the gingival margin, only detectable by scraping with a probe		
2	Moderate layer of plaque along the gingival margin; interdental spaces free, but plaque is visible to the naked eye		
3	Abundant plaque along the gingival margin; interdental spaces filled with plaque		

Abbreviation Grade
PI 0-3

Calculus Index (CI)

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

CI 0 — No observable calculus.

CI 1 — Supragingival calculus covering not more than 1/3 of the exposed tooth surface.

CI 2 — Supragingival calculus covering more than 1/3 but not more than 2/3 of the exposed tooth surface or presence of flecks of subgingival calculus.

CI 3 — Supragingival calculus covering more than two-thirds of the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of the tooth.

Gingiva

The gingiva must be dried before accurate observations can be made. Light reflection from moist gingiva obscures detail. In addition to visual examination and

exploration with instruments, firm but gentle palpation should be used to detect pathologic alterations in normal resilience as well as to locate areas of exudate. Features of the gingiva to consider include color, size, contour, consistency, position, ease of bleeding, and pain.

Clinically, gingival inflammation can produce two basic types of tissue response: **edematous and fibrotic.**

Edematous tissue response is characterized by a smooth, glossy, soft, red gingiva. With the **fibrotic tissue response**, some of the characteristics of normality persist; the gingiva is more firm, stippled, and opaque; it is usually thicker, and the margin appears rounded.

Gingival Index (GI) (Loe, 1967)

Measures the degree of gingival inflammation. Tissues surrounding each tooth divided into 4 gingival scoring units: distal facial papilla, facial gingival margin, mesial facial papilla, lingual gingival margin.

Score of gingival index

Score 0 Normal gingiva

Score 1 Mild inflammation — slight change in color, 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 prevalence and severity of gingivitis in populations, groups and individuals.

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. Gingival **bleeding on probing** also helps us to determine whether the lesions are in an **active or inactive state.**

Bleeding on probing (BOP)

A periodontal probe is inserted to the bottom of the gingival/periodontal pocket by applying light force and is moved gently along the tooth (root) surface. If bleeding is provoked upon retrieval of the probe, the site examined is considered **positive BOP** and, hence, is inflamed.