EXAMINATION OF PATIENT WITH PERIODONTAL DISEASEDone

Lecture 1+2

First visit

1)Medical History

*Most of the medical history is obtained the first visit.

*It can be supplemented by pertinent questioning at subsequent visits.

* The health history can be obtained verbally by questioning the patient and recording his or her responses on a blank piece of paper or by means of a printed questionnaire that the patient completes

*** THE MEDICAL 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 untoward events (e.g.,anesthetic, hemorrhagic, or infectious complications) should be provided.

3. A list of all medications being taken.

4. All medical problems (e.g., cardiovascular, hematologic, endocrine), including infectious diseases, sexually transmitted diseasess should be listed.

5. 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.

6. The patient's allergy history should be taken, including asthma, sensitivity to foods, sensitivity to
drugs (e.g., aspirin, codeine, barbiturates, sulfonamides, antibiotics, procaine, laxatives), and sensitivity to dental materials (e.g., eugenol, acrylic resins).

7. Information is needed regarding the onset of puberty and for females, menopause, menstrual disorders,pregnancies, and miscarriages.

8. A family medical history should be taken, including that of bleeding disorders and diabetes.

WHAT IS THE RELEVANCE OF A PATIENT'S MEDICAL HISTORY TO HIS OR HER PERIODONTAL CARE?

- Medical problems can increase susceptibility to periodontal diseases (e.g., diabetes and HIV).

- Medical problems can have periodontal and other oral manifestations (e.g., leukaemia and mucocutaneous disorders).
- Prescribed and nonprescribed medications can have oral and periodontal side effects (e.g., calcium channel blocker or phenytoin).
- Precautions to be taken to avoid complications during or after treatment (e.g., antibiotic prophylaxis and patients on certain medications such as anticoagulants).
- Treating certain conditions may present additional risk to the dental team (e.g., communicable diseases) and may alter the way treatment is provided (e.g., not using ultrasonic instrumentation to avoid producing aerosol)

- 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 toothbrushing 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, or with regular periodicity; whether it is associated with the menstrual period or other specific factors; and the duration of the bleeding and the manner in which it is stopped.

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, or biting on foreign objects?

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) and the approximate

period of termination of the previous treatment. If, in the opinion of the patient, the present problem
is a recurrence of previous disease, what does he or she think caused it?
10. Note whether the patient wears any removable prosthesis.
11. Does the patient have implants to replace any of the missing teeth?

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3)social history

1) details of habits such as tobacco use, including smokeless tobacco.
, and alcohol consumption.
NOTE A smoking history should include not only whether patients are current smokers but also if they have smoked in the past, when they quit smoking, how many they smoked or are smoking now, and whether are they interested in quitting.
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
*(e.g., wind instrument player and importance of aesthetics in a job).
*It can also provide information about the patient's ability to attend appointments regularly and
*identify issues such as stress in a patient's life.

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4) Casts

Casts from dental impressions are useful adjuncts during the oral examination.

- They indicate the position of the gingival margins (recession).
- 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 pretreatment and posttreatment
- comparisons as well as for reference at recall visits.
- They are also helpful to determine the position of implant placement if the case will require it.

- 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 informative overall radiographic picture of the distribution and severity of bone destruction with periodontal disease.

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6)Clinical Photographs

Color photographs are useful for recording the appearance of the tissue before and after treatment. Photographs cannot always be relied on for the comparison of subtle color changes in the gingiva, but they do depict gingival morphologic changes. With the advent of digital clinical photography, record keeping for mucogingival problems (e.g., areas of gingival recession, frenum involvement, papilla loss) has become important.

Oral Examination

1) Oral Hygiene. The cleanliness of the oral cavity is appraised in terms of the extent of accumulated food debris, plaque, and tooth surface stains.
*Disclosing solution 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.
2) Oral Malodor which is also termed fetor oris, or halitosis, is a foul or offensive odor that emanates from the oral cavity. Mouth odors may be of diagnostic significance, and their origin may be either oral or extraoral (remote).
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.

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.

Wasting Disease of the Teeth.

Wasting is defined as any gradual loss of tooth substance, which is characterized by the formation of smooth, polished surfaces without regard to the possible mechanism of this loss.

Erosion, is a sharply defined wedge-shaped depression in the cervical area of the facial tooth surface.

*The etiology of erosion is not known. Decalcification by acidic beverages or citrus fruits in combination with the effect of acid salivary secretion are suggested causes.

Abrasion refers to the loss of tooth substance that is induced by mechanical wear other than that of mastication. Abrasion results in saucer-shaped or wedge-shaped indentations with a smooth, shiny surface. Abrasion starts on the exposed cementum surfaces rather than on the enamel, and it extends to involve the dentin of the root. A sharp "ditching" around the cementoenamel junction appears to be the result of the softer cemental surface as compared with the

much harder enamel surface.An abrasion attributed to aggressive toothbrushing (arrow). The involvement of the roots is followed by the undermining of the enamel.
*Toothbrushing and the action of clasps are frequently mentioned, but aggressive toothbrushing is the most common cause.
*Occasionally, abrasion of the incisal edges occurs as a result of habits such as holding objects (e.g., bobby pins, tacks) between the teeth.

Attrition

- is occlusal wear that results from functional contacts with opposing teeth.
- Such physical wear patterns may occur on incisal, occlusal, and approximal tooth surfaces.
- 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 curviplanar facets are usually the best indicator of ongoing frictional activity. If dentin is exposed, a yellowish brown discoloration is frequently present.

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.

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. *One should carefully evaluate post-orthodontic cases
for possible apical shortening of the root, which may lead to excessive mobility.
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) is a common cause of tooth mobility.
Mobility produced by trauma from occlusion occurs initially as a result of resorption of the cortical layer of bone, which leads to reduced fiber support, and later as an adaptation phenomenon that results in a widened periodontal space.
3. Extension of inflammation from the gingiva or from the periapex into the periodontal ligament results in changes that increase mobility. The spread of inflammation from an acute periapical abscess may increase tooth mobility in the absence of periodontal disease.
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. This is unrelated to periodontal disease, and it occurs presumably because of physicochemical changes in the periodontal tissues.
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.

Trauma from Occlusion. Trauma from occlusion refers to tissue injury produced by occlusal forces.
The criterion that determines that an occlusion is traumatic is whether it causes damage in the periodontal tissues; therefore, the diagnosis of trauma from occlusion is made from the condition of the periodontal tissues.
*Periodontal findings that suggest the presence of trauma from occlusion include excessive tooth mobility, particularly in teeth that show radiographic evidence of a widened periodontal space; vertical or angular bone destruction; infrabony pockets; and pathologic migration, especially of the anterior teeth.

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, they cannot be relied on for the thorough detection of calculus

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 normalcy persist; the gingiva is more firm, stippled, and opaque; it is usually thicker, and the margin appears rounded.

Periodontal Pockets.

Examination for periodontal pockets must include their presence and distribution on each tooth surface, the pocket depth, the level of attachment on the root, and the type of pocket (i.e., suprabony or infrabony).
Signs and Symptoms. Although probing is the only reliable method of detecting pockets,
clinical signs such as 1)color changes (i.e., a bluish-red marginal gingiva or a bluish-red vertical zone that extends from the gingival margin to the attached gingiva); a
2)"rolled" edge separating the gingival margin from the tooth surface;
or 3)an enlarged, edematous gingiva may suggest their presence. The presence of 4)bleeding, suppuration, may also denote the presence of a pocket
Periodontal pockets are generally painless, but they may give rise to symptoms such as
1) localized or sometimes radiating pain or
2) the sensation of pressure after eating that gradually diminishes.
3) foul taste in localized areas,
4) sensitivity to hot and cold,
5) and toothache in the absence of caries is also sometimes present.

Detection of Pockets.

*The only accurate method of detecting and measuring periodontal pockets is 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, and consequently they show no difference before and after pocket elimination unless bone has been modified.
Gutta-percha points or calibrated silver points can be used with the radiograph to assist with determining the level of attachment of the periodontal pockets. They may be used effectively for individual pockets or in clinical research, but theirroutine use throughout the mouth would be difficult to manage. Clinical examination and probing are more direct and efficient.

Pocket Probing. There are two different pocket depths: (1) the biologic or histologic depth; and (2) the clinical or probing depth
The biologic depth is the distance between the gingival margin and the base of the pocket (i.e., the coronal end of the junctional epithelium). This can be measured only in carefully prepared and adequately oriented histologic sections. The probing depth is the distance to which a probe penetrates into the pocket.
Probe penetration can vary, depending on the 1)force of introduction, 2)the shape and size of the probe tip,3) the direction of penetration, 4)the resistance of the tissues, 5)the convexity of the crown, and 6)the degree of tissue inflammation.
Several studies have been made to determine the depth of penetration of a probe in a sulcus or pocket
The probing forces have been explored by several investigators forces of 0.75 N have been found to be well tolerated and accurate.

Probing Technique. 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 in addition, special attention should be directed to detecting the presence of interdental craters and furcation involvements.
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.
In multi-rooted teeth, the possibility of furcation involvement should be carefully explored. The use of specially designed probes (e.g., Nabers probes) allows for an easier and more accurate exploration of the horizontal component of furcation lesions

Level of Attachment Versus Pocket Depth.

Pocket depth is the distance between the base of the pocket and the gingival
margin. It 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. Therefore, it may be unrelated to the existing attachment of the tooth.

the level of attachment 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 a gain or loss of attachment, and they can afford a better indication of the degree of periodontal destruction or gain.

Determining the Level of Attachment.

#When the gingival margin is located on the anatomic crown, the level of attachment is determined by subtracting from the depth of the pocket the distance from the gingival margin to the CEJ. If both are the same,
the loss of attachment is zero.

#When the gingival margin coincides with the CEJ, the loss of attachment equals the pocket depth.

#When the gingival margin is located apical to the CEJ, the loss of attachment is greater than the pocket depth. Therefore, the distance between the CEJ and the gingival margin should be added to the pocket depth. Drawing the gingival margin on the chart where pocket depths are entered helps to clarify this important point.

Bleeding on Probing. The insertion of a probe to the bottom of the pocket elicits bleeding 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.

*Depending on the severity of inflammation, bleeding can vary from a tenuous red line along the gingival sulcus to profuse bleeding.

*If periodontal treatment is successful, bleeding on probing will cease.

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 to60 seconds after probing.

Amount of Attached Gingiva. It is important to establish
the relationship between the bottom of the pocket and the mucogingival line. The width of the attached gingiva is the distance

between the mucogingival junction and the projection on the external surface of the bottom of the gingival sulcus or the periodontal pocket.
The width of the attached gingiva is determined by subtracting the sulcus or pocket depth from the total width of the gingiva (i.e., the gingival margin to the mucogingival line). This is done by stretching the lip or cheek to demarcate the mucogingival line while the pocket is being probed.The amount of attached gingiva is generally considered to be insufficient when the stretching of the lip or cheek induces the movement of the free gingival margin.

Degree of Gingival Recession. During periodontal examination, it is necessary to record the data regarding the amount of gingival recession. This measurement is taken with a periodontal probe from the CEJ to the gingival crest, and it is drawn on the patient's chart.

Alveolar Bone Loss. Alveolar bone levels are evaluated via both clinical and radiographic examination. Probing is helpful for determining the following: (1) the height and contour of the facial and lingual bones, which are obscured on the radiograph by the roots; and (2) the architecture of the interdental bone.
Transgingival probing, which is performed after the area is anesthetized, is a more accurate method of evaluation, and it provides additional information about bone architecture.
A panoramic radiograph demonstrating generalized horizontal bone loss supplemented with a periapical of the UL1 showing vertical bone loss almost to the apex.

Is there a difference between horizontal and vertical bone loss?

- If the level of the bone is essentially equal interdentally, it is called horizontal bone loss and measured as the percentage of bone lost (e.g., 20% of the original bone height is lost).
- Vertical/angular bone loss occurs when one tooth has lost more bone than the tooth next to it and is

suggested when the bone crest is more apical to the CEJ adjacent to one tooth than to the other

- Bone loss around an individual tooth can also be a combination of a horizontal component and a vertical component and is still expressed as the total amount of bone lost from the CEJ.

Suppuration. The presence of an abundant number of neutrophils in the gingival fluid transforms it into a purulent exudate.
Several studies have evaluated the association between suppuration and the progression of periodontitis, and they have reported that this sign is present in a very low percentage of diseased sites (i.e., 3% to 5%).4 Therefore, it is not by itself a good indicator. Clinically, the presence of exudate in a periodontal pocket is determined by placing the ball of the index finger along the lateral aspect of the marginal gingiva and applying pressure in a rolling motion toward the crown
Visual examination
without digital pressure is not enough. The purulent exudate is formed in the inner pocket wall, and therefore the external appearance may give no indication of its presence. Exudate formation does not occur in all periodontal pockets, but digital pressure often reveals it in pockets where its presence is not suspected.

Periodontal Abscess. A periodontal abscess is a localized accumulation of exudate within the gingival wall of a periodontal pocket.
Periodontal abscesses may be acute or chronic.
The acute periodontal abscess appears as an ovoid elevation of the gingiva along the lateral aspect of the root .
The gingiva is edematous and red, with a smooth, shiny surface. The shape and consistency of the elevated area vary; the area may be domelike and relatively firm, or it may be pointed and soft. In most cases, exudate may be expressed from the gingival margin with gentle digital pressure.

The acute periodontal abscess is accompanied by symptoms such as
*throbbing, radiating pain, and tenderness of the gingiva to palpation.
* Other symptoms may include sensitivity of the tooth to palpation; tooth mobility and lymphadenitis; and,
*less frequently,systemic effects such as fever, leukocytosis, and malaise.
*Occasionallythe patient may have symptoms of an acute periodontal abscess without any notable clinical lesion or radiographic changes.

The chronic periodontal abscess usually presents a sinus that opens onto the gingival mucosa along the length of the root. There may be a history of intermittent exudation. The orifice of the sinus may appear as a difficult-to-detect pinpoint opening, which, when probed, reveals a sinus tract that leads deep into the periodontium.

*The chronic periodontal abscess is usually asymptomatic. However, the patient may report episodes of dull,gnawing pain; a slight elevation of the tooth; and a desire to bite down and grind the tooth.
The chronic periodontal abscess often undergoes acute exacerbations, with all of the associated symptoms.

Periodontal Abscess and Gingival Abscess. The principal differences between the periodontal abscess and the gingival abscess are location and history .
The gingival abscess is confined to the marginal gingiva, and it often occurs in previously disease-free areas. It is usually an acute inflammatory response to the forcing of foreign material into the gingiva.
The periodontal abscess involves the supporting periodontal structures, and it generally occurs during the course of chronic destructive periodontitis.

Periodontal Abscess and Periapical Abscess.

If the tooth is nonvital, the lesion is most likely periapical. However, a previously nonvital tooth can have a deep periodontal pocket that can abscess.
Moreover, a deep periodontal pocket can extend to the apex and cause pulpal involvement and necrosis.
An apical abscess may spread along the lateral aspect of the root to the gingival margin.
Radiographic findings are helpful for differentiating between a periodontal lesion and a periapical lesion.
Early acute periodontal and periapical abscesses present no radiographic changes. Ordinarily, a radiolucent area along the lateral surface of the root suggests the presence of a periodontal abscess, whereas apical rarefaction suggests a periapical abscess.

Clinical findings such as the presence of extensive caries, pocket formation, lack of tooth vitality, and the existence of continuity between the gingival margin and the abscess area often the term **"risk factor"** is used to describe something that is causally related to increased risk of disease,
whereas the term **"risk marker"** is a factor that, although associated with increased risk of disease, is not necessarily causally related. For example, age is a well-recognized marker of disease in that there is an increased prevalence of periodontitis in older people.
However, this is not necessarily because getting older increases one's susceptibility to disease but, rather, because periodontal attachment loss

is cumulative, so more people in older age groups are likely to have the disease.

The term risk determinant /background characteristic, which is sometimes substituted for the term risk factor, should be reserved for those risk factors that cannot be modified.

Risk indicators are risk factors that have been identified in cross-sectional studies but not confirmed through longitudinal studies.

Smoking

* smoking is one of the most important risk factors for periodontitis.

- In patients who regularly smoke more than 10 cigarettes daily, it has been estimated that the relative risk of periodontitis may be as high as fivefold.
- The effect of smoking is both time and dose dependent.
- It appears that the effects of smoking are largely due to

1) a systemic effect resulting in an impaired inflammatory respond reduced neutrophil numbers and function at the inflammatory site.

2) some studies have suggested an increased number of pathogenic bacteria present in plaque of smokers.

3) The clinical appearance of periodontal disease in smokers is usually characterized by reduced gingival bleeding, and often the gingivae have a relatively pink and uninflamed appearance because of the suppressive effects of smoking on the inflammatory response. However, the amount of periodontal breakdown seen is markedly increased.

*smoking markedly impairs periodontal treatment outcomes.

Diabetes

Diabetes is a clear risk factor for periodontitis. Epidemiologic data demonstrate that the prevalence and severity of periodontitis are significantly higher in patients with type 1 or type 2 diabetes mellitus than in those without diabetes, and that the level of diabetic control is an important variable in this relationship Oral Manifestations. Numerous oral changes have been described in patients with diabetes, including cheilosis, mucosal drying and cracking, burning mouth and tongue, diminished salivary flow, and alterations in the flora of the oral cavity, with greater predominance of Candida albicans, hemolytic streptococci, and staphylococci.

An increased rate of dental caries has also been observed in patients with poorly controlled diabetes.

It is important to note that these changes are not always present the specific effects of diabetes on the periodontium,a variety of changes have

been described, including a tendency toward an enlarged gingiva, sessile or pedunculated gingival polyps, polypoid gingival proliferations, abscess formation, periodontitis, and loosened teeth.
Perhaps the most striking changes in patients with uncontrolled diabetes are the reductions in the defense mechanisms and the increased susceptibility to infections, which lead to destructive periodontal disease.
C, Adult patient
with uncontrolled diabetes. Note the enlarged, smooth, erythematous gingival margins and papilla in the anterior area. D, The same patient as shown in C. This is a lingual view of the right mandibular area. Note the inflamed and swollen tissues in the anterior and premolar areas.Risk Determinants/Background

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Risk Determinants/Background characteristics for Periodontal Disease

Genetic Factors

Evidence indicates that genetic differences between individuals may explain why some patients develop periodontal disease and others do not. Studies conducted in twins have shown that genetic factors influence clinical measures of gingivitis, probing pocket depth, attachment loss, and interproximal bone height.
The familial aggregation seen in localized and generalized aggressive periodontitis also is indicative of genetic involvement in these diseases

Age

Both the prevalence and severity of periodontal disease increase with age. It is possible that degenerative changes related to aging may increase susceptibility to periodontitis. However, it also is possible that the attachment loss and bone loss seen in older individuals are the result of **prolonged exposure to other risk factors over a person's life, creating a cumulative effect over time.** In support of this, studies have shown minimal loss of attachment in aging subjects enrolled in preventive programs throughout their lives.
However, it remains to be determined whether changes related to the aging process, such as intake of medications, decreased immune function, and altered nutritional status, interact with other well-defined risk factors to increase susceptibility to periodontitis.

Gender

Gender plays a role in periodontal disease.Surveys conducted in the United States since 1960 demonstrate that men have more loss of attachment than women.

In addition, men have poorer oral hygiene than women, as evidenced by higher levels of plaque and calculus.

Therefore gender differences in prevalence and severity of periodontitis appear to be related to preventive practices rather than any genetic factor.

Socioeconomic Status

Gingivitis and poor oral hygiene can be related to lower socioeconomic status (SES).This can most likely be attributed to decreased dental awareness and decreased frequency of dental visits compared with more educated individuals with higher SES.

After adjusting for other risk factors, such as smoking and poor oral hygiene, lower SES alone does not result in increased risk for periodontitis

Stress

The incidence of necrotizing ulcerative gingivitis increases during periods of emotional and physiologic stress, suggesting a link between the two. Emotional stress may interfere with normal immune function and may result in increased levels of circulating hormones, which can affect the periodontium.

Adult patients with periodontitis who are resistant to therapy are more stressed than those who respond to therapy.

Risk Indicators for Periodontal Disease

Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome

*It has been hypothesized that the immune dysfunction associated with human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) increases susceptibility to periodontal disease Early reports on the periodontal status of patients with AIDS or individuals who are HIV seropositive revealed that these patients often had severe periodontal destruction characteristic of necrotizing ulcerative periodontitis.

*Evidence suggests that AIDS-affected individuals who practice good preventive oral health measures, including effective home care and seeking appropriate professional therapy, can maintain periodontal health.

Therefore, although it seems reasonable to hypothesize that HIV infection and immunosuppression are risk factors for periodontal disease, the evidence is not conclusive.

Osteoporosis

Osteoporosis has been suggested as another risk factor for periodontitis. In a study of 12 women with osteoporosis and 14 healthy women, von Wowern et al reported that the women with osteoporosis had greater loss of attachment than the control subjects. In contrast, Kribbs examined pocket depth, bleeding on probing, and gingival recession in women with and without osteoporosis.

Although the two groups had significant differences in bone mass, no differences in periodontal status were noted.

*However, it appears that a link may exist between osteoporosis and periodontitis, and additional studies may need to be conducted to determine whether osteoporosis is a true risk factor for periodontal disease.

Bleeding on Probing

Bleeding on probing is the best clinical indicator of gingival inflammation. Although this indicator alone does not serve as a predictor for loss of attachment, bleeding on probing coupled with increasing pocket depth may serve as an excellent predictor for future loss of attachment.

Lack of bleeding on probing does appear to serve as an excellent indicator of periodontal health.