Introduction to Dentistry
Periodontics

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Lecture objectives

At the end of this lecture, the students will be able to:

- Define the branch of periodontics.
- Recognize the structures of periodontium.
- Classify the periodontal diseases.
- Identify the pathogenesis and risk factor for periodontal diseases.
- Recognize the recent trends in periodontal treatment.

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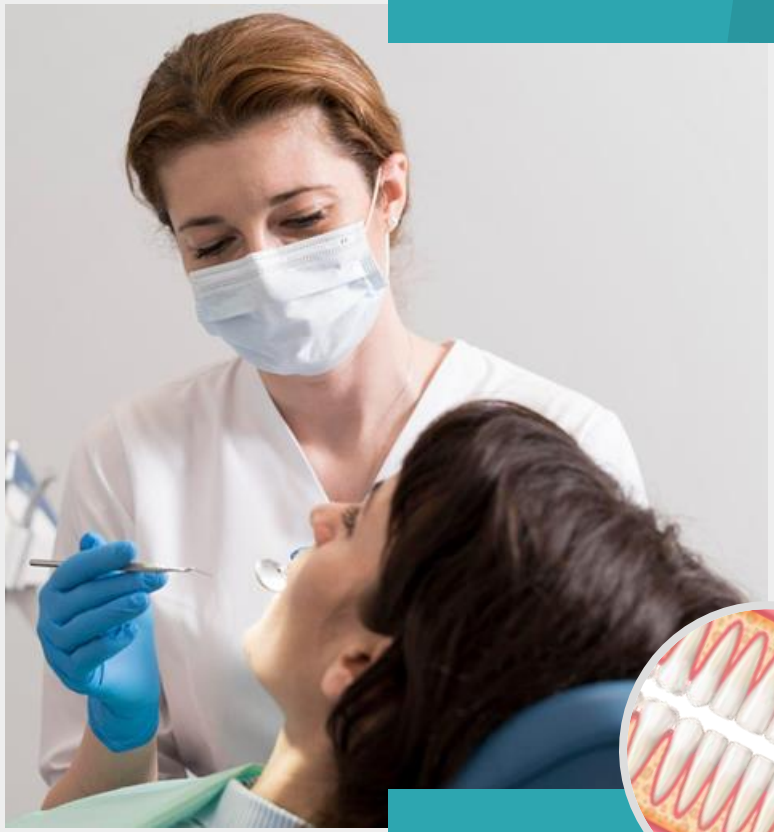
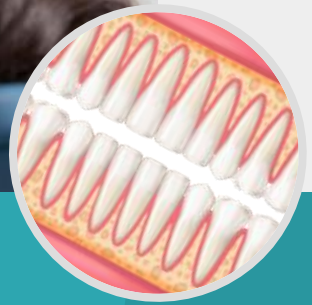
01 Definition

Periodontics





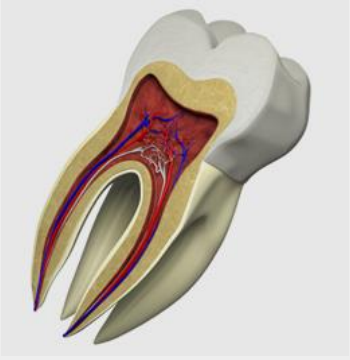
The branch of dentistry dealing with the diagnosis and management of diseases and disorders of supporting apparatus of teeth (Periodontium).

What is periodontium

They are the tissues surrounding, investing and supporting teeth

Gingiva

Soft tissue



Cementum

Hard tissue

Periodontal ligament (PDL)

Soft tissue

Alveolar bone

Hard tissue

Periodontology

The science of studying periodontium and the diseases affecting it

Periodontitis

Inflammation of the tissues supporting teeth

02

Importance of periodontics

Periodontics plays a crucial role in maintaining dental health

Prevention and Treatment of gingival Disease

Periodontists specialize in preventing, diagnosing, and treating gingival diseases like gingivitis and periodontitis. These conditions, if left untreated, can lead to tooth loss and other serious problems.

Maintaining the Health of Supporting Structures

Periodontics focuses on the health of the structures that support your teeth. Keeping these structures healthy is essential for maintaining overall dental health.

Periodontics plays a crucial role in maintaining dental health

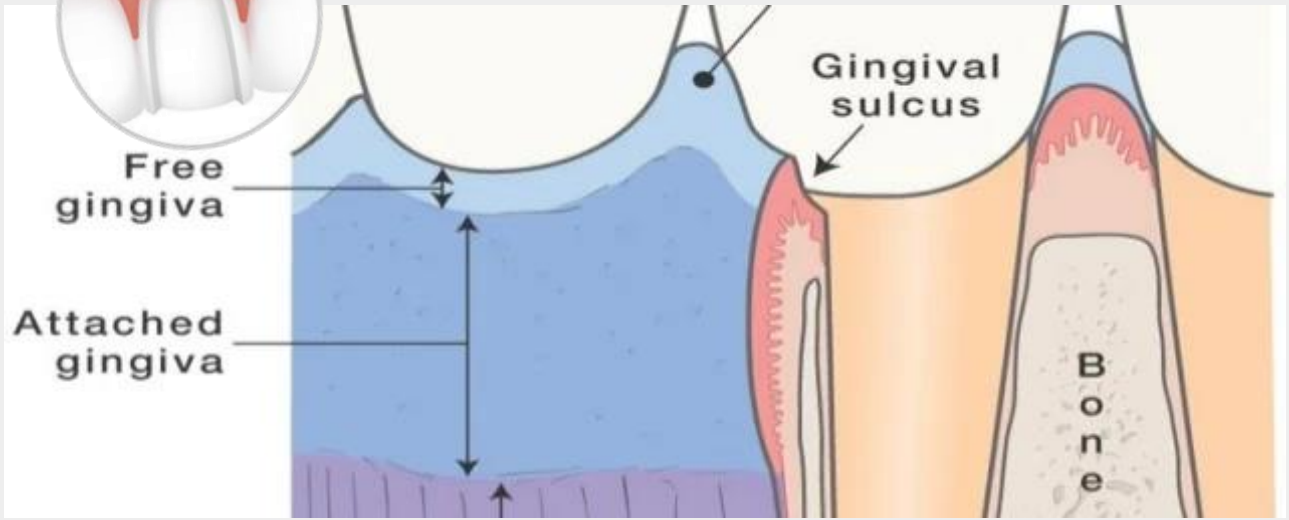
Cosmetic Periodontal Procedures

Periodontists can perform cosmetic procedures to help you achieve the smile you desire.

Periodontics plays a crucial role in maintaining dental health

Maintenance of general health

Research has indicated that periodontal disease is associated with other chronic inflammatory diseases, such as diabetes and cardiovascular disease. Therefore, managing oral inflammation through periodontal care can also help manage these conditions.



03

Anatomy and physiology of periodontium

Periodontium

Gingiva

Soft tissue

Cementum

Hard tissue

Periodontal ligament (PDL)

Soft tissue

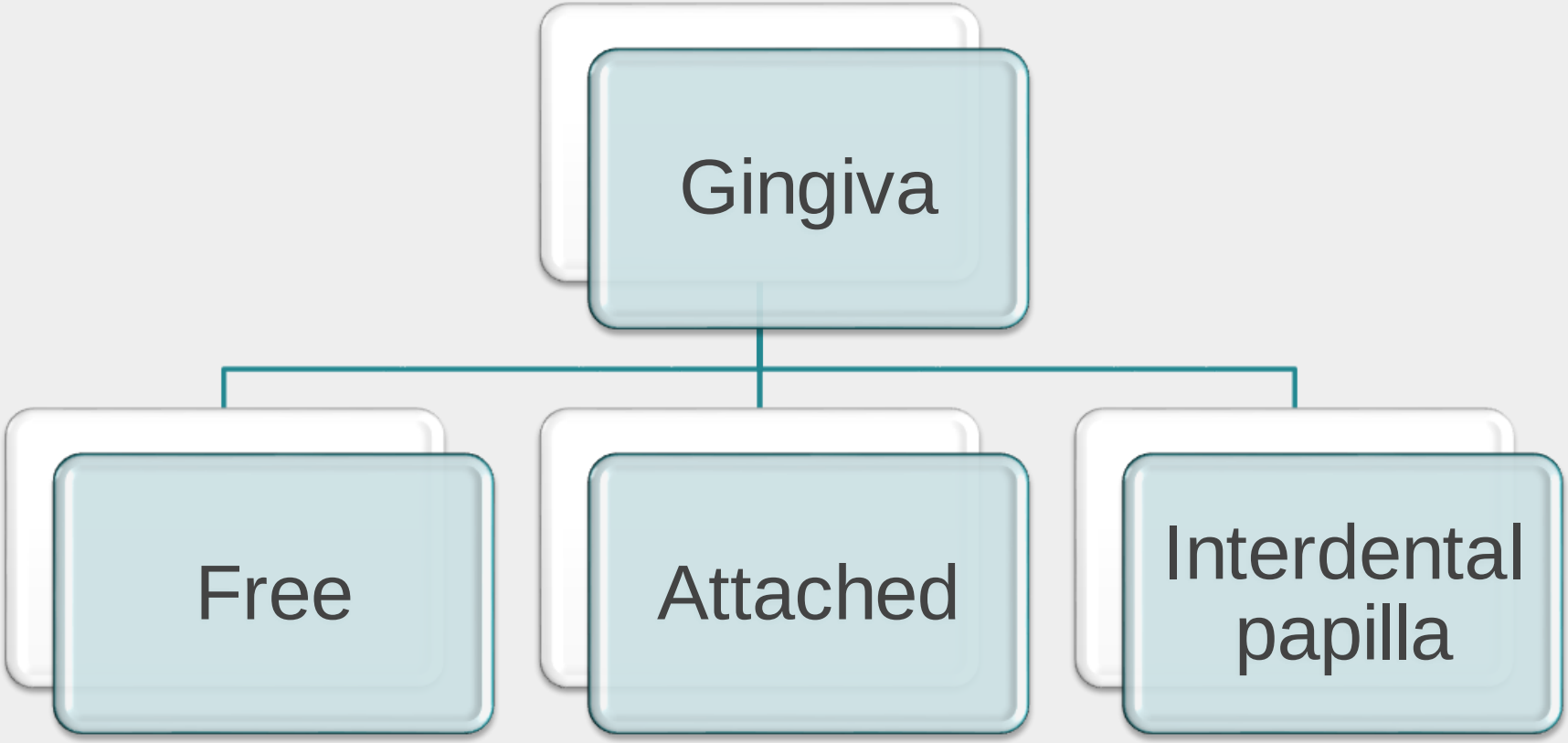
Alveolar bone

Hard tissue

Periodontium

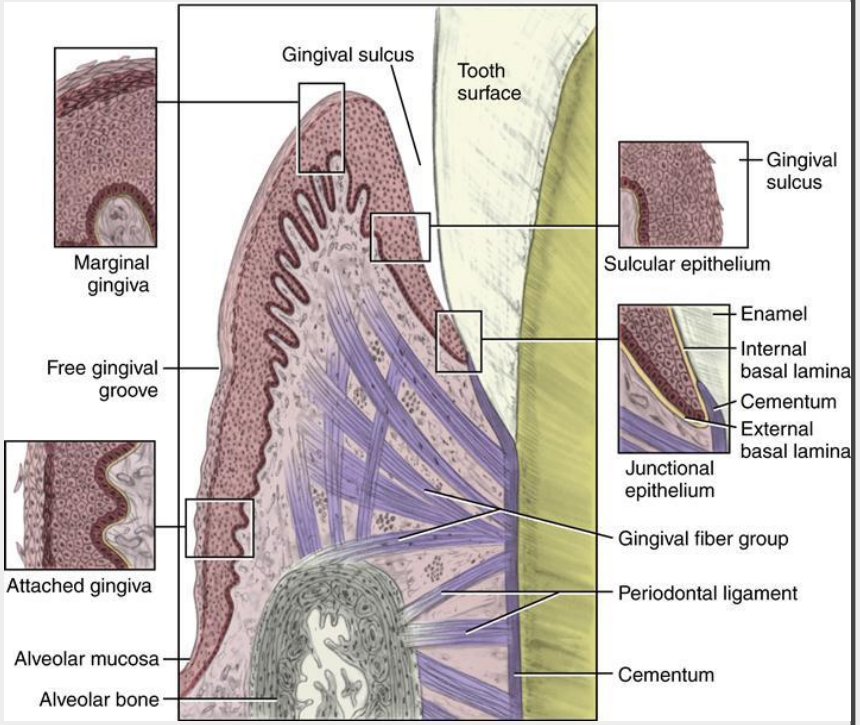
Gingiva

- The gingiva is the part of the oral mucosa that covers the alveolar processes of the jaws and surrounds the necks of the teeth


Gingiva
Free
Attached
Interdental papilla

Free

- The terminal edge or border of the gingiva that surrounds the teeth in collar-like fashion and not attached to the tooth or bone.
- The space between the free gingiva and tooth is called *gingival sulcus.*
- The gingival sulcus depth should be 0.5-1.5 mm.



Free

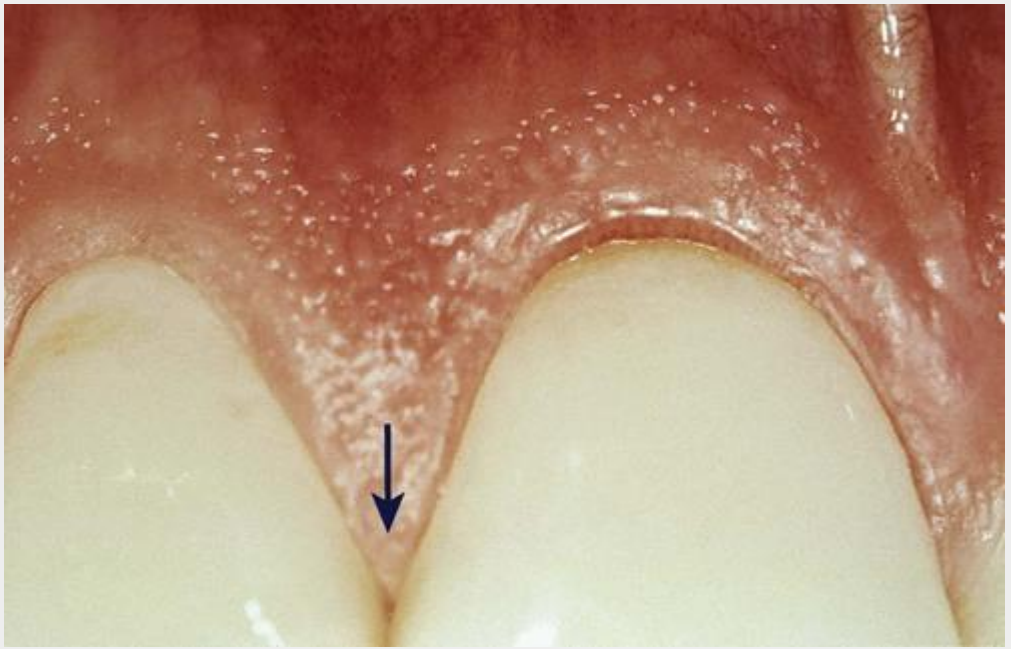
- **Periodontal pockets** are deepening of gingival sulcus (more than 3 mm).
- These pockets can become filled with infection-causing bacteria and, if left untreated, may lead to tooth loss.

Attached

- It is firm, resilient, and tightly bound to the underlying periosteum of alveolar bone.

Interdental papilla

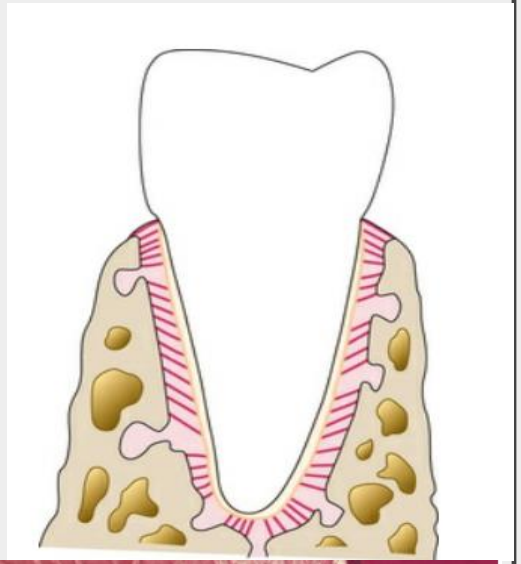
- It is the pyramidal part of gingiva that occupies the gingival embrasure, which is the interproximal space beneath the area of tooth contact.

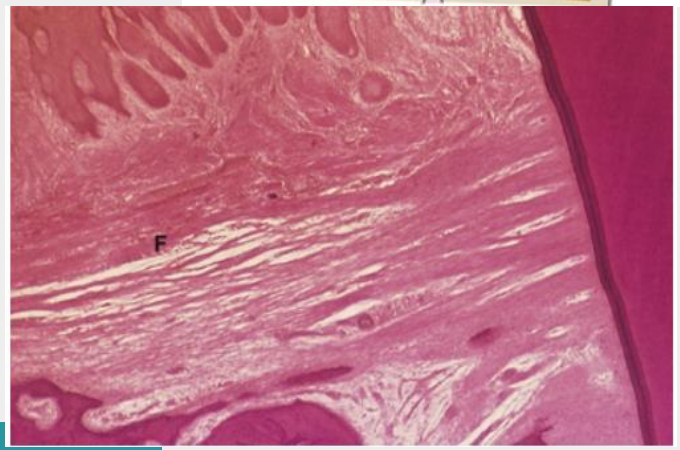


Periodontium

Periodontal ligament (PDL)

- It is a complex vascular and highly cellular connective tissue that surrounds the tooth root and connects it to the inner wall of the alveolar bone.
- The average width of the periodontal ligament space is
- about 0.2 mm.

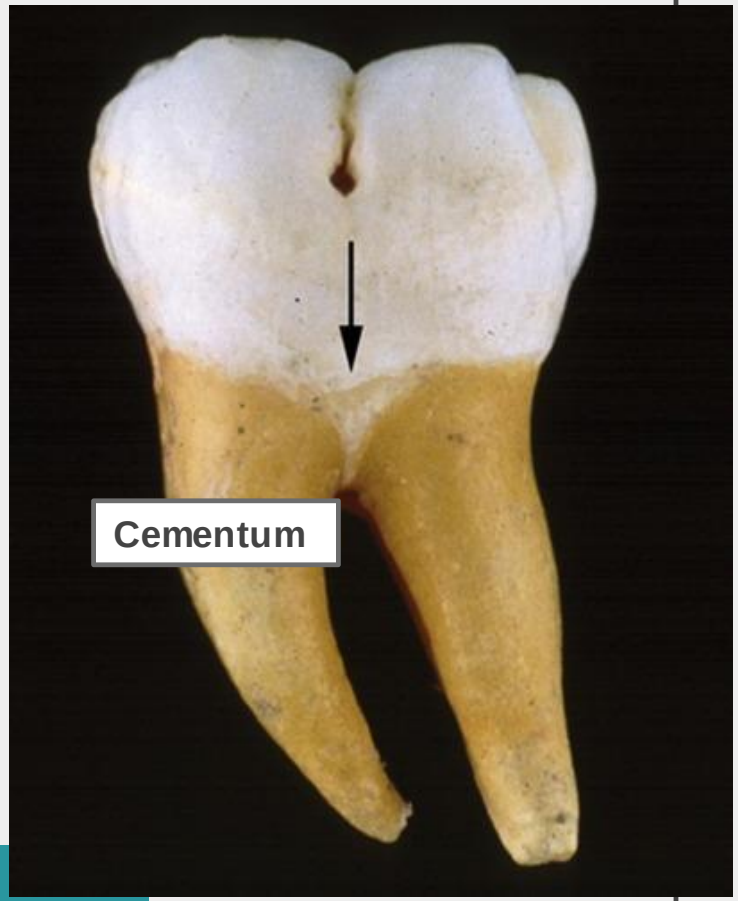




Periodontium

Cementum

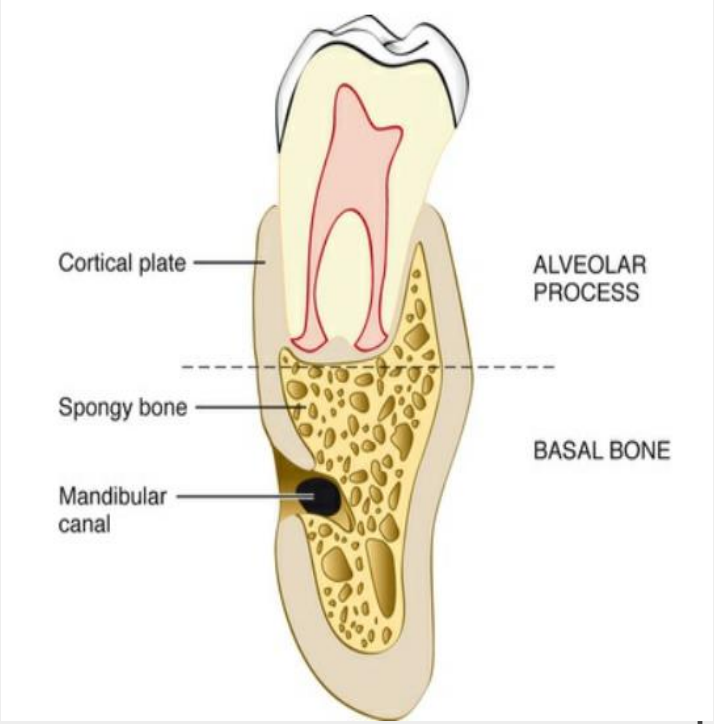
- Cementum is the calcified, avascular mesenchymal tissue that forms the outer covering of the anatomic root.
- It serve as a medium for attachment of periodontal ligaments.
- Thickness 16-60 µm coronally and 150-200 µm apically

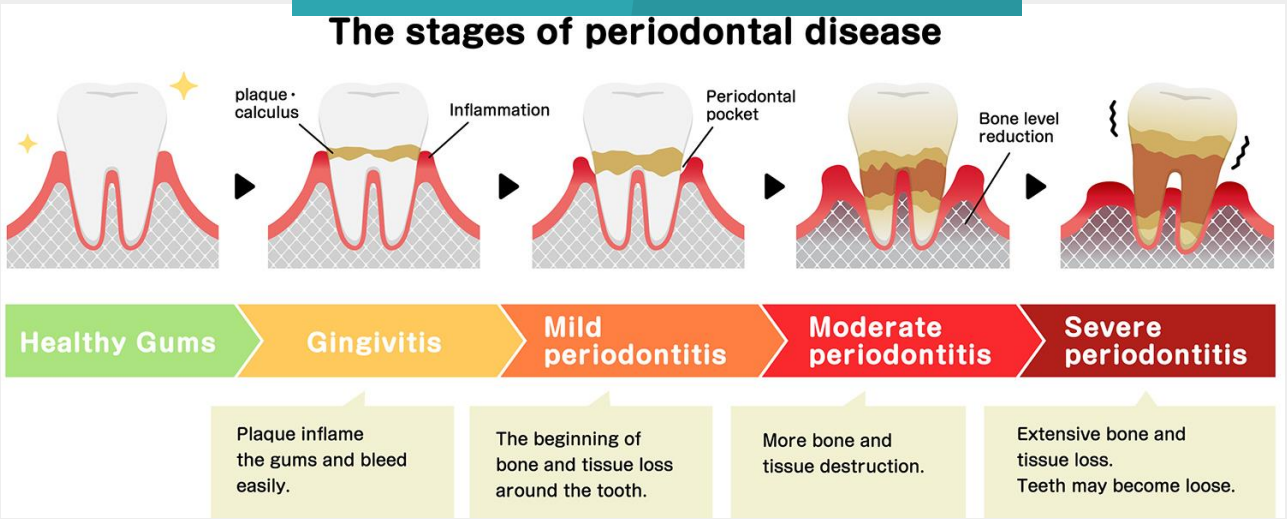


Periodontium

Alveolar bone

- The alveolar process is the portion of the maxilla and mandible that forms and supports the tooth sockets (alveoli).
- It forms when the tooth erupts to provide the osseous attachment to the forming periodontal ligament.
- It disappears gradually after the tooth is lost.





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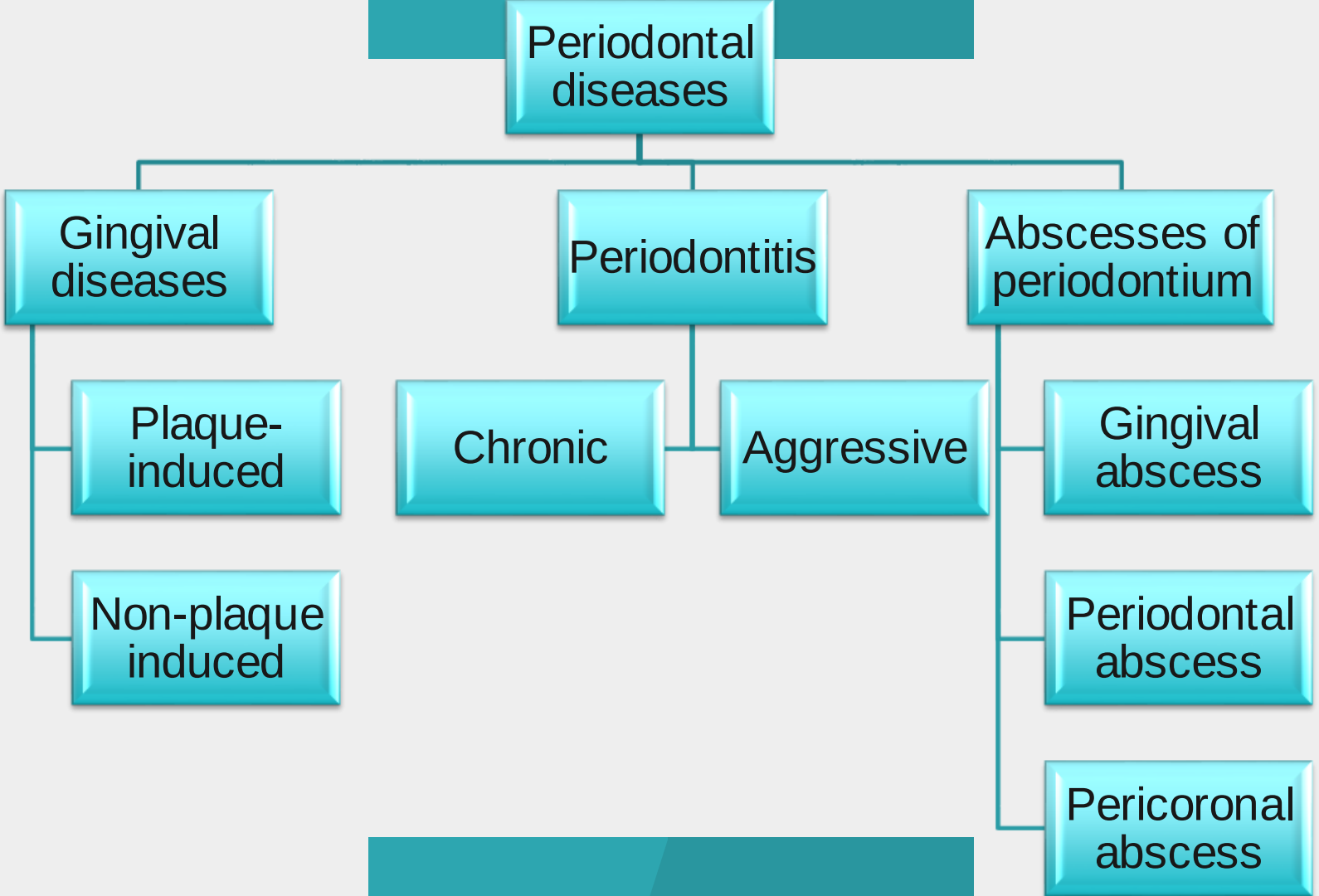
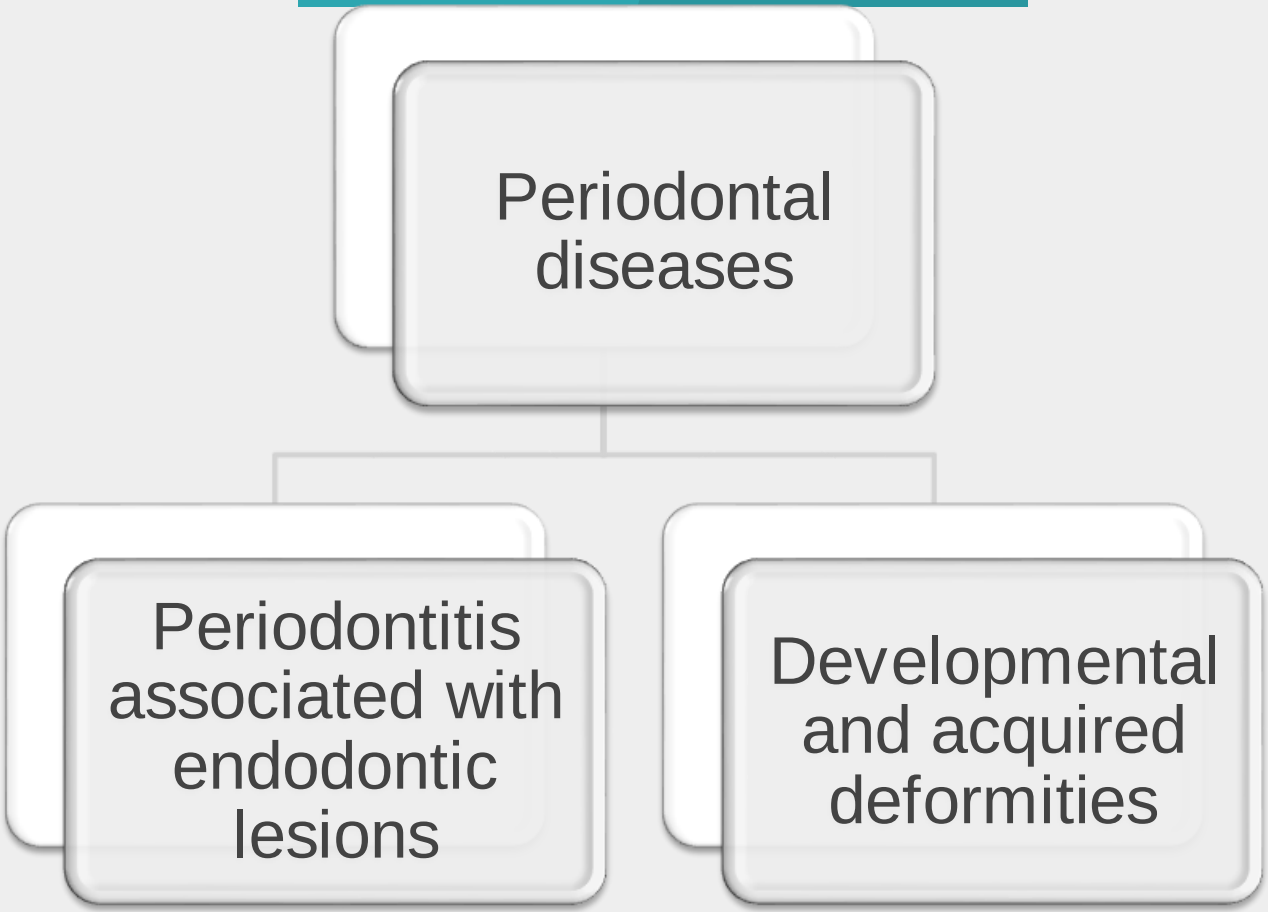
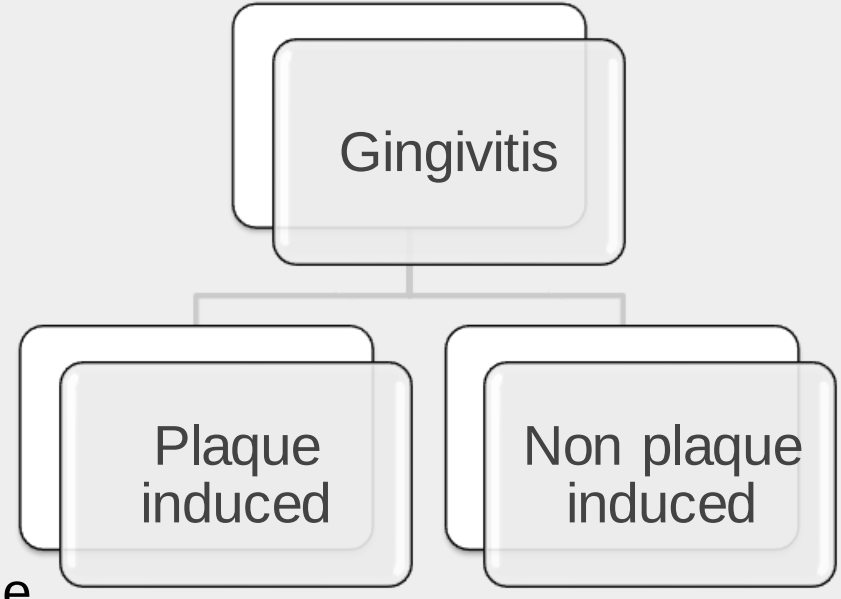
Classification of Periodontal Diseases


Periodontal diseases
Gingival diseases
Periodontitis
Abscesses of periodontium
Plaque-induced
Non-plaque induced
Chronic
Aggressive
Gingival abscess
Periodontal abscess
Pericoronal abscess


Periodontal diseases
Periodontitis associated with endodontic lesions
Developmental and acquired deformities

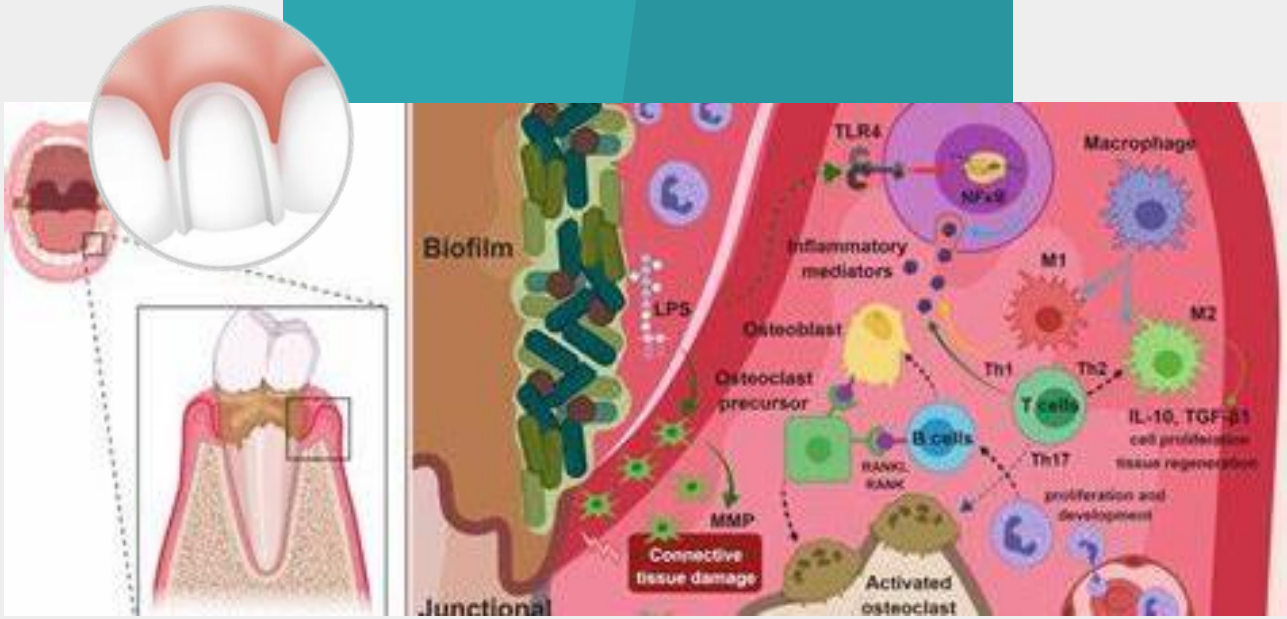
Gingivitis

These diseases occur on periodontium (gingiva) with no loss of teeth.



Dental Plaque

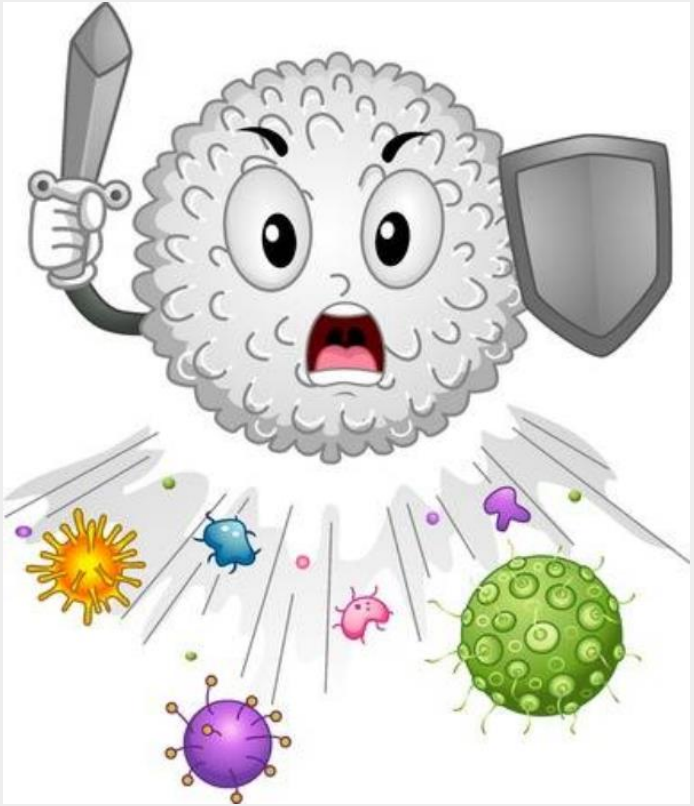
It is a sticky film of salivary proteins, food debris and bacteria forms on teeth. If it isn't removed through routine dental cleanings and daily brushing and flossing, it can lead to caries and gingival diseases.



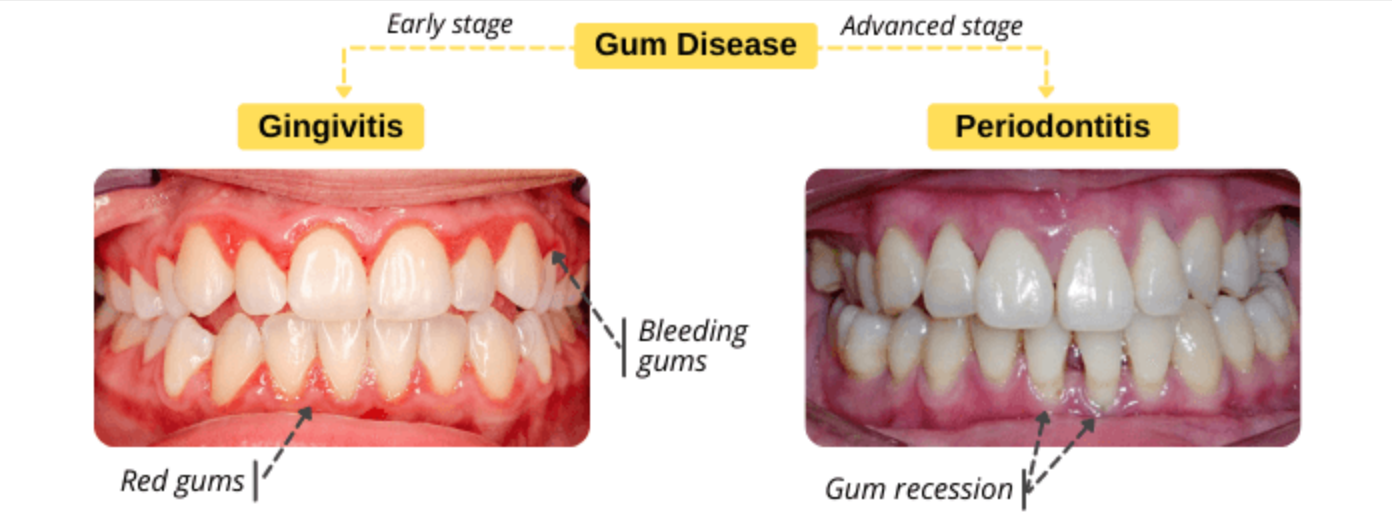
05

Pathogenesis of periodontal diseases

- Periodontal disease results from a complex interplay between the subgingival biofilm (Plaque) and the host immune–inflammatory events that develop in the gingival and periodontal tissues in response to the challenge presented by the bacteria.
- The tissue damage that results from the immune–inflammatory response is recognized clinically as periodontitis.



- In gingivitis, the inflammatory lesion is confined to the gingiva.
- In periodontitis, the inflammatory processes extend to additionally affect the periodontal ligament and the alveolar bone.



- The net result of inflammatory changes is the breakdown of the fibers of the periodontal ligament, resulting in clinical loss of attachment together with resorption of the alveolar bone.

Role of bacterial biofilm

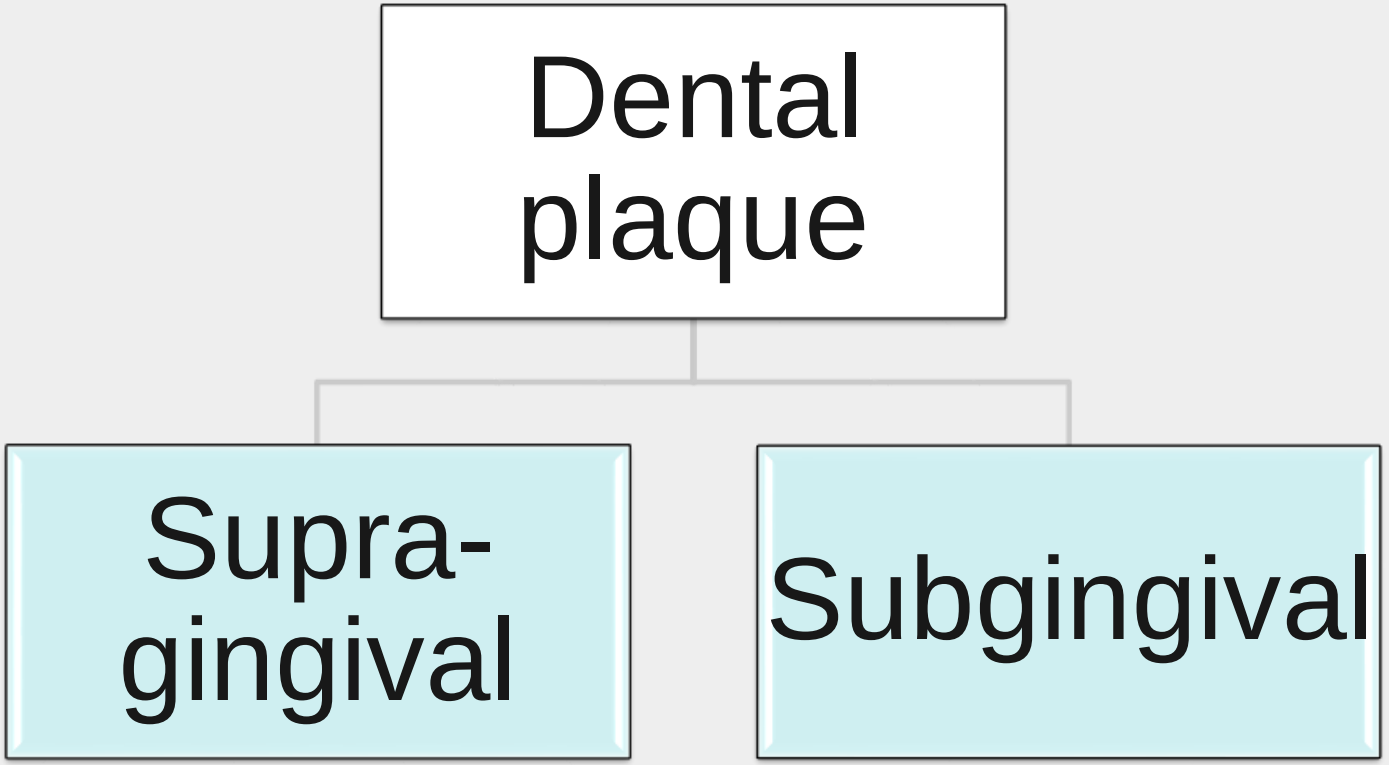
Most organisms can be pathologic in the oropharynx only when they adhere and accumulate to either the soft tissues or the hard surfaces.
Otherwise, they may be removed by:

- Swallowing, mastication, or blowing the nose
- Tongue and oral hygiene methods (tooth brushing, flossing)
- The wash-out effect of the salivary, nasal, and crevicular fluid outflow.

Role of bacterial biofilm

- **Dental plaque** is a yellow-grayish substance that adheres hardly to the intraoral hard surfaces, including removable and fixed restorations.
- It is impossible to remove plaque by rinsing or with the use of sprays.
- **Calculus** is a hard deposit that forms via the mineralization of dental plaque

Role of bacterial biofilm



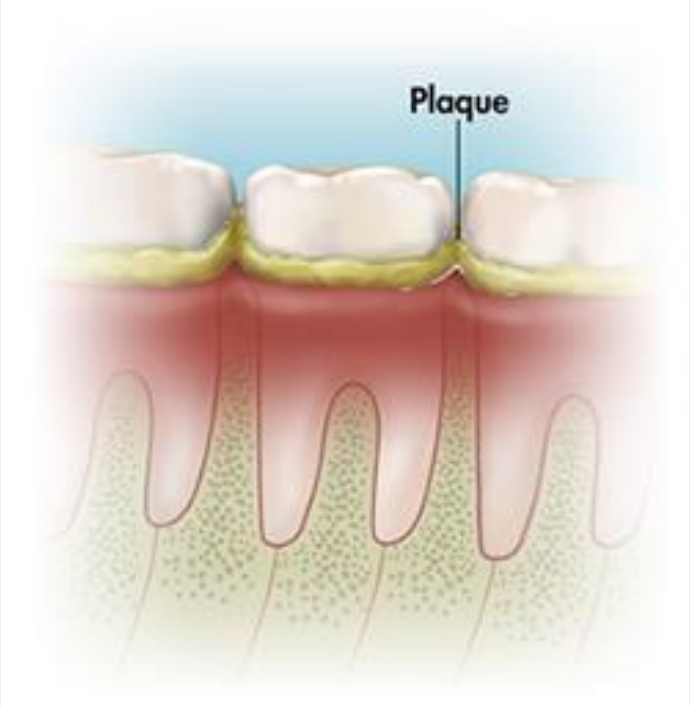
Accumulation of a Dental Plaque Biofilm

- The process of plaque formation can be divided into several phases:

(1) The formation of the pellicle (saliva protiens) on the tooth surface,

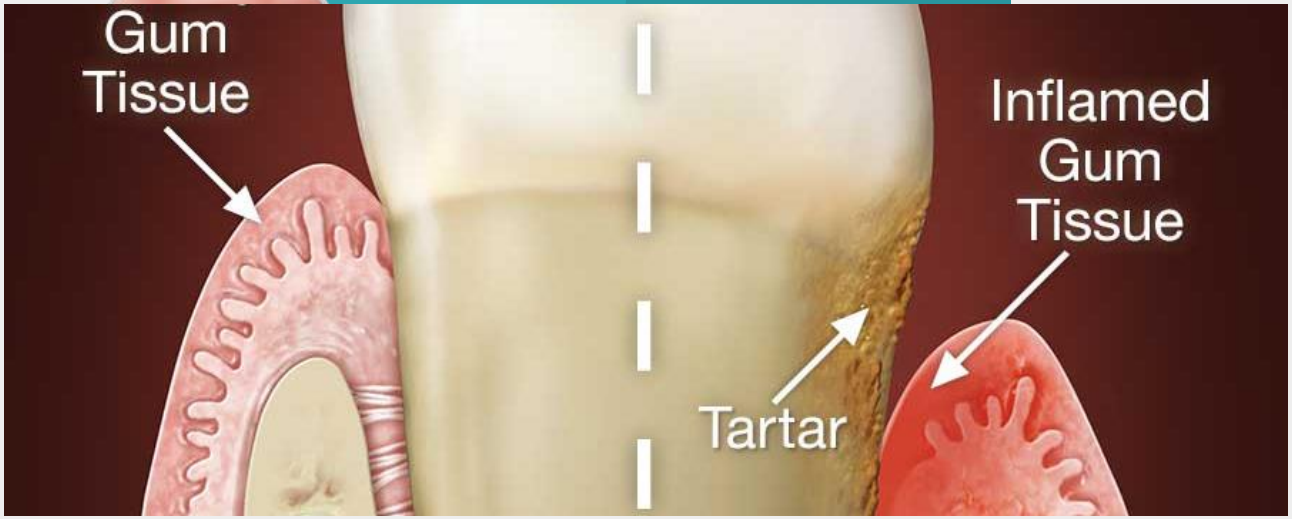
(2) The initial adhesion/ attachment of bacteria.

(3) Colonization/plaque maturation.

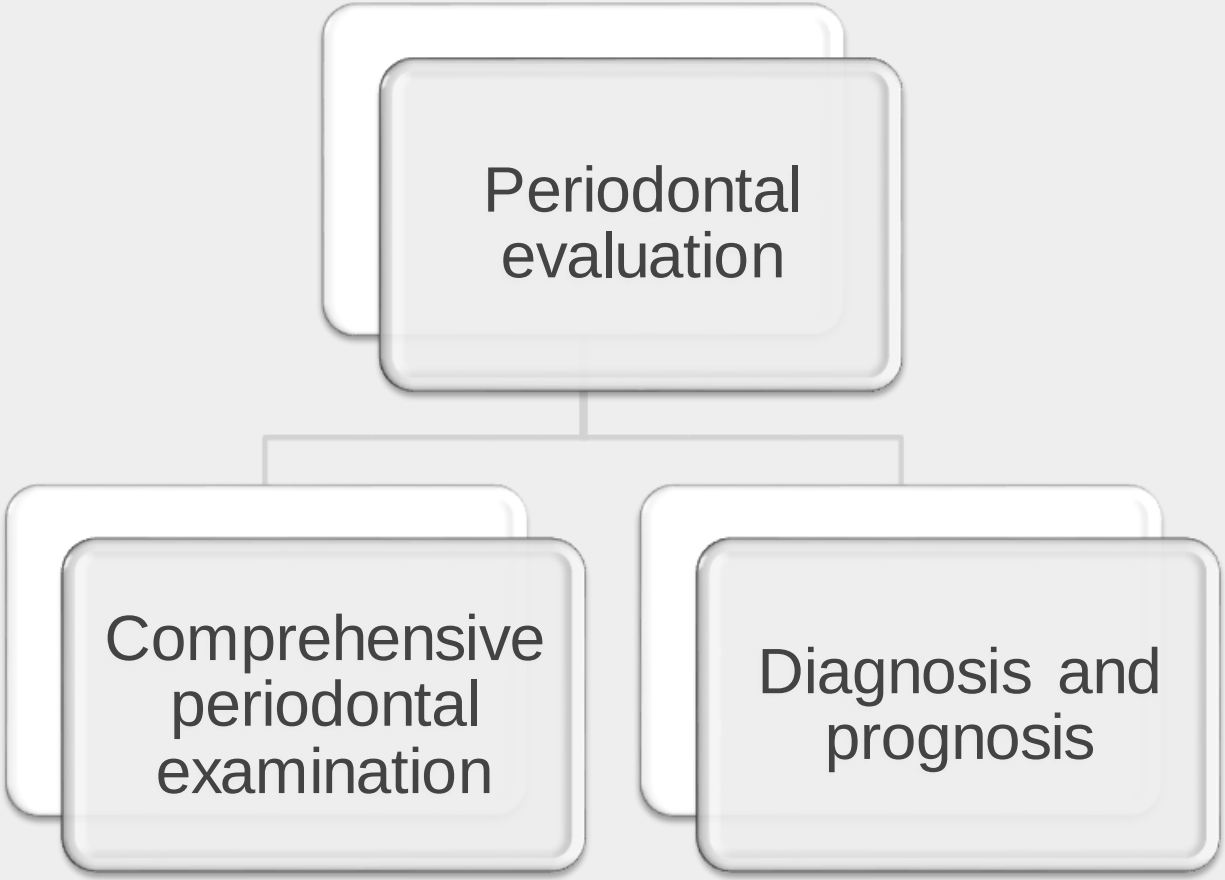


Effects of Smoking on the Prevalence and Severity of Periodontal Diseases

- Smoking is a major risk factor for periodontal disease.
- According to the literature, smoking may be responsible for more than half of periodontitis cases among adults in the United States.

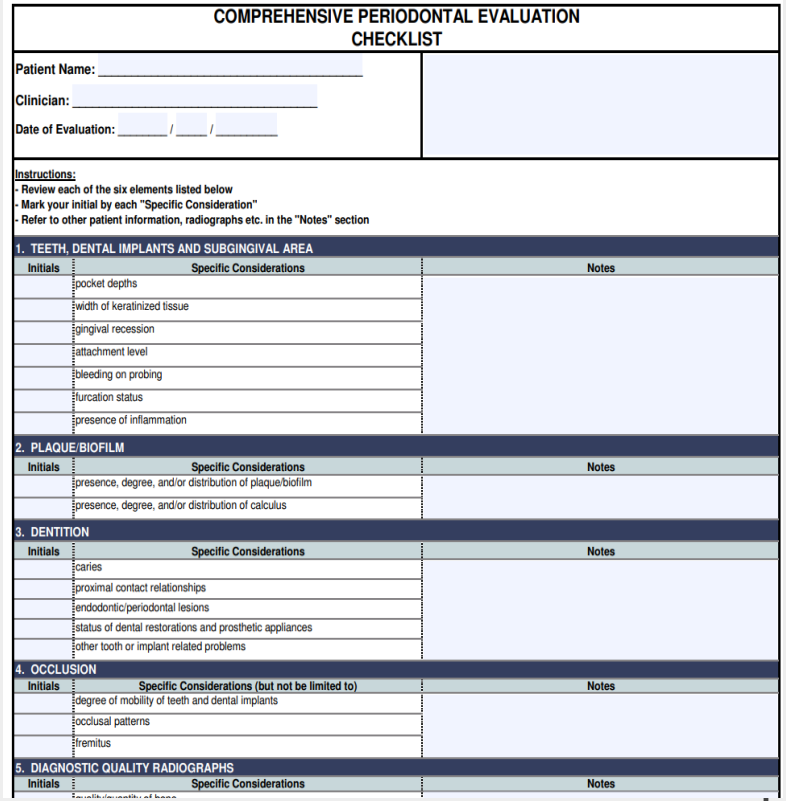


06 Diagnosis and Assessment (comprehensive periodontal examination)


Periodontal evaluation
Comprehensive periodontal examination
Diagnosis and prognosis

Comprehensive periodontal examination

A Comprehensive Periodontal Evaluation (CPE) is a thorough dental procedure that assesses the health of teeth and supporting periodontium. This evaluation is crucial for maintaining oral health and preventing conditions such as periodontal disease.



COMPREHENSIVE PERIODONTAL EVALUATION CHECKLIST

Patient Name: _____

Clinician: _____

Date of Evaluation: _____ / ____ / _____

Instructions:
- Review each of the six elements listed below
- Mark your initial by each "Specific Consideration"
- Refer to other patient information, radiographs etc. in the "Notes" section

1. TEETH, DENTAL IMPLANTS AND SUBGINGIVAL AREA

Initials	Specific Considerations	Notes
	pocket depths	
	width of keratinized tissue	
	gingival recession	
	attachment level	
	bleeding on probing	
	furcation status	
	presence of inflammation	

2. PLAQUE/BIOFILM

Initials	Specific Considerations	Notes
	presence, degree, and/or distribution of plaque/biofilm	
	presence, degree, and/or distribution of calculus	

3. DENTITION

Initials	Specific Considerations	Notes
	caries	
	proximal contact relationships	
	endodontic/periodontal lesions	
	status of dental restorations and prosthetic appliances	
	other tooth or implant related problems	

4. OCCLUSION

Initials	Specific Considerations (but not be limited to)	Notes
	degree of mobility of teeth and dental implants	
	occlusal patterns	
	fremitus	

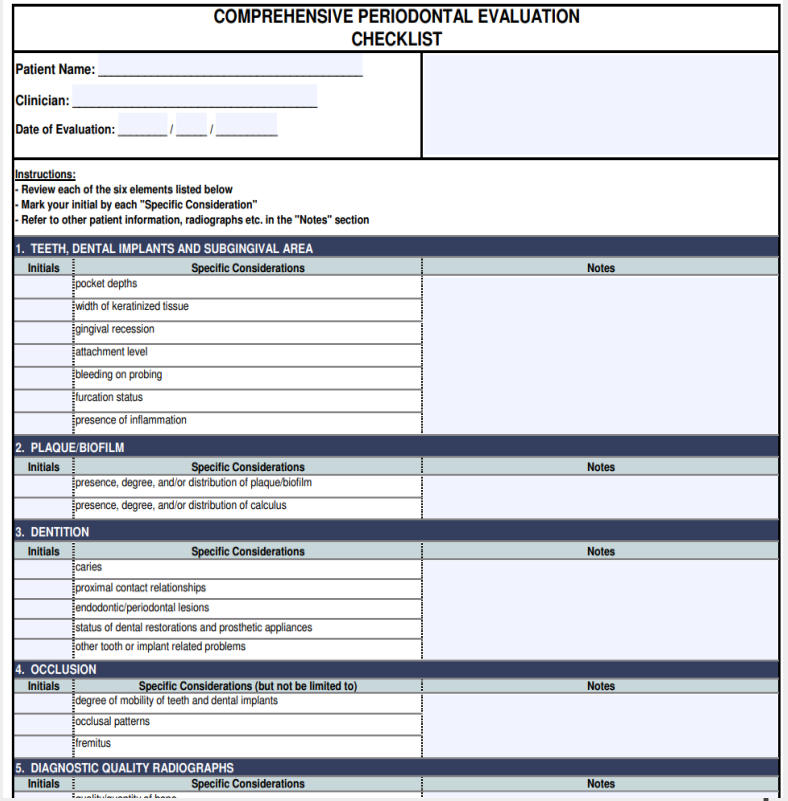
5. DIAGNOSTIC QUALITY RADIOGRAPHS

Initials	Specific Considerations	Notes

Comprehensive periodontal examination

A Comprehensive Periodontal Evaluation typically examines:

- Teeth
- Plaque
- Gingiva
- Bite
- Bone structure
- Risk factors



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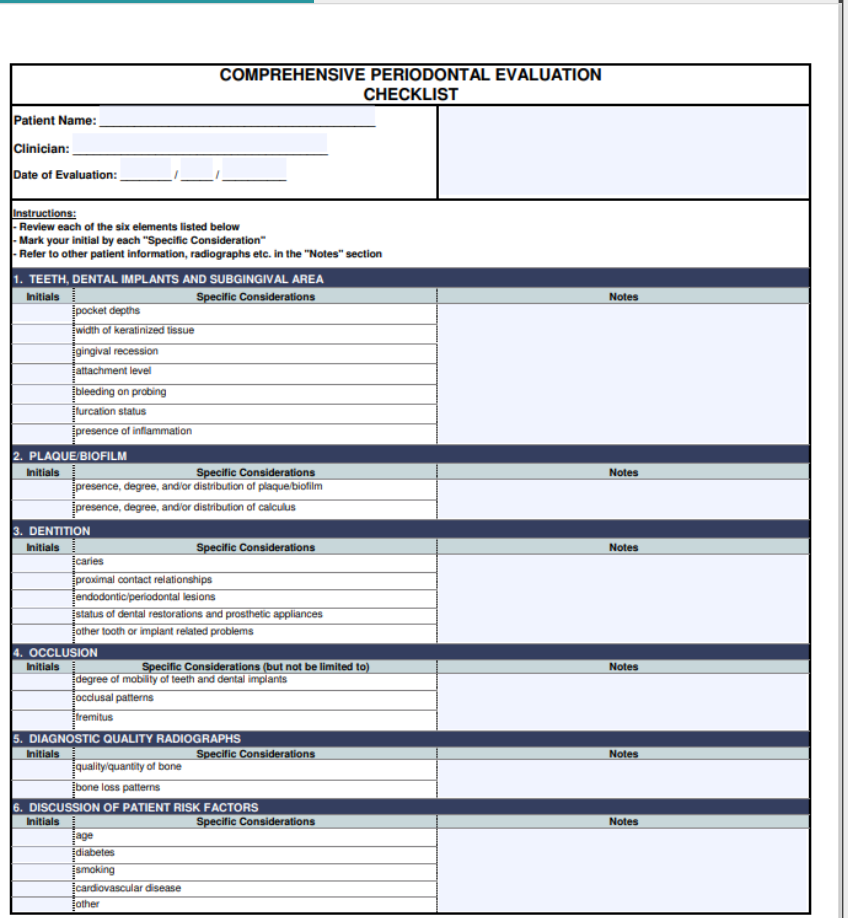
	occlusal patterns	
	fremitus	

5. DIAGNOSTIC QUALITY RADIOGRAPHS

Initials	Specific Considerations	Notes

Comprehensive periodontal examination

The American Academy of Periodontology has developed a Comprehensive Periodontal Evaluation checklist to help you learn more about the state of your oral health



COMPREHENSIVE PERIODONTAL EVALUATION CHECKLIST

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Clinician: _____

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2. PLAQUE/BIOFILM

Initials	Specific Considerations	Notes
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	presence, degree, and/or distribution of calculus	

3. DENTITION

Initials	Specific Considerations	Notes
	caries	
	proximal contact relationships	
	endodontic/periodontal lesions	
	status of dental restorations and prosthetic appliances	
	other tooth or implant related problems	

4. OCCLUSION

Initials	Specific Considerations (but not be limited to)	Notes
	degree of mobility of teeth and dental implants	
	occlusal patterns	
	fremitus	

5. DIAGNOSTIC QUALITY RADIOGRAPHS

Initials	Specific Considerations	Notes
	quality/quantity of bone	
	bone loss patterns	

6. DISCUSSION OF PATIENT RISK FACTORS

Initials	Specific Considerations	Notes
	age	
	diabetes	
	smoking	
	cardiovascular disease	
	other	

Diagnosis and prognosis

Key principles of diagnosis and prognosis:

- **Early Detection and Management:** Early detection and proper management of periodontal disease can help patients maintain their natural dentition.
- **Risk Assessment:** It's important to consider the individual's risk factors and their compliance with biofilm control.
- **Prognosis Systems:** Various periodontal prognosis systems exist, which consider risk factors affecting treatment and prognoses. These systems can help in determining tooth prognosis for every single case.

Diagnosis and prognosis

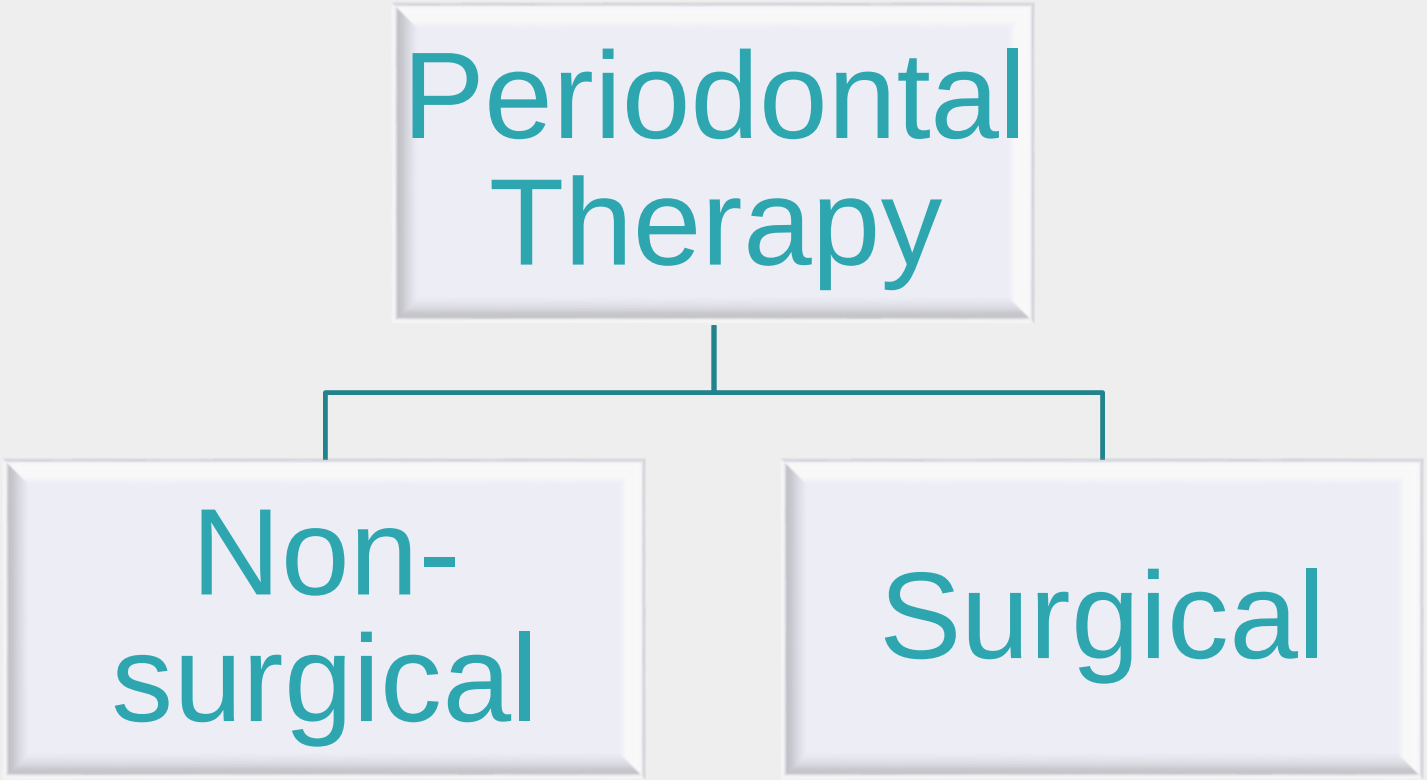
Key principles of diagnosis and prognosis:

- **Patient and Tooth-Related Factors:** Factors affecting tooth prognosis include patient-related factors (age, systemic condition, oral hygiene, compliance with recall visits, smoking, etc.) and tooth-related factors (number of teeth involved, clinical attachment loss, loss of bone support, furcation involvement, mobility, crown/root ratio, etc.).
- **Evidence-Based Decision Making**: Evidence-based dentistry requires application of current evidence in making decisions about the care of individual patients..
- **Treatment Alternatives**: The alternatives for each case must be considered.

07

Treatment Planning

Overall treatment plan



Non-surgical therapy

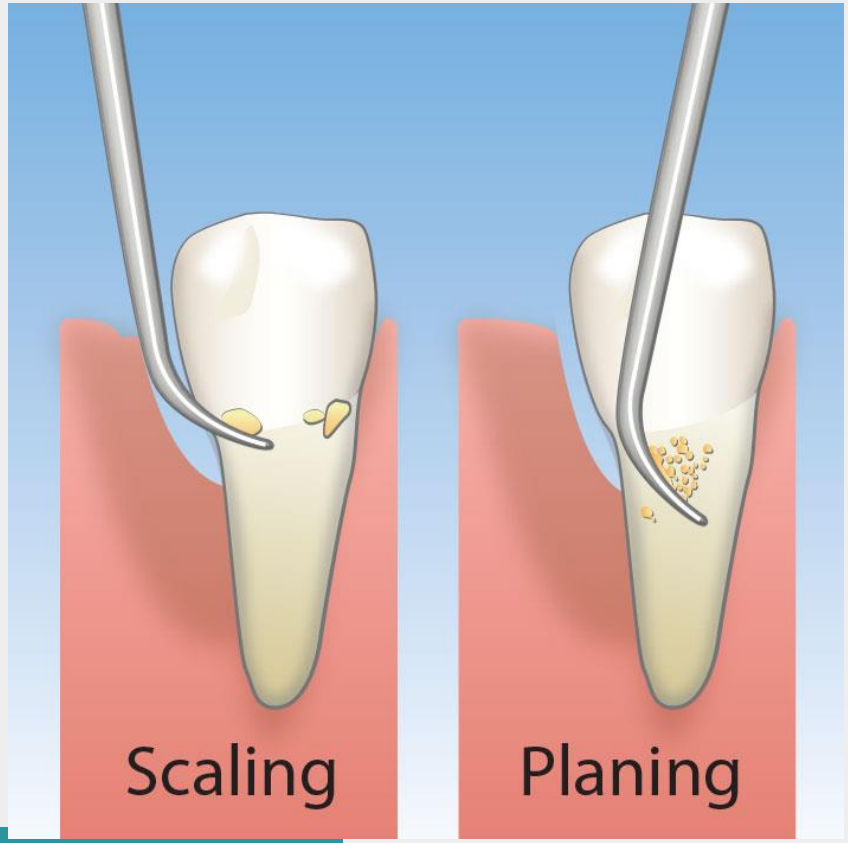
Overall treatment plan

1. **Oral hygiene education**
2. **Infection control**

- Supragingival and subgingival scaling and root planning

3. **Reduction of local risk factors**

- • Removal or reshaping of overhangs and over-contoured restorations
- • Restoration of carious lesions
- • Restoration of open contacts



Surgical therapy

Overall treatment plan

Objectives:

• Primary: Access for root instrumentation

• Secondary: Pocket reduction through periodontal regeneration

1. **Periodontal access surgery**
2. **Extraction of hopeless teeth**
3. **Periodontal plastic surgery**
   - Aesthetic crown lengthening
4. **Preprosthetic surgery**

• Prosthetic crown lengthening

• Implant site preparation and implant placement

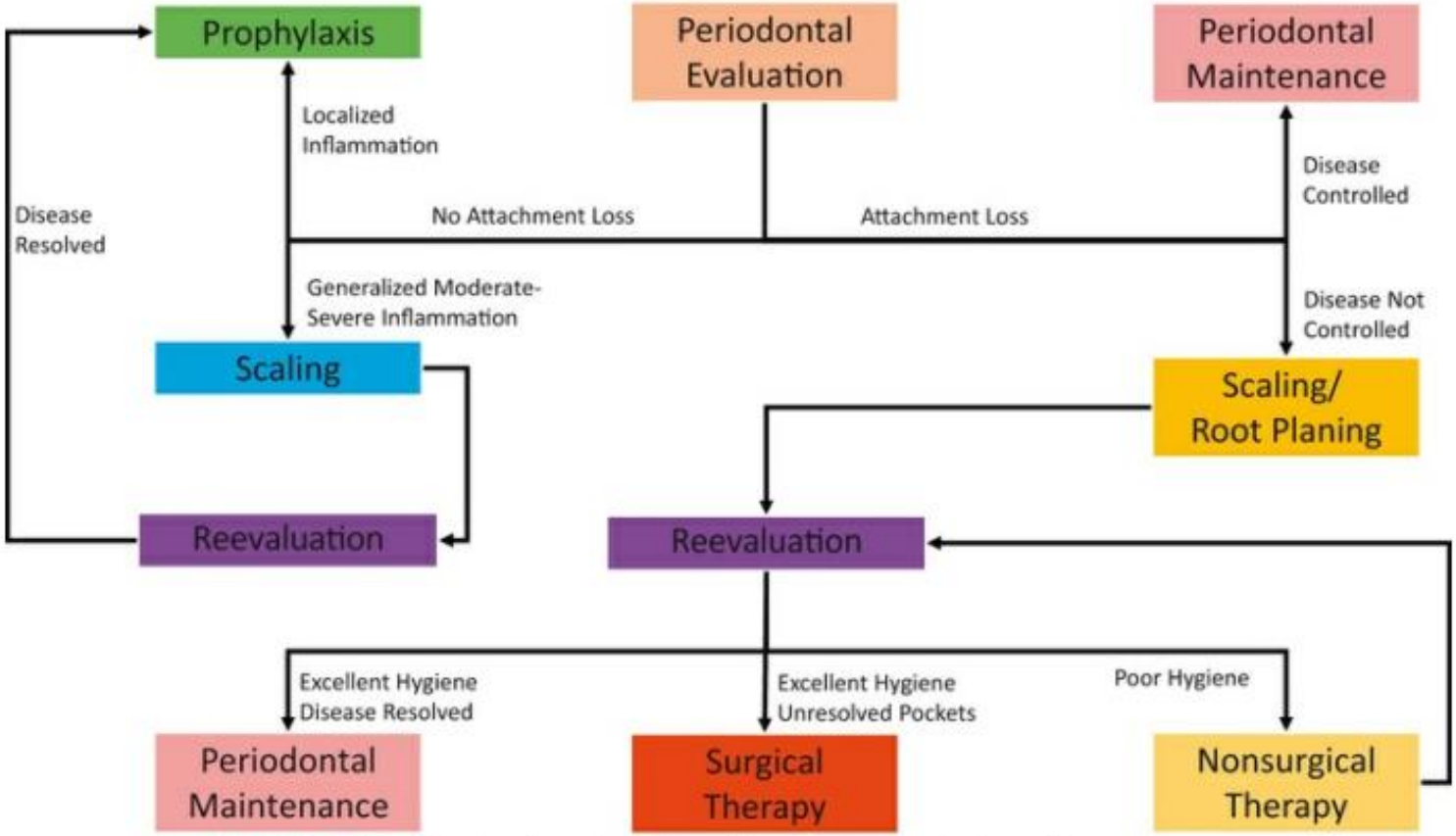


FIG. 36.1 Periodontal treatment decision tree.

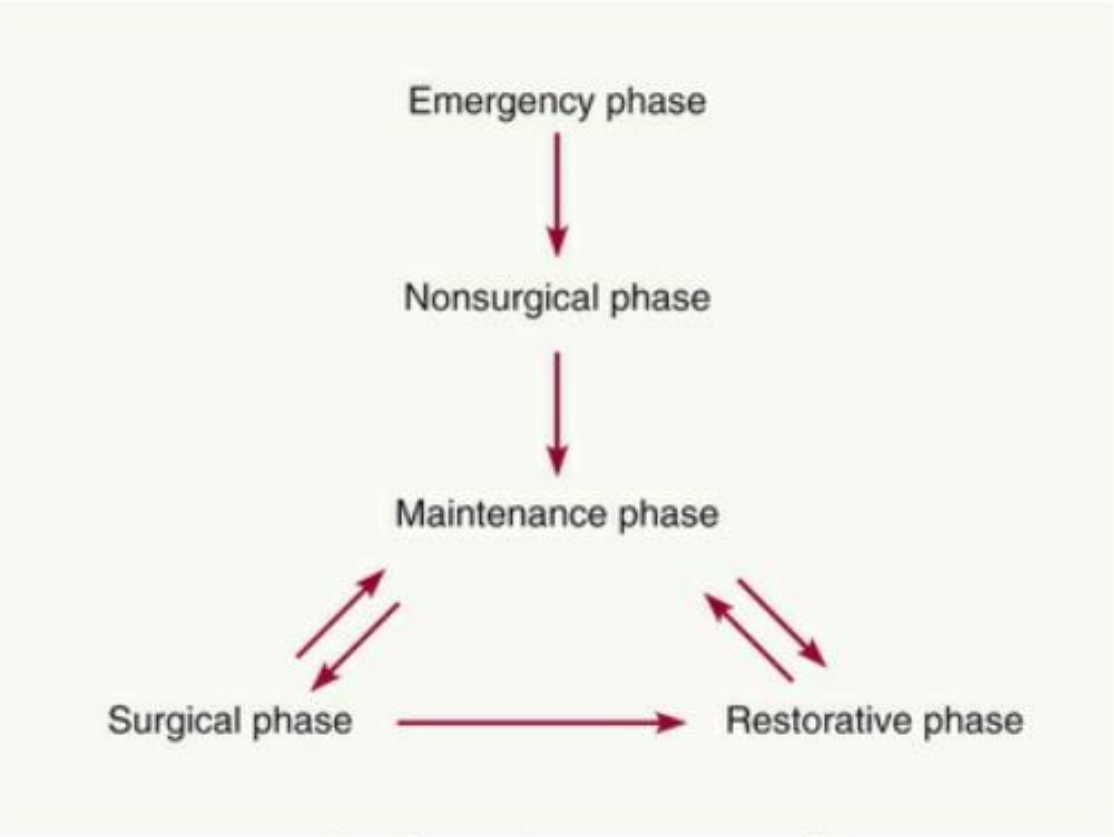
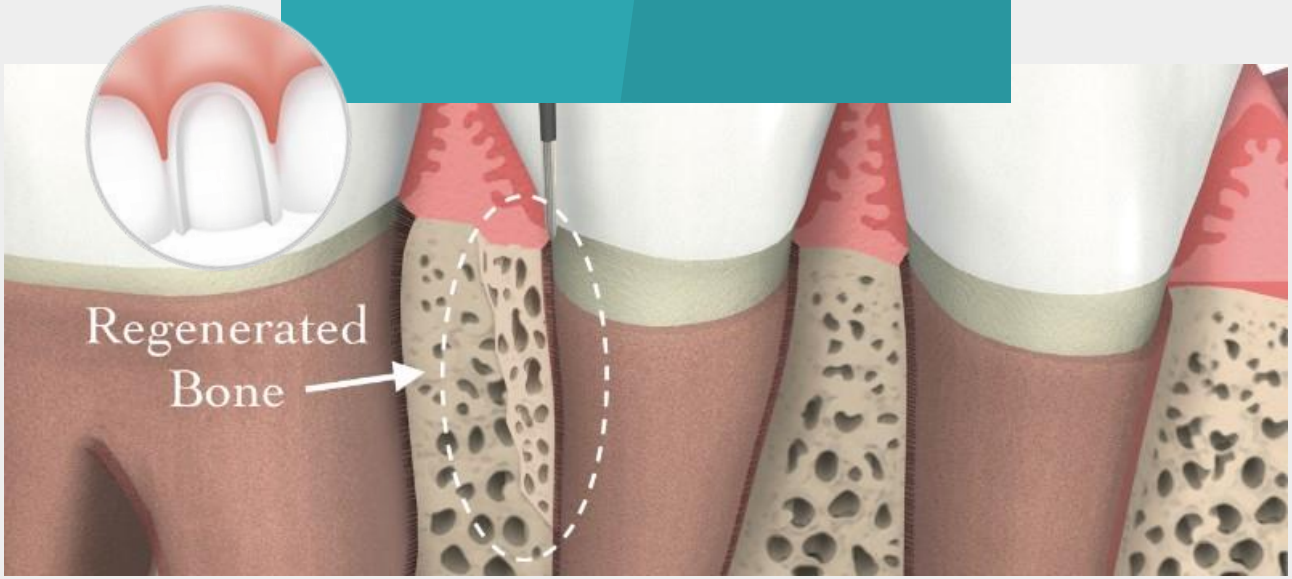


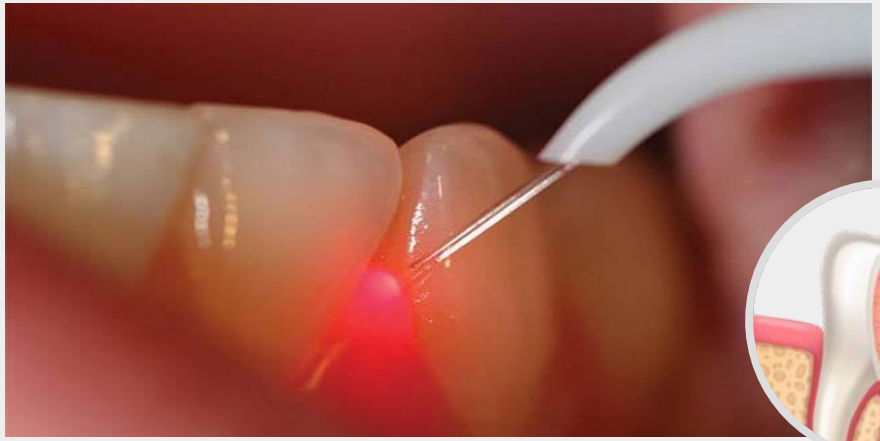
FIG. 36.2 Preferred sequence of therapy.

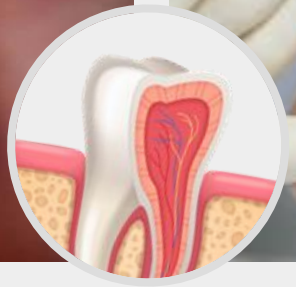


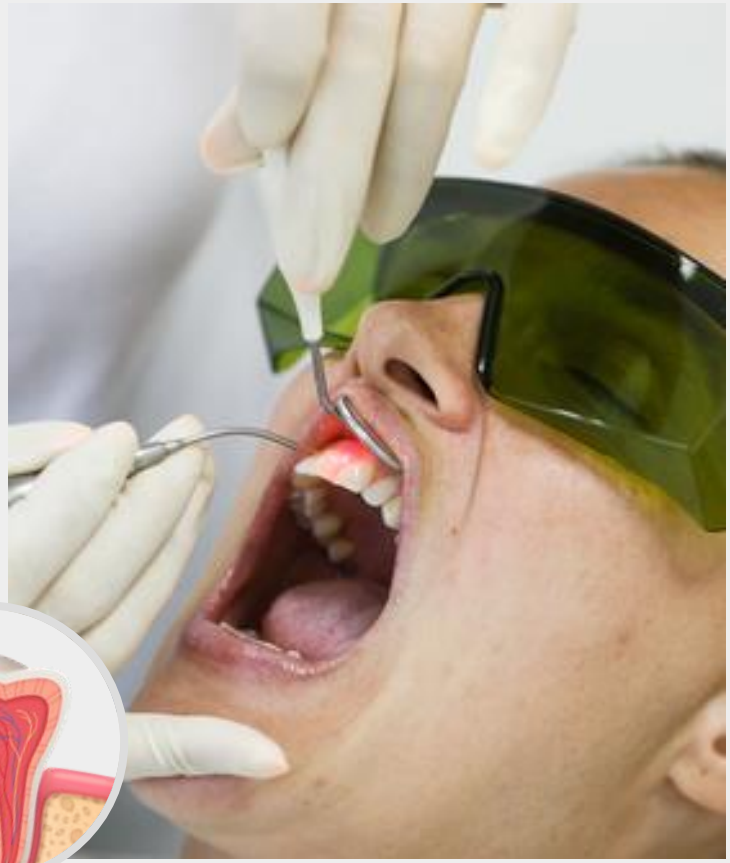
08 Recent Advances in Periodontics

Laser Therapy

Laser therapy is used for the treatment of periodontal disease. It can be used to remove diseased tissue, reduce bacteria, and promote the growth of new, healthy tissue.

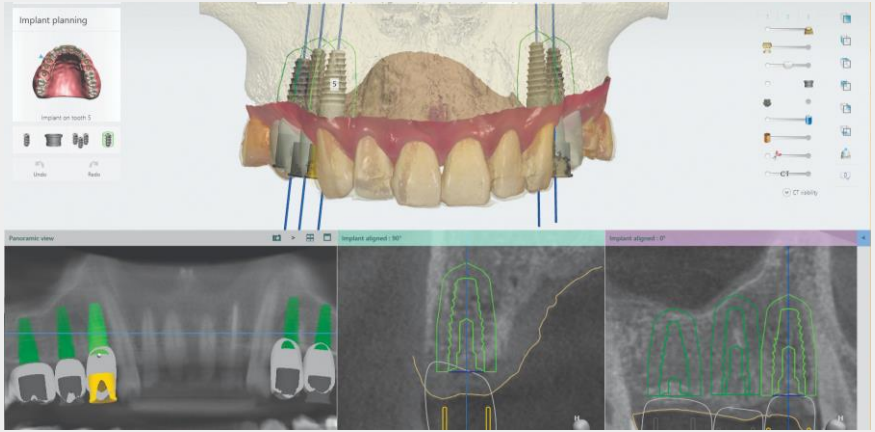


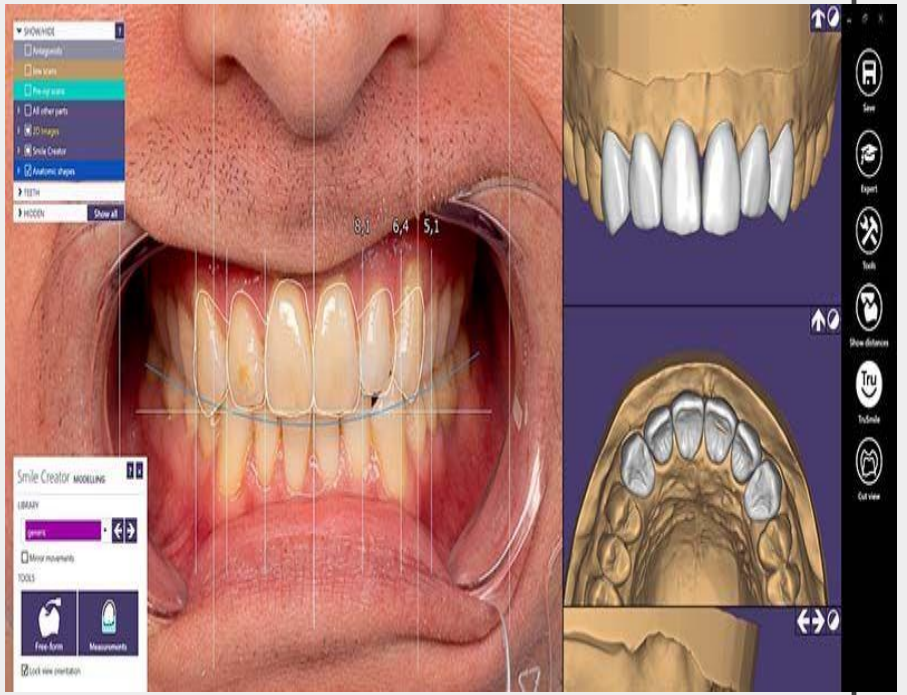




CAD/CAM Technology

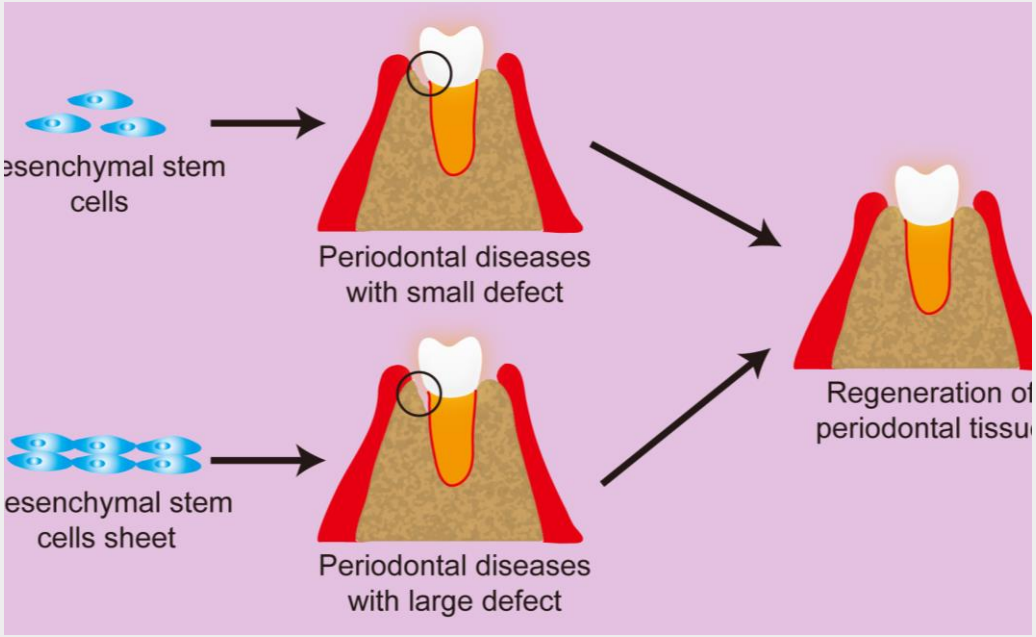
Computer-aided design and computer-aided manufacturing (CAD/CAM) technology have been introduced in periodontics for precise and efficient treatment planning and execution.





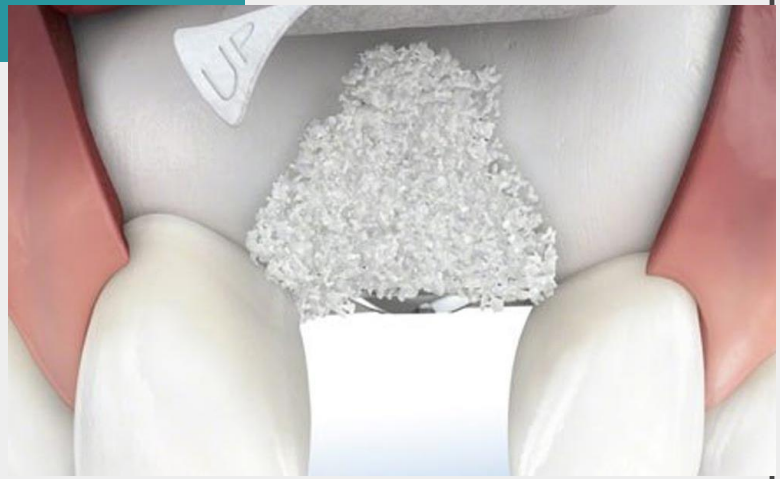
Stem cell Therapy

Stem cells have the potential to regenerate periodontal tissue and are being explored as a treatment option for periodontal diseases.



Biomaterials

The use of biomaterials in periodontics has increased significantly. These materials are used for bone and soft tissue regeneration.




Thank
you!

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