

Principles of periodontology –I

PER 711

Why study periodontology?

Dr. Sivaraman Prakasam

(slide courtesy: Dr. Katancik).

Periodontology Curriculum

- DS1
 - PER 711 Principles of Periodontology I
 - PER 712 Principles of Periodontology II
- DS2
 - Special topics in Periodontology
 - Surgical Periodontics
- DS3/DS4
 - Patient contact as part of comprehensive care
 - Periodontics Honors Elective

PER 711

- Didactic
 - Periodontium in Health
 - Periodontal Clinical examination
 - non surgical periodontal therapy
 - Patient compliance.
- Simulation
 - Probing, periodontal measurements;
 - Non surgical instruments and instrumentation.
 - Oral hygiene measures
- Clinical
 - Medical evaluation
 - Periodontal charting
 - Oral hygiene measures
 - Prophylaxis/non surgical therapy.

Objectives

- What is Periodontology? Periodontitis?
- How common are periodontal diseases?
- People lose teeth because of cavities – right?
- What does this have to do with restorative dentistry?
- Do periodontal (oral) diseases have anything to do systemic health?
- What does a Periodontist do?

Terminology

- *Periodontology*: The scientific study of the periodontium in health and disease.
- *Periodontal diseases*: The pathologic processes affecting the periodontium; most often gingivitis and periodontitis.
 - *Periodontitis*: Inflammation of the periodontal tissues resulting in clinical attachment loss, alveolar bone loss, and periodontal pocketing.

How common are periodontal diseases?

Epidemiology: the branch of medicine that deals with the incidence, distribution, and possible control of diseases and other factors relating to health.

Study by the Centers for Disease Control and Prevention (CDC) and the American Academy of Periodontology (AAP)

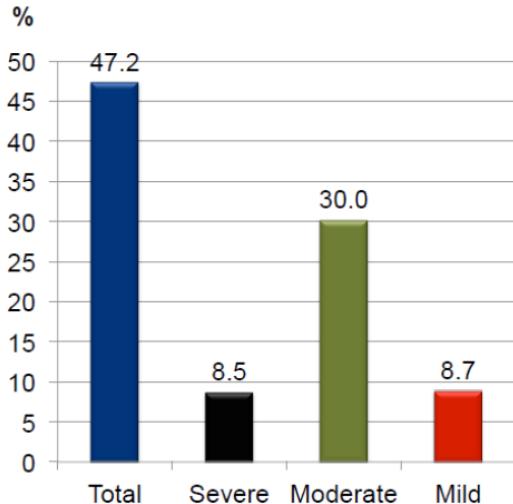
- Describe the burden, distribution and trends of periodontal disease in the adult U.S. population
- Identify persons/populations at high risk for periodontal disease
- Elucidate and measure attributable risk of periodontal disease

Eke PI, Dye BA, Wei L, Thornton-Evans GO, and Genco RJ. Prevalence of Periodontitis in Adults in the United States: 2009 and 2010. *J Dent Res* 91(10): 914-920, 2012

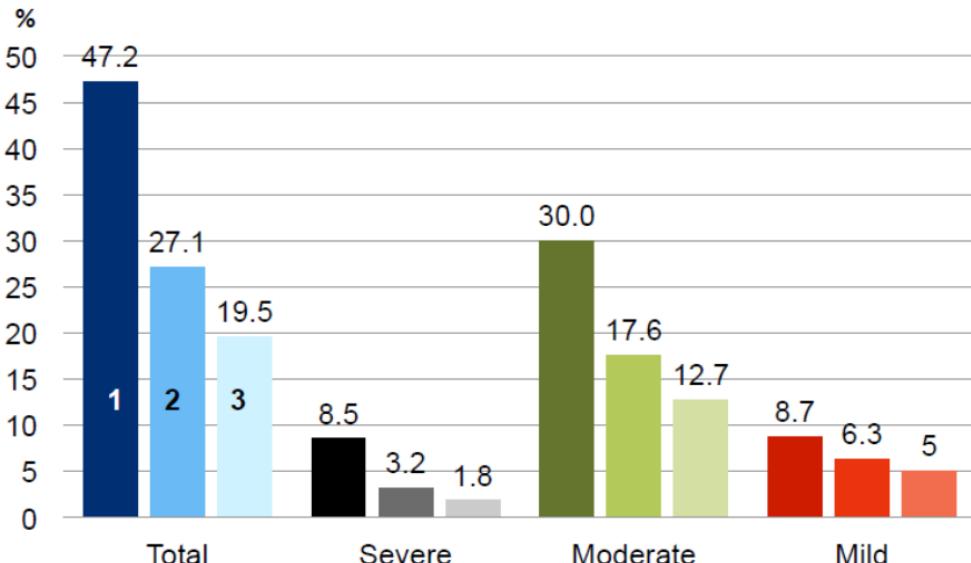
Why bother?

- Understand the relationship between periodontal and other chronic diseases at the population level
- Develop intervention strategies, programs and evaluate the effectiveness in preventing and controlling periodontal diseases
- Evaluate social and economic impacts of periodontal diseases in adults

Prevalence of Periodontitis
U.S. Adults \geq 30 years

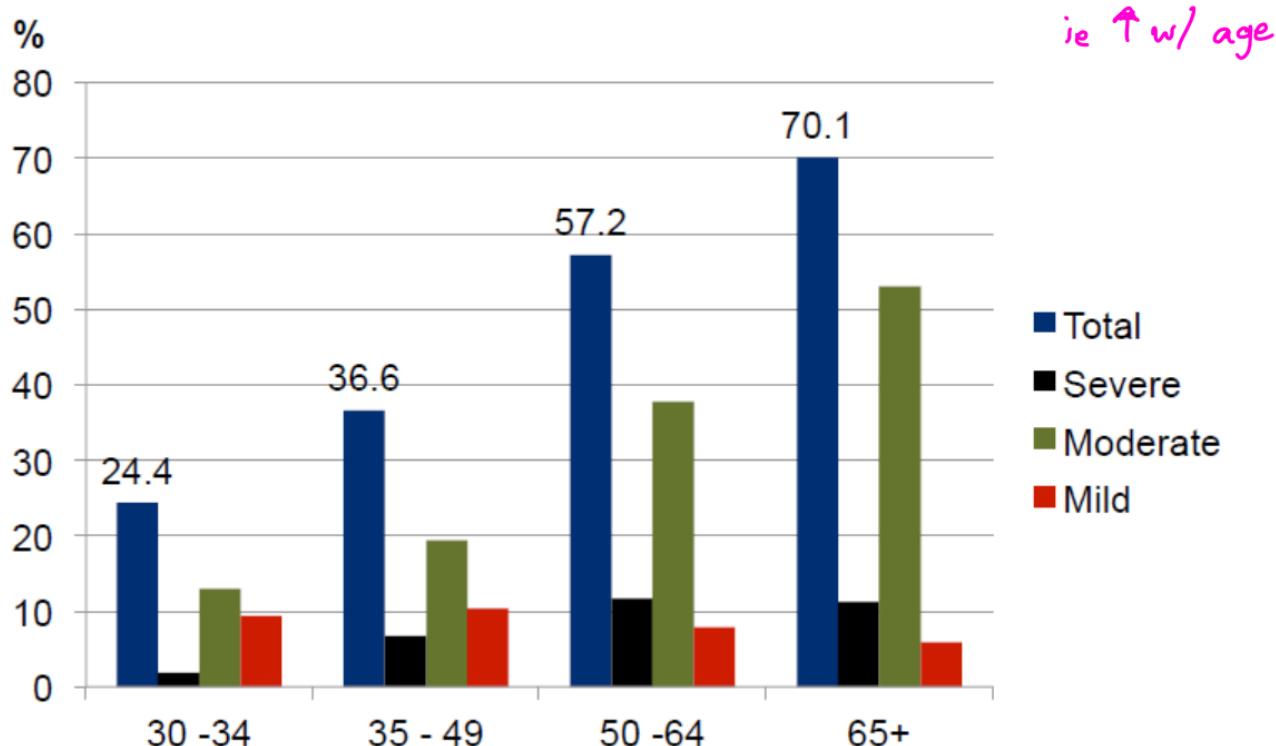


Prevalence: Full Mouth (FMEP) vs.
Partial Mouth Examination Protocols (PMEP)

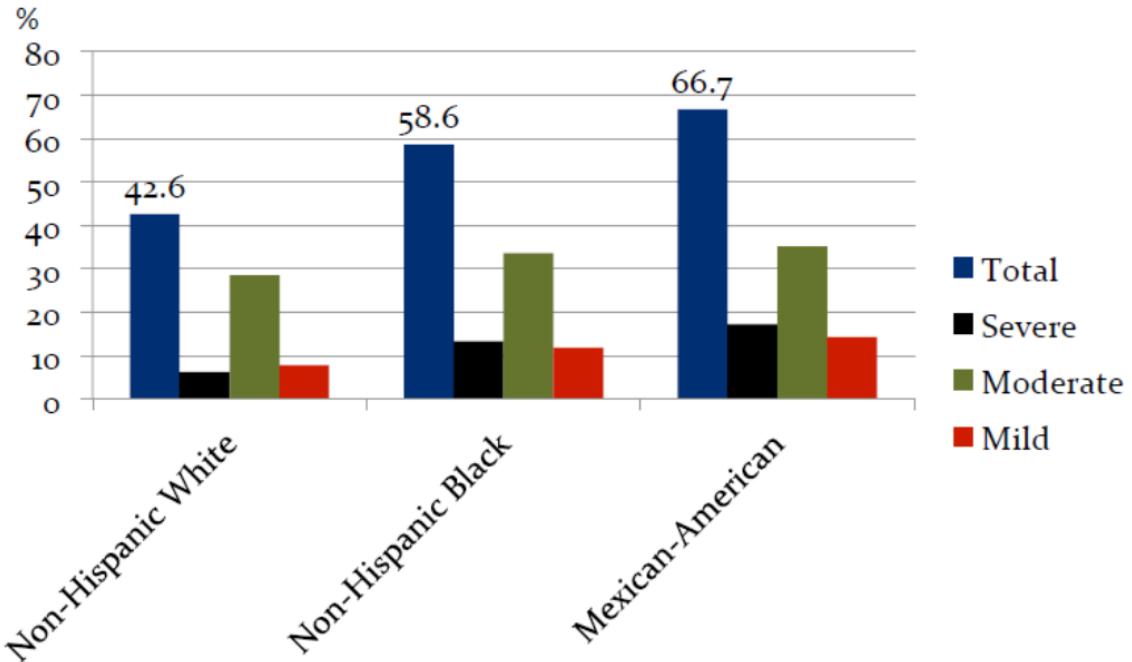


(1) NHANES 09-10 FMEP (2) NHANES 2000 PMEP (3) NHANES III PMEP

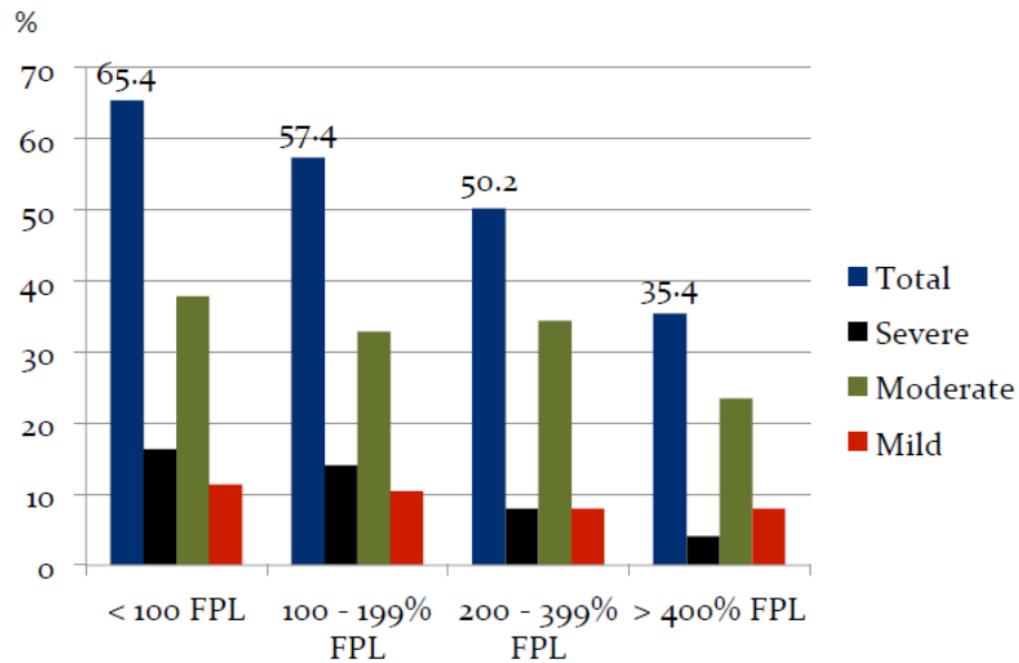
Prevalence of Periodontitis by Age Groups



Periodontitis by Race/Ethnicity

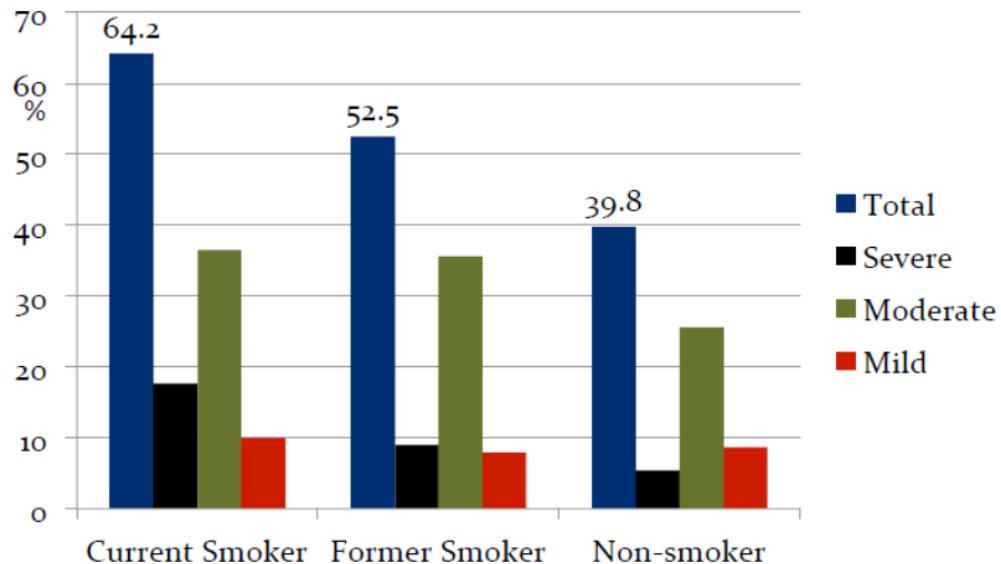


Periodontitis by Poverty Levels



Federal Poverty Level (FPL) 2015 = \$11,770 for individuals

Periodontitis by Smoking Status



Current smoker: 100 cigarettes in life and currently smoking

Former smoker: 100 cigarettes in life but not currently

Non-smoker: never smoked

Conclusions

- This is the first time we have direct evidence of a high burden of periodontitis
- Moderate periodontitis increases with age
- Severe and mild periodontitis remains <15% across all age groups
- Disparities by socio-economic status, race/ethnicity and counties
- Important implications for aging US population
- Data collection continued into 2014

*

THE AMERICAN ACADEMY OF PERIODONTOLOGY WARNS OF A SIGNIFICANT PUBLIC HEALTH PROBLEM

HALF OF AMERICAN ADULTS SUFFER FROM GUM DISEASE

47.2%

Have periodontitis

THAT'S
64.7

Million
Adults 30 years
and older

8.7%

Mild Periodontitis

30%

Moderate Periodontitis

8.5%

Severe Periodontitis



*SOURCE: P.I. Eke, B.A. Dye, L. Wei, G.O. Thornton-Evans, and R.J. Genco. Prevalence of Periodontitis in Adults in the United States: 2009 and 2010. J DENT RES 0022034512457373, first published on August 30, 2012 as doi:10.1177/0022034512457373

Tooth Loss by Age

Age	Teeth Remaining (mean)	Edentulous (percentage of adults)
20-39	26.6	< 1
40-59	23.9	4.9
≥60	19.4	24.9

Surveillance for Dental Caries, Dental Sealants, Tooth Retention, Edentulism, and Enamel Fluorosis --- United States, 1988--1994 and 1999--2002

Reason for Tooth Extraction

- Ten-year incidence of tooth loss and dental caries in elderly Swedish individuals
- 208 participants followed for up to 10 years
 - Dental caries and its sequelae accounted for 60% of extractions
 - Periodontitis accounted for 35%

Fure, S. Ten-Year Incidence of Tooth Loss and Dental Caries in Elderly Swedish Individuals. *Caries Res* 2003;37:462-469

Periodontal health

As it relates to restorative dentistry.

Partially Edentulous Patients

- Tooth supported and implant supported fixed/removable partial dentures and implant supported single crowns
- Long-term success depends on the periodontal condition being stabilized

Dhingra K. O Oral Rehabilitation Considerations for Partially Edentulous Periodontal Patients. *J Prosth* 21 494-513 (2012)

Survival rates and complications of fixed dental prostheses (FDPs) in periodontal patients

- Periodontal tissue support and the survival of FDPs after a follow-up of at least 5 years
- Survival of FDP and abutment teeth
- Conclusion: *If periodontally maintained* both the FPDs and abutment teeth have 95% or better success rates

Ante's (1926) law revisited: a systematic review on survival rates and complications of fixed dental prostheses (FDPs) on severely reduced periodontal tissue support. *Clin Oral Impl Res* 18 (Suppl. 3), 2007/63-72

Risk of Implant Failure and Marginal Bone Loss in Subjects with a History of Periodontitis

- marginal bone loss around implants and implant failure in subjects with a history of periodontitis compared with periodontally healthy subjects in studies with a minimum 3-year follow-up.
- periodontitis subjects were at significantly higher risk for implant failure and greater marginal bone loss as compared with periodontally healthy subjects

Risk of Implant Failure and Marginal Bone Loss in Subjects with a History of Periodontitis: A Systematic Review and Meta-Analysis. *Clin Implant Dent Related Res*, 12(3), 165-174 2010

Implant outcomes in treated periodontitis patients

- determine implant outcomes in partially dentate patients who have been treated for periodontitis compared with periodontally healthy patients
- patients treated for periodontitis may experience more implant loss and complications around implants than non-periodontitis patients.

Ong CTT, Ivanovski S, Needleman IG, Retzepi M, Moles DR, Tonetti MS,
Donos N. Systematic review of implant outcomes in treated periodontitis subjects.
J Clin Periodontol 2008; 35: 438–462

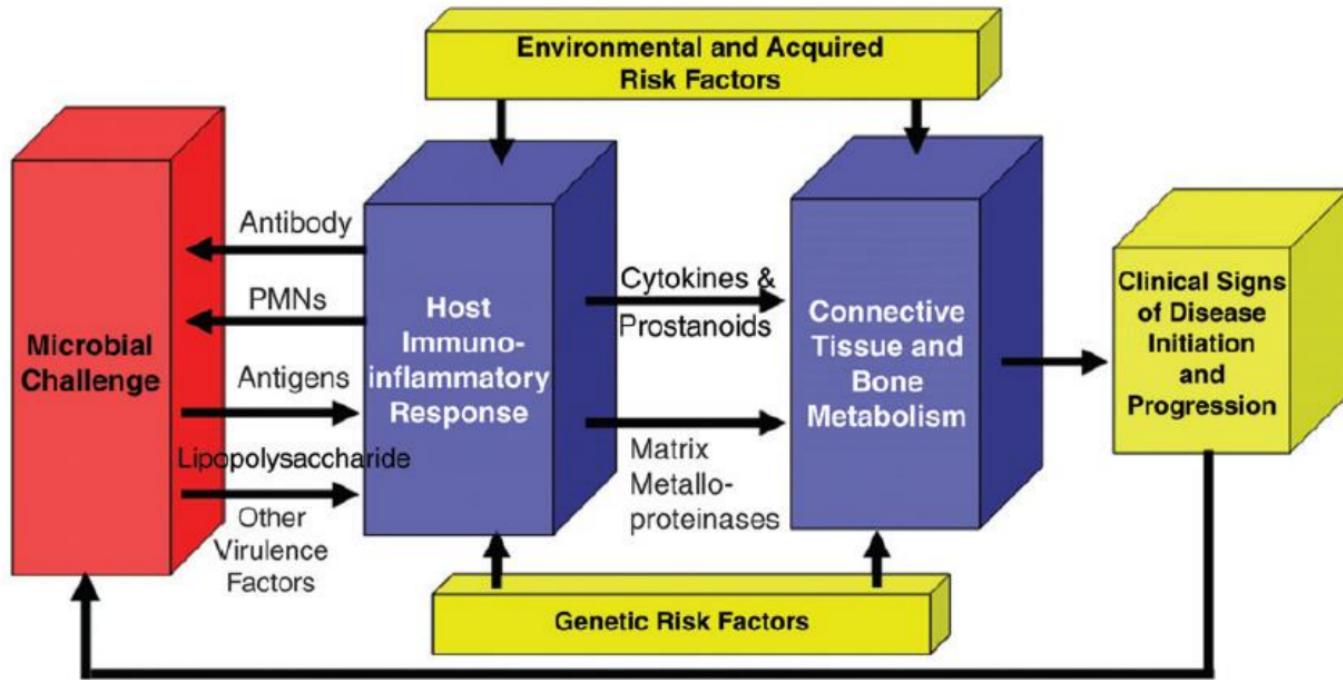
Periodontal health

& systemic health

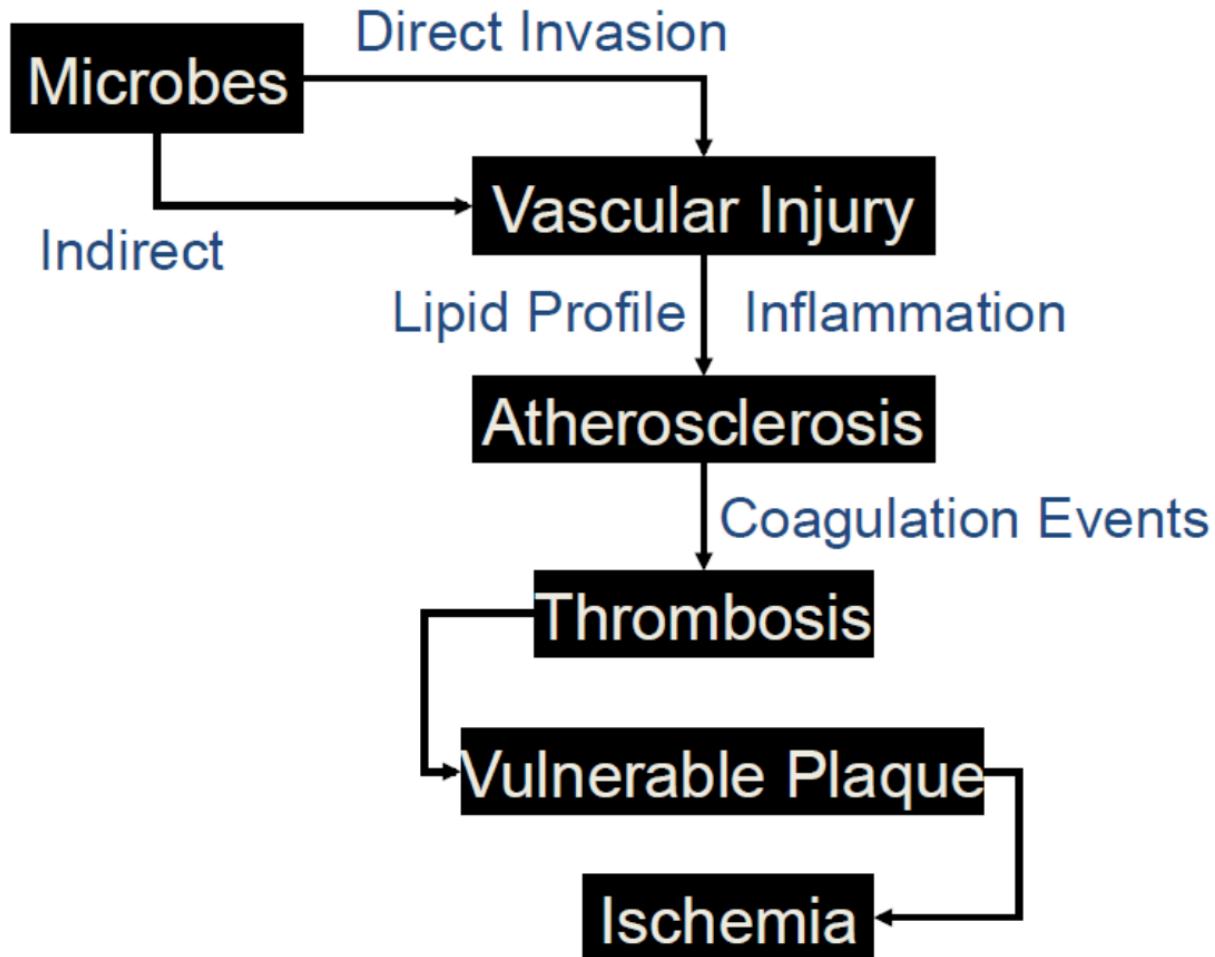
Periodontal disease and...

- Cardiovascular disease
- Diabetes mellitus
- Adverse pregnancy outcomes
- Respiratory diseases
- Cancers





how periodontitis occurs



Career Opportunities

- clinical practice
- academics
- administration
- research

The over 4,000 active U.S. Periodontists represent a multitude of practice settings (e.g., solo practices, group practices, hospitals, dental schools, and community clinics)

Dental Student Periodontics

Our goal:

Diagnose and treat mild to moderate periodontitis
and manage more severe periodontitis cases

- Non-surgical therapy
- Periodontal maintenance
- Occlusal therapy
- Hands on surgical therapy – assisting and surgical experience

Advanced Program in Periodontics

- Osseous surgery and open flap debridement
- Guided tissue regeneration (GTR)
- Root resection
- Biopsy
- Frenectomy
- Fiberotomy
- Uncovering impacted teeth
- Tori removal
- Conscious (IV) sedation

Advanced Periodontics

- Implants and implant-related procedures
 - Extractions
 - Bone grafting (GBR)
 - Sinus augmentation
- Soft-tissue grafting (CTG and FGG)
- Crown lengthening

Advantages of Periodontics as a Specialty

- Long-term relationships with patients
- Interdisciplinary treatment
 - Work closely with restorative dentists and all specialties
- Variety of procedures

Research

- research project concurrent with clinical and didactic components the clinical certificate in Periodontics (awarded a Masters or Ph.D. degree)
- postdoctoral students are exposed to relevant biomedical and population sciences including:
 - oral microbiology
 - Immunology
 - connective and mineralized tissue biology
 - epidemiology

Finit

For now!

Periodontium in Health

Dr. Sivaraman Prakasam

Objectives

- List the components of the normal periodontium and identify cells associated with the periodontium
- Describe the relationship of the gingival epithelium to the tooth.
- Describe the relationship of the gingival fiber groups within gingival corium to the gingival epithelium and the tooth.
- Identify clinical features of healthy gingiva
- Identify the fibers and cellular components of the periodontal ligament (PDL) & define the role of the periodontal ligament in the periodontium
- Identify the relationship of the mineralized structures of the attachment apparatus Course Goal # 1

Oral Mucosa



- The gingiva and the covering of the hard palate, termed the *masticatory mucosa*
- The dorsum of the tongue, covered by *specialized mucosa*
- The oral mucous membrane lining the remainder of the oral cavity.

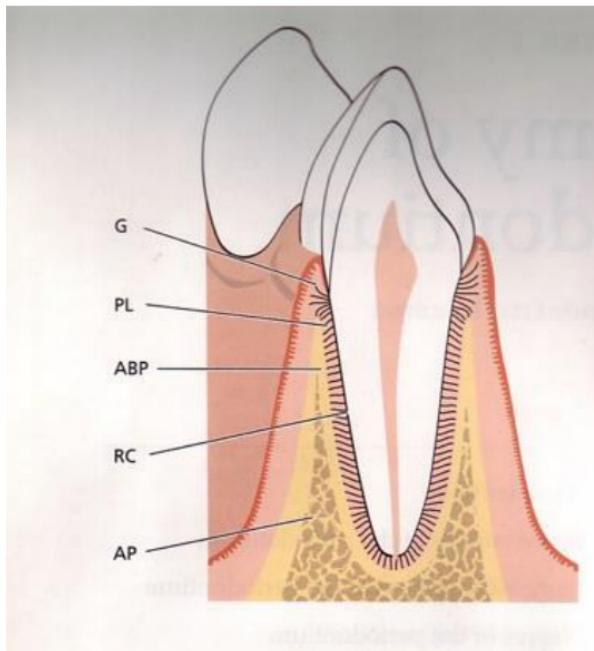


The *gingiva* is the part of the oral mucosa that covers the alveolar processes of the jaws and surrounds the necks of the teeth

The Normal Periodontium

The Periodontium: the investing and supporting tissues of the tooth

- Gingiva (G)
- Periodontal Ligament (PL)
- Cementum (RC)
- Alveolar bone (ABP & AP)



Periodontium

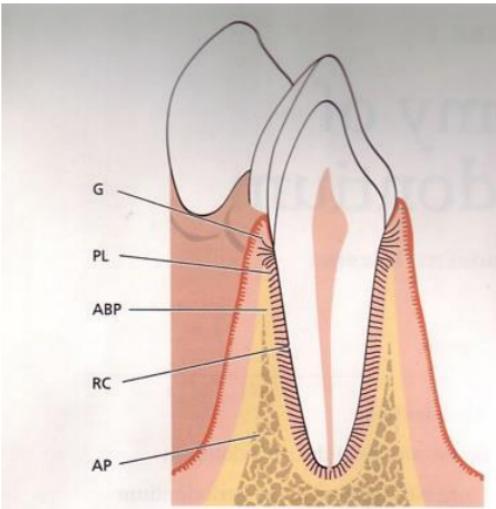
Gingiva

Periodontal ligament

Attachment apparatus

Cementum

Alveolar bone



Periodontium

Soft Tissue

Hard Tissue

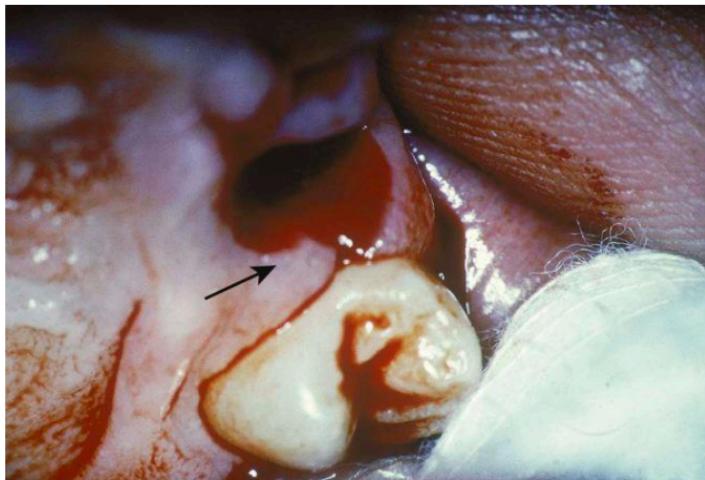
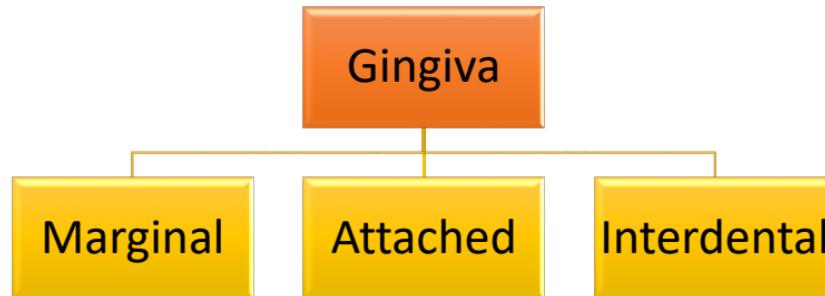
Gingival
epithelium

Connective
tissue

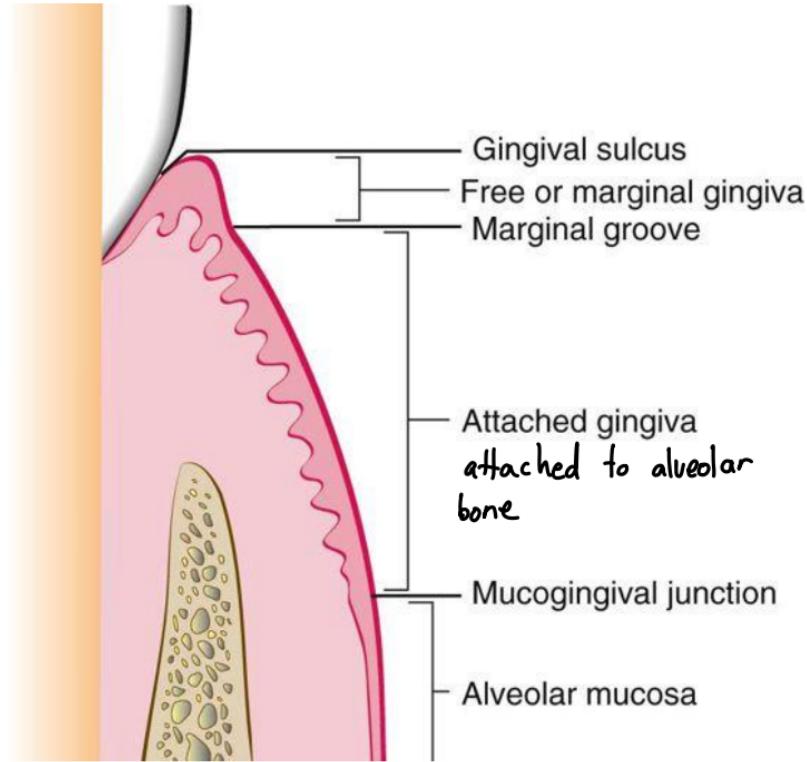
Periodontal
Ligament
(PDL)

Bone

Cementum

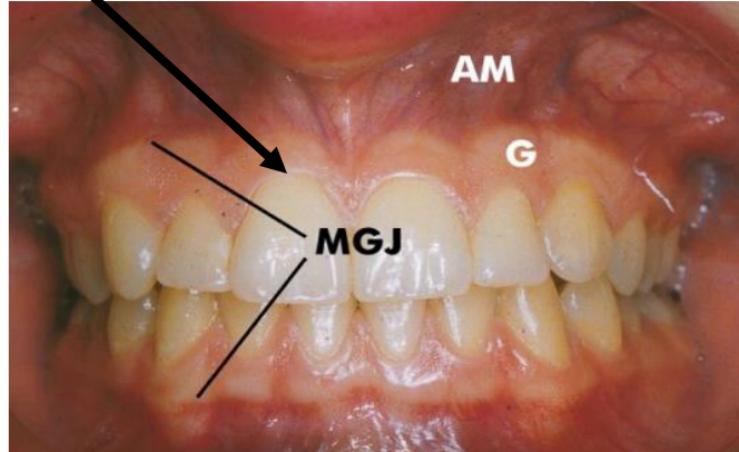
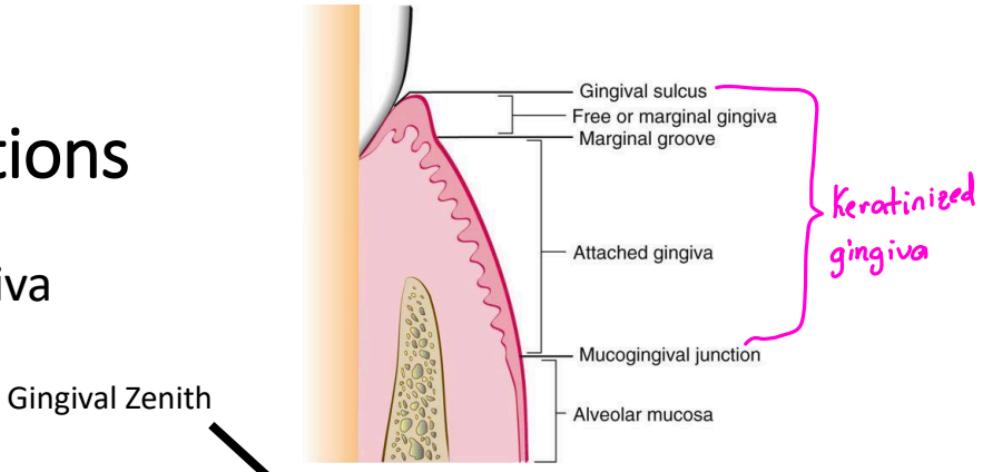


Arrow indicates interdental gingiva - Interdental Papillae and intervening col



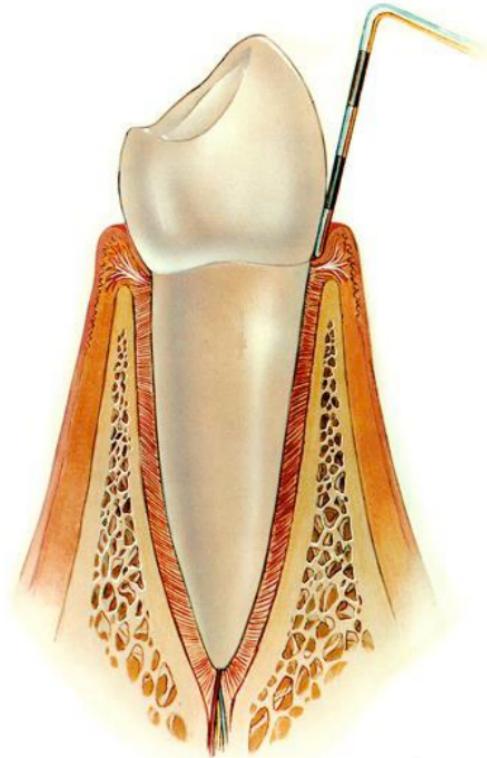
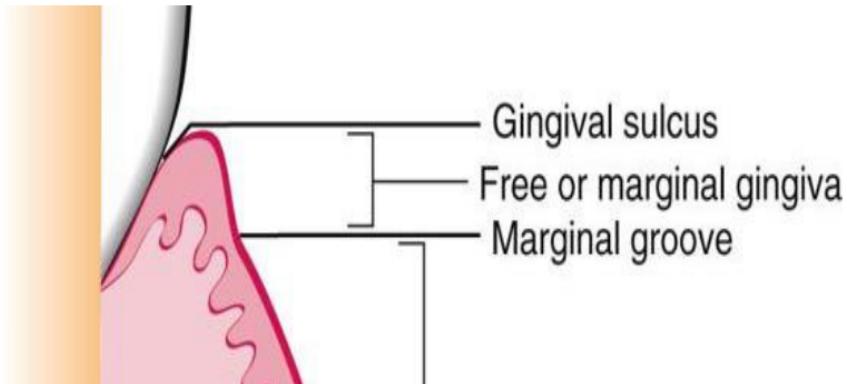
Anatomic delineations/descriptions

- Marginal gingiva + Attached Gingiva
=Width of Keratinized Gingiva
- Gingival Sulcus
- Free or Marginal Gingiva
- Gingival Zenith *most apical part of gingiva*
- Marginal Groove
- Attached Gingiva (G)
- Mucogingival Junction (MGJ)
- Alveolar Mucosa (AM)



The Free or Marginal Gingiva

- unattached gingiva
- the terminal edge of the gingiva surrounding the teeth
- In $\cong 50\%$ of cases its demarcated from the attached gingiva by the marginal groove (1mm wide)
- forms the soft tissue wall of the healthy gingival sulcus
- separated from the tooth surface with a periodontal probe



Attached Gingiva

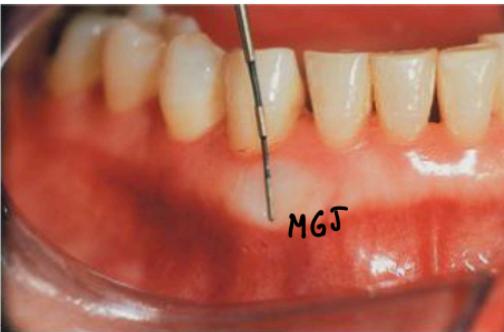
- Is continuous with the marginal gingiva
- Free marginal gingival groove, if present, forms the coronal limit
- It is firm, resilient and tightly bound to the periosteum of alveolar bone.
- It extends apically to the mucogingival junction which separates it from the loose and movable alveolar mucosa.
- Clinically delineated by depth of the sulcus subtracted from width of the Keratinized gingiva

Width of Keratinized gingiva vs. Width of the attached gingiva.

Depth of sulcus – Marginal gingiva



Width of Keratinized gingiva = AG + FG

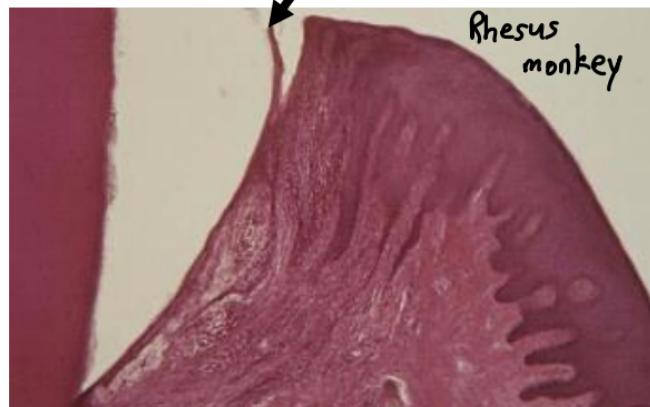


Movable alveolar mucosa
– delineates MGJ

- Marginal gingiva = Depth of sulcus
- Keratinized gingiva = Distance from gingival margin to MGJ
- Gingival margin – most coronal part of the free or marginal gingiva.
- Attached gingiva = Keratinized gingiva – depth of sulcus (Free gingiva).

Gingival Sulcus

- shallow crevice or space around the tooth
- bounded by the surface of the tooth on one side and the epithelium lining the free margin of the gingiva on the other side
- V shaped and barely permits the entrance of a periodontal probe.
- Sulcus depth can be accurately measured only histologically
- Ideal conditions (only experimentally possible) depth = 0mm; histologically healthy human gingival sulcus mean depth \cong 1.8mm
- Surrogate used clinically = Probing depth; probing depth in healthy gingiva = 2-3mm
- Clinically filled with Gingival crevicular fluid



Interdental gingiva



A no recession



C



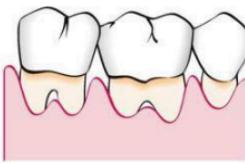
broad contact
cone



narrow contact
pyramid



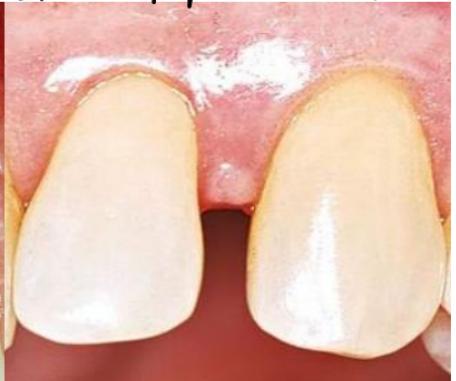
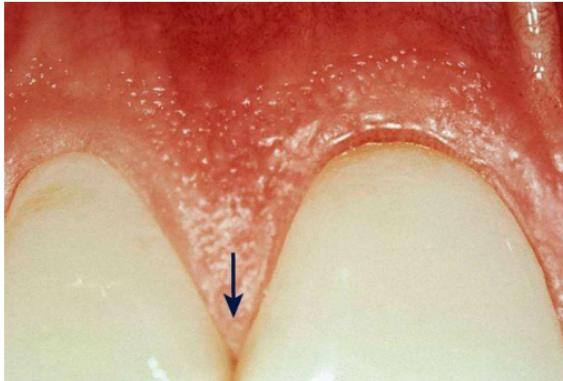
B recession



D

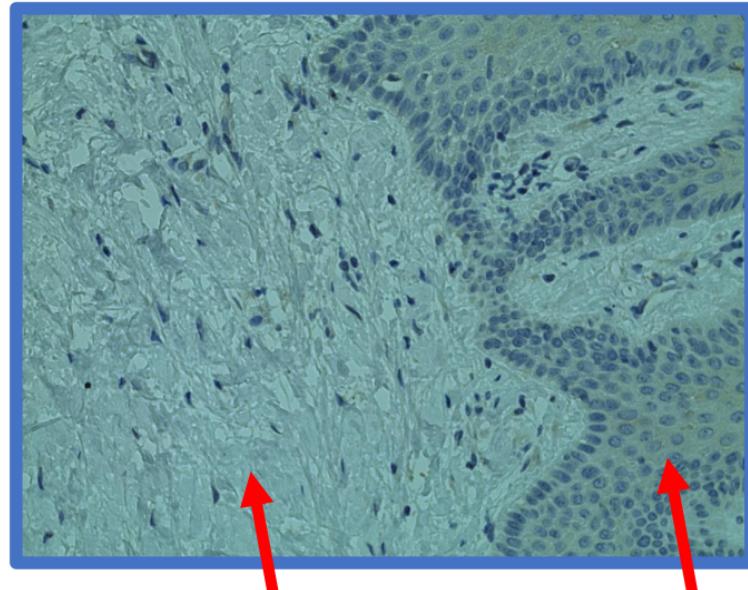
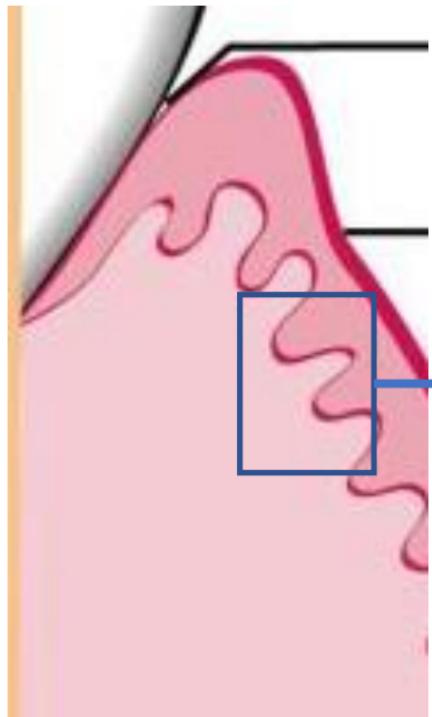


Blunted papilla - lose cone shape



- In health it fills the gingival embrasure, which is the interproximal space apical to the tooth contact
- Can be pyramidal or can have a col shape

Microscopic features of Gingiva



Connective tissue

Epithelium

Gingival Epithelium

- Consists of a continuous lining of stratified squamous epithelium
- Three areas based on morphologic and functional characteristics:
 1. Oral or outer epithelium
 2. Sulcular epithelium
 3. Junctional epithelium
- The principle cell type is the keratinocyte – (produces Keratin)
- Other cells - Langerhans cells, the Merkel cells, and the melanocytes.

Histological Section of the Gingiva

* - connective tissue papillae – Rete ridges

A - dentin

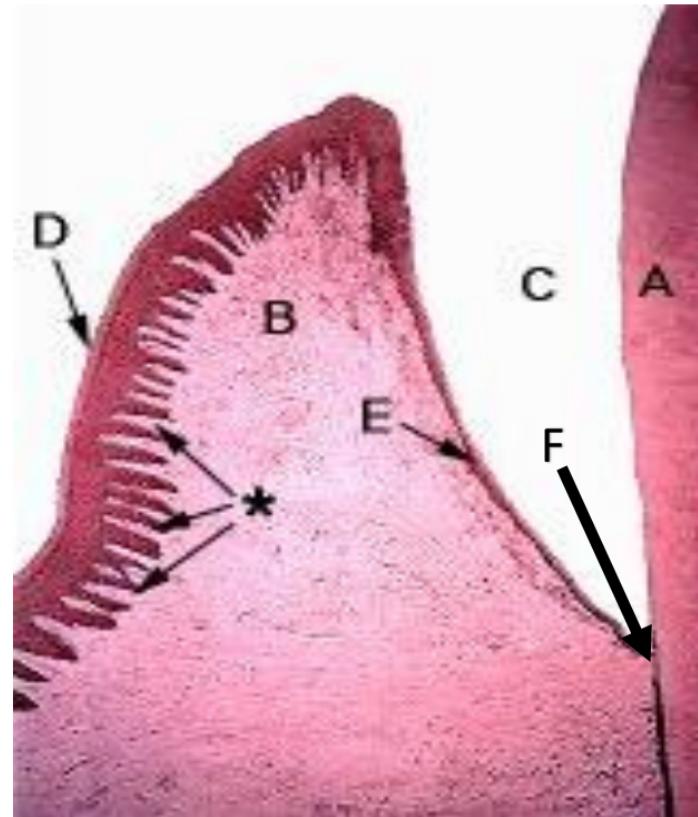
B - gingiva

C - enamel space

D – **Outer** keratinized stratified squamous **epithelium** with rete pegs

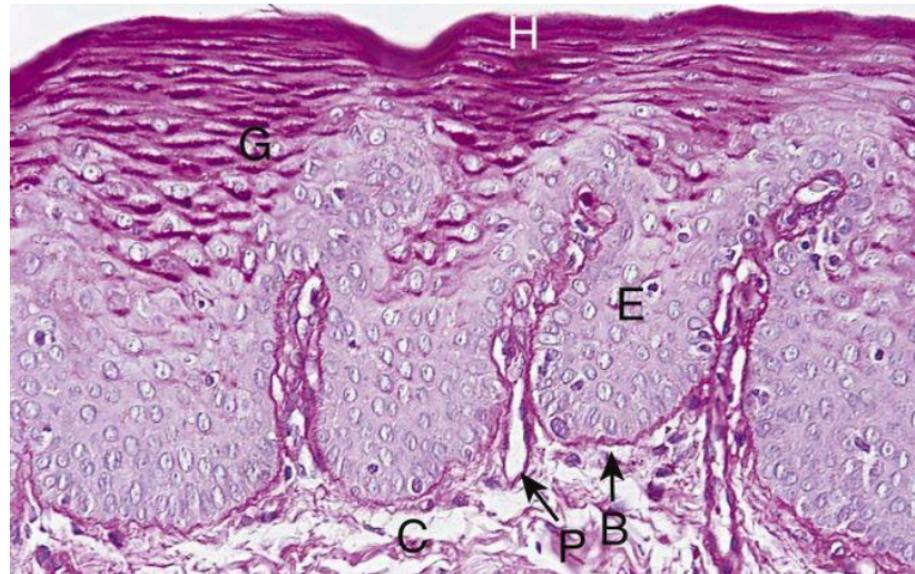
E - **sulcular epithelium** – is not keratinized, and lacks the CT papillae.

F Junctional Epithelium

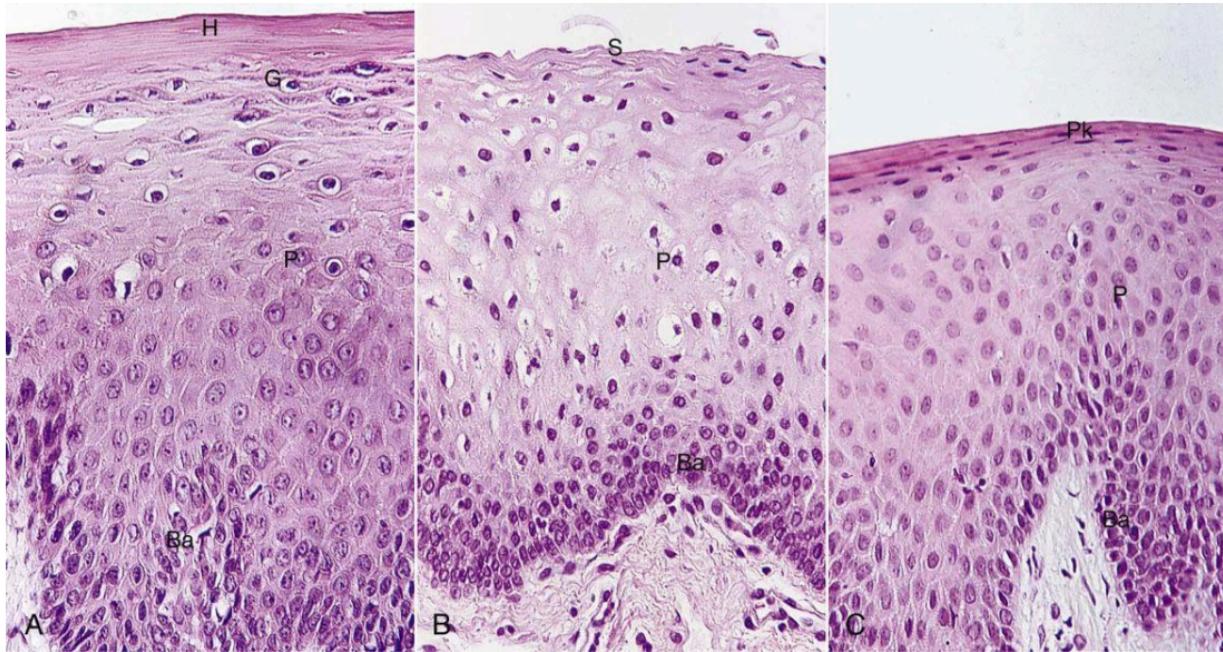


Function of gingival epithelium

- to protect the deep structures
 - Mechanical, chemical, water, and microbial barrier
- Allows for a selective interchange with the oral environment.
 - Signaling functions
- Constant renewal
 - Wound healing functions.



Variations in the gingival epithelium

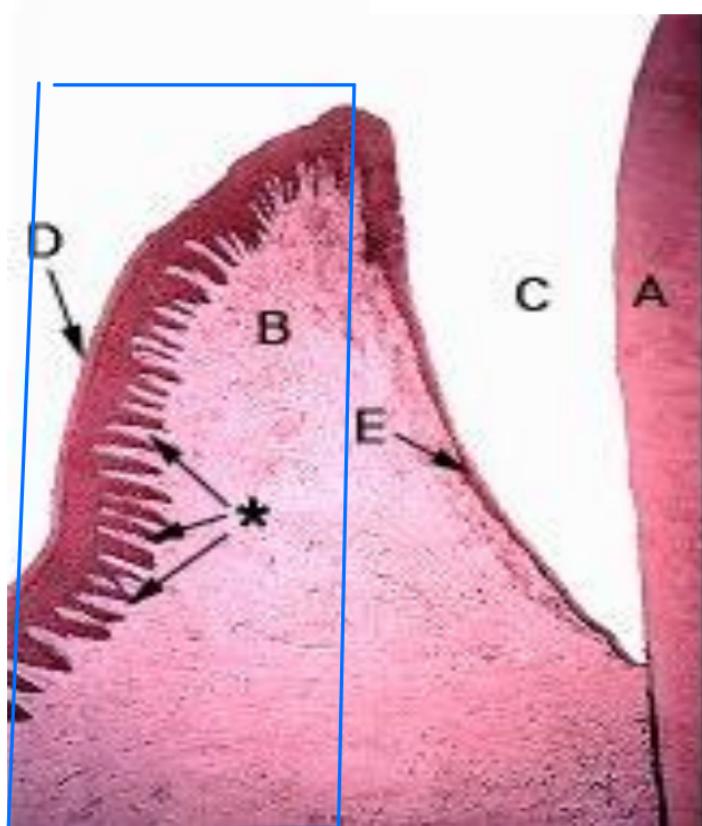


A, Keratinized.
B, Nonkeratinized.
C, Parakeratinized.
Horny layer (H),
granular layer (G),
prickle cell layer (P),
basal cell layer (Ba),
flattened surface
cells (S), and
parakeratotic layer (Pk).

- Keratinization of the oral mucosa varies in different areas being the most keratinized on the palate and the least on the alveolar mucosa.
: mastication
- Only some areas of the outer gingival epithelium are orthokeratinized; the other gingival areas are covered by parakeratinized or nonkeratinized epithelium

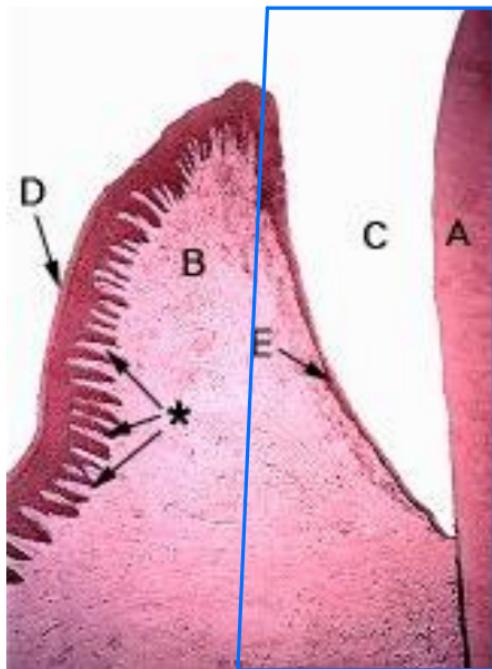
Outer Epithelium

- Covers the crest and outer surface of the marginal gingiva and attached gingiva
- Only some areas of the outer gingival epithelium are orthokeratinized;
- the other gingival areas are covered by parakeratinized or nonkeratinized epithelium



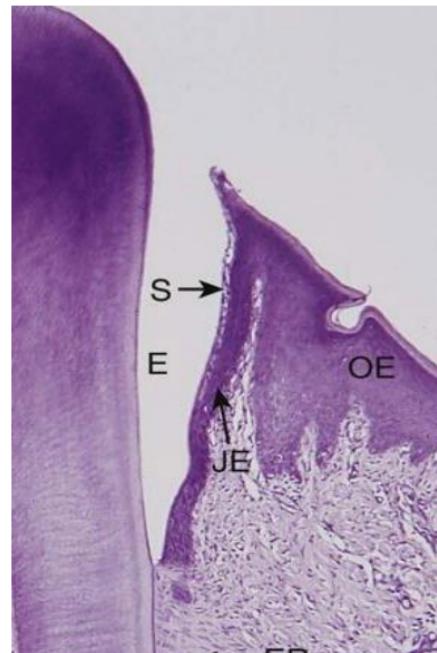
Sulcular Epithelium

- Lines the gingival sulcus from the crest of the gingival margin to the coronal limit of the junctional epithelium
- Thin nonkeratinized stratified squamous epithelium without rete pegs
- Acts as a semipermeable membrane from which tissue fluid seeps; and injurious bacterial products pass into the gingiva
- less permeable than Junctional epithelium



Junctional Epithelium

- collar like band of stratified squamous non-keratinizing epithelium.
- 3 to 4 layers thick in early life, number of layers increases with age to 10 -20 layers.
- tapers from its coronal end, (10 to 29 cells wide) to 1 or 2 cells wide at its apical termination, i.e., the cementoenamel junction in healthy tissue.
- These cells can be grouped in two strata: the basal layer that faces the connective tissue and the supra-basal layer that extends to the tooth surface.
- Firmly attached to the tooth surface (hemidesmosomes) forming an epithelial barrier to bacteria; Rapid turnover – further defense to bacterial plaque
- Allows gingival fluid and inflammatory cells access to the gingival margin
- The length of the junctional epithelium ranges from 0.25 to 1.35 mm



Dentin (*D*) enamel (*E*), oral epithelium (*OE*), junctional epithelium (*JE*). Sulcus with epithelial debris (*S*),

Dento-gingival Unit

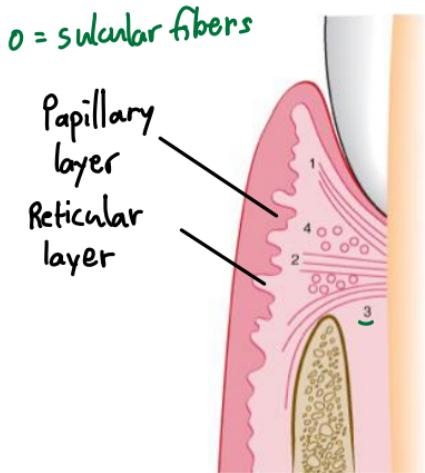


Diagram of the gingivodental fibers extending from the cementum to the:

- (1) crest of the gingiva
- (2) outer surface
- (3) external to the periosteum
- (4) circular fibers are shown in a cross section

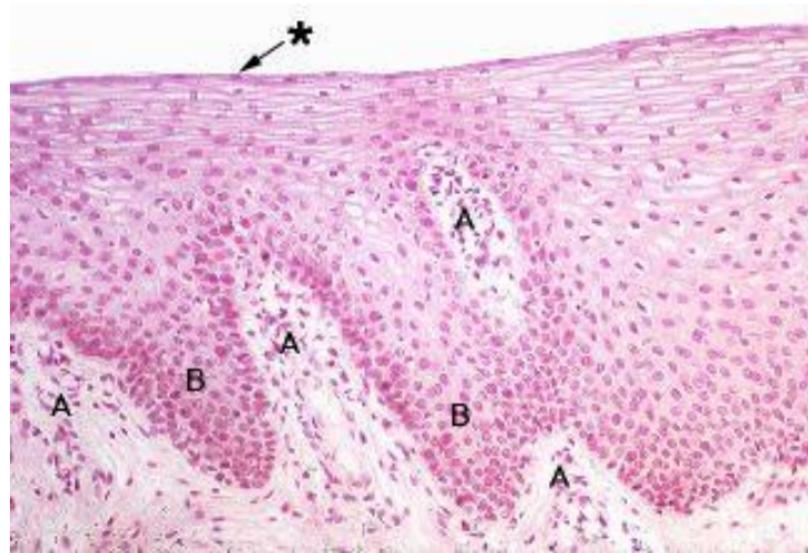
- The junctional epithelium and the gingival fibers are considered a functional unit, bracing the marginal gingiva against the tooth surface
- – Mainly composed of collagen fibers forming 4 basic gingival fibers groups:
 - Gingivodental,
 - alveologingival, (3) *insert into periosteum*
 - circular and
 - transeptal

Gingival connective tissue

- Basement Membrane separates Epithelium from Connective tissue.
- major components of the gingival connective tissue
 - collagen fibers (about 60% by volume),
 - fibroblasts (5%),
 - vessels, nerves, and matrix (about 35%).
- The connective tissue of the gingiva is known as the *lamina propria*, consists of
 - a *papillary layer* subjacent to the epithelium that consists of papillary projections between the epithelial rete pegs; and
 - a *reticular layer* that is contiguous with the periosteum of the alveolar bone.

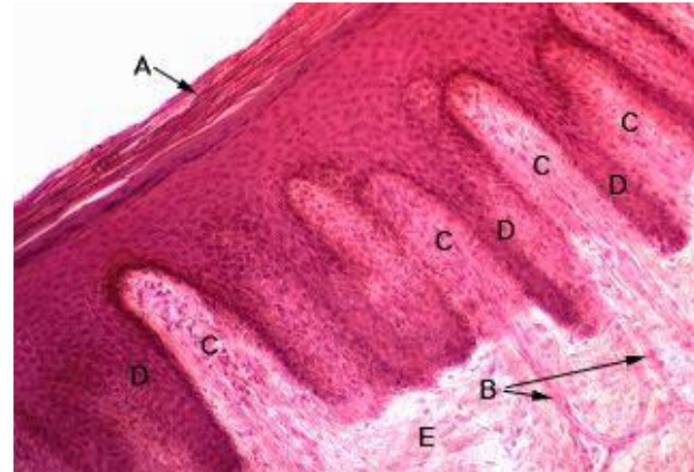
Labial Mucosa

- The epithelium (B) is non-keratinized stratified squamous
- Cells of uppermost layer (*) still have nuclei
- Loose connective tissue of the lamina propria inserts as finger-like papillae (A)



Mucosa of the Hard Palate

- A distinct keratinized layer, the stratum corneum (A)
- High connective tissue papillae associated with keratinized epithelium
- Referred to as orthokeratinized stratified squamous epithelium



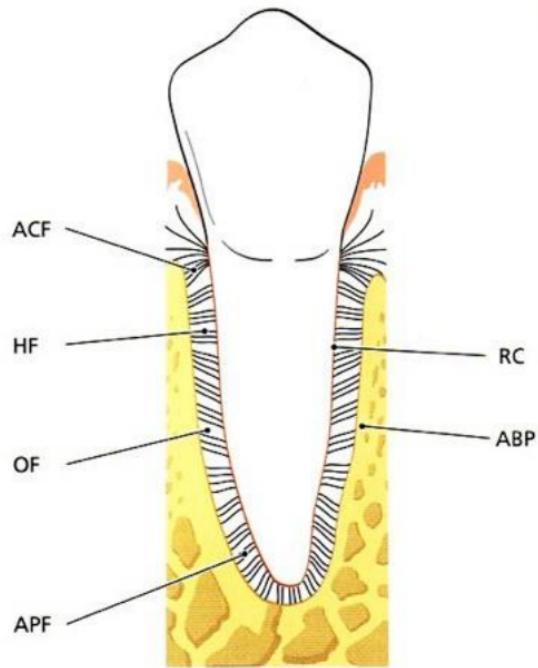
- A - stratum corneum
- B - capillary
- C - connective tissue papilla
- D - rete peg
- E - lamina propria

Clinical Description of the Gingiva

- Color: 'coral pink', red, purple
 - ↳ eg. smoking
- Size: thick versus thin, enlarged, edematous
- Contour/shape: dependent on teeth, proximal contact, embrasure spaces
- Consistency: firm and resilient versus boggy
- Surface Texture:
 - ↳ eg orange peel
 - ↳ stippled versus smooth
- Margin – Knife edged versus enlarged
 - ↳ meet at a point
 - ↳ inflammation

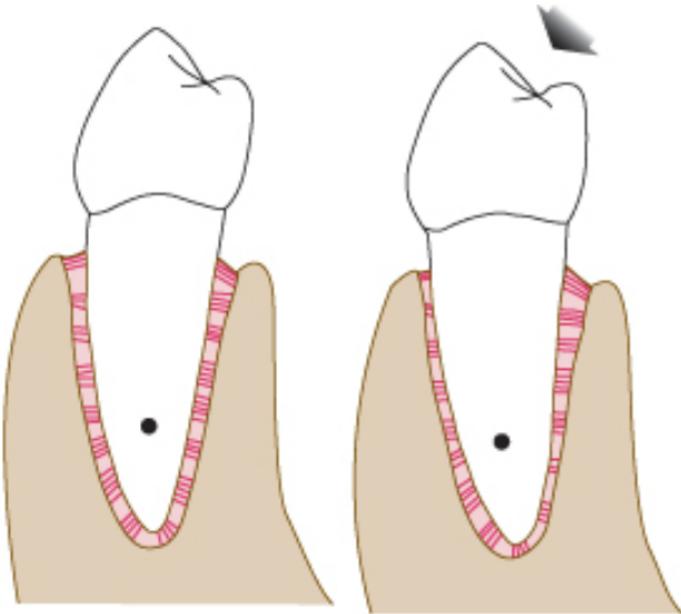
The Periodontal Ligament (PDL)

- A complex vascular and cellular connective tissue that surrounds the tooth root and connects it to the alveolar wall
- It is continuous with the connective tissue of the gingiva and communicates with the marrow spaces through vascular channels in the bone
- Measures approximately 0.2 mm on average, but varies considerably



Physical Functions

- Transmission of occlusal forces to the bone
- Attachment of the teeth to the bone
- Maintenance of the gingival tissue in their proper relationship to the teeth
- Resistance to the impact of occlusal forces (shock absorption)



Copyright © 2006 by Saunders, an imprint of Elsevier Inc.

Formative and Remodeling Function:

- PDL is exposed to physical forces in response to mastication, parafunction, speech and orthodontic tooth movement.
- PDL participates in the formation and resorption of cementum and bone which occur in physiologic tooth movement, in the accommodation of the periodontium to occlusal forces, and in repair of injuries

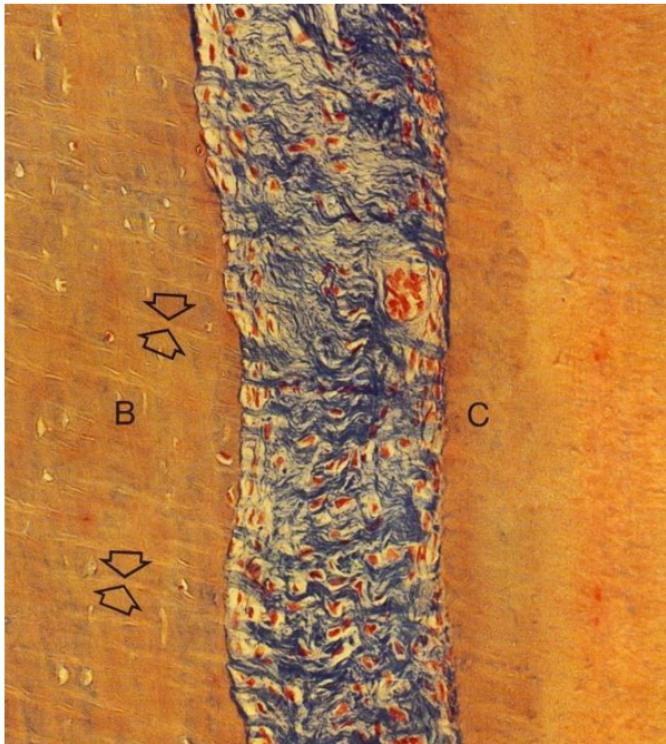
Nutritional and Sensory Functions

- PDL supplies nutrients to the cementum, bone, and gingiva via blood vessels and provides lymphatic drainage
- PDL is supplied with sensory nerve fibers transmitting tactile, pressure and pain sensation

Periodontal Ligament Elements

- PDL Fibers: mainly type I collagen
- PDL cells:
 - Fibroblast is the predominant cell type
 - Macrophages
 - Mesenchymal stem cells
 - Cementoblasts and cementoclasts
 - Osteoblasts and osteoclasts
 - Cell rests of Malassez

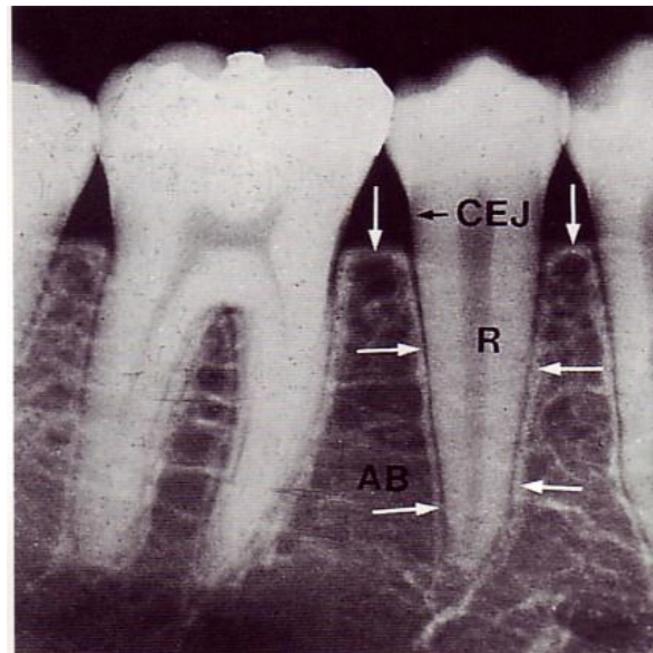
Sharpey's Fibers



- The most important elements of the PDL are the principal fibers.
- The terminal portion of the fibers that are inserted into the cementum and bone are the Sharpey's Fibers

The Periodontal Ligament Space

- Radiographic evidence of PDL
 - CEJ: Cemento-enameljunction
 - R: Root



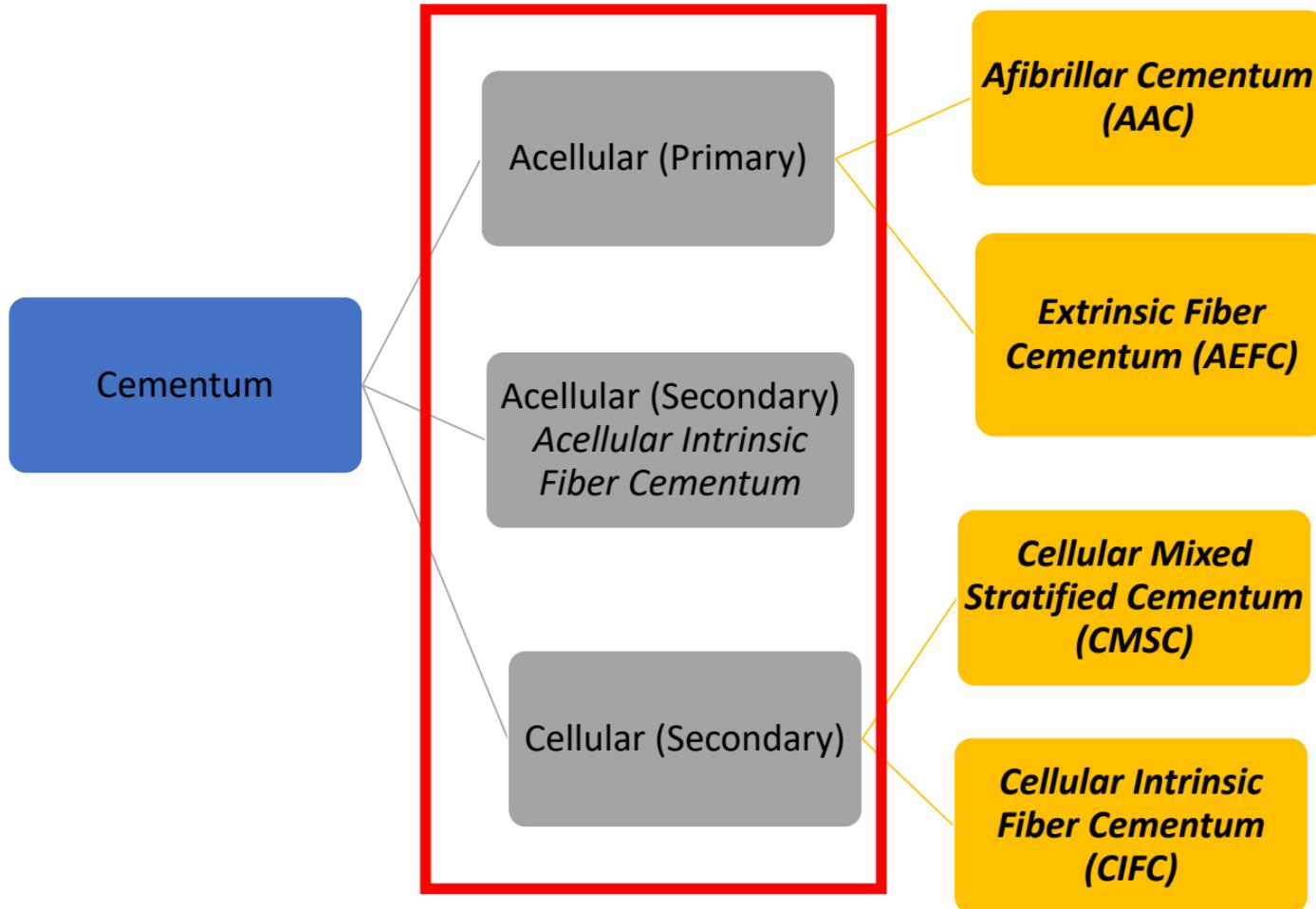
Cementum

- What is Cementum?
 - A hard connective tissue that covers the roots of teeth.
- Why do we need it?
 - to attach the PDL fibers supporting the tooth/root (*dentin is smooth*)
- How can we describe its appearance?
 - Embryological:
 - Calcified mesenchymal tissue covering the anatomic root
 - Histological
 - Consists of calcified intra fibrillar matrix and collagen fibers; Not vascularized. No lymphatics or innervation and covers the root
- What are the principal cells of Cementum
 - Cementocytes

Cementum- Comparative Composition of Mineralized Tissue of Teeth.

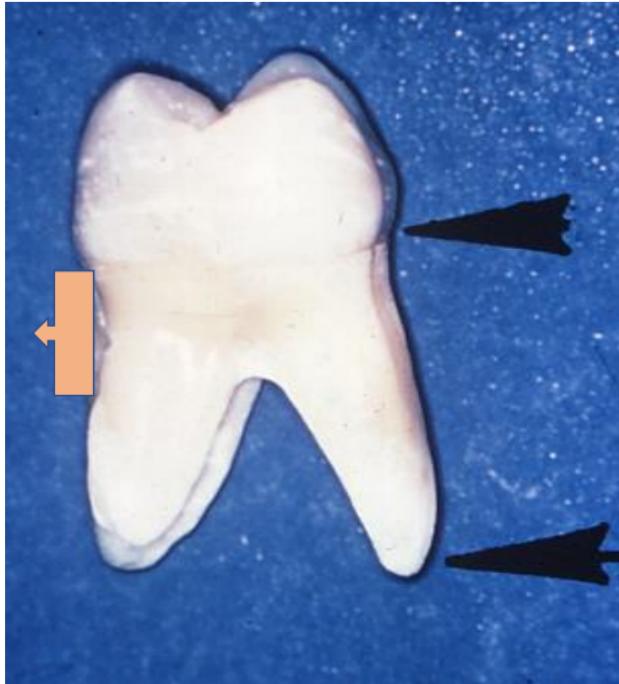
% by weight	Enamel	Dentin	Cementum	Bone
Mineral	95	70	61	45
Organic	1	20	27	30
Water	4	10	12	25

- 45-50% inorganic substances- Ca and P forms of hydroxyapatite, trace elements
- 50-55% organic material and water
- Organic material- Type 1 collagen and proteoglycans

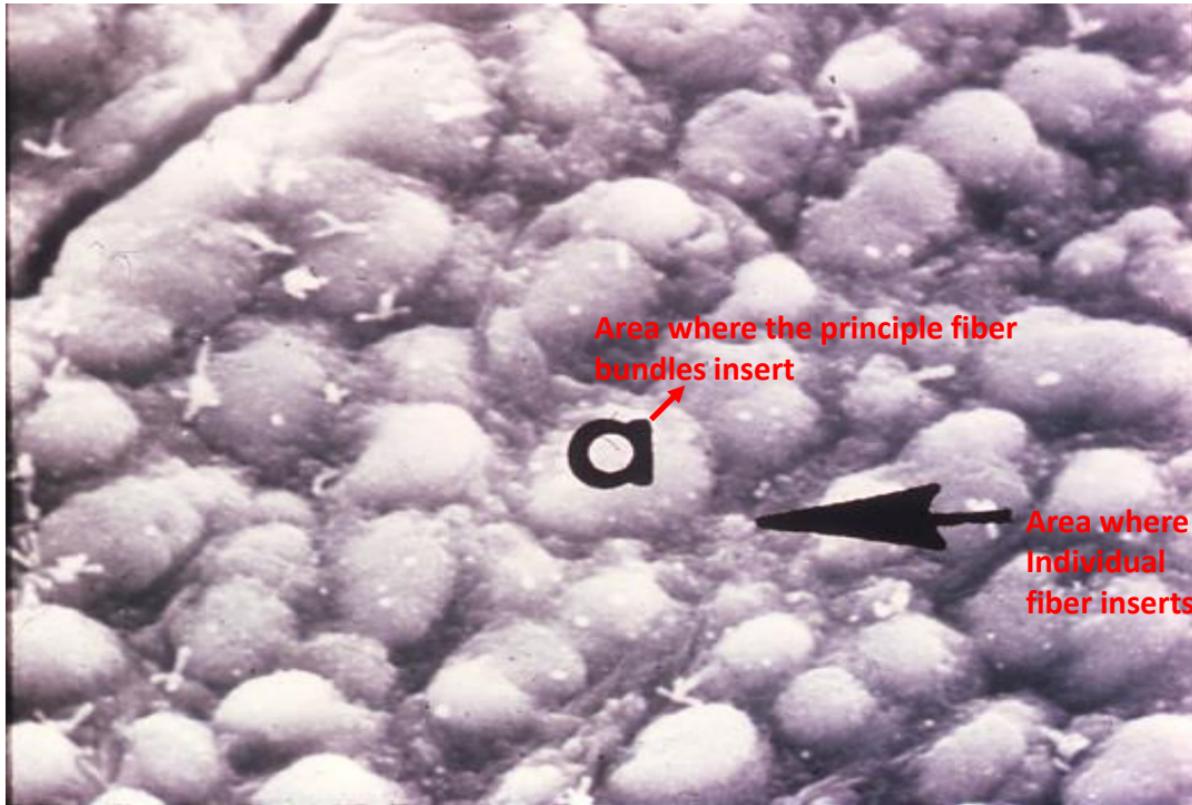


Acellular Cementum

- ✓ First formed
- ✓ Covers cervical 1/3-1/2
- ✓ Formed before teeth are in occlusion
- ✓ Calcified Sharpey's Fibers
- ✓ Other collagen fibers parallel to the root
- ✓ 30-230 um
- ✓ Formed in distinct layers

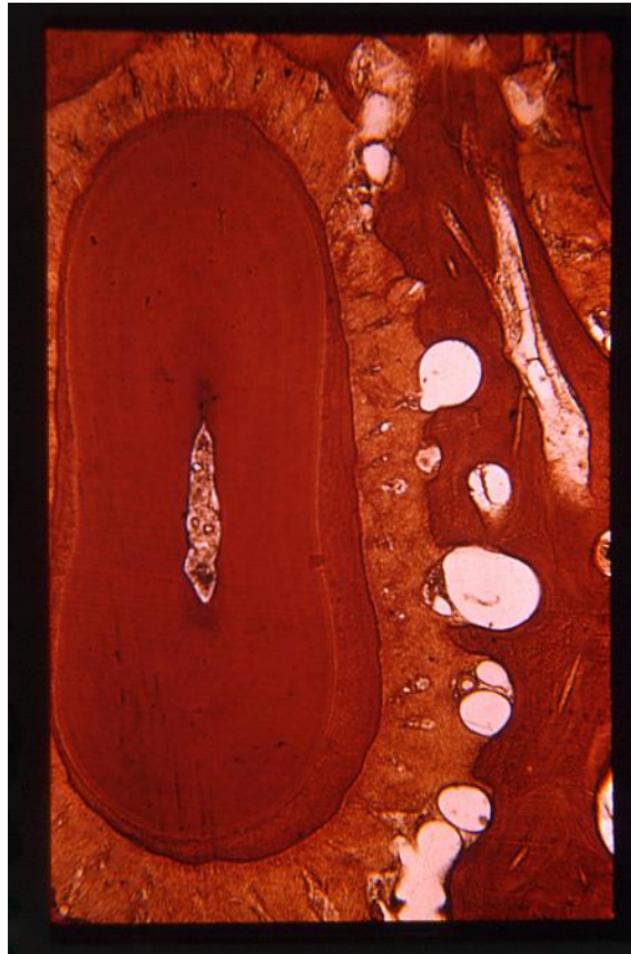


Surface of the Acellular Cementum

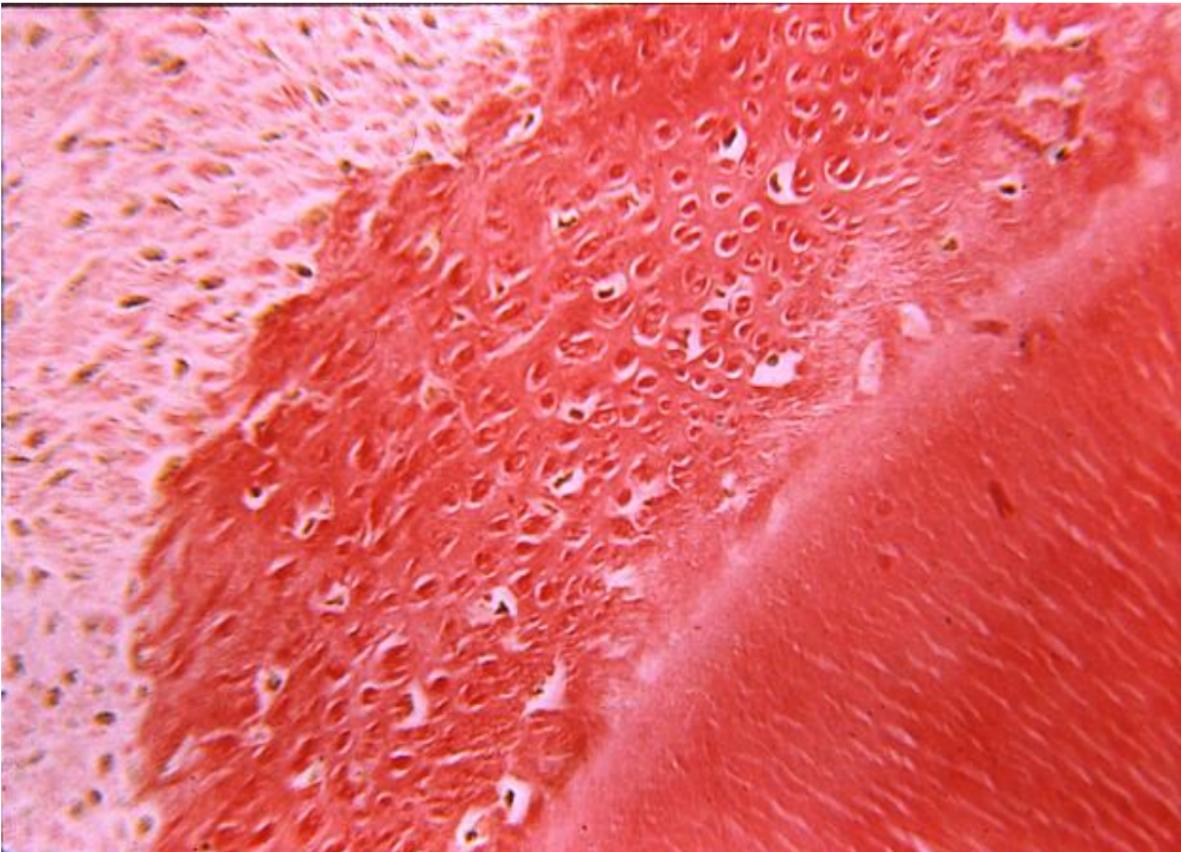


Cellular Cementum

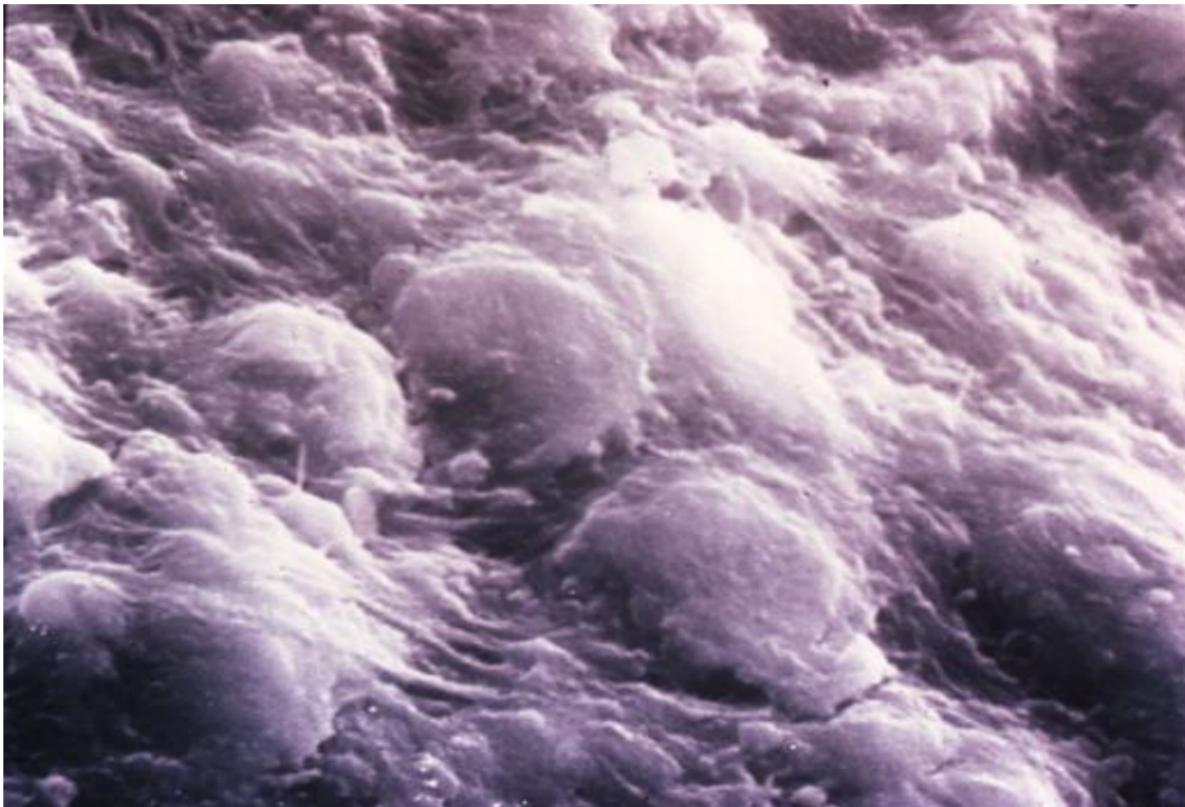
- Formed after tooth is in occlusion
- More irregular
- Contains cementocytes in lacunae
- Resembles bone
- Less calcified than acellular cementum
- Formed in distinct layers



Cellular Cementum



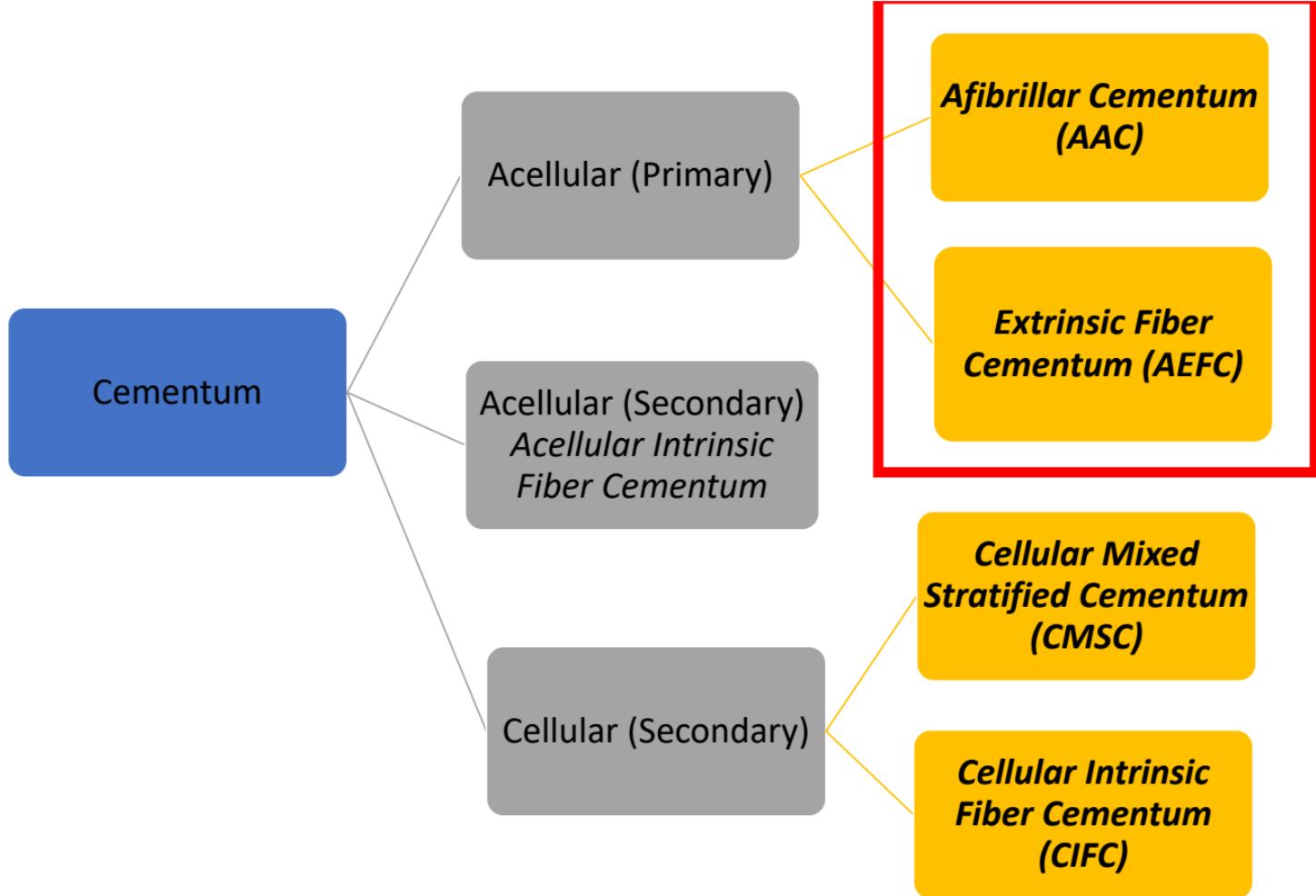
Cellular Cementum



Note fewer large projections than acellular cementum. Less fiber insertion

Sources of Collagen in Cementum

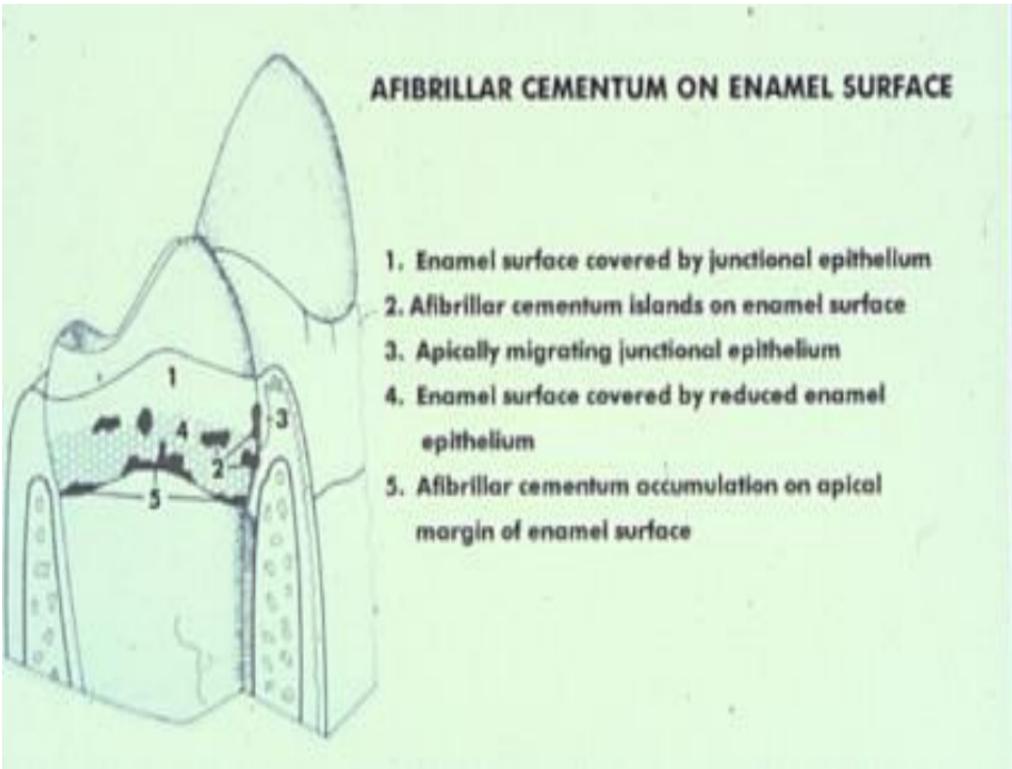
- Fibroblasts which form Sharpey's Fibers (Extrinsic)
- Fibers of matrix formed by Cementoblasts (Intrinsic)



Cementum- Types

- ***Acellular Afibrillar Cementum (AAC)-***
 - contains neither cells nor intrinsic or extrinsic collagen fibers. Product of cementoblasts. Found in coronal cementum
- ***Acellular Extrinsic Fiber Cementum (AEFC)-***
 - composed of densely packed Sharpey's fibers. Lacks cells. Product of the fibroblasts and cementoblasts. Found in the cervical third of the roots

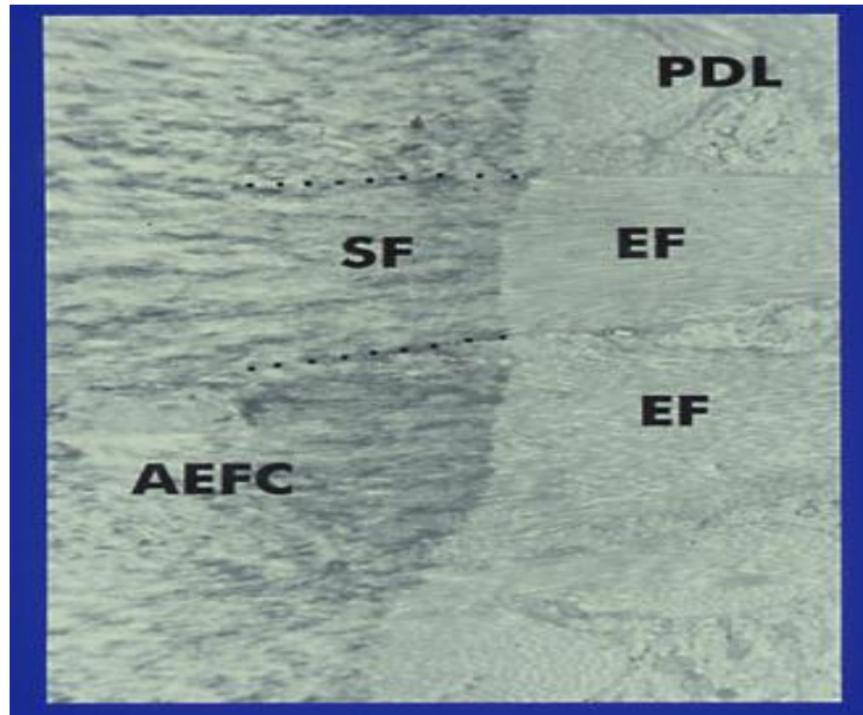
Afibrillar Cementum

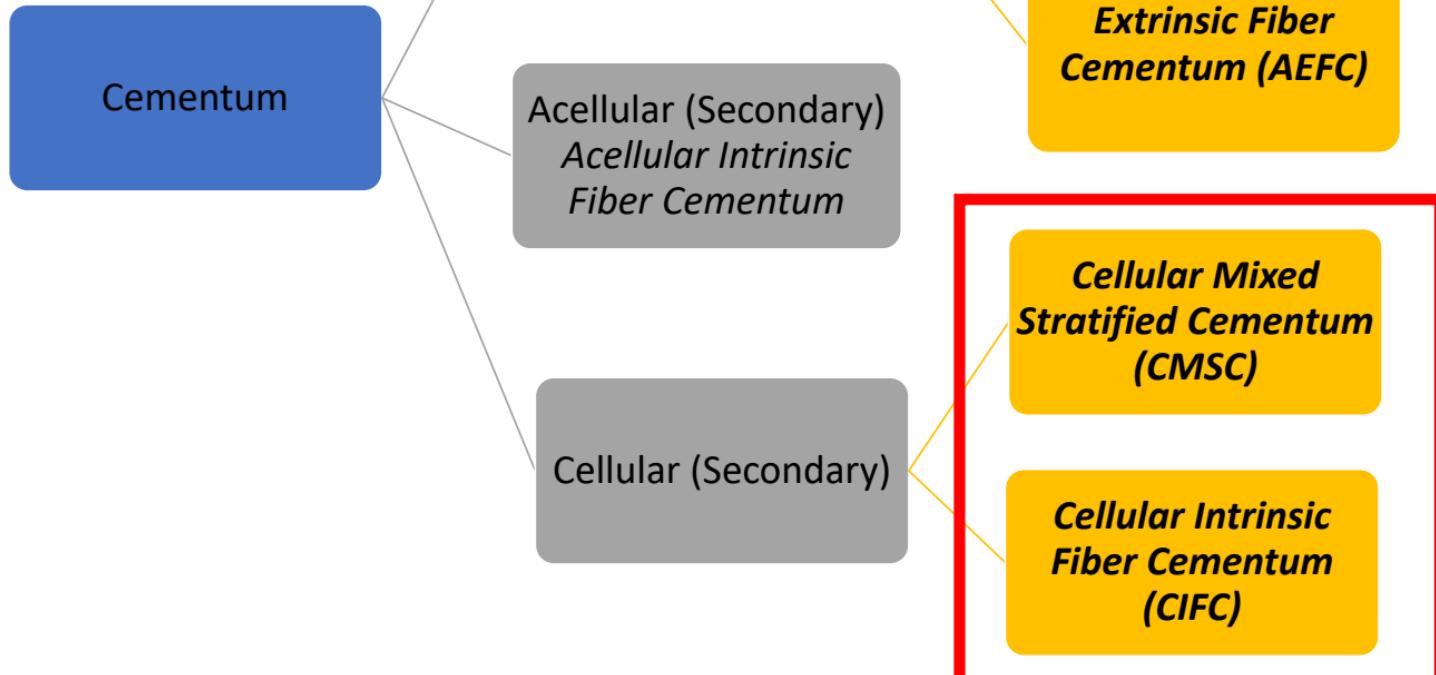


- Mineralized Ground Substance
- No collagen
- No cells
- Formed on apical enamel at the time of eruption
- an aberration in the development process

Acellular Extrinsic Fiber Cementum (AEFC)

- AEFC fibers increase in thickness with age
- Usually located on the coronal one third of the root surface



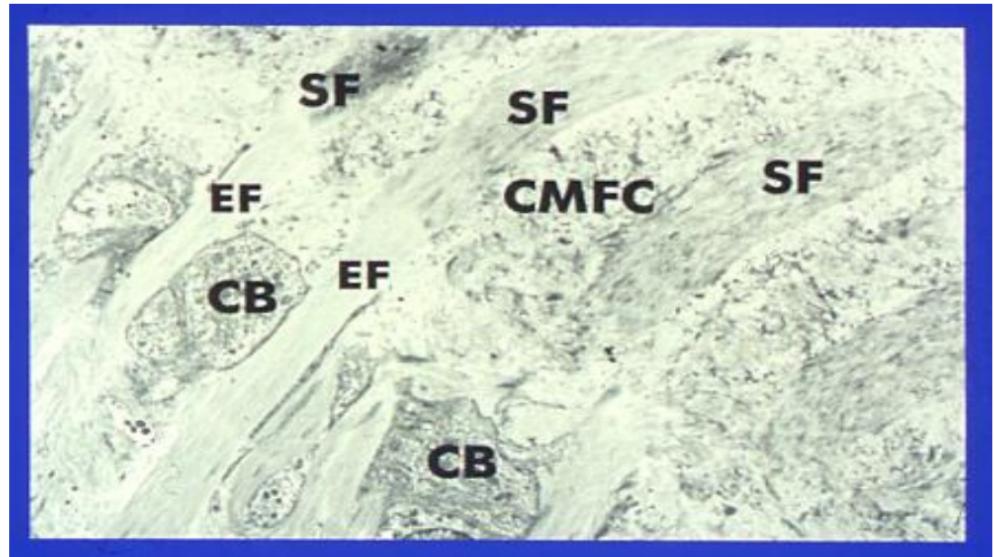


Cementum- Types

- ***Cellular Mixed Stratified Cementum (CMSC)-***
 - composed of extrinsic and intrinsic fibers and cells. Co-product of fibroblasts and cementoblasts. Found in apical third of roots, apices and furcation areas
- ***Cellular Intrinsic Fiber Cementum (CIFC)-*** contains cells but no extrinsic collagen fibers. Formed by cementoblasts. Fills resorption lacunae

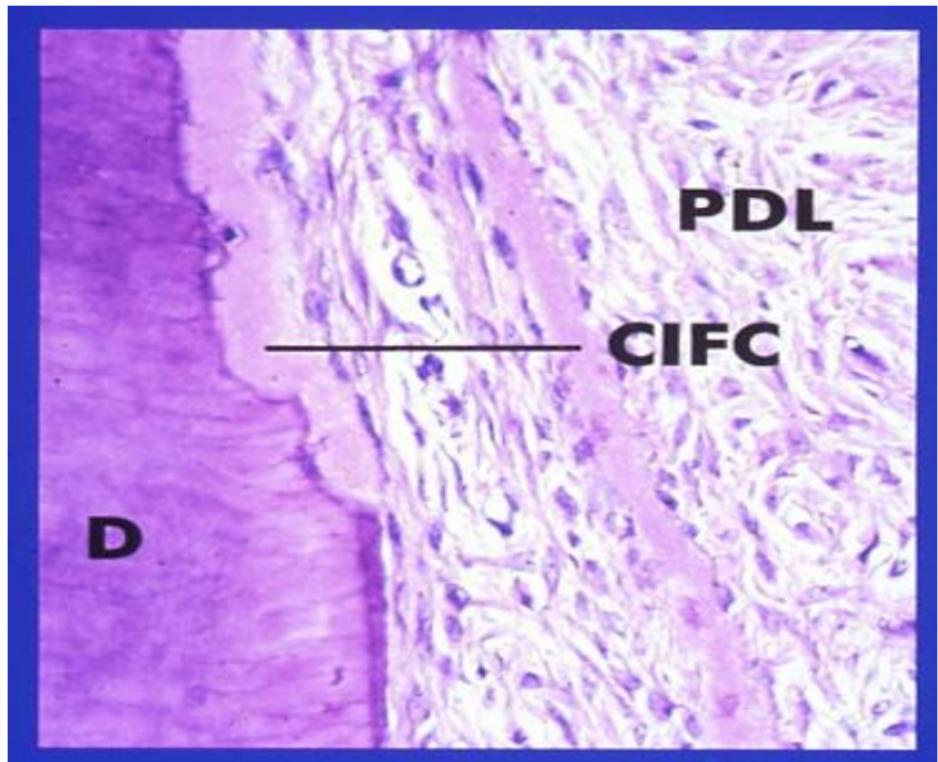
Cellular Mixed Stratified Fiber Cementum

- Presence of intrinsic collagen fibers produced by the cementoblasts that run parallel to the root surface
- Some extrinsic Sharpey's fibers may be seen
- Consists of AEFC and CIFC
- Deposited on root surfaces lining furcations and extends to the apical third portion of the roots



Cellular Intrinsic Fiber Cementum

- Considered a form of reparative cementum
- Commonly associated with repair of resorptive defects and the healing of root fractures
- No evidence of extrinsic fiber insertion



Cemental Repair ?



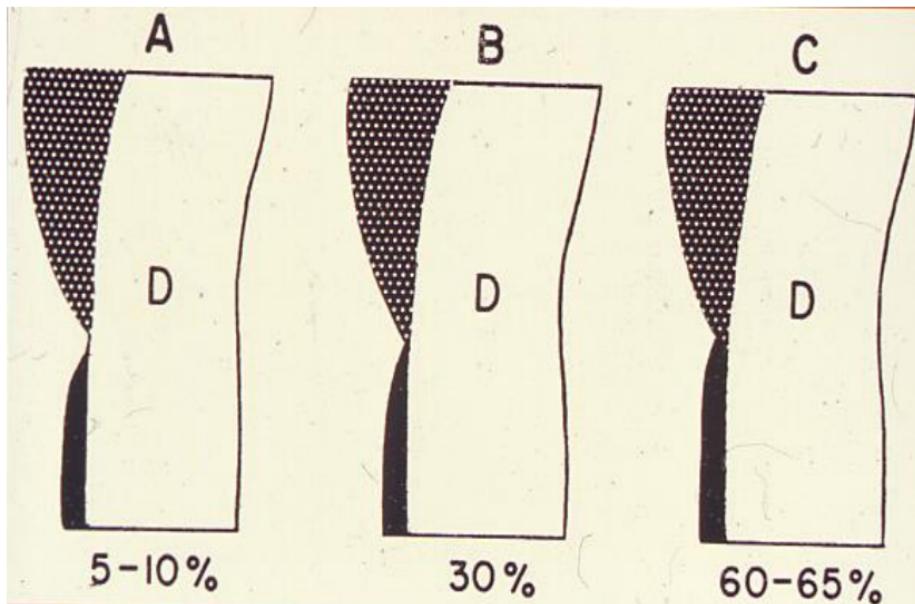
Acellular Intrinsic Fiber Cementum

- An acellular variant of the CIFC
- Deposited during adaptive responses to external forces
- Forms without leaving cells behind

Clinical Relevance of Cemental Types

- The ultimate goal of periodontal regenerative procedures is to induce the production of AEFC and CMFC
- CIFC which forms in many instances following periodontal regenerative surgery does not have the functional integrity of cementum containing extrinsic Sharpey's fibers

Cemento-enamel (CEJ) Junction

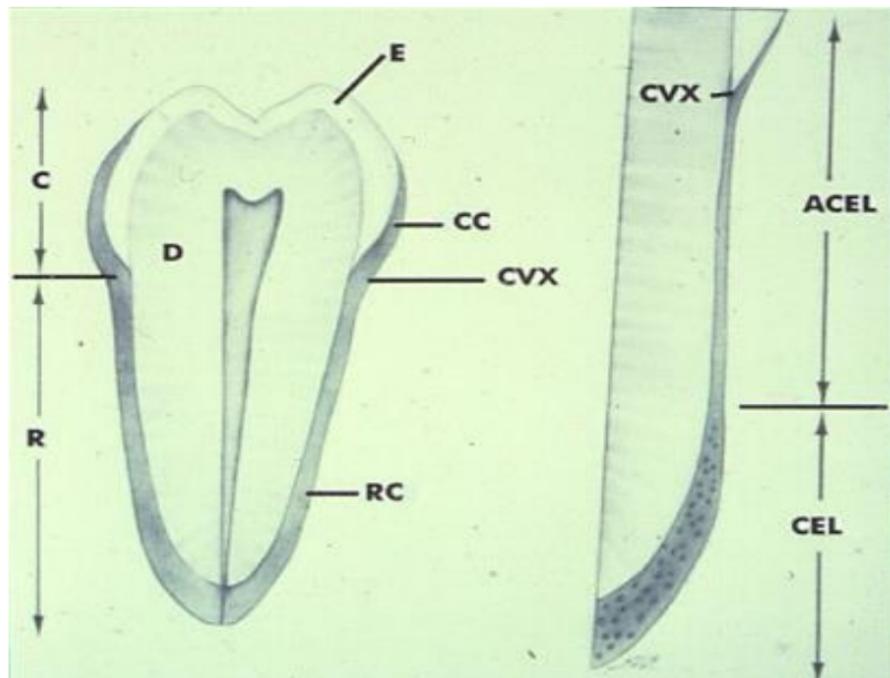


Normal variations of the CEJ junction:

- A - Space between enamel and cementum with dentin exposed.
- B - End to end relationship of enamel and cementum.
- C - Cementum overlapping the enamel.

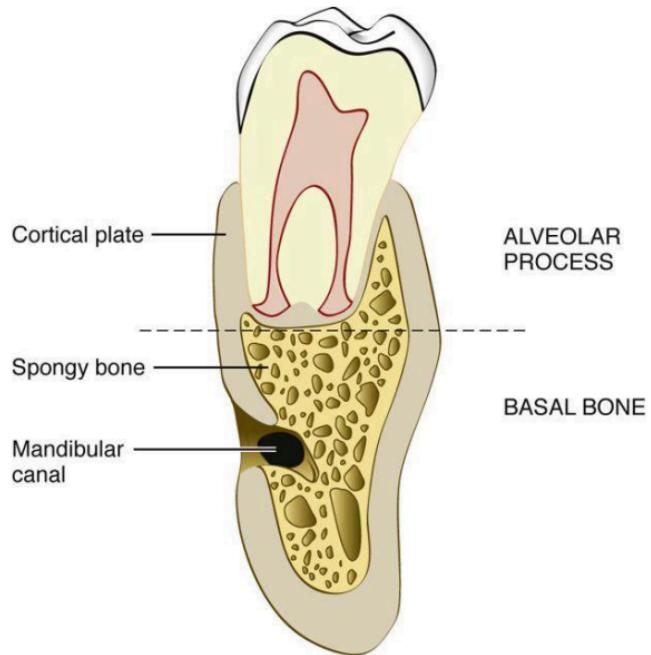
Cementum Thickness

- Coronal Half- 16-60 um *thinner*
- Apical third, trifurcation and bifurcation area- 150-200 um *3x larger*
- Ages 11-70- 3 fold increase in thickness
- Age 20- average thickness- 95 um
- Age 60- average thickness- 215 um
- Thicker on the distal surface than the mesial surface *← tend to drift mesially as we age*



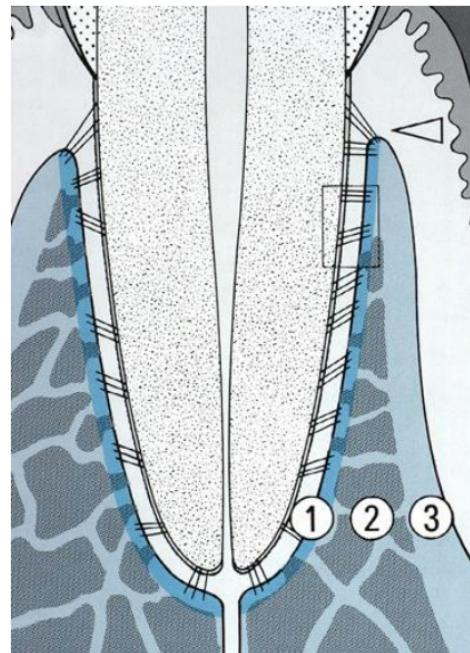
Alveolar bone

- Is the portion of the maxilla and mandible that forms and supports the tooth sockets (alveoli)
- Consists of the following:
 - External cortical plate formed by haversian bone and compacted bone lamellae
 - Inner socket wall of compact bone called alveolar bone proper, seen as lamina dura in radiographs
 - Cancellous trabeculae between these two compact layers



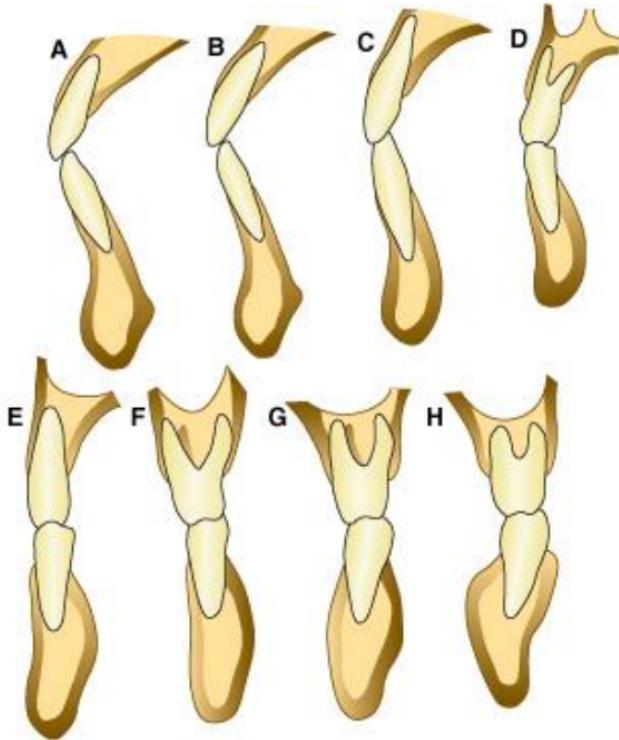
Alveolar Bone

- 1. Alveolar bone proper
- 2. Trabecular (cancellous) bone
- 3. Compact (cortical) bone



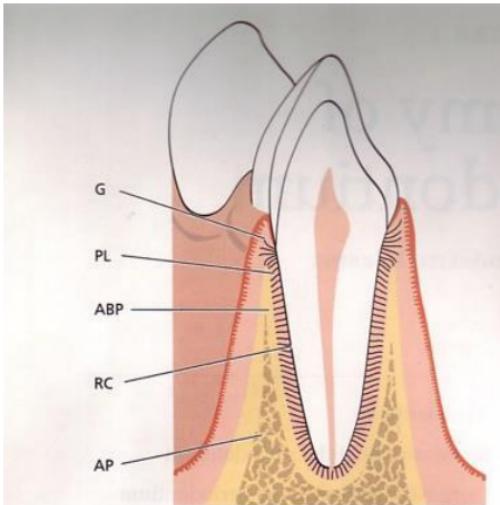
Alveolar Process

- Relative proportions of cancellous bone and compact bone in longitudinal faciolingual section of:
 - A central incisors
 - B lateral incisors
 - C canines
 - D first premolars
 - E second premolars
 - F first molars
 - G second molars
 - H third molars



Copyright © 2006 by Saunders, an imprint of Elsevier Inc.

Periodontium



Gingiva

periodontitis → may have recession

lost in periodontitis

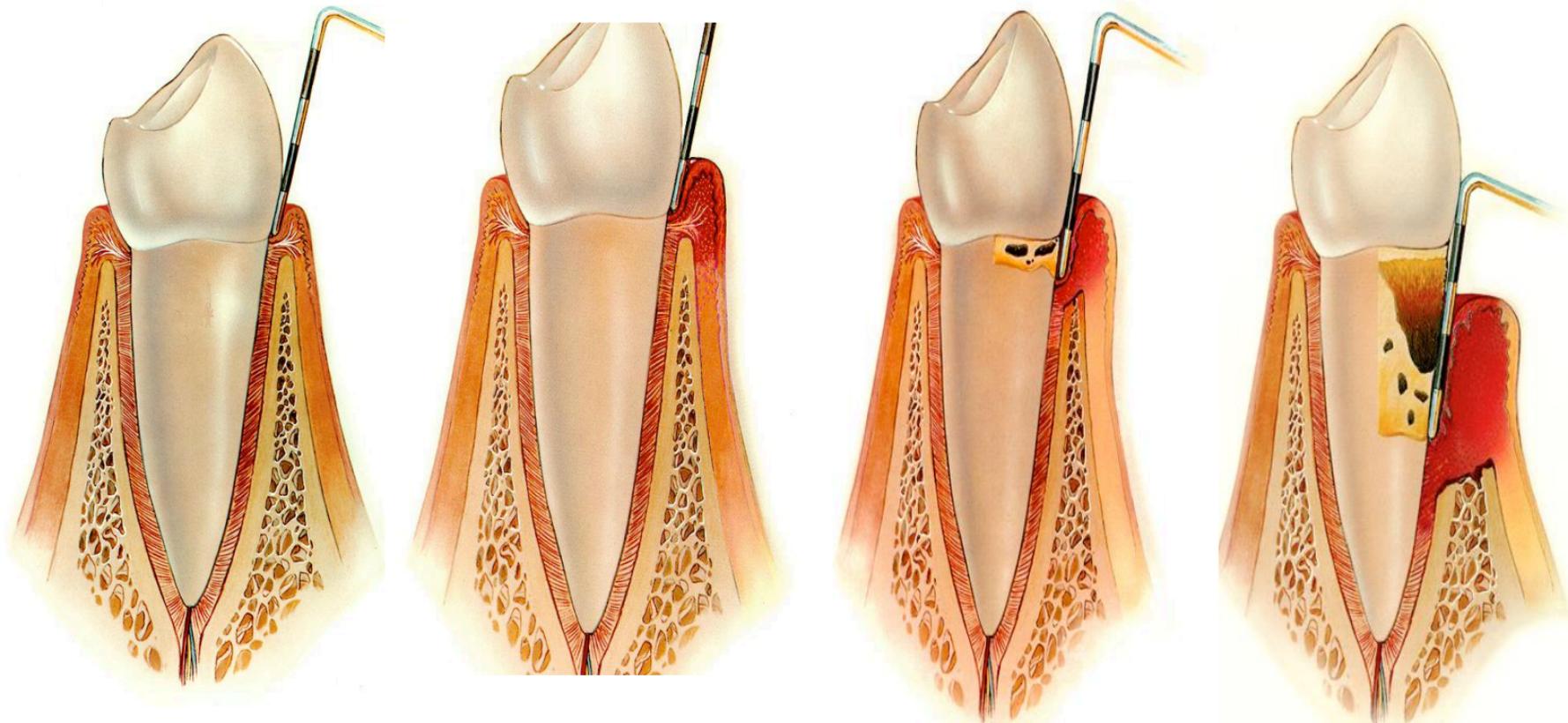
Attachment apparatus

Periodontal ligament

Cementum

Alveolar bone

Health – gingivitis-periodontitis





What to Expect, Assessments!

JEREMY MILLER, RDH

Assessments

Assessment Method	Rubric Y/ N	Outcome Required to Pass	Remediation allowed prior to final exam?
Written Examination (Winter Term)	N	Score >70%	Y
Practical Exam (Instrumentation - Winter Term)	Y	Score >70%	Y
Daily Self Assessments / Reflection (Winter Term)	Y	Must submit a self-assessment that meets requirements for all sessions	N
Quizzes (Winter Term)	N	Must participate in all Quizzes	N
Attendance (Both Terms)	N	Must be present for all scheduled sessions and rotations.	N
Patient Care (Winter Term)	Y	Must earn a score of Standard Met on all criteria for at least 2 patients	Y
Home Care Instructions (Spring Term)	Y	Must earn a score of Standard Met on all criteria	Y
Clinical Patient Exercises (Spring Term)	Y	Must earn a score of Standard Met on all criteria for at least 2 patients	N
CaseCATs (Winter Term)	N	Complete group CaseCAT before end of winter term	N

Exams

- Written Exam – 40 %
 - Given 3/21 @ 8:00am
 - Consists of multiple choice and True/False questions.
- Practical Exam – 40%
 - Given 3/21 from 9:30 - 4:00. Each student will be assigned a 15 minute block of time.
 - Consists of faculty watching you demonstrate proper instrument choice and use on a typodont in the sim clinic.

Daily Self-Assessment

- Daily Self Assessment – 3%
 - Done after every class in the sim clinic or pre-doc clinic.

Comp. Instrumentation (sim clinic)

	Student Evaluation	Faculty Evaluation	Comments
<u>Positioning and Use of Light</u> Neutral body position. Ability to move to different clock positions. Adjusts light for maxillary/mandibular arches.			
<u>Instrument Grasp / Use</u> Uses C-shaped instrument grasp. Adequate fulcrum. Ability to roll Instrument. Holds instrument with the proper amount of pressure.			

Quizzes / Attendance

- Quizzes – 2%
 - Given during every sim clinic day to ensure everyone has looked at the Power Point presentation for that day's material.
- Attendance – 2%
 - Winter Term: You must come to every assigned class, you only have 11 weeks to learn to do an Adult Prophy before you see your first patient. If you are ill or have a family emergency please email both of us.

Patient Care (Winter Term)

- Patient Care (Winter Term) – 2%
 - After Week 4:
 - You are required to help 2 different DS3 or DS4 students during a periodontal procedure.
 - IE: Periodontal probing/charting, Periodontal instrumentation (helping with a few teeth during their prophy/maintenance appts.), or assisting them while they perform SRP.
 - Check in with perio faculty when you want to do any of these things, we may be able to assist you in finding something appropriate to do.
 - Have Perio faculty sign your patient care form before leaving clinic.

* **Do Not** perform any procedure/instrumentation that we have not done on class partners first!!!

Spring Term

- Home Care Instructions – 2%
 - Formative assessment done during one of your 2 patient experiences.
- Clinical Patient Exercises – 9%
 - You will have 3 patients assigned to you during the term.
 - First Appt: Simulated patient appointment on a peer.
 - 2 Appointments with SoD patients referred by DS3 or DS4 student.

Instruments and Typodonts

- Pick up Perio Cassettes and Typodonts from Marcus before our first meeting in the sim clinic 1/25.
 - Check typodont teeth and ensure that there is calcite (artificial calculus) present on all typodont teeth, if not, get new replacement teeth from Marcus.
 - Do Not wait until the day of class to try and get your materials. You have 2 weeks from now to get it and replace your old teeth!

?

