Geriatric dentistry

Aging Refers to irreversible and inevitable changes occurs with time.

Gerontology: - Is the study of aging in all its aspects biologic, physiologic, sociologic & psychologic.

Geriatric Dentistry:

Geriatric dentistry is the branch of dentistry that emphasizes on dental care for the elderly population and focuses upon patients with chronic physiological, and/or Psychological changes or morbid conditions/ diseases.

Factors influencing Aging:

A) Genetic:

1- **Mutation**:- Several mutations reduces life span.

2. **Species specific life span**:-Each species is characterized by its own pattern of aging & maximum life span.

3. **Hybrid vigor (heterosis):-**, A genetic effect that results from mating between members of genetically distinct subpopulations.

4. **Sex:-** In humans\animals, female lives longer.

5**. Parental age:-** Like father like son.

6. **Premature aging syndrome :-** Single gene changes results in premature aging in humans e.g. progeria (Hutchinson-Gilford syndrome), Cockayne's syndrome, Werner's syndrome (rapid premature aging).

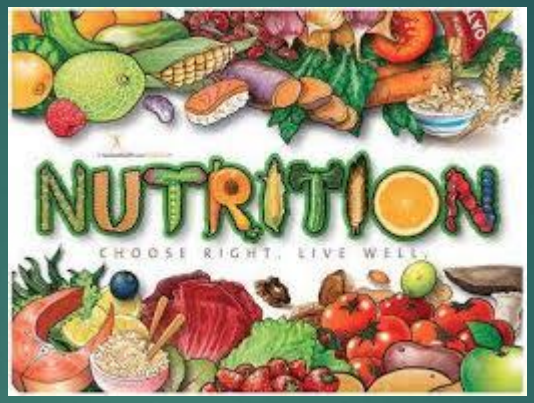
Hutchinson-Gilford

Cockayne's syndrome

Werner's syndrome

B) Environmental


Physical and chemical




Pathogens and Parasites


stress


Bad housing

Goal of Geriatric dentistry

1. To maintain oral health of individuals.

2. To maintain ideal health and function of masticatory system by establishing adequate preventive measures.

3., Treatment, management, and maintaining of oral and general health status in diseased patients.

Objectives of geriatric dentistry

1. To recognize and relieve difficulties of elderly people.

2. Restoration and preservation of function for maintaining normal life in elderly patients.

Geriatric dentistry vs general dentistry

Aspect	Geriatric Dentistry	General Dentistry
Demographics (patients living in nursing homes)	Focuses on aging patients, many with at least one chronic disorder (86%) and multiple concurrent disorders.	Serves a general population with varied age groups.
Cognitive Challenges	Deals with patients who may have cognitive dysfunctions like dementia, affecting compliance and oral health.	Generally not a primary concern.
Medication Impact	Addresses the effects of polypharmacy (use of ≥5 medications), including side effects like xerostomia (dry mouth).	Fewer issues with medication-induced complications.
Physical Disabilities	Manages vision, hearing, taste disorders, and other physical disabilities common in elderly patients.	Less frequent encounters with such disabilities.
History Taking and Management	Requires exceptional skills in obtaining medical history and managing older patients effectively.	Standard history-taking and management skills.
Treatment Planning	Involves challenges in designing treatment plans, distinguishing normal aging from pathological aging.	Less focus on age-specific distinctions.

Psychological disorders of elderly patients generally seen by prosthodontist

Anxiety

Depression

Conversion Hysteria

Factors that influence the patient's response

1.Parental influences

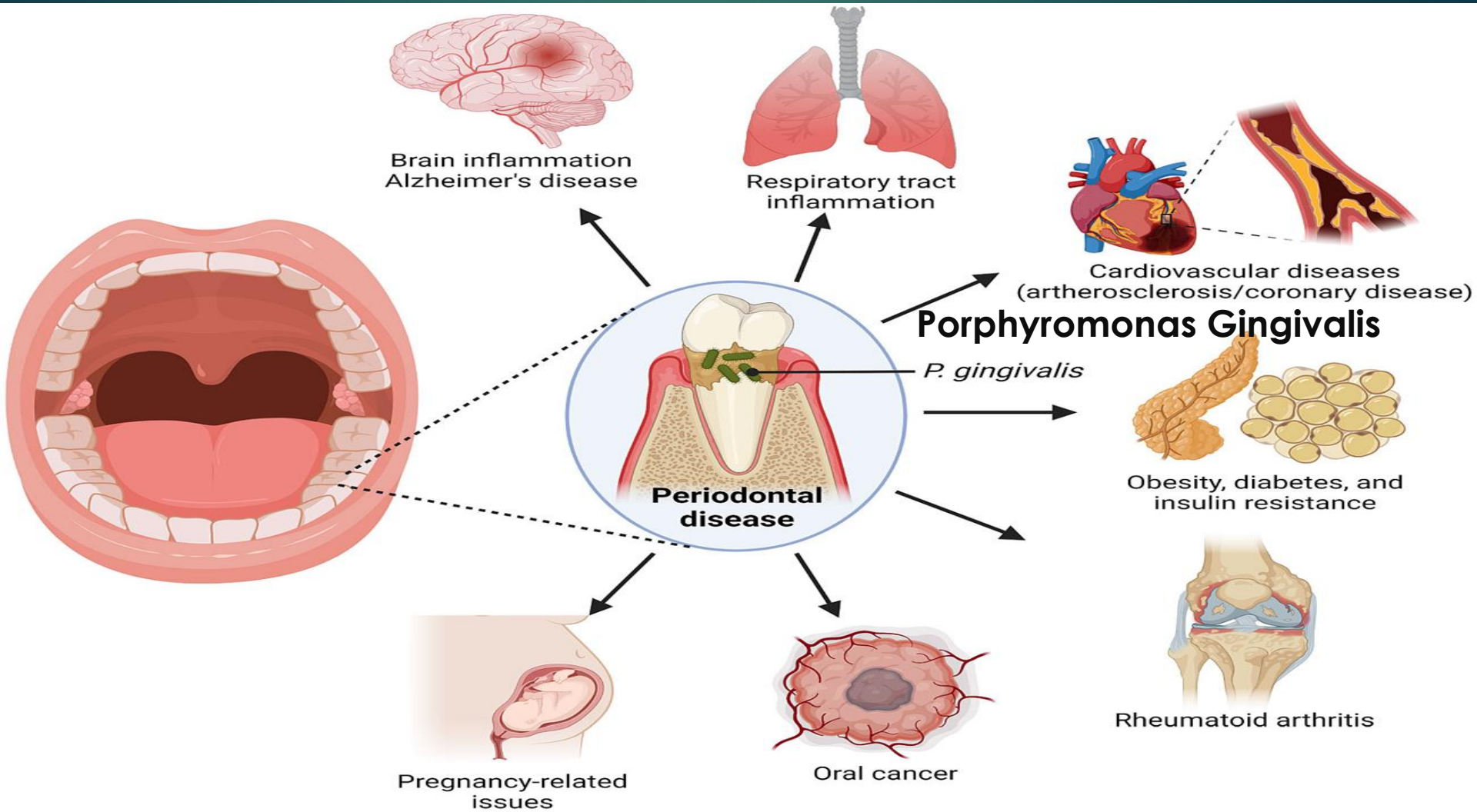
2. Sibling's influence

3.Peer group

4.Current life circumstances

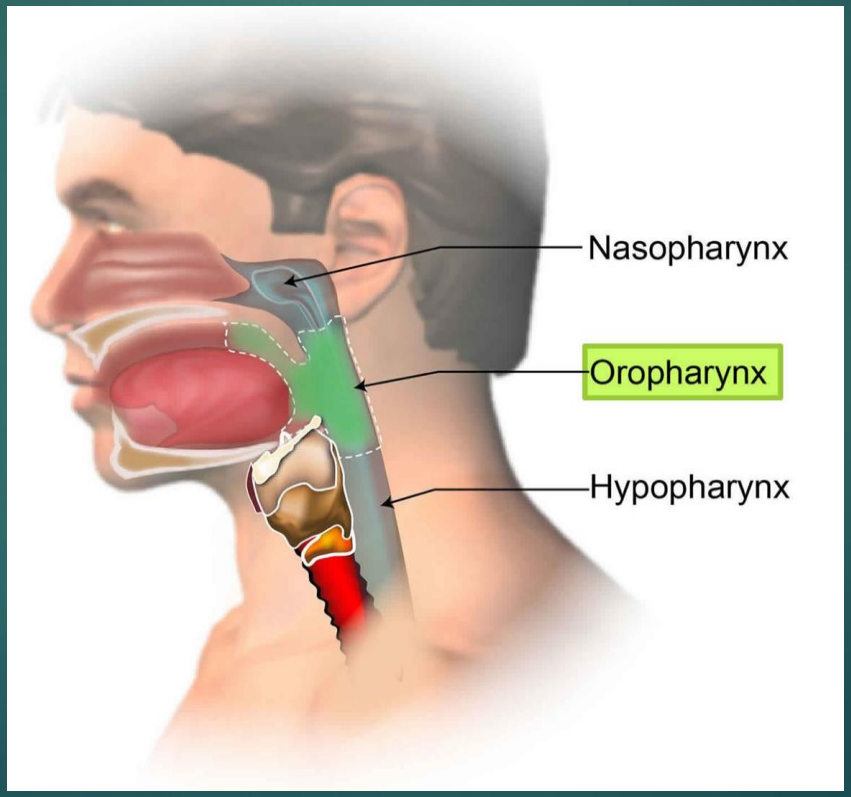
Systemic Diseases and its dental relation

Cardiovascular diseases (CVD) **and periodontitis** has interrelationship because of common bacteria associated with its pathogenesis.

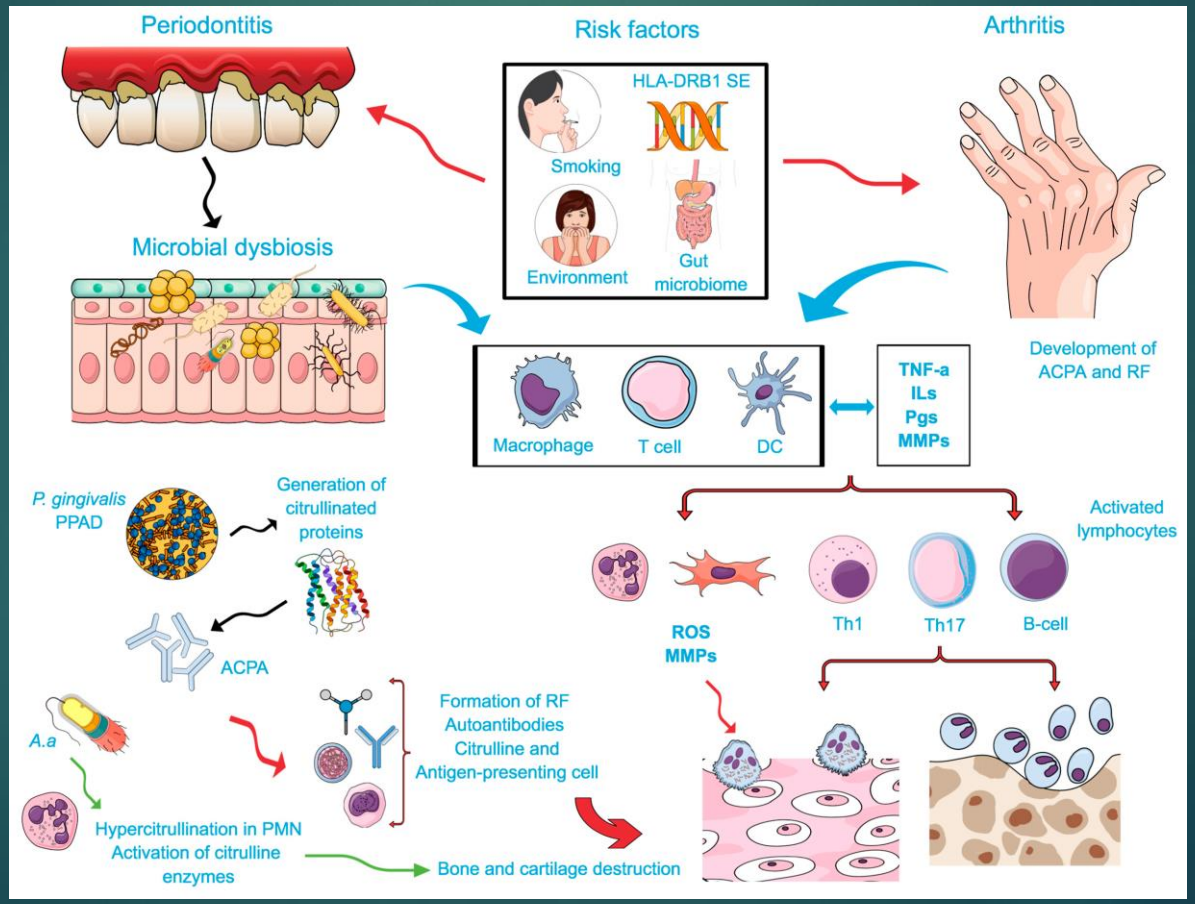


The bacteria that live in your mouth when you have gum disease can cross into your bloodstream, enter the heart, and directly infect the heart valves.

Respiratory infections The main cause of respiratory infections and bacterial pneumonia in adults is aspiration of oropharyngeal bacteria.



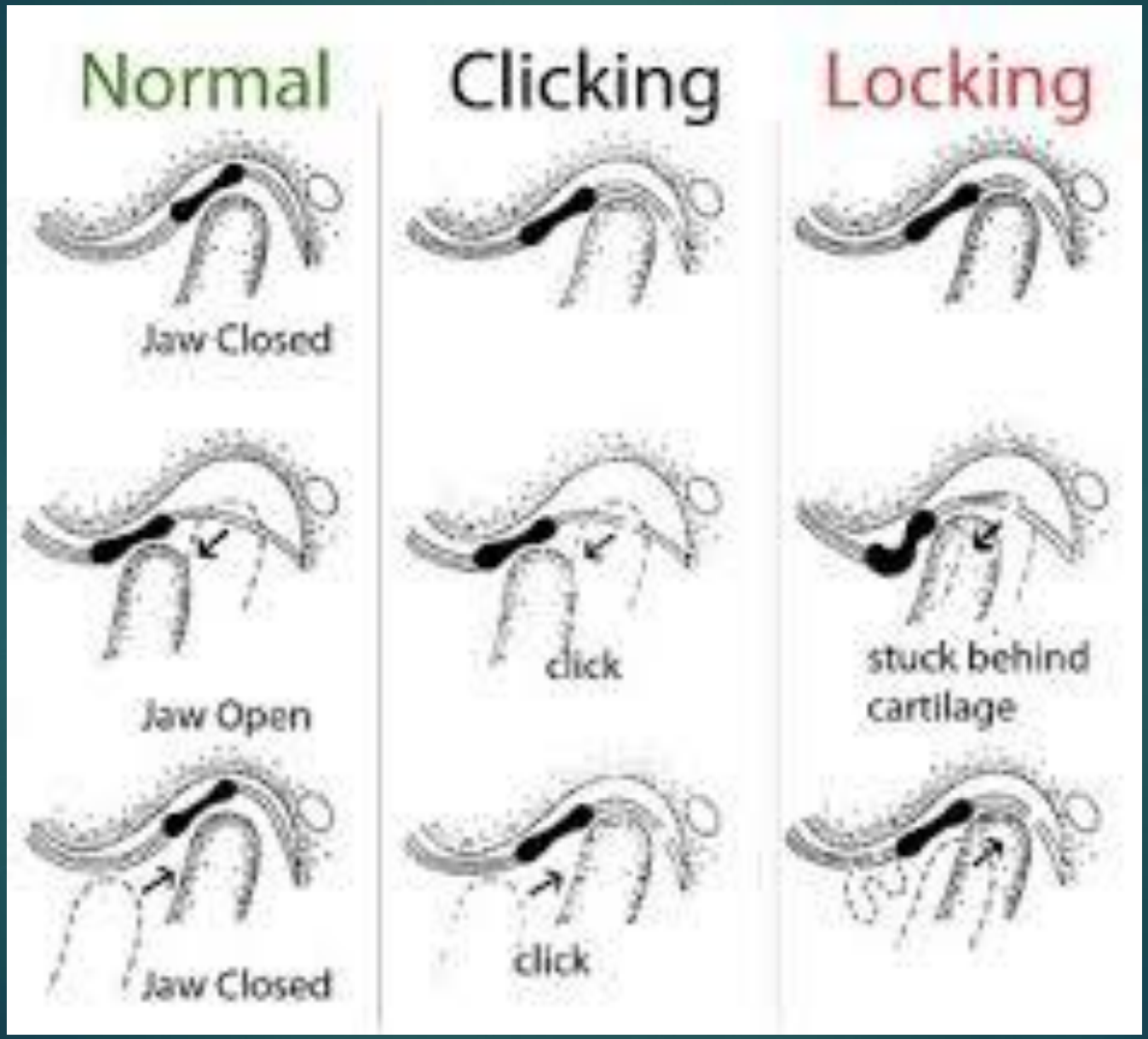
Rheumatoid arthritis (RA) is seen in elderly patients. This RA has similar characteristic of periodontitis as there is a destruction of hard and soft tissues as a result of inflammatory response.



Diabetes Mellitus (DM) It has been proved and found that the patients suffering from Type 1 and Type 2 DM have distinguished dental manifestations such as loss of periodontal attachment, gingival and periodontal abscess, and early loss of teeth.

Effect of Aging on Oral Tissues (Gerontology of the Oral Cavity):

- temporomandibular joint



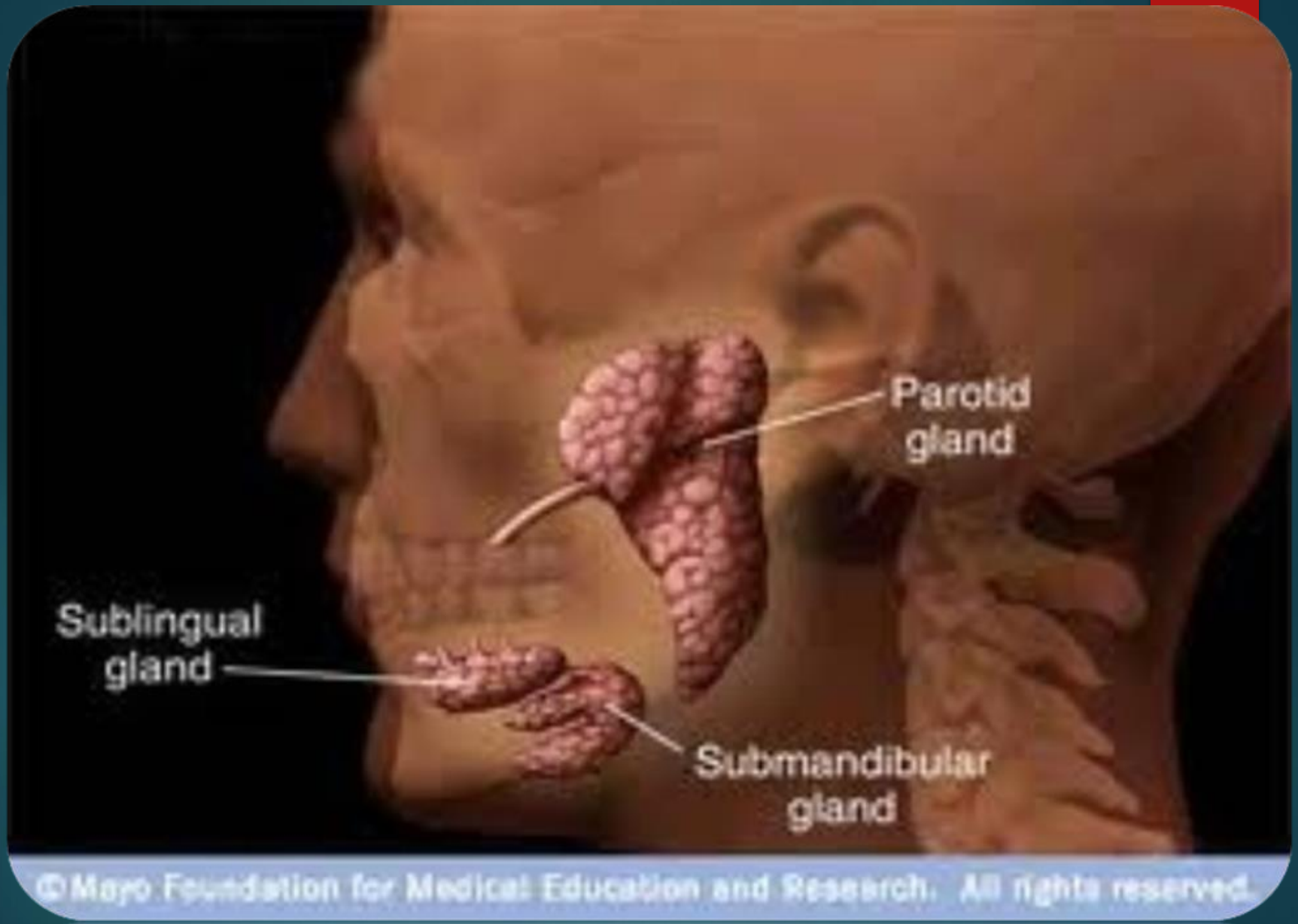
- Abrasion, attrition, and erosion of teeth usually increase with advancing age. The dental pulp becomes smaller.

Salivary glands and saliva

There are 3 major paired & several minor salivary glands present in oral cavity.

Major glands are:- parotid, sublingual, submandibular

Minor glands are:- labial, buccal, palatal Primary function-exocrine production of saliva.


Parotid gland
Sublingual gland
Submandibular gland
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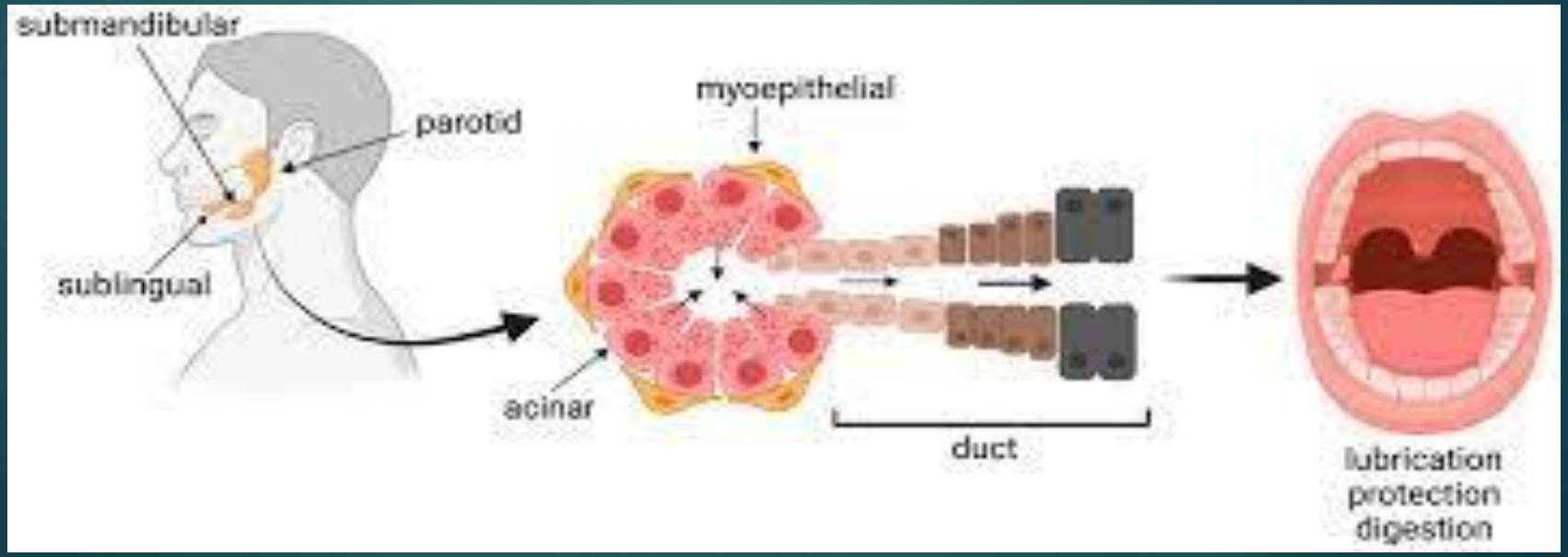
Major roles of saliva in maintenance of oral health:

- Preparation & translocation of food bolus.
- Lubrication of oral mucosa.
- Preservation of microbial balance.
- Mechanical cleansing.
- Antibacterial &antifungal activities.
- Maintenance of oral ph.
- Remineralization of dentition.
- Mediation of taste activity.

The salivary glands produce fluid that contains enzymes to help us to digest our food. These glands contain a tree-like network of cells – known as acinar cells – that **produce the fluid**, and cells that form ducts to transport the fluid out of the glands.



Salivary function during aging

A quite linear loss of acinar cells, replaced by fatty or connective tissue.

- Submandibular gland – 40% loss of acinar cells
- Parotid gland - 30% loss of acinar cells
- Minor labial glands - 45% loss of acinar cells.

Oral mucosal barrier

The oral mucosa performs essential protective function:

- It provides the first line of defence.

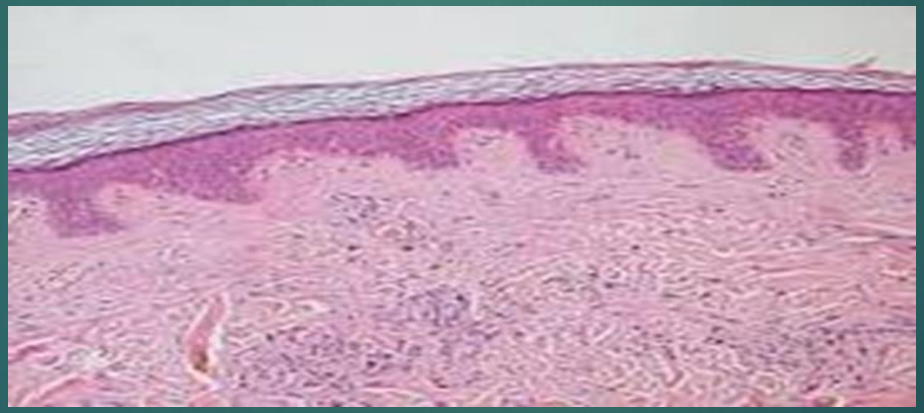
- Specialized mucosal sensory detectors serve to warn us of many potentially harmful situations such as spoiled food stuffs, temperature extremes, sharp objects, etc.

- Mucosal epithelial cells synthesize keratin & laminin Preserve structural integrity & restore wound healing.

Effects of aging on periodontium

❖ Gingival epithelium

- Thinning & decreased keratinization of the gingival epithelium
- Flattening of rete pegs, altered density.
- Migration of functional epithelium from its position in healthy individual (on enamel) to more apical position on the root surface with accompanying gingival recession.



Rete pegs are the epithelial extensions that project into the underlying connective tissue.

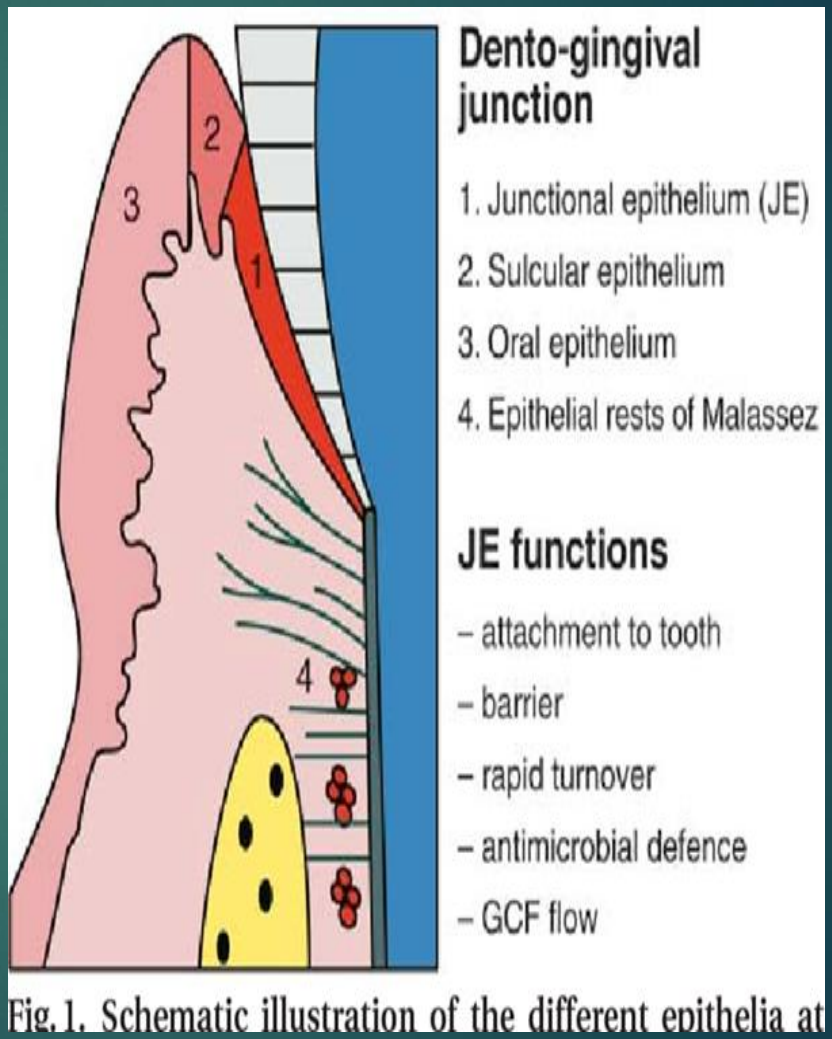


Fig. 1. Schematic illustration of the different epithelia at

Periodontal Disease Etiology

1. Gram positive and negative bacteria.
2. Exacerbated in the elderly by Arthritis, Stroke, and poor hygiene.

Treatment:

1. Antimicrobial therapy (chlorhexidine 0.12% mouth wash, Collagen-impregnated tetracycline sulcular fibers, metronidazole 500mg qid or clindamycin 300 mg qid for 10 days).
2. Surgical elimination of pockets.

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Efficacy of clindamycin compared with amoxicillin-metronidazole after a 7-day regimen in the treatment of periodontitis in patients with diabetes: a randomized clinical trial

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Abstract

Go to:

Objective

To determine the efficacy of clindamycin compared with amoxicillin-metronidazole after a 7-day regimen during nonsurgical treatment of periodontitis in patients with type 2 diabetes mellitus.

Research design and methods

In this double-blind, randomized clinical trial, a total of 42 patients with chronic periodontitis and type 2 diabetes were included. Patients were randomly assigned to treatment with either clindamycin or amoxicillin-metronidazole three times a day during 7 days. Clinical determinations (probing depth, bleeding on probe, and plaque index) were performed to determine the extent and severity of periodontitis before and after the pharmacological treatment.

Results

After 7 days of administration of clindamycin or amoxicillin-metronidazole, no differences were observed between the clinical determinations, probing depth (0.44 vs 0.50 mm, p=0.624), plaque index (17.62 vs 15.88%, p=0.910), and bleeding on probing (16.12 vs 22.17%, p=0.163), respectively. There were no adverse events in either group.

Conclusion

The administration during 7 days of clindamycin or amoxicillin/metronidazole showed the same efficacy for the reduction of probing depth, plaque index, and bleeding on probing in patients with periodontitis and type 2 diabetes.

Keywords: periodontal disease, type 2 diabetes, antibiotics

❖ Cementum

- Cementum continuously be laid through out life.
- A thickening of cementum is observed on teeth that are not in function (hypercementosis).
- Increase in cemental width (5-10 times) as cementum deposition is continues after tooth eruption.
- Increase in width is greater apically & lingually.

- **Alveolar bone** (in relation to periodontium)
  - A more irregular PDL surface of bone and less irregular insertion of collagen fibers.

  - Healing of bone in extraction socket appears to be unaffected by aging.

- **Bacterial plaque**

Dento-gingival plaque accumulation increase because increase in hard tissue surface area as a result of gingival recession and the surface characteristic of the exposed root surface for plaque formation compared to enamel.

Aging and teeth

Enamel changes

Attrition It may be defined as physiological wear of occlusal or incisal surfaces and proximal contacts as a result of mastication, physiologic tooth movement, functional or para-functional movements of mandible.

Clinical features

a) Small polished facets on cusp tips.
b) Slight mobility of teeth in their sockets.
c) Decreased cusp height.
d) Flattening of occlusal plane.
e) Shortening of length of dental arch.

Dentin changes

- **Vitality of dentin**

Since odontoblasts & its processes are integral part of dentin, therefore, there is no doubt that dentin is vital tissue.

- It is laid throughout life, however dentinogenesis slows with advancing age.

Aging and functional changes in dentin

reparative\secondary dentin

If attrition, abrasion, erosion, cavity cutting procedures causes odontoblast processes to cut or exposed, either they die or if they live they form dentin called as reparative dentin.

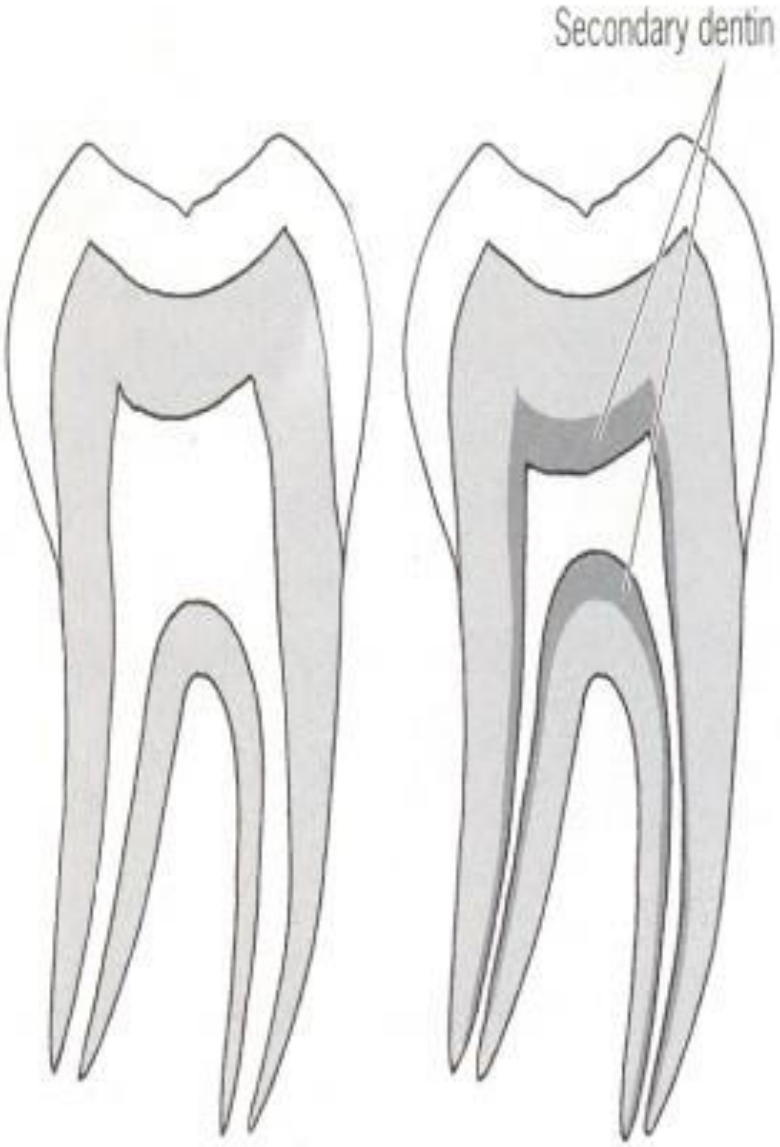
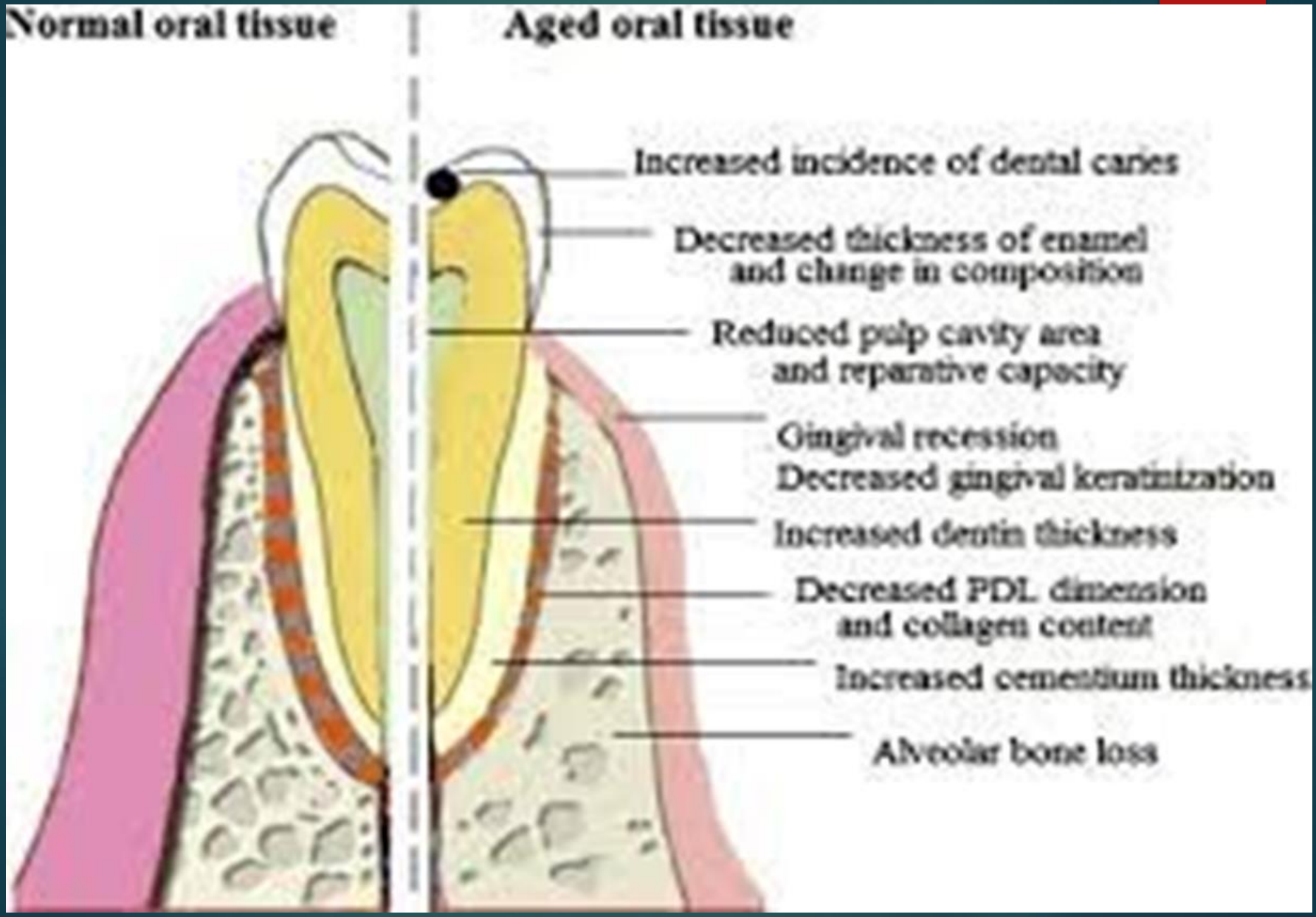


Fig. 5-5. Diagram of tooth showing the narrowing of the pulp chamber by secondary dentin. Note that relatively more secondary dentin is deposited on the ceiling and floor of the pulp chamber than on the walls.

Pulp cell changes:



Pulp stones /denticles

- They are defined as nodular, calcified masses appearing in either or both the coronal or root portion of pulp organ.
- They are seen in functional as well as embedded unerupted teeth.

Tooth Loss

- Not a normal part of aging.
- A consequence of oral disease:

✓ *Caries*
✓ *Periodontal disease*
✓ *Often associated with systemic diseases*

Improving dental health care has led to significant declines in the number of edentulous adults with increased retention of teeth into old age.

Tongue

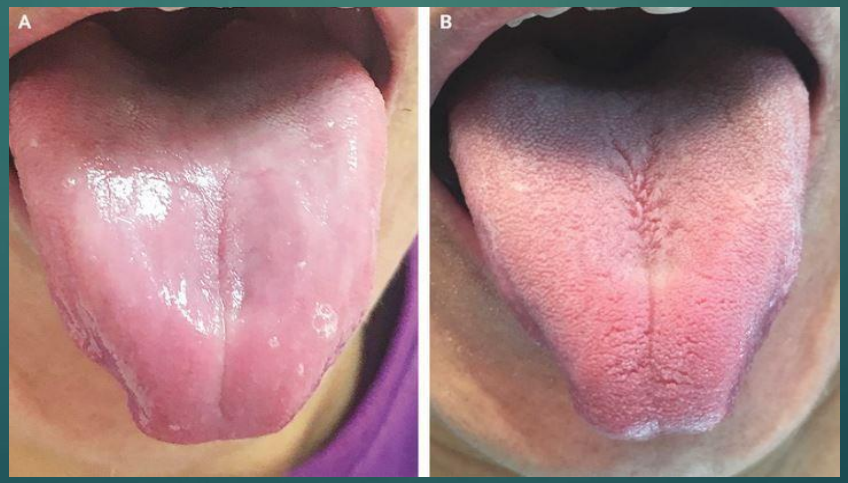
- It seems to increase in size in edentulous mouth.
- Enlarged tongue have negative effect on retention of denture.
- There is depapillation.
- Fissuring is also common.
- There is also reduction in the taste buds.

Taste

Reasons for decline in sense of taste are unclear

- Possible decline in number of taste buds
- Possible decline in density of taste buds
- Possible decline in sensitivity of taste buds

All of the above also possible.



Medications Known to Interfere with Taste

- Antibiotics: Ampicillin Azithromycin (Zithromax).
- Ciprofloxacin (Cipro) Clarithromycin (Biaxin).
- Metronidazole (Flagyl).
- Tetracycline.
- Anticonvulsants: (Tegretol).

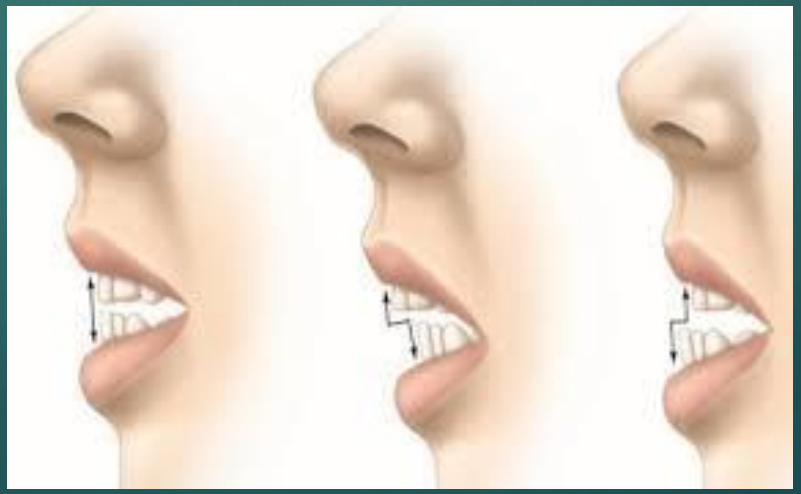
Oral motor performance:

Speech

Speech production is most resistant to aging but that does not mean there are no age-related changes in speech.

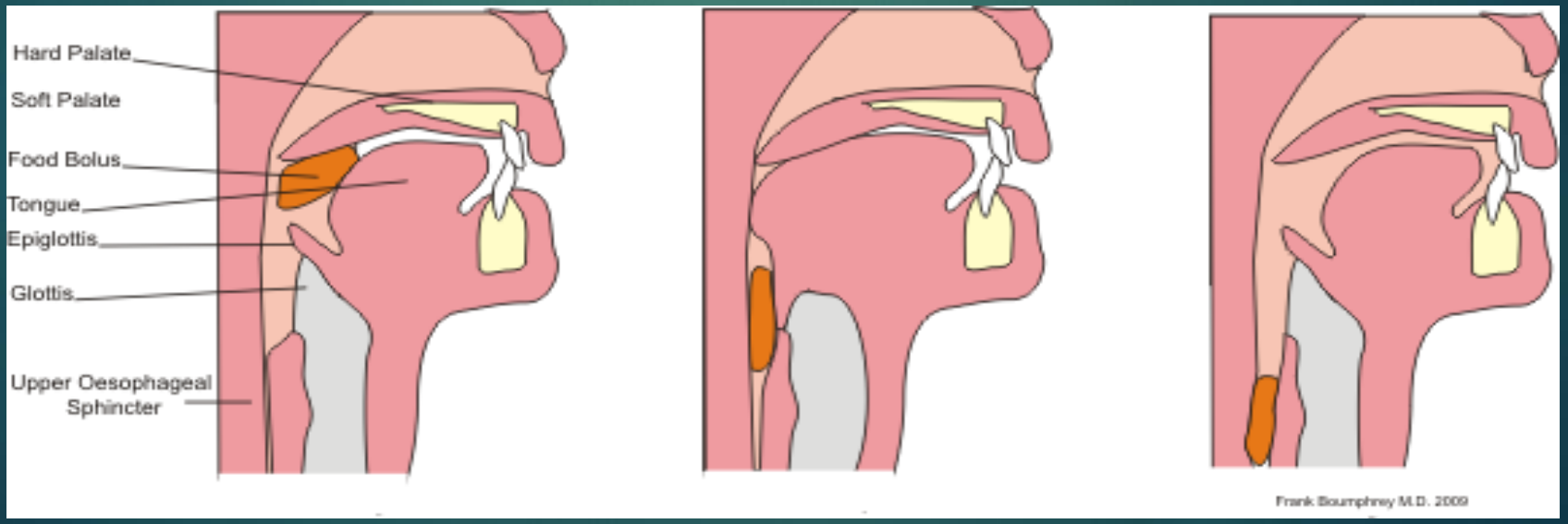
Other speech changes may occur due to:

- Edentulous patient (partial or complete)
- ill-fitting prosthesis.



Swallowing

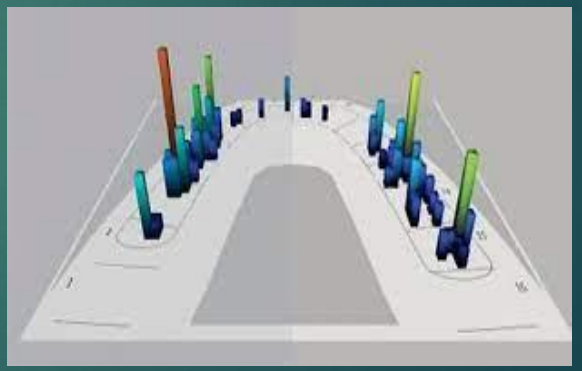
- Reduced chewing effectiveness.
- Decreased tongue strength.
- Muscle atrophy and an increase in fatty and connective tissue in the tongue.
- Atrophy of the alveolar bone with lost dentition.
- Swallowing disorders.



Atrophy of masticatory muscles and masticatory ability and performance

Masticatory ability: it is an individual's own assessment of his/her masticatory function.

Masticatory efficiency: it is the capacity to grind the food during mastication.




Thanks