

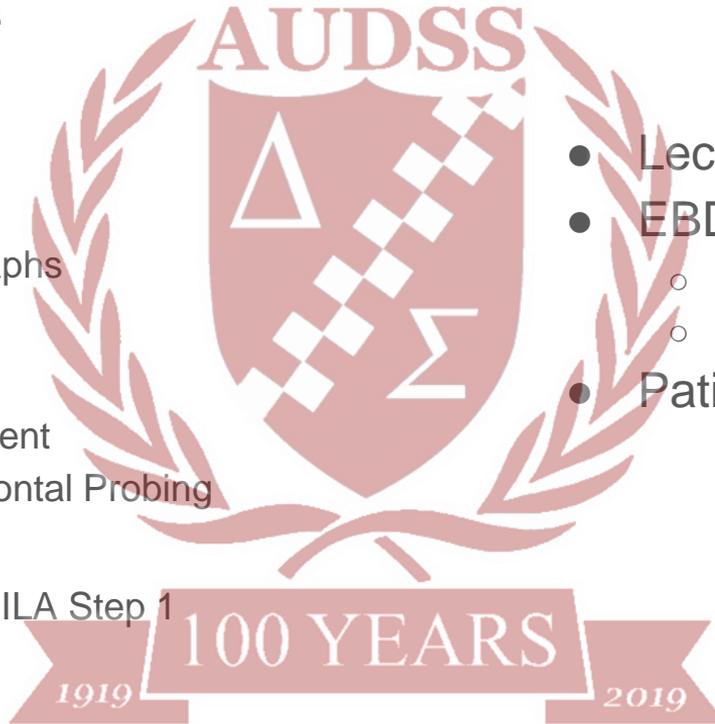
BDS1 Sem 1 Exam GIL

Esther, Coral, and Lei



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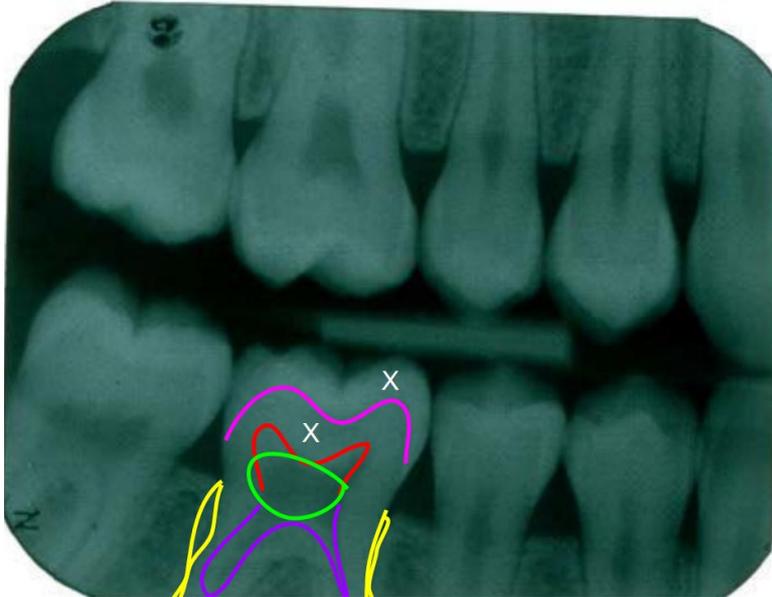


BDS1 Sem 1 Topics

1. Homeostasis
2. Cells
3. Epithelium
4. Skin
5. Muscle
6. Endocrine
7. Genetics
8. Connective Tissue
9. Enzymes and Buffers
10. Oral Cavity
11. PCC
12. Radiography
13. Nervous System
14. Cardiovascular System
15. Biochem
16. EBD
17. Infection Control

Reading and Interpreting Radiographs

- Orientation
 - Bitewings and OPGs are viewed as if you're looking at a patient front on
- Anatomical features
 - Enamel/Dentine
 - DEJ
 - Pulp Horns
 - Pulp Chamber
 - Pulp Channels
 - Periodontal Ligament
 - Lamina Dura (???)



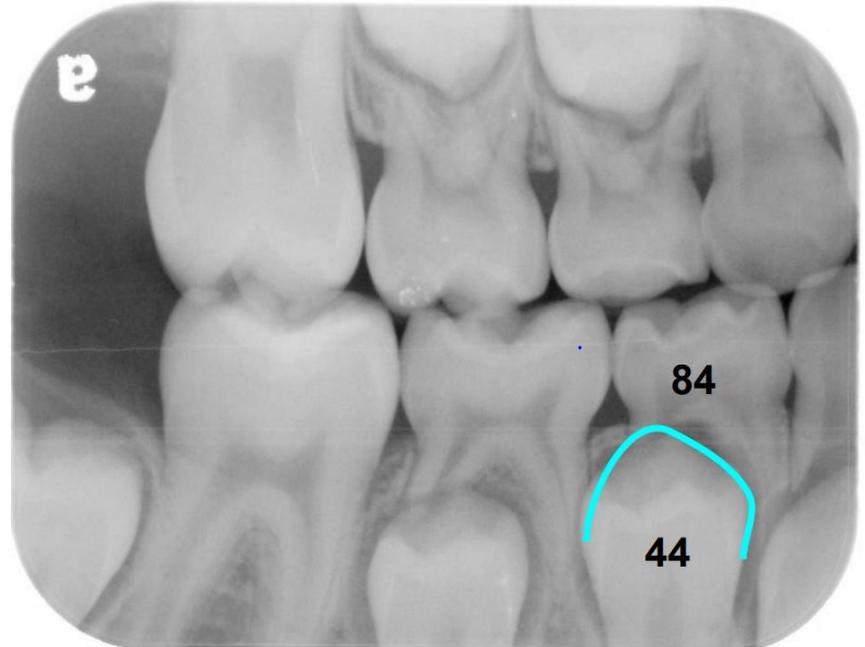
(Lerche, 2015)

What is the Lamina Dura???

A dense radioopaque layer of alveolar bone lining the tooth socket

Reading and Interpreting Radiographs

- Radiographs will be oriented correctly unless specified
- Interproximal radiolucency - caries or cervical burnout?
- Know different mesial and distal features
- Differentiate between cusp tips of deciduous and permanent teeth



(Kaplan, 2015)

Reading and Interpreting Radiographs



(Araki et al, 2011)

At an early BDS1 Level

- Identify restorations present - describe as metallic not amalgam as material is unknown
- Note teeth present
 - Primary
 - Permanent
- Principles of radiography and safety

Charting

- Be systematic: Usually going quadrant 1 to 4
- Check notation!! If unsure or unspecified, write in which notation you are using
- Tooth ID
 - Compare sizes of teeth to determine primary/permanent
 - Compare morphology and landmark
 - For partially imaged teeth: state that mesial/distal aspect imaged
 - Present/Restored for visible teeth
 - State surface and type of restoration
- Correct orientation unless specified



(Watt et al, 2018)

Charting



(Innes et al, 2007)

<https://bmcoralhealth.biomedcentral.com/articles/10.1186/1472-6831-7-18/>



(Bilgin and Kaya, 2018)

<https://sdsjournal.com/article/view/2910>

ILA Step 1

- Today you are seeing a new patient Marcus Chung from Port Pirie. Marcus is 8 years old and accompanied by his mother, May Zhou. May booked her son in for a check-up.
- You examine Marcus's mouth. When you shine your light in some areas you notice some white spots and unsure of what they are, you ask May whether her family drinks tap water at home.



- May tells you that they boil their tap water before drinking and that Marcus and his sister are not allowed fizzy drinks
- Upon reporting to May that her son's mouth has no decay and healthy gums, she interjects to ask if his teeth are growing correctly and asks whether he will need braces

(Zou et al, 2018)

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(Zou et al, 2018)

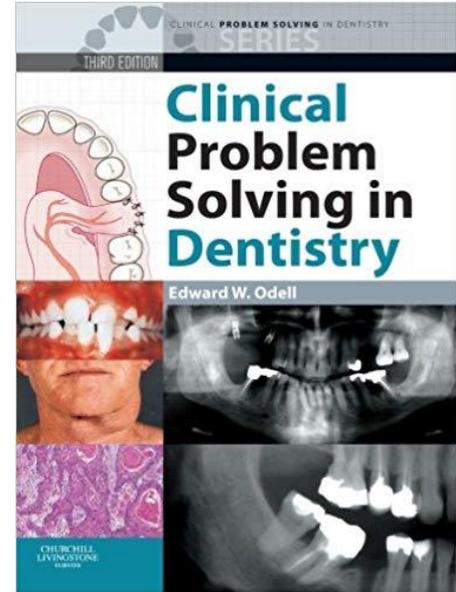
- May tells you that they **boil their tap water before drinking** and that Marcus and his sister **are not allowed fizzy drinks**
- Upon reporting to May that her son's mouth has **no decay and healthy gums**, she interjects to ask if his teeth are growing correctly and asks whether he will need braces

ILA Step 1

Organized Facts	Preliminary Ideas	Key Observations (Prioritize)
Setting: Unknown Dental Clinic		
<p>People Involved:</p> <p>Marcus Chung</p> <p>Patient Information/MHx/DHx/SHx</p> <ul style="list-style-type: none">- 8 years old, from Port Pirie- Medical History Unknown- Visiting dentist on a check-up- Has unidentified white spots on teeth- Drinks boiled tap water and no fizzy drinks <p>Examination findings</p> <ul style="list-style-type: none">- No decay and healthy gums- Mixed dentition- 11 is behind 41 in occlusion <p>May Zhou (mother)</p> <ul style="list-style-type: none">- Concerned about appearance of son's teeth, enquires about orthodontics- Does not allow children to have soft drinks, allows boiled tap water <p>Dentist</p> <ul style="list-style-type: none">- Identifies white spots on patient's teeth and asks follow up questions- Identifies Marcus's teeth and gums as being healthy		

Tips on Step 1 in an exam situation

- Consider how to organize key facts
 - Think about the importance of facts and whether it is relevant to the case. The way you organize key facts also defines the case
 - Think about how you would group information in a scenario, how have you been grouping information in ILA 1.1 to 1.4
 - Use headings to help organize information
- Practice beforehand
 - Find scenarios to organize
 - Review past ILA and guides
 - Helps you to think about how the facts can connect
 - Compare how you prioritize information to how someone else did



Gingival Assessment



(Zou et al, 2018)

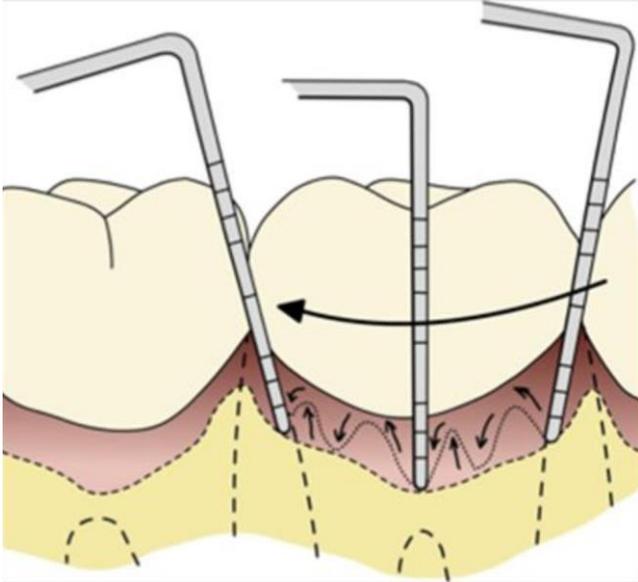
- Use Headings - be systematic!
- Be specific when describing localized features e.g. (labial of 41 to 43, interproximal of 23 and 24)
- Use clear wording and terminology
- Know how reliable indicators of gingival health are



(Beaumont et al, 2017)

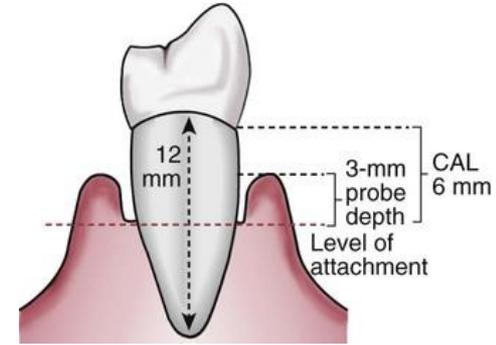
	Healthy	Unhealthy
Colour	Coral pink and red May have medium to dark brown pigmentation	Deeper or dark red
Contour	Scalloped margins Knife-edged interdental papillae	Rolled, bulbous margins Flattened/blunted interdental papillae
Consistency	Firm, bound to tooth, less retractable	Spongy, retractable, squishy
Texture	Stippled, but may be absent	No stippling, appears smooth and shiny
Exudate	Not Present	Present

Periodontal Probing



Key Points to Show in drawing

- Upside down if Maxillary tooth
 - Show bottom of sulcus, tip of probe
 - Show walking step, along tooth
 - Show angulation of probe
 - Denote which surface you are doing
-
- Read question and understand what it is asking
 - e.g. “EXPLAIN” would require written information as well as a drawing
 - Recession \neq pocketing - recession measured from CEJ to top of gingiva



<https://pocketdentistry.com/7-periodontal-diseases/>

Infection Control

- Modes of Transmission
 - Airborne: tiny droplets from aerosols
 - Droplet: from sneezing, coughing, and talking
 - Contact: direct or indirect
- Standard Precautions
 - Know when and for what reasons standard precautions are applied
 - Importance of hand hygiene
 - Why masks, eyewear, and gloves are used
- Needlestick Injury - SADS
 - Correct order for each step
 - Explicit detail: remove gloves and wash hands with soap and water, not just “wash hands”
 - Why wash?

Patient Centered Care and Culture - Key Points

- Meet, greet & seat
 - What is the purpose of this?
- Taking MHx in a PCC way
- Empathy → empathy vs sympathy
 - Provide scenario → ‘how would you show empathy?’
- Wording to a pt → use layman’s terms

Evidence-Based Dentistry

- PICO
 - What does PICO stand for?
 - Be as specific as possible in regards to P
 - How do you find it in the abstract?
- Confidence Interval
 - What does a 95% confidence interval mean?
 - How can you determine statistical significance from a 95% CI in both a single study and comparison study?
- Randomisation
 - What are some of the ways a study can achieve randomisation?
 - How do we know when there is randomisation?
- Risk Ratio
 - What does a risk ratio of <1 , 1 and >1 mean?

Practice PICO

- Be specific and details
 - Use a highlighter and see what demographics are mentioned
- Use headings
- Practice
 - Getting used to academic literature will help for many years

Effects of Water Fluoridation on Caries Experience in the Primary Dentition in a High Caries Risk Community in Queensland, Australia

Rongzhen Koh^a Margaret L. Pukallus^b Bruce Newman^b Michael Foley^c
Laurence J. Walsh^a W. Kim Seow^a

^aCentre for Paediatric Dentistry, The University of Queensland School of Dentistry, Herston, ^bMetro South Oral Health Services, Queensland Health, Kingston, and ^cMetro North Oral Health Services, Queensland Health, Brisbane, Australia

Key Words

Water fluoridation · Caries experience · Primary dentition · Low socioeconomic

Abstract

Objectives: In December 2008, artificial water fluoridation was introduced for the first time to the Logan-Beaudesert district in the state of Queensland, Australia. The aim of this study was to evaluate the effects of water fluoridation in the primary dentition in this community after a period of 36 months. **Methods:** Children aged 4–9 years with clinical examinations and bitewing radiographs (BWs) taken before water fluoridation (pre-F) were randomly selected as comparison controls for age matched children who had been exposed to a mean period of 36 months of water fluoridation (post-F). A total of 201 sets of pre-F BWs from children (mean age 6.95 ± 1.05 years) and 256 sets of post-F BWs from children (mean age 7.19 ± 1.23 years) attending schools in the district were randomly selected. Caries experience in the primary dentition was determined as decayed, missing or filled teeth/surfaces (dmft/dmfs). **Results:** The caries prevalence for the pre-F group was 87% compared to 75% in the post-F group (Odds ratio (OR): 0.44, 95% CI: 0.27–0.72). Overall, there was a 19 percent reduction of mean dmft from 4.54 in the pre-F group to 3.66 in the post-F group (p = 0.005). After fluoridation, the dmfs was reduced from 6.68 to 5.17 (p = 0.0056). The distal surfaces of maxillary first primary molars

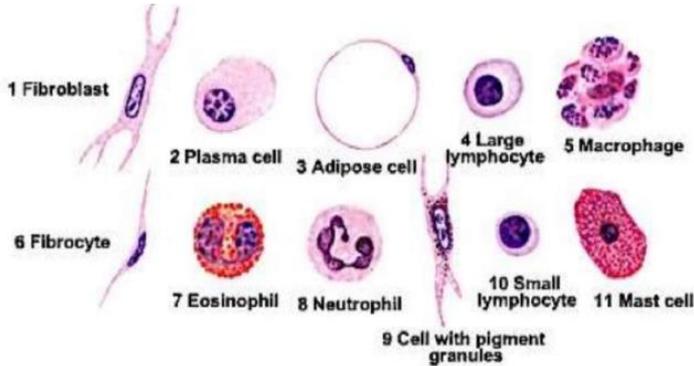
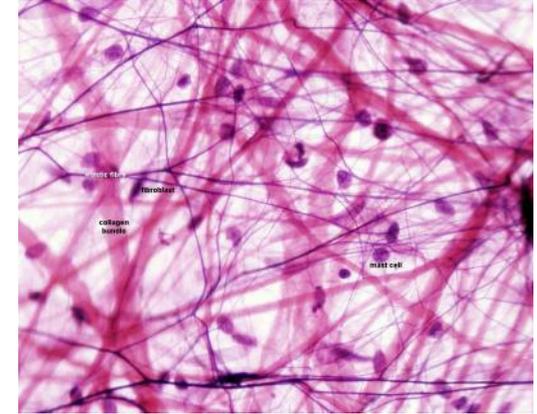
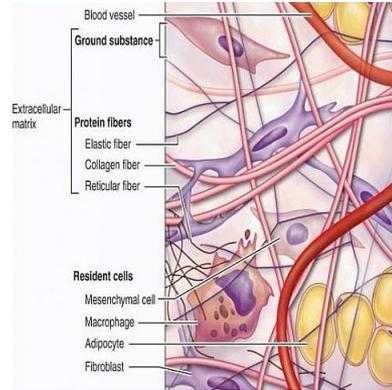
experienced the greatest reduction (26%) in caries experience after water fluoridation (p < 0.001). **Conclusions:** After only 36 months of water fluoridation there was a significant drop in caries prevalence from 87 to 75% and a 19% reduction in caries experience in a community with one of the highest caries rates in Australia. © 2015 S. Karger AG, Basel

Introduction

Water fluoridation is a cost-effective and safe method of caries prevention, and has provided benefits to many communities in Australia [Armfield, 2008; Cobiac and Vos, 2012; Slade et al., 2013]. While most technology-based advances in caries prevention tend to benefit to a greater extent those who have ready access to dental services, water fluoridation indiscriminately protects an entire community regardless of socioeconomic status [Armfield, 2008]. Prior to the introduction of water fluoridation in 2008, only 5 percent of children in the state of Queensland in Australia had access to fluoridated water, compared to approximately 86 percent of the rest of the country [Armfield, 2006]. However, within two years after a large scale rollout of water fluoridation commencing in 2008, 80% of the state's population had access to optimally fluoridated water, with an adjusted fluoride concentration between 0.6 and 0.8 mg/l.

Histology

- Cell types and how to recognize them under a microscope
- Basic cell functions
- Describing cellular components
- Basic principles in microscopy
- Identify features in ultrastructure



Classification of CT Cells

Structural or Storage cells

- fibroblasts, (7)
- fat cells, (9)

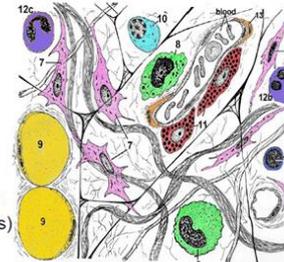
Defence Cells

- macrophages, (8)
- plasma cells, (10)
- mast cells, (11)

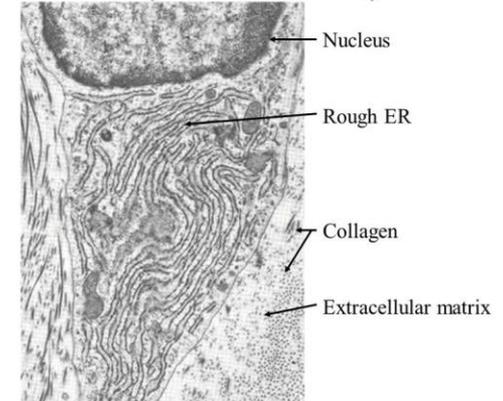
including leukocytes that migrate from bloodstream

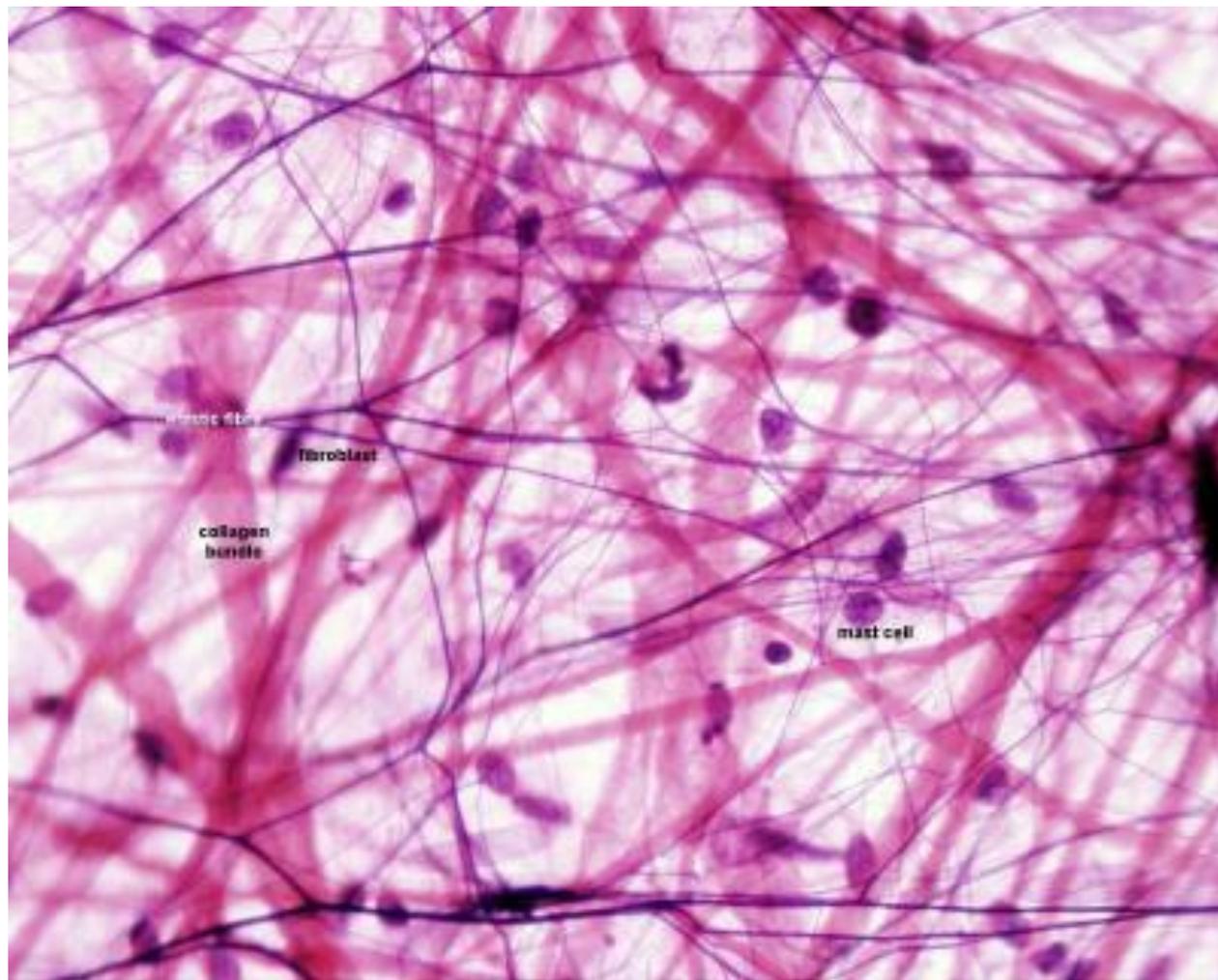
- leukocytes, (12a, b, c) or reserve cells (stem cells)
- pericytes (13)

- primitive mesenchyme cells (not shown)



Fibroblast (Ultrastructure)





Epithelium and Mucosal Surfaces

Know:

- Epithelium of all mucosal surfaces of the mouth
- Layers of the epithelium
- Sensory Nerves in the skin and their Fx
- Papillae histology and Fx of the tongue

Structure of the Mucosa in Different Regions of the Oral Cavity			
REGION	COVERING EPITHELIUM	LAMINA PROPRIA	SUBMUCOSA
Lining Mucosa			
Soft palate	Thin, nonkeratinized stratified squamous epithelium; taste buds present	Thick with numerous short papillae; elastic fibers forming on elastic lamina; highly vascular with well-defined capillary network	Diffuse tissue containing numerous minor salivary glands
Ventral surface of tongue	Thin, nonkeratinized, stratified squamous epithelium	Thin with numerous short papillae and some elastic fibers; a few minor salivary glands; capillary network in subpapillary layer; reticular layer relatively avascular	Thin and irregular; may contain fat and small vessels; where absent, mucosa is bound to connective tissue surrounding tongue musculature
Floor of mouth	Very thin, nonkeratinized, stratified squamous epithelium	Short papillae; some elastic fibers; extensive vascular supply with short anastomosing capillary loops	Loose fibrous connective tissue containing fat and minor salivary glands
Alveolar mucosa	Thin, nonkeratinized, stratified squamous epithelium	Short papillae, connective tissue containing many elastic fibers; capillary loops close to the surface supplied by vessels running superficially to the periosteum	Loose connective tissue, containing thick elastic fibers attaching it to periosteum of alveolar process; minor salivary glands
Labial and buccal mucosa	Very thick, nonkeratinized, stratified squamous epithelium	Long, slender papillae; dense fibrous connective tissue containing collagen and some elastic fibers; rich vascular supply giving off anastomosing capillary loops into papillae	Mucosa firmly attached to underlying muscle by collagen and elastin; dense collagenous connective tissue with fat, minor salivary glands, sometimes sebaceous glands
Lips: vermilion zone	Thin, orthokeratinized, stratified squamous epithelium	Numerous narrow papillae; capillary loops close to surface in papillary layer	Mucosa firmly attached to underlying muscle; some sebaceous glands in vermilion border, minor salivary gland and fat in intermediate zone
Lips: intermediate zone	Thin, parakeratinized, stratified squamous epithelium	Long, irregular papillae; elastic and collagen fibers in connective tissue	-
Masticatory Mucosa			
Gingiva	Thick, orthokeratinized or parakeratinized, stratified squamous epithelium often showing stippled surface	Long, narrow papillae; dense collagenous connective tissue; not highly vascular but has long capillary loops with numerous anastomoses	No distinct layer; mucosa firmly attached by collagen fibers to cementum and periosteum of alveolar process (mucoperiosteum)
Hard palate	Thick, orthokeratinized (often parakeratinized in parts), stratified squamous epithelium thrown into transverse palatine ridges (rugae)	Long papillae; thick, dense collagenous tissue, especially under rugae; moderate vascular supply with short capillary loops	Dense collagenous connective tissue attaching mucosa to periosteum (mucoperiosteum); fat and minor salivary glands are packed into connective tissue in regions where mucosa overlies lateral palatine neurovascular bundles
Specialized Mucosa			
Dorsal surface of tongue	Thick, keratinized and nonkeratinized, stratified squamous epithelium forming three types of lingual papillae, some bearing taste buds	Long papillae; minor salivary glands in posterior portion; rich innervation especially near taste buds; capillary plexus in papillary layer; large vessels lying deeper	No distinct layer; mucosa is bound to connective tissue surrounding musculature of tongue

Oral histology

Function of different types of histological features in the mouth:

- Keratin, rete ridges, BVs.... why do the lips look like they do?
- Relate appearance to form (La/Bu/alveolar mucosa)

Which taste buds are/are not keratinised?

Which taste buds are/are not keratinised?

Histology of the floor of the mouth & why?

** KNOW TOUR OF THE MOUTH PPT **

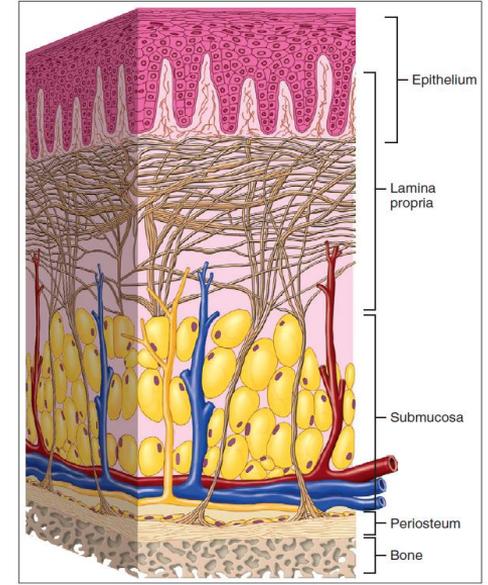


FIGURE 12-4 Main tissue components of the oral mucosa.

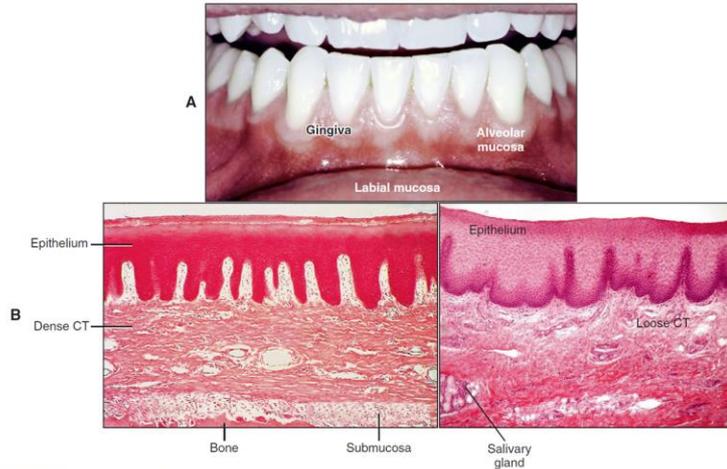
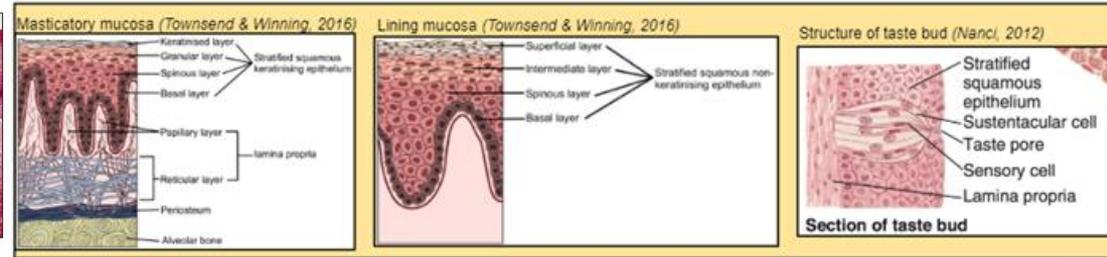
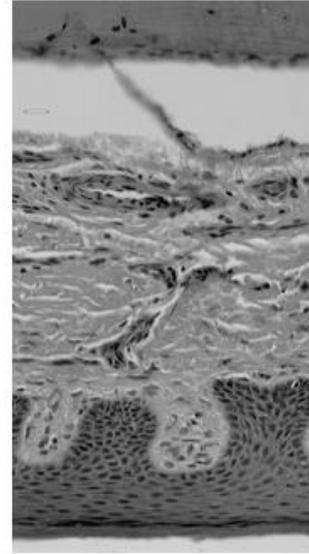
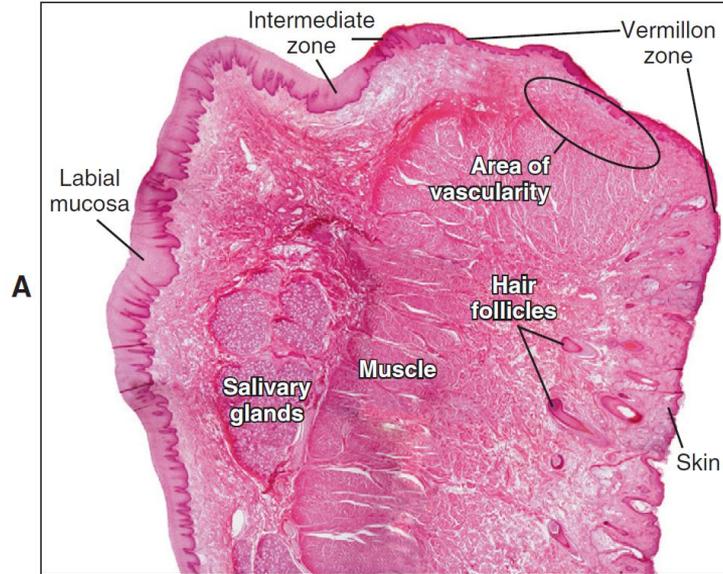


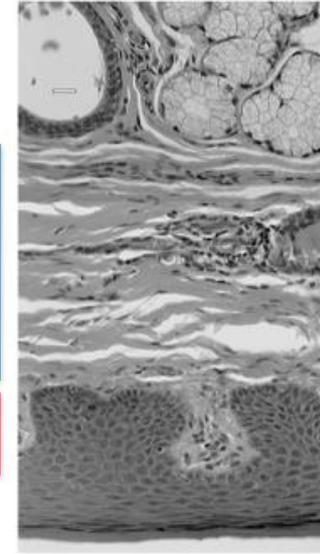
FIGURE 1-6 Oral mucosa. **A**, Note the difference between tightly bound mucosa of the gingiva (gum) and mobile mucosa of the labial sulcus (alveolar mucosa). **B**, In histologic sections, the gingival epithelium is seen to be tightly bound to bone by a dense fibrous connective tissue (CT), whereas the epithelium of the lip (**C**) is supported by a much looser connective tissue.



Oral histology



Anterior hard palate



Postero-lateral
hard palate

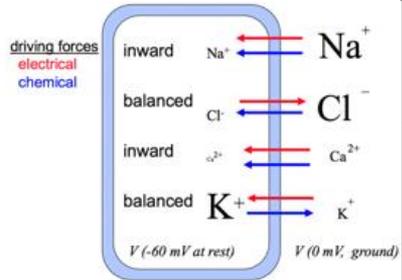
| Papillary layer of lamina propria

| Reticular layer of lamina propria

Nervous System

Ionic concentrations

	internal	external (ECF)
K	140	4
Na	15	150
Cl	10	110
Ca	<0.0002	2



Scenario	Na ⁺ can't enter cell	K ⁺ cannot re enter cell during recovery	LA
Graph form	<p>1</p> <p>Only the passive response to the applied stimulus remains.</p> <p>Tetrodotoxin (TTX)</p> <p>$V \text{ (mV)}$ vs time</p> <p>(some slight undershoot is possible if K_v channels are opened)</p>	<p>2</p> <p>Only Na channel inactivation allows the downstroke. <u>No undershoot</u> occurs.</p> <p>Tetraethylammonium</p> <p>$V \text{ (mV)}$ vs time</p>	<p>3</p> <p>a local anaesthetic</p> <p>$V \text{ (mV)}$ vs time</p>
Effect	<p>Na⁺ can't enter the cell therefore the cell cannot reach threshold</p>	<p>K⁺ cannot re enter the cell during recovery therefore downstroke is slower as only the Na⁺ exiting drives the downstroke</p>	<p>LA <u>slowly</u> stabilises the inactivated state of the Na⁺ voltage gated channels, therefore no Na⁺ enters the cell</p>

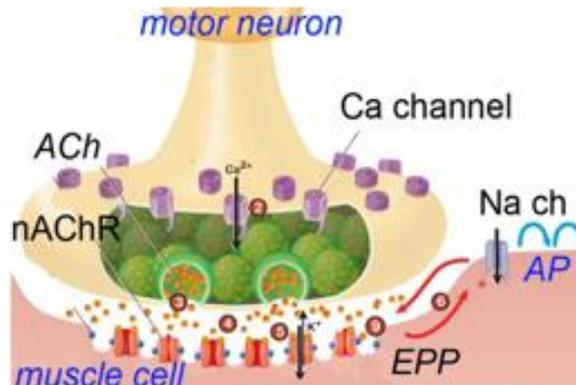
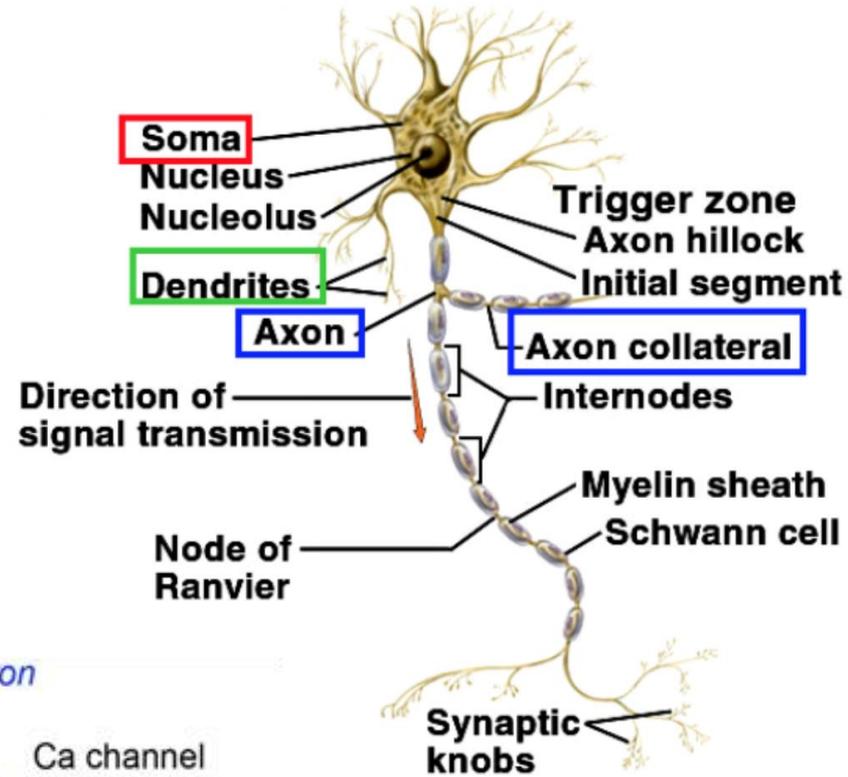
Nervous System

Know generally:

- CNS vs PNS
- ANS vs SNS vs ENS
- ANS: SNS vs PNS

Know process:

- Depolarisation
- Neuromuscular Junction



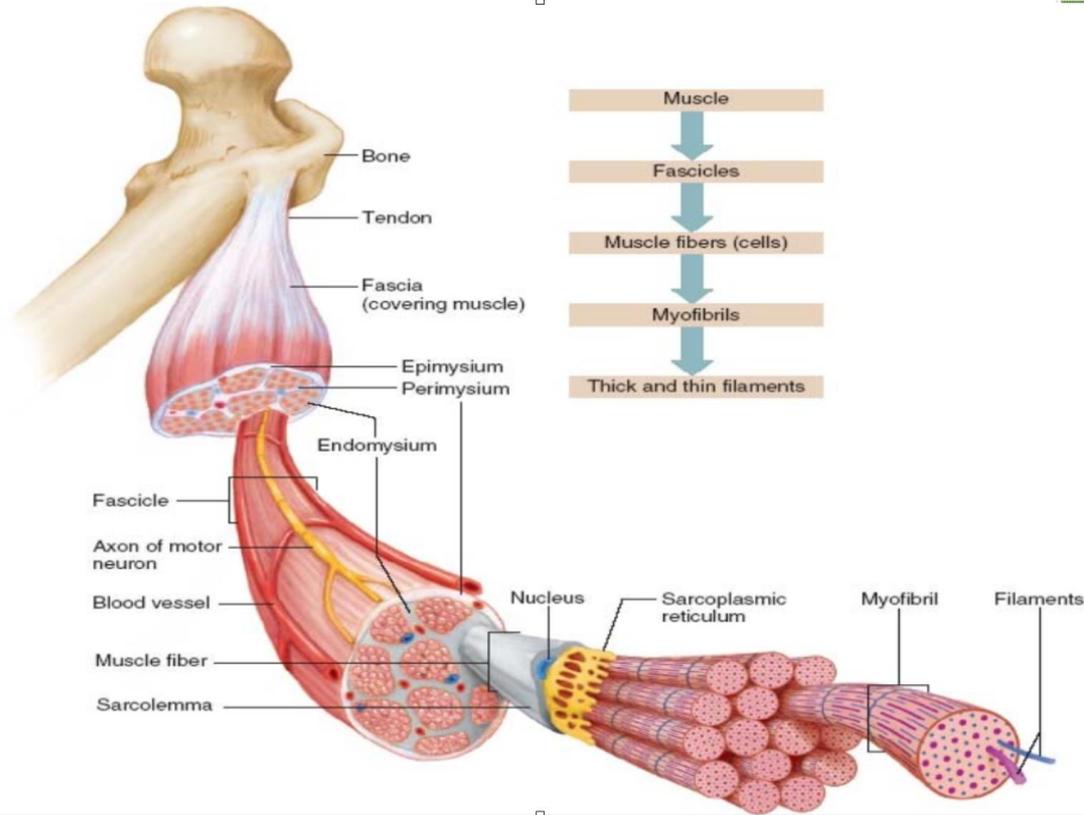
Muscle

Know

- Make up of muscle fibre
- Process of muscle contraction

Know and be able to label

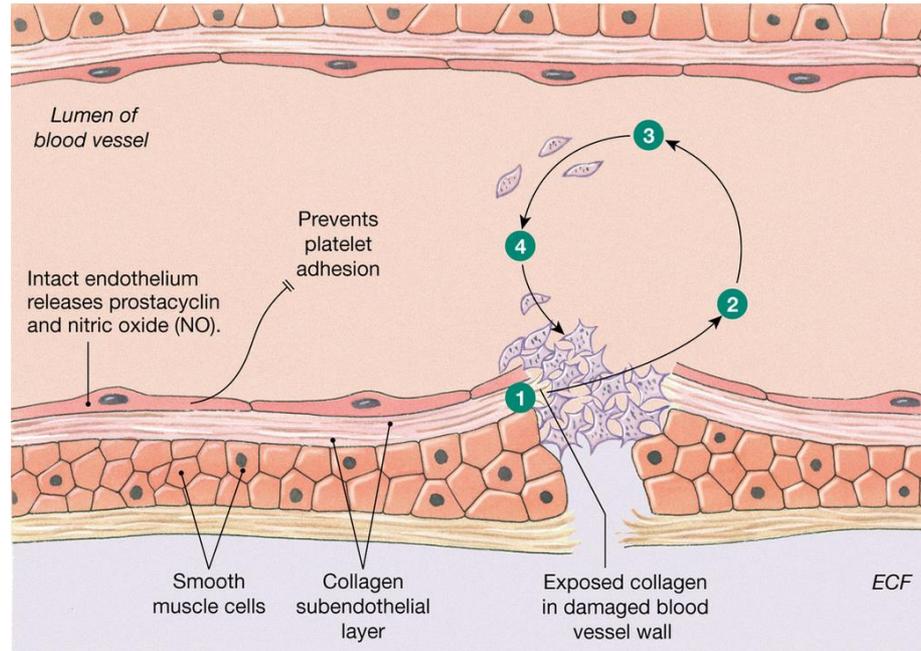
- Anatomy of muscle fibre



Blood

- Buffering systems
- Haemoglobin role
- Clotting cascade
- Platelet formation

Platelets will not adhere to intact endothelium. Damage triggers platelet plug formation where collagen has been exposed.



- 1 Exposed collagen binds and activates platelets.
- 2 Release of platelet factors
- 3 Factors attract more platelets.
- 4 Platelets aggregate into platelet plug.

Osteology

Cartilage growth

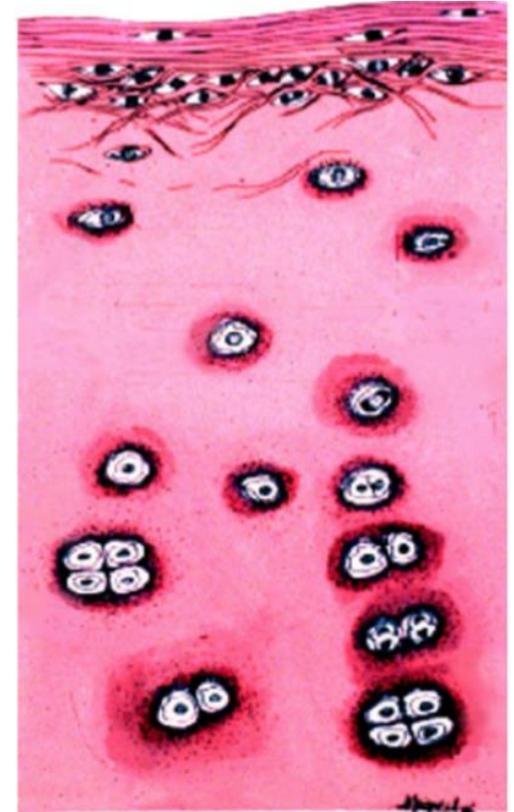
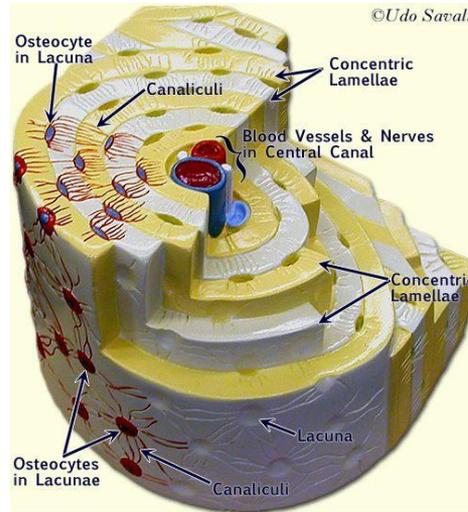
- Interstitial vs Appositional growth

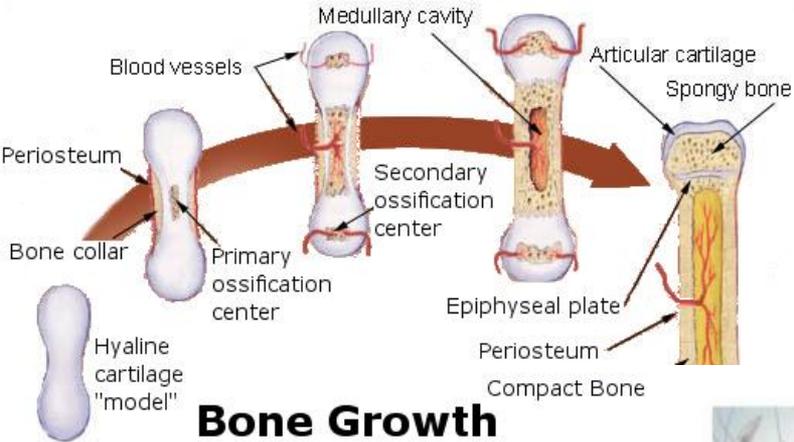
Osteogrowth

- Endochondral vs Intra-membranous

Be able to recognise and label

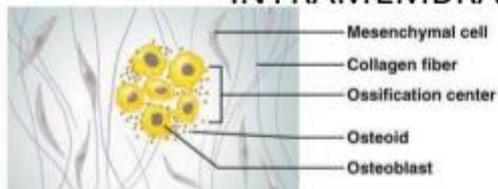
- Osteon/Haversian System





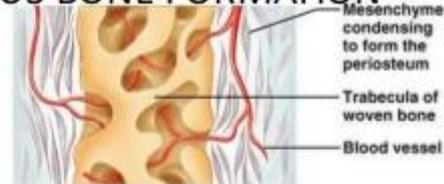
Bone Growth

INTRAMEMBRANOUS BONE FORMATION



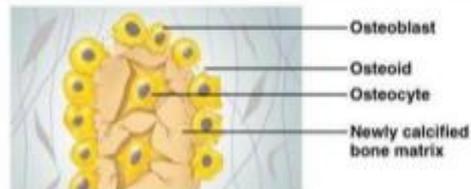
① An ossification center appears in the fibrous connective tissue membrane.

- Selected centrally located mesenchymal cells cluster and differentiate into osteoblasts, forming an ossification center.



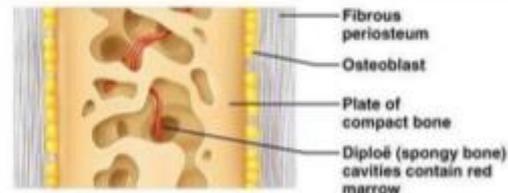
③ Woven bone and periosteum form.

- Accumulating osteoid is laid down between embryonic blood vessels, which form a random network. The result is a network (instead of lamellae) of trabeculae.
- Vascularized mesenchyme condenses on the external face of the woven bone and becomes the periosteum.



② Bone matrix (osteoid) is secreted within the fibrous membrane.

- Osteoblasts begin to secrete osteoid, which is mineralized within a few days.
- Trapped osteoblasts become osteocytes.



④ Bone collar of compact bone forms and red marrow appears.

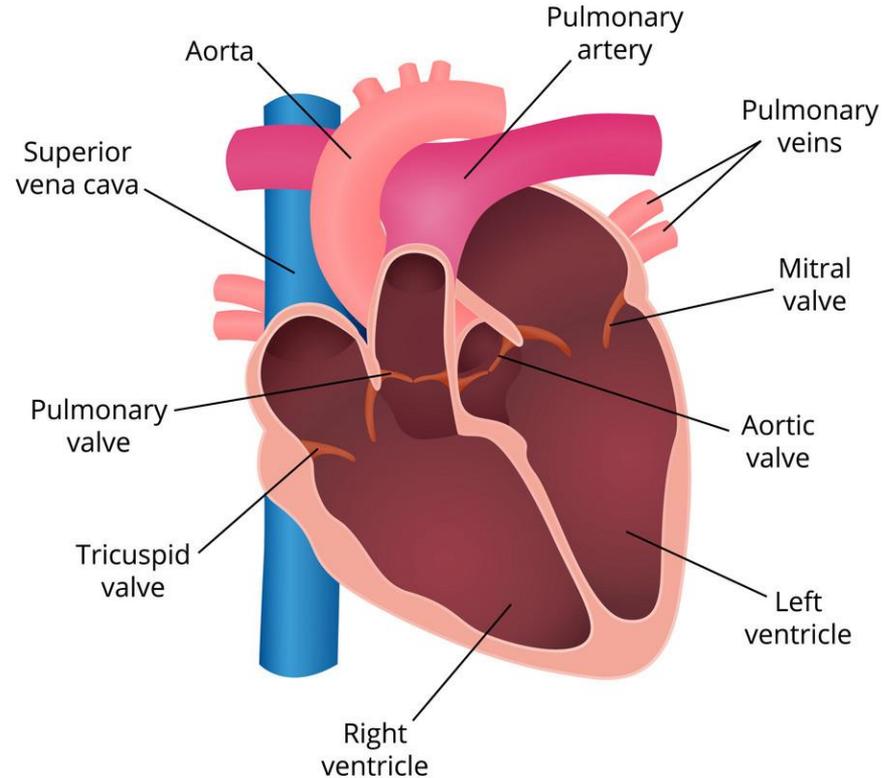
- Trabeculae just deep to the periosteum thicken, forming a woven bone collar that is later replaced with mature lamellar bone.
- Spongy bone (diploë), consisting of distinct trabeculae, persists internally and its vascular tissue becomes red marrow.

Cardiovascular

Be able to draw and label

- Anatomy of the heart
- Electrical conductivity of the heart
- Blood flow of the heart

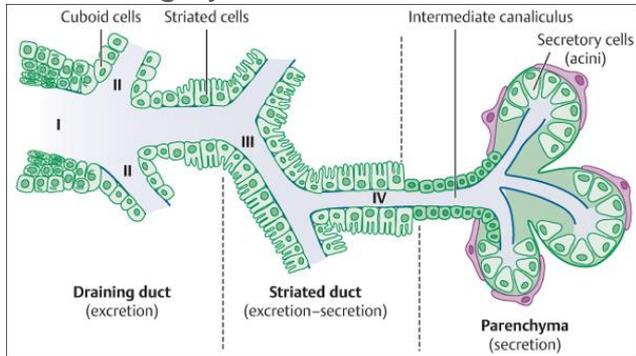
HEART ANATOMY



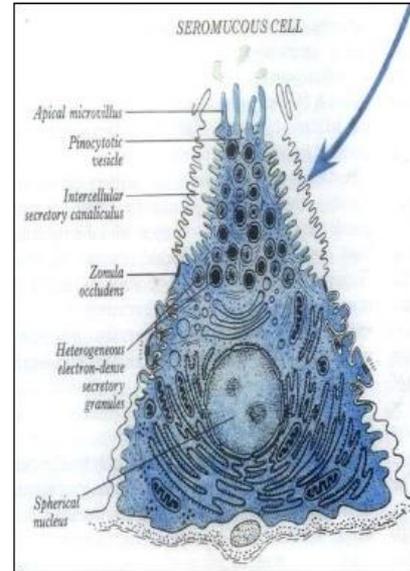
Saliva and their Glands

Know:

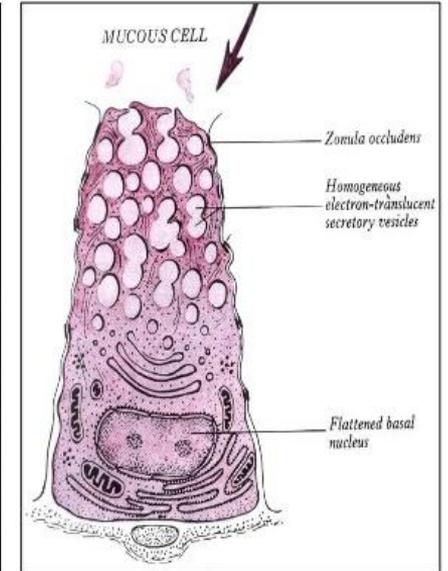
- Major and Minor salivary gland secretions
- Difference diagrammatically between serous and mucin cell
- Saliva Fx
- Saliva composition
- Buffering systems



SEROUS CELLS



MUCOUS CELLS



Effective Studying and Planning

- Writing your notes → aids with retaining information
 - Rewrite concisely in own words & by hand
- Use flash cards & quiz each other → verbal revision
- Revision timetable → dedicate days to revise topics systematically
- Use yellow highlighters!
- Read through all notes in morning & night everyday
- Write own questions & quizzes for each other
- Make powerpoint slides on different topics
- Use any form of resources you have → online quizzes, exam papers, notes etc.
- Take regular breaks



Exam Day

Prior Exam

- Plan transport → aim to arrive 30-45min early
 - Public transport → take at least one bus/tram earlier than intended (in case it runs late, you have back-up)
 - Uber → keep in the traffic in mind!
- Once there → find seat number & memorise it
- Bring snacks & wear warm clothes - Wayville can be quite cold!
- Chill → eat, drink, use bathroom, chat about anything BUT the exam
- Turn off devices or put them on silent

Exam Day

What to Bring

- Black / blue pens → a MUST for exams
- Other different coloured pens → for labelling
- Pencil/pacer & eraser → drawing
- Highlighters
- Analog watch → clock is small & hard to see depending on seated position
- CLEAR PLASTIC water bottle
- Bring spares

Exam Day

Exam Format

- Exam 1 - SAQ, 107 marks
 - 5 Scenarios, 30 questions
 - EBD, ILA Step 1, drawing, labelling, structure & function, PCC
 - More clinic > biodental questions
- Exam 2 - SBA (63 marks) & EMQ (45 marks)
 - 63 SBA's
 - 34 EMQ's
 - More biodent-related questions, plus anything included above!

Exam Day

During Exam

- Find your seat ASAP
- Write name + ID on all exam booklets & answer sheets once seated
- Listen very carefully to microphone person → will say when to start
- Reading time (10min) → check all pages present
 - SBA & EMQ → answer as many as possible on scrap paper!!
 - SAQ → skim through & identify difficult q's to think through, jot ideas
- Working time (120min)
 - Work as fast as you can → skip the 1 mark question if you can't answer immediately, circle missed/undecided questions
 - Try leave 10min at the end to check through your work
 - Read what the question wants & be concise!!!
 - Dot points are ok
 - Number of “minutes” on a question can be guide on number of marks

Exam Day

Post-Exam

- BREATHE
- Be happy :)
- If you prefer, discuss the exam but don't get down about it!
- Write a braindump - helps studying for Exam 2
- Relax with your friends - clear your mind & get some dessert or dinner
- Sleep early



Questions?